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*Profil Epidémiologique de l'Asthme et de la  
Bronchopneumopathie Chronique Obstructive au Centre  
Hospitalier Provincial de Sidi Saïd de Meknès, Maroc  
[Epidemiological Profile of Respiratory Diseases in Health  
Centers under the Jurisdiction of the Prefecture of Meknes,  
Morocco]*

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#### Résumé

**Objectif:** Cette étude a pour but d'étudier le profil épidémiologique des hospitalisations pour asthme et pour bronchopneumopathie chronique obstructive (BPCO) au centre hospitalier provincial de Sidi Saïd. **Méthodes:** Il s'agit d'une étude rétrospective et descriptive portant sur les sujets hospitalisés pour asthme et pour BPCO au centre hospitalier de Sidi Saïd et s'étalant sur une période de 8 années (2005-2012). **Résultats:** la BPCO était plus prononcée chez les sujets de sexe masculin (93,05 %), alors que les crises d'asthme étaient plus fréquentes chez le sexe féminin avec un taux noté de 52,86 %. 93,04 % des cas de BPCO avaient plus de 44 ans et 65 % des asthmatiques avaient 45 ans ou plus. Les deux affections respiratoires chroniques étaient plus répandues durant la période automno-hivernale. **Conclusion:** Les pathologies respiratoires chroniques représentent un véritable problème à la fois sanitaire et socio-économique pour les familles et les structures sanitaires d'accueilles. La fréquence, l'évolution et la gravité de ces maladies doivent nous inciter à mener des recherches plus poussées à propos de ce sujet afin de trouver les solutions les plus plausibles pour réduire les répercussions négatives.

**Mots clés –** Hospitalisations; Pathologies Respiratoires; BPCO; Asthme; Meknès

#### Abstract

**Objective:** The aim of this research is to study the epidemiological profile of hospitalisations for asthma and chronic obstructive pulmonary disease (COPD) in the provincial hospital centre of Sidi Saïd. **Methods:** This is a retrospective and descriptive study of subjects hospitalised for asthma and COPD at the Sidi Saïd Hospital Centre over a period of 8 years (2005-2012). **Results:** COPD was more pronounced in males (93.05%), while asthma attacks were more frequent in females (52.86%). 93.04% of COPD cases were over 44 years of age and 65% of asthmatics were 45 years of age or older. Both chronic respiratory affections were more prevalent during the autumn-winter period. **Conclusion:** Chronic respiratory diseases represent a real health and socio-economic problem for families and health care facilities. The frequency, evolution and severity of these diseases should prompt us to conduct further research on this subject in order to find the most plausible solutions to reduce the negative repercussions.

**Keywords –** Hospitalisations; Respiratory Diseases; COPD; Asthma; Meknes.

## I. INTRODUCTION

Les pathologies respiratoires représentent l'une des causes majeures de morbidité et de mortalité [1]. A l'échelle mondiale, on estime que 300.000.000 de personnes souffrent de l'asthme et 210.000.000 de la bronchopneumopathie obstructive chronique (BPCO) [2].

Annuellement, 417 918 décès sont attribuables à l'exacerbation de l'asthme [3] et 3000.000 à la BPCO [4].

Dans les pays en voie de développement, la prévalence des maladies respiratoires est encore inconnue [1].

Au Maroc, très peu d'études publiées, se sont intéressées de façon rigoureuse aux affections respiratoires chroniques. De ce fait, l'objectif majeur de cette recherche est d'étudier le profil épidémiologique de l'asthme et de la BPCO au niveau du centre hospitalier provincial de Sidi Saïd (Meknès).

## II. MATÉRIELS ET MÉTHODES

Il s'agit d'une étude rétrospective et descriptive étudiant le profil épidémiologique de l'asthme et de BPCO au niveau du centre hospitalier provincial (CHP) de Sidi Saïd, situé au niveau de la ville de Meknès (**Fig. 1**) sur une période de 8 années (2005-2012). Les données sanitaires ont été collectées à partir des registres médicaux des hospitalisations. Les informations exploitées sont: l'âge, le sexe, le sexe, l'adresse et le trimestre de déclaration. Ces données ont été saisies et analysées par Microsoft Excel 2010.

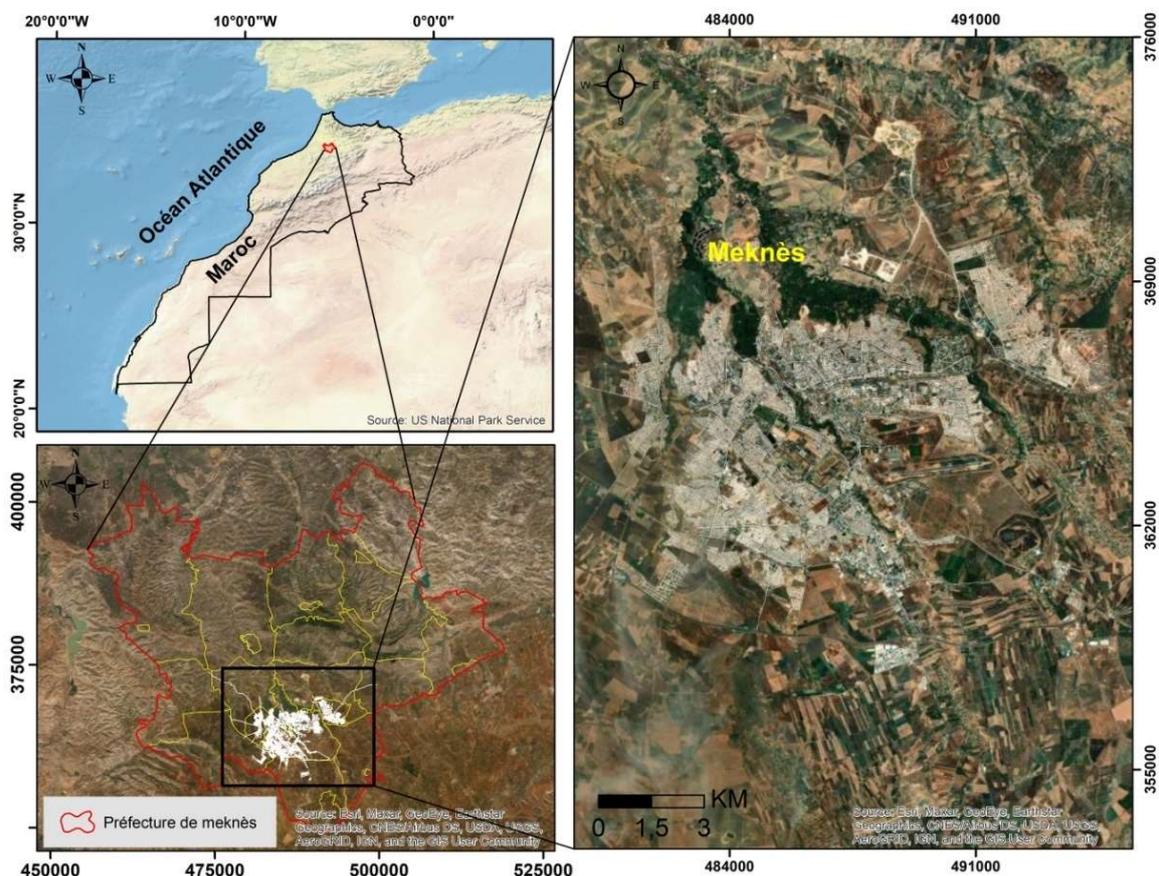


Figure 1. Géolocalisation de la préfecture de Meknès

## III. RÉSULTATS

### 3.1. Asthme

Des 3170 hospitalisations pour pathologies respiratoires, 1084 cas d'asthme ont été répertoriés, soit une fréquence de 34, 19 %.

La répartition des sujets asthmatiques selon le sexe montre que 52,86 % des patients étaient de sexe féminin et 47,14 % de sexe masculin (Fig. 2). Le sexe ratio a été de 1,12 en faveur du sexe féminin.

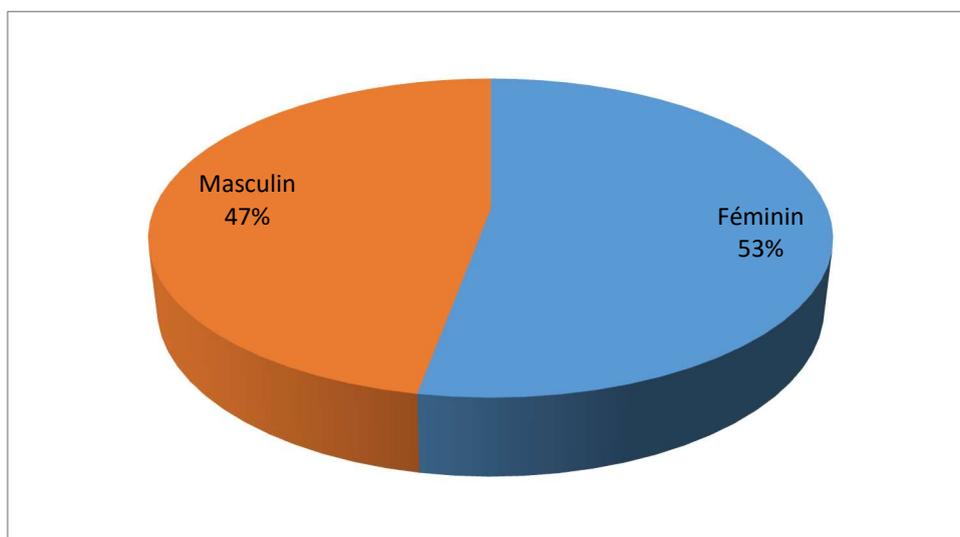


Figure 2. Répartition des hospitalisations pour asthme selon le sexe

L'âge moyen des patients a été de  $49,83 \pm 16,58$  ans (âge extrême 6-90 ans). La médiane d'âge a été de 50 ans. La tranche d'âge la plus représentée a été celle allant de 45 à 54 ans (23,33 %) et plus de 65% des sujets avaient un âge supérieur ou égal à 45 ans (Fig.3).

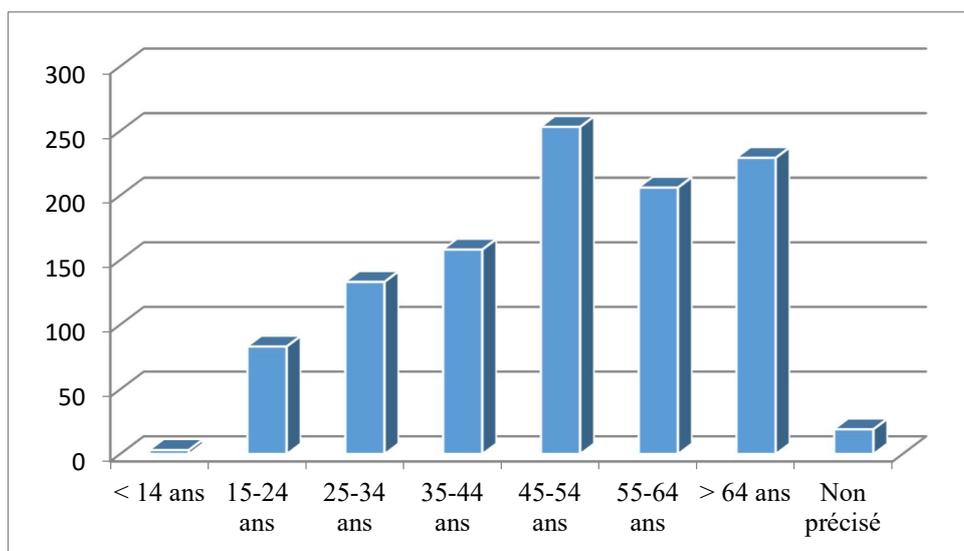


Figure 3. Répartition des hospitalisations pour asthme selon l'âge

La répartition trimestrielle des hospitalisations pour asthme montre que 29,05 % des cas ont été enregistrés en hiver et 27,85 % en automne (Fig.4).

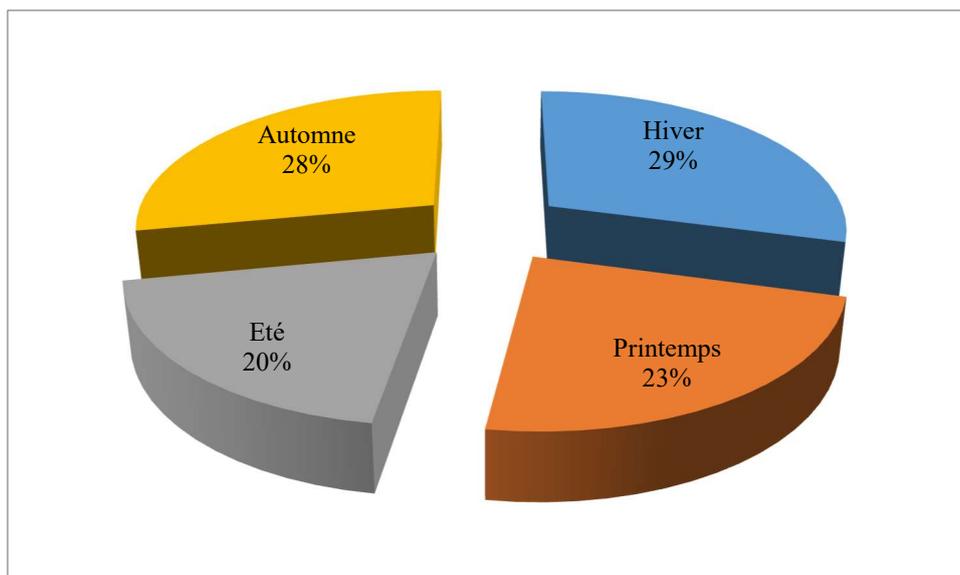


Figure 4. Répartition trimestrielle des hospitalisations pour asthme

La durée moyenne d'hospitalisation pour asthme a été de 8,44 jours.

### 3.2. BPCO

La BPCO a représenté le quatrième motif d'hospitalisation pour affections respiratoires, avec 360 cas (soit 11,56 %). Les sujets de sexe masculin ont été plus touchés que ceux de sexe féminin avec 335 cas (93,50 %) contre 25 cas (6,94 %) (Fig. 5). Le sex-ratio a été de 13,4 en faveur du sexe masculin.

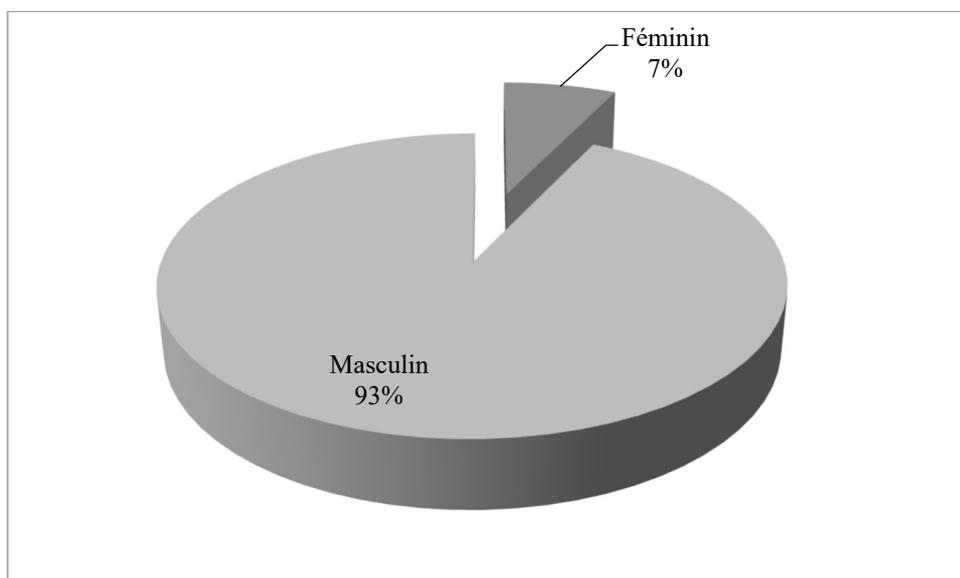


Figure 5. Répartition des hospitalisations pour BPCO selon le sexe

L'âge moyen des patients a été de  $62,70 \pm 12,8$  ans (âge extrême 15 - 98 ans). La médiane d'âge a été de 62 ans. Quarante-quatre pourcent des cas hospitalisés pour BPCO avaient plus de 64 ans et 93,04 % avaient plus de 44 ans (Fig.6).

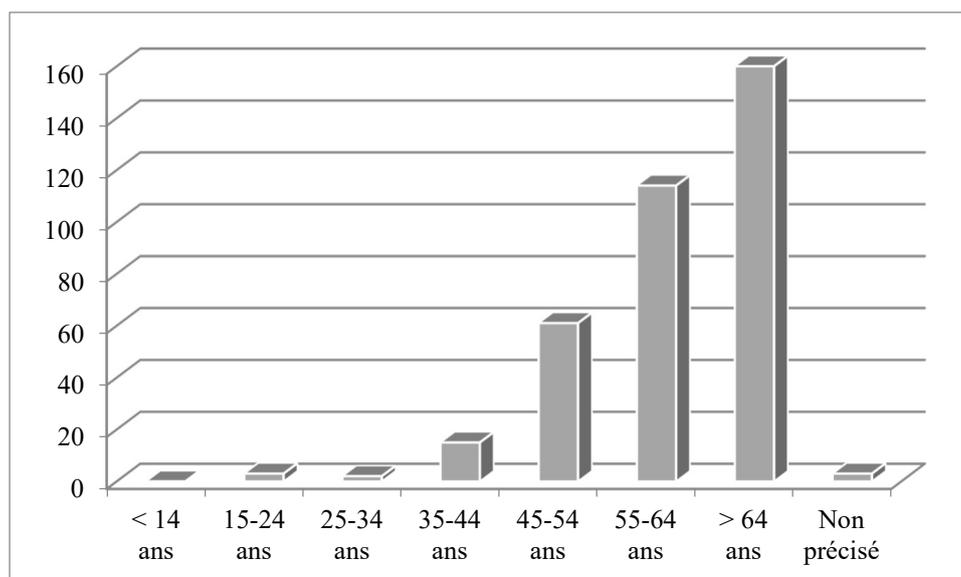


Figure 6. Répartition des hospitalisations pour BPCO selon l'âge

L'analyse de la répartition saisonnière des hospitalisations pour BPCO montre que 37,22 % des cas ont été notés en hiver et 22,77 % en automne (Fig.7).

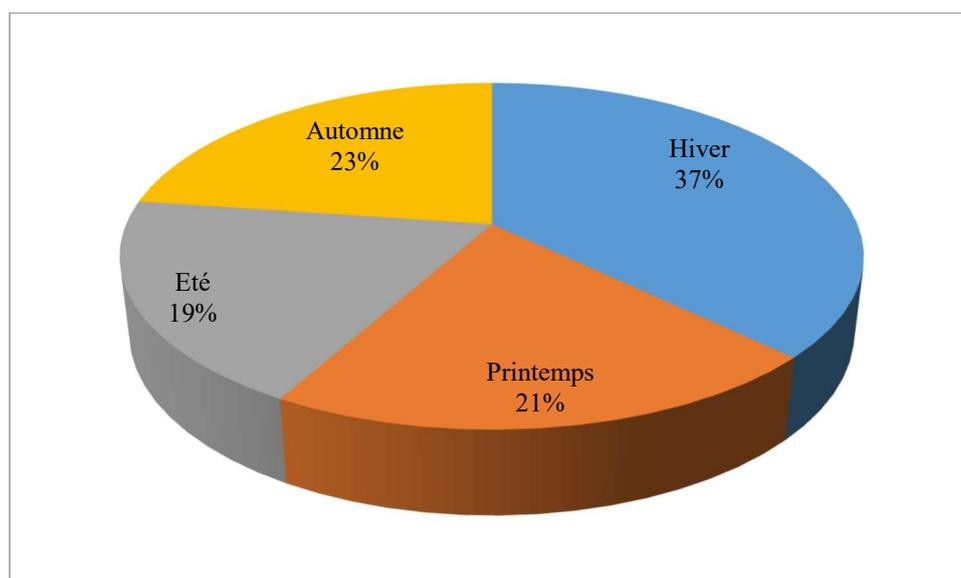


Figure 7. Répartition trimestrielle des hospitalisations pour BPCO

La durée moyenne d'hospitalisation pour BPCO a été de 8,38 jours.

#### IV. DISCUSSIONS

##### 4.1. Asthme

Les sujets de sexe féminin sont légèrement plus touchés que ceux de sexe masculin (52,86 % versus 47,14 %) avec un sex-ratio de 1,12. La prédominance féminine a été rapportée par d'autres auteurs travaillant sur le même sujet [5], [6], [7], [8]. En revanche, certains études ont noté une prédominance du sexe masculin, surtout chez les populations pédiatriques [9], [10], [11]. Au CHP de Sidi Saïd, la tranche d'âge la plus affectée par les crises d'asthme est celle de 45-54 ans (23,33 %), suivie de celle de plus de 64 ans (21,12 %) et les moins de 14 ans ne représentent que 0,27 %. Aux centres de santé de la préfecture de Meknès, la tranche d'âge la

plus touchée est celle de 50 ans et plus (45,38 %), suivie de celle allant de 15 à 49 ans (44,56 %) et les sujets âgés de 5-14 ans sont les moins représentés avec un taux de 10,05 % [12]. Les crises d'asthme sont plus fréquentes durant la période automne-hiver. Cette augmentation peut-être liée aux variations de la température. La baisse de la température a pour effet de favoriser la propagation des virus responsables des infections respiratoires et dont certains sont susceptibles de provoquer des épisodes d'asthme [13] et elle contribue également au développement des moisissures et des acariens qui libèrent des pneumallergènes qui peuvent participer à la genèse de l'asthme chez les personnes indemnes et à l'apparition des crises d'asthme chez les personnes asthmatiques [13]. Au CHP de Sidi Saïd, la durée moyenne d'hospitalisation pour asthme est de 8,44 jours. Au centre hospitalier universitaire Hassan II de Fès, la durée moyenne du séjour est de 10 jours [14].

#### **4.2. BPCO**

À Meknès, l'exacerbation de la BPCO est plus fréquente chez les patients de sexe masculin avec un sex-ratio de 13,4. Ces résultats rejoignent ceux de l'étude menée au niveau des centres de santé de Meknès, où une nette prédominance masculine est observée (82,26 %) [12]. Cependant, quelques auteurs ont rapporté une prédominance du sexe féminin [15], [16]. Ceci pourrait s'expliquer par le fait qu'au Maroc, le nombre de femmes fumeuses est largement inférieur à celui des hommes, contrairement à certains pays industriels où la prévalence des femmes fumeuses dépasse celle des hommes [17]. Dans cette série, la tranche d'âge la plus sujette à l'exacerbation de la BPCO est celle de plus de 64 ans et 93,04 % des sujets ont plus de 44 ans. Ce résultat concorde avec celui rapporté au niveau des centres de santé de Meknès où la tranche d'âge la plus affectée par la BPCO est celle de 50 ans et plus avec un taux de 57,73 % [12]. Dans cette étude, 37,22 % des cas de BPCO sont notés en hiver. Ce résultat est proche de celui enregistré au niveau des centres de santé de Meknès où 32,45 % des exacerbations de la BPCO sont déclarées au premier trimestre [12]. Ce résultat rime également avec celui rapporté par El Ihyaoui, qui a enregistré une augmentation des exacerbations des symptômes de la BPCO durant la saison hivernale [18]. La chute de la température favorise la propagation des virus. Ces virus sont retrouvés chez 30 à 60 % des patients souffrant de la BPCO [19] et les virus fréquemment identifiés lors des exacerbations sont les rhinovirus, le virus de la grippe et le virus respiratoire syncytial [19]. A Marrakech, l'étiologie infectieuse est retrouvée chez 72,03 % des patients [18]. Au CHP de Sidi Saïd, la durée moyenne d'hospitalisation pour BPCO est de 8,38 jours. Au Royaume-Uni, la durée moyenne d'hospitalisation est de 9,9 jours [20] tandis qu'au Canada, elle est de 10,5 jours [21].

#### **V. CONCLUSION**

Les pathologies respiratoires représentent un véritable problème à la fois sanitaire et socio-économique pour les familles et les structures sanitaires. La fréquence, l'évolution et la gravité de ces maladies doivent nous inciter à mener des recherches plus poussées à propos de ce sujet afin de trouver les solutions les plus plausibles pour réduire les répercussions négatives.

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Les auteurs ne déclarent aucun conflit d'intérêts en relation avec cet article.

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# *Linguovoculary Properties Of Art Terms (On The Example Of French And Uzbek Languages)*

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**Abstract** – This article discusses the penetration of terminology into science as a field. It also discusses research by foreign and Uzbek scholars and research in the field of terminology, as well as the linguocultural features of art terms in French and Uzbek.

**Keywords** – Terminology, Term, Schools Of Terminology, Art Terms, International Cultural Relations, Musical Instruments, Tambourine, Fiddle, Dutar, Trumpet, Devon, Paintbrush.

## I. INTRODUCTION

It is no exaggeration to say that the 21st century is not only the age of engineering and technology, but also a period of high attention to language, especially foreign languages. Indeed, as a shining example of today's intellectualism, a perfect knowledge of at least two foreign languages along with one's own language is also implied.

It is well known that language is the most important component of national culture, and the word is a means of understanding the spirituality, philosophy and history of a people. In this regard, in world linguistics, the study of the specific features of each national language on a scientific basis and their transmission to future generations is of great importance in today's rapidly developing science.

Language is the greatest discovery in the spiritual world of man in the way of realizing his identity. As many studies language over time, he discovers its various and new facets. Thus, it is safe to say that a huge "pyramid" of linguistic unity, called "linguistics" and its peculiarities, has been created and is still expanding.

## II. LITERATURE REVIEW

As linguistics is studied as a field, terminology has become an integral part of it as an important link. There are different definitions of the term "terminology" in science:

Terminology (Latin *terminus* - border + Greek *logos* - science, doctrine) has several meanings.

1. A set of terms used in a field of science, technology, profession. For example, Uzbek terminology.
2. The field of linguistics, which deals with the study and regulation of terms. For example, the Department of Terminology, a specialist in terminology [5, 74].

Terminology is a set of terms related to a particular field and a branch of linguistics that deals with the regulation of terms. For example, grammatical terminology, terminology issues [12, 564].

Terminology is a unique language created by each author. [13, 350].

In the field of terminology, many world scientists have shared their research over the years. Its composition as a science is based on the first works of the Austrian scientist O.V. Nubasov and Russian scientist D.S. Lotte, published in 1930. Currently, terminology schools have emerged in countries such as Austria, Germany, France, Russia, and the Czech Republic [11, 125].

In addition, Russian scientists, V.G. Gak, O.S. Akhmanova, S.O. Kartsevsky, V.V. Antimirova, V.A. Tatarinov, A.L. Abramyan, B.N. Golovin, R.Y. Kobrin, V.P. Danilenko, M.A. Marusenko, A.A. Streltsov, N.M. Golubeva-Monatkina, French scientists F. de Saussure, Uzbek scientists M. Kholbekov, P. Nishanov, O. Ahmedov, J. Buronov, M. Buronova, M. Toshbaeva, H. Dadaboev, M. Umarkhodjaev, N. Kambarov, D. The scientific works of Khodjaeva, [7, 149-159], M. Juraeva, [2, 62] and N. Kuldashova [3, 148] are of special importance. Along with F. de Saussure, French scholars such as Guy Rondeau (Guy Rondeau, Introduction to the Terminology, Boucherville, Québec, Gaëtan Morin, 2nd ed., 1984, p. 238), Maria Teresa Cabre Castellvi (Maria Teresa Cabré Castellvi, La terminologi) . Théorie, Methods and Applications, Paris, Armand Colin, 1998, 322 p.), Marie-Claude Lom (Marie Claude l'Homme, La terminologie. Principles and techniques, Presses of the University of Montreal, 2004, 278 p.) studies by scientists such as [14] are also relevant.

### III. ANALYSIS

Ulug Tursunov was one of the first to clarify the issues of Uzbek language terminology and wrote many monographs on this topic. In particular, "Against the aspirations of the bourgeoisie in language terminology", "Problems of Uzbek terminology", "Problems of terminology", "Principles of selection of words and terms in the Uzbek literary language" [8, 15]. These works reflect on different perspectives and concepts in the field of generation, collection, arrangement, unification, and publication of terms. It is also noted that the confusion that has occurred and continues to occur in the field of terminology is beginning to become apparent. For example, the beginning of a concept in different terms and spellings; giving long explanations instead of clear and concise terms; underutilization of the native language in the creation of the term; One of the sources of enrichment of Uzbek terminology is the fact that there are different approaches to the external factor.

Terms related to various disciplines were first studied in Uzbek linguistics in the 1920s and 1930s. The main purpose of studying the terms is to replace and translate the words coming from foreign languages into words that correspond exactly to our native language. Therefore, the emergence and development of terminology has led not only to the analysis of terms in one language, but also to the study of their lexical-semantic and national-cultural features and the formation of explanatory dictionaries by comparing terms in one language with other languages. As a result, the formation of terminology has led to another important step - the emergence of explanatory dictionaries, as well as their coverage of all aspects, in this regard, research in the field of music and art is particularly noteworthy.

In recent years, special attention has been paid in our country to the fields of music and art, the development of international cultural ties in this area. Due to the regularity of the festivals "Sharq Taronalari" (Samarkand), "Ipak va ziravorlar" (Bukhara), "Maqom challenge" (Shakhrisabz) in our country, the importance of art, especially music, in international cultural relations requires a deeper study.

The introduction of a new term into linguistics not only opens up new possibilities, but also creates specific difficulties [2, 62]. Furthermore, without studying the vocabulary of a language, it is impossible to know perfectly the rich spiritual heritage and history of a nation that expresses its identity. After all, every learned language gives a person new life. This idea is confirmed by the opinion of the French writer Voltaire, "Knowing many languages means having several keys that can be locked in one" [4, 159].

Of course, each nation has its own nature, living conditions, customs, culture and art. Although the aspirations of each nation are similar, they also have their own national character.

In addition to the analysis of lexical-semantic and national-cultural features of music and art terms in the Uzbek and French annotated dictionaries, we can observe some peculiarities in the following tables:

Table №1

<i>№</i>	<i>In Uzbek</i>	<i>In French</i>
1.	<i>Asbob (tool)</i>	1) <i>instrument m</i> ; 2) <i>outil m</i> ; 3) <i>ustensile m</i> ; 4) <i>matériel m</i> ; 5) <i>outillage m</i> ; 6) <i>installation f</i> ; 7) <i>objet m</i> ;
2.	<i>Asbob-uskuna (equipment)</i>	1) <i>outillage m</i> ; 2) <i>installation f</i> ; 3) <i>équipement m</i> ; 4) <i>appareillage m</i> ;
3.	<i>Ashyo (thing)</i>	1) <i>objet m</i> ; 2) <i>chose f</i> ; 3) <i>ustensile m</i> ; 4) <i>affaire f</i> ; 5) <i>effet m</i> ; 6) <i>matière f</i> .

In the above examples, the Uzbek words "tool", "equipment" and "thing" are semantically synonymous in French. This is because the words “ustensile” and “object” in Examples 1 and 3 and “installation” and “outillage” in Examples 1 and 2 have the same meaning. It follows that the same meaning can be expressed in both languages in several ways:

- } musical **instruments** instruments de musique;
- } musical **equipments** équipement musical;
- } musical **things** ustensiles musisaux.

Table № 2

<i>№</i>	<i>In uzbek</i>	<i>In french</i>	<i>Uzbek musical instruments</i>	<i>French musical instruments</i>
	<i>doira</i>	<i>tambourin m.</i>		
2.	<i>g'ijjak</i>	<i>violon m.</i>		

#### IV. DISCUSSION

The musical instruments cited in these examples are derived from the national and cultural features of the Uzbek and French languages, and the names of very similar objects in both nations have created mutual equivalence.

Table № 3

<i>№</i>	<i>In uzbek</i>	<i>In french</i>	<i>picture</i>
.	<i>dutor</i>	<i>doutor</i>	
.	<i>chang</i>	<i>tchagne</i>	
.	<i>Sunray (trumpet)</i>	<i>sournai</i>	

Due to the fact that the names of the Uzbek musical instruments in Example 3 do not have an alternative in French, their translation has been translated while retaining their national language.

It is known that in linguistics words are divided into two groups in terms of structure: simple and compound.

Simple words are called so ("simple") because they have only one lexical meaning [11, 9]. Simple words are words consisting of one stem, and compound words are word units consisting of two or more words - stems. In the process of studying the form features of art terms, they were also analyzed in the form of terms in the form of words and compounds.

1. Art terms in the form of words:

1) terms in the form of simple words;

2) terms in the form of compound words.

Simple words are further subdivided into 2 types: primitive simple, which does not contain a word-forming suffix, and artificial simple, which is formed by adding a word-forming suffix. Primitive simple words can include:

Table № 4

<i>№</i>	<i>In Uzbek</i>	<i>In French</i>
1.	<i>Ajib</i>	1) <i>bizarre</i> 2) <i>étrange</i>
2.	<i>akkord mus</i>	<i>accord m</i>
3.	<i>akkordeon</i>	<i>accordéon m</i>
4.	<i>akrobat</i>	<i>acrobate mf</i>
5.	<i>aksent</i>	<i>accent m</i>
6.	<i>akustik</i>	<i>acoustique</i>
7.	<i>akvarel</i>	<i>aquarelle f</i>
8.	<i>alloma</i>	1) <i>savant m</i> 2) <i>érudit m</i>
9.	<i>an'ana</i>	<i>tradition f</i>
10.	<i>ansambl</i>	1) <i>ensemble m</i> 2) <i>groupe m.</i>
11.	<i>devon</i>	1) <i>divan m</i> 2) <i>ensemble des œuvres d'un poète ou d'un compositeur</i>

In the example in Table 4, both the art terms in Uzbek and their alternatives in French are expressed in simple terms. It is known that the "devon" (Persian "collection of poems") is a complete collection of poems (except epics) of a particular poet, arranged in alphabetical order, following the lines and rhymes [6, 587]. In this sense, this translation uses not only a simple word, but also a definition that describes it as "a collection of works by a poet or composer."

Any artificial word consists of two parts - the basis of word formation and the word-forming part, [9, 29-33] the meaning of words formed using such special units is derived from the meaning of its parts, i.e. its meaning can be substantiated by the meaning of parts: *dutorchi* - *dutor* player (musician) [10, 10] Accordingly, the following examples of simple words in Uzbek and French can be given:

Table № 5

<i>№</i>	<i>In Uzbek</i>	<i>In French</i>	<i>Way of making</i>
1.	<i>an'anaviy</i>	<i>traditionnel</i>	<i>an'ana+viy</i> <i>tradition+nel</i>
2.	<i>ardoqli</i>	1) <i>respectable</i> 2) <i>estimable</i>	<i>ardoq+li</i> <i>respect+able</i> <i>estim+able</i>
3.	<i>bezavol</i>	1) <i>immortel</i> 2) <i>invulnérable</i>	<i>be+zavol</i> <i>im+mortel</i> <i>in+vulnérable</i>
4.	<i>dongdor</i>	<i>renommé</i>	<i>dong+dor</i> <i>re+nommé</i>
5.	<i>dramatik</i>	<i>dramatique</i>	<i>drama+tik</i> <i>drame+tique</i>
6.	<i>dutorchi</i>	<i>doutariste m</i>	<i>dutor+chi</i> <i>doutar+iste</i>
7.	<i>garmonchi</i>	<i>accordéoniste mf</i>	<i>garmon+chi accordéon+iste</i>

In the examples given in Table 5, both the Uzbek terms of art and their French equivalents are expressed in the form of simple words, i.e. “base + constructive addition” or “constructive addition + basis”. It can be seen that in the process of making the French term “*dramatique*” the letter “e” in the stem became “a”, the words “im + mortel”, “in + vulnérable” are given with the prefixes “im-” and “in-”, as well as “respect The words “able” and “estim + able” are explained by the suffix “-able”.

In linguistics, terms in the form of a compound word are formed from a combination of two or more words with independent meanings.

Unlike simple words, “compound words” are sometimes structurally similar to phrases, but they are distinguished by a holistic meaning: like a railroad, a rosette, a porcelain flower, a manuscript. [1, 62] and the meaning of some compound words cannot be justified by the meaning of the words that make up their parts. Compound words can also be made by learning words from other languages.

Table № 6

<i>№</i>	<i>In Uzbek</i>	<i>In French</i>
1.	<i>avtoportret</i>	<i>autoportrait m</i>
2.	<i>bosmaxona</i>	<i>imprimerie f</i>
3.	<i>darsxona</i>	<i>salle f de classe</i>
4.	<i>kamol topmoq</i>	<i>toucher à la perfection</i>
5.	<i>kasb etmoq</i>	<i>Acquérir</i>
6.	<i>kinoapparat</i>	<i>appareil m cinématographique</i>
7.	<i>kinojurnal</i>	<i>ciné-journal m</i>
8.	<i>kinofestival</i>	<i>festival m de cinéma</i> <i>festival m du film</i>
9.	<i>kinohikoya</i>	<i>scénario m</i>
10.	<i>kinostudiya</i>	<i>studio m de cinéma</i>
11.	<i>kinoteatr</i>	1) <i>salle f de cinéma</i> 2) <i>cinématographe m</i> 3) <i>cinéma m</i> 4) <i>ciné m</i>
12.	<i>kinoxona</i>	<i>salle f de cinéma</i>
13.	<i>mo'yqalam</i>	<i>pinceau m de poils</i>
14.	<i>nafis adabiyot</i>	<i>belles-lettres</i>

The analysis of these examples shows that the words self-portrait, film camera, film magazine, film festival, film studio and cinema belong to terms that are fully mastered in Russian, and terms such as film story, cinema, printing house, classroom, and brush belong to units that are partially mastered in Russian and Tajik. At the same time, it should be noted that the terms in the Uzbek language, such as perfection, acquisition, are intertwined and have a unified meaning, and if one of their constituent parts is replaced, the pure semaphore disappears.

## V. CONCLUSION

Based on the analysis, the following conclusions can be made about the translation of terms and terminology, as well as terms within the same field into two or more languages:

1. Based on the analysis of terms of art, it can be said that terminology is a set of terms related to any scientific or artistic field.
2. In our view, the task of terminology is not only to distinguish or analyze terms, but also to discover new terms in order to achieve a goal and convey meaning.
3. The conclusion that the translation of art terms in Uzbek and French is very similar to the names of very similar objects in both nations, and the names of some Uzbek musical instruments are not exactly alternate in French, so their translation can be translated while maintaining their national language.

It is also known that terms are dictionaries for a specific field, and that such dictionaries can be one or more language dictionaries focused on a specific purpose. Furthermore, the origin, historical development, formation and development of terminology, of course, arise due to specific rules. At the same time, the terminology appears, develops and serves to enrich the lexicon of the common language.

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# *Interpretation Of Navruz In Navoi's Work*

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**Abstract – There are a number of traditions formed by our ancestors in ancient times and preserved for thousands of years, which, despite all obstacles, are becoming more and more firmly ingrained in the way of life of new generations. One of such living, ancient and young, beautiful traditions is Navruz. It is based on man's attitude towards nature. The history of the origin of Navruz dates back to very ancient stages of development of society.**

**Keywords – Interpretation, Navruz , Navoi's Work.**

## I. INTRODUCTION

Navruz is a common holiday of the peoples of the East, including Central Asia. During the years of independence, due to the high attention paid to the restoration of historical memory for self-realization, attention was paid to the study of these ceremonies and holidays. Because every ceremony or holiday, which embodies the most ancient traditions of our people, is valuable, first of all, because it reflects the centuries-old way of life, culture, beliefs of our ancestors, expands the historical understanding of young people, has a spiritual and aesthetic impact on their upbringing. Navruz has a special place in this system of sacred values. It is valuable for its ability to provide information about changes in the nature of our people, mythological notions about the calendar, ancient religious beliefs, the unique way of life and culture of the ancients.

## II. LITERATURE REVIEW

The holiday of Navruz, which promotes only noble ideas, has been valued and passed down from generation to generation for centuries due to its strengthening and development of the spiritual spirit. Therefore, the concepts associated with Navruz are interpreted not only in folklore, but also in classical and modern literature. After all, the study of the interpretation of Navruz, which is deeply ingrained in the life and psyche of our people, is very relevant and has scientific and practical value.

## III. ANALYSIS

The interpretation and depiction of Navruz has been one of the main themes in the works of classical poets. This includes Umar Khayyam's pamphlet "Navro'znoma", which contains traditions, events and legends related to Navruz, Narshahi's "Buxoro tarixi" (History of Bukhara), Abu Rayhan Beruni's "Qadim xalqlardan qolgan yodgorliklar" (Monuments from Ancient Peoples), Firdavsi's "Shohnoma", Mahmud Kashgari's "Devonu lug'otit turk", Yusuf Khosos. Hajib's poem "Bahor Madhi" in "Qutadgu bilig",

Khorezmian verses, Nosiriddin Rabguzi's ghazal, Haydar Khorezmi's epic "Gul va Navro'z" (Flower and Navruz), Alisher Navoi's "Tarihi muluki ajam", Hafiz Tanish Bukhari's "Abdullanoma ("Sharafnomai shohiy ") can be formed.

The creation of special epics, many poems and ghazals, Navruznamas dedicated to Navruz in Uzbek and Persian-Tajik literature requires the study of their artistic features. If the peculiarities of the artistic interpretation of Navruz by classical poets are studied in comparison with its interpretation in folklore, the possibility of a deeper understanding of the aspects of oral and written creativity expands. However, this issue has not yet been specifically studied in our literature.

In Uzbek folklore, T. Mirzaev and M. Juraev have identified a number of important scientific and theoretical information about the traditions and folk sayings associated with Navruz.<sup>1</sup>

The books of G. Gafurov, U. Karabaev, M. Sattor, A. Ashirov also contain some comments on the style and purpose of Navruz, its tradition.<sup>2</sup>

J.Eshonkulov and Sh. Turdimov created a collection of proverbs, songs and poems about spring called "Navro'z Nashidasi", which includes classical poetry such as Mahmud Kashgari, Rabguzi, Umar Khayyam, Alisher Navoi, Babur, Ogahi, Furkat, Muqimi, as well as representatives of modern lyric poetry. They included poetic works dedicated to the anthem of Navruz and Spring [3.206].

Alisher Navoi's 1486 scientific-historical work "Tarihi muluki Ajam" gives special information about the tradition of celebrating Navruz and its connection with the name of the legendary king Jamshid. It is hard to believe that one cannot see until one sees. And they say *ani chihil minor*. When this building was finished, the world gathered *salotin* and *ashraf* and *akobirin* and celebrated in a moment. At that time, the belief in the sun was in full view, he sat on the throne in the building, proclaimed justice to the world, and laid the horse of that day, Navruz. And the reign of his reign was up to seven hundred years ..." [10.196].

Thus, Alisher Navoi, relying on ancient legends and written sources created before him (mostly Firdavsi's "Shohnoma"), says that the holiday of Navruz was celebrated by the noble ruler Jamshid. The poet emphasizes that Navruz is the spring equinox, the tradition of celebrating it dates back to ancient times, to the time of the semi-legendary king Jamshid.

Alisher Navoi's famous epic "Xamsa", the largest epic "Saddi Iskandariy" also mentions the celebration of Navruz:

Ki bu sur erur olamafro'z ham,

Xususan erur fasli Navro'z ham.

On this basis, the poet emphasizes that the good and the bad of the year are known from the coming of spring, and that when a new ruler comes to the country, there is much hope from the illuminator of the world.

Rabguzi started the tradition of writing ghazals about Navruz in classical poetry. In his ghazal dedicated to Navruz, he sees that with the advent of Navruz, a person's emotions are aroused by the awakening of nature, the joy and passion of seeing cabbage covered in greenery and flowers, the signs of Navruz: the beginning of the day, the melting of snow and ice, the pleasant spring

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<sup>1</sup> Navruz. (Songs, legends, customs and myths associated with Navruz). Compilers: T.Mirzaev, M.Juraev. - T.: Fan, 1992. - 100 p.; Jo'raev M. On the ethno-folklore analysis of the "Red Flower" festival // Uzbek language and literature. - Tashkent, 2003. - Issue 4. - B.13-19. Also: Navruz holiday. - T.: Fan, 2009. - 230 p.

<sup>2</sup> G'afurov G'. In customs - the heart of the people. - T.: Young Guard, 1986. - P.171-186; Qoraboev U. Holidays of Uzbekistan. - T.: Teacher, 1991. - 190 p.; Mahmoud Sattor. Uzbek customs. - T.: Fan, 1993. - P.28-32; Ashirov A. Ancient beliefs and ceremonies of the Uzbek people. - T.: Alisher Navoi National Library of Uzbekistan Publishing House, 2007. - 276 p.

wind the spread, the hills covered with crimson tulips and tulips, the return of birds that have flown to distant hot lands in winter, the cold days end and the warm days begin:

Kun hamalga kirdi esa keldi olam navro'zi,  
Kechdi bahman, zamharir qish, qolmadi qori, buzi.  
Kun kelu ming ko'rki ortib tirilur o'lmish jahon,  
Tong badizlab naqshi birla bezanur yer yuzi.  
[The day has come and the world Navruz has come,  
The winter is over, the winter is over, there is no snow left.  
The dead world will be resurrected in a thousand days,  
This is the place where the morning is decorated with patterns.]

Rabguzi's experience of ending ghazals about Navruz was later successfully continued by Atoi, Gadoi, Lutfi, Alisher Navoi, Babur, Ogahi, Muqimi and Furqat. The ghazals created by them about Navruz attract more attention with their artistic embodiment of the poetic traditions of folklore and written literature.

Atoi's ghazals, "Kel, ey dilbarki, bo'ston vaqti bo'ldi" [1,250], Gadoi's "Ey, jamoling suvratu ma'nida xurram navbahor", "Nakhati navro'zdin bo'ldi mashomi jon latif" [2.277-283] were written in a mystical spirit "Sharif Ayyom". Appreciating this holiday, the idea was put forward that every moment should be used productively, that the New Year should be filled with pure intentions and new desires, and especially that the cup of the heart should be filled with the purity of May, the light of Allah.

It should be noted that in the pre-Navoi period, there were only a few ghazals dedicated to the Navruz hymn. The great poet further developed the tradition of creating Navruz poems.

In the great poetic heritage of the great Uzbek thinker and poet Alisher Navoi, there are more and more paintings depicting the Navruz and spring flower festivals, the charming nature of spring, its unique beauty and vitality. The poet describes spring, spring and Navruz, in which Khorezmi's "Muhabbatnoma (Love Letter)" takes a unique approach to interpretation and depicts his beloved beautiful lover with Navruz (spring) symbols. In particular, Khorezmi writes:

Pari ruxsorlarning ko'rkaboyi,  
Yuzing navro'zu, qoshing bayram oyi.  
[The beauty of Parisian spirits,  
Navruz on your face, add a holiday month.]

Just as the face of the Khorezmian spring resembles the holiday of purity Navruz, and the eyebrows resemble the crescent moon on the eve of this holiday, so in Alisher Navoi the spring of the spring is celebrated:

El yangi oy ko'rdiy men ko'rmadim qoshing hamin,  
Elga bayram bo'ldi, ammo bizga bayram bo'lmadi.  
[Public saw the new moon and I didn't see it.  
Public had a holiday, but we did not have a holiday [7.448].

#### IV. DISCUSSION

Alisher Navoi also likens the dark hair of the beloved to the night, the beautiful white figure to the day, and on this basis points to the changes in nature that take place in Navruz: an equal day. In the third verse of one of the ghazals in the Badoe ul-vasat divan of the Khazain ul-Maoniy College, the poet describes the pleasure of seeing that the black hair of the earth is equal to his stature as follows:

Vasli aro ko'rdum, teng emish bo'iyu sochi,  
Tun-kun teng ekan zohir o'lur, bo'ldi Navro'z  
[I saw Vasli between, equal breastfeeding neck and hair,  
As the days and nights seem to die, it is Navruz [7.161.].]

Or:

Yuz ochib birdurdi qad birla sochi teng erkanin,  
Zohir o'lg'ondek tunu kun tengligi navro'zdin<sup>3</sup>  
[He turned his face away and said that his hair was equal to his height,  
Apparently, the equality of night and day is Navruz [5.409].]

Apparently, the poet was able to create not only analogies, but also the arts of proportion and parallelism, using the concepts of night / hair, day / white figure, Navruz / visol (rendezvous) on a parallel basis. In particular, in the following verses of the poet, we can be sure that Navruz is interpreted in the visual sense:

Kuyunga har kun borib har dam ko'ray, derman seni,  
Menga har kun bayramu har lahza Navro'z kerak!  
[I go to the sun every day and see you every time, I'll cure you,  
I need Navruz every day and Navruz every moment! [5.303].]

People's appreciation and longing for Navruz was influenced by the good deeds associated with it. For example, on the days of Navruz, everyone said kind words to each other and wished them well. Anger is forgotten. Even the wars were stopped and everyone celebrated.

This was due to the magical-mythological notions of the ancients about the "first day". People looked at how to celebrate Navruz, the first day of the new year, which affects the life and productivity of people throughout the year. This belief is reflected in Alisher Navoi's folk proverb, which is embedded in the following verses written by his teacher Mawlana Lutfi:

Zulfi vaslin istasam ruxsori mehr afro'zidin,  
Yo'q ajab chun yil kelishi **bilgurur** Navro'zidin.  
Ko'zlarim uyi buzuldi ashki sayla anduzidin,  
Men bu ko'z birla uyotlig'men jamoling yuzidin  
Kim, kelur har lahzavu ul go'shaning bordur nami [6.495].

Or again:

Ulus chehrai olam afro'zidin,

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<sup>3</sup> . Navoi Alisher. A perfect collection of works. Volume XX. Volume II. Navodir un-nihoya. - T.: Fan, 1987. 409-p.

Bilur yil kelishin Navro'zidin ...

Indeed, on the basis of many years of observations, our people have tried to determine how the year will turn out, depending on which day of the week Navruz falls. Let's say that this year Navruz fell on a Friday. If Navruz falls on a Friday, there will be a lot of rain, a lot of cold, and the harvest will be abundant, even if it ends late; there will be plenty of blessings on Navruz on Saturday, and lots of winds in the summer; Sunday Navruz is expected to be less bad, more prosperous, more productive in cotton growing and more abundant in horticulture. If Navruz is expected on Tuesday, it is said that the welfare of the people will increase, farming will start early, the harvest will be abundant and the income will be good.

At the end of the year, the rainfall is expected to exceed the norm. In the year of Navruz, which falls on Wednesday, the harvest of melons, vegetables and fruits will be good. The harvest of legumes is also abundant. Precipitation is low and there is difficulty in harvesting grain. But if you work with efficiency. The result will not be bad. It is said that Navruz falls on a Thursday, the year is rich in treats, the moon and the sun are eclipsed, the number of diseases increases a little, but the end of the year is good and there is a blessing in agriculture.

The people's connection of Navruz with the notion of "first day" also gave rise to the applause of Navruz. This is why people wish each other "Let there be Navruz every day" and value it as a holiday of friendship and harmony.

Zulfu ruxsor ila kominga meni yetkursang,

Har tunung qadr o'lubon har kuning bo'lsun Navro'z! [8.162]

Influenced by such verses of Navoi written in the spirit of Navruz applause, later Babur and Ogahi also composed verses in this sense. In particular, Ogahi writes:

Iloho, har kuning Navro'z bo'lsin!

Hamisha toleing feruz bo'lsin!

In Navoi's interpretation, Navruz is not only the beginning of spring, the season of awakening, renewal and purification of nature, but also a symbol of divine love, interpretation of the power and miracles of Allah. At Navruz, at the beginning of spring, the poet praises the power of Allah as he observes the rebirth of dead nature, the growth and revival of dead trees. Addressing the reader as "my mind," he encourages people to acknowledge and believe in the miracles of his Creator:

Jamali vasf etarmen hamdamim ul gul'uz o'lg'och

Quruq shox o'ylakim zohir qilur gullar bahor o'lg'och! [6.96]

In general, in most of Alisher Navoi's verses, Navruz, spring, and the flowering season are sung as a holiday that brings joy, happiness, good mood, abundance, abundant food, health, and light to people:

Muvofiq kiydilar – bo'lmish magar navro'z ila bayram,

Chaman sarvi yashil xilvat mening sarviravonim ham [4.392].

It is said that the coincidence of Navruz and Eid occurs every thirty-three years. So the poet is glad to have encountered such a moment. He emphasizes that the New Year (Navruz) and the holiday of Eid happened at the same time as another miracle of Allah. But the poet warns that not everyone is fortunate enough to attain this happiness, for which one must be pure:

Agar iyd istasang har dam, fano zaylini tut mahkam,

Ki, bir damda iki bayramg'a uchrar soliki foni [9.410].

Since the poet directly likened youth to spring, he wrote more poems dedicated to the Navruz hymn in the "G'aroyib us-sig'ar" divan, which was composed of lyrics created during this period. It is especially noteworthy that among them the beauty of the mistress, dressed in a spring (green and red) dress, is associated with mystical views about the manifestation of the divine beauty. By likening the beauty of the mistress to the flowers of spring, the poet is in fact glorifying the miracle and incomparable beauty of Allah. Because Alisher Navoi was also a mystical poet. Therefore, it was impossible to imagine and describe the beauty of nature and man from their creator. According to the poet's mystical views, according to the material world, being, nature, man seems to see the beauty of Allah in the mirror. Especially because of Navruz, the beautiful and pleasant changes that take place in nature, the beauties, the miracles that man cannot do, can motivate him to feel the power of God. In a word, God's grace is manifested in the beauty of nature and man. The whole being shines as its image, its splendor, its beauty.

In the "Navodir ush-shabob" divan, the poet follows the poetic traditions of classical poetry, invites to drink may (boda), which is a symbol of divine love, from spring flowers and drink it in his youth. That is why he praises Navruz as a holiday of love, a time of love, and uses the art of intimidation.

Bodayu ishq shabob ayyomiga fasli bahor  
Pand ketsunkim - erur oshifalig'larning chog'i [7.423].

Ghazals about Navruz and spring can also be found in the "Favoyid ul-Kibar" office. It also often describes the owners of divine beauty.

Alisher Navoi's skill in selecting spring events, its beautiful plates and landscapes as a source to depict the image of his mistress in harmony with the nature of Navruz, served to increase the artistic value and ideological impact of his poems.

It should be noted that Alisher Navoi's poems about Navruz contain the image of a farmer, and it is said that "His martyr is a farmer, and his martyr is the whole world." Because farming will start in Navruz. Navruz is also called "Farmers' Day" or "Labor Day". Consequently, on Navruz, when day and night become equal and the sun passes from the hut sign to the bearer sign, the farmer begins to work in the fields. That is why there is a saying among the people: "The bearer has entered - the action has taken place." Aware of this, the great poet Navoi embodies the farmer in the image of a lover.

In Navoi's poems, Navruz and spring rain are equated with the legendary water of life - "animal ziloli", "water of life", which glorifies the miracle of reviving the whole being, its vitality, the creative power of spring. It is emphasized that spring, Navruz, flowers give people energy, high spirits, new hopes and joys. Even the mildness of the weather typical of the days of Navruz did not escape the attention of the great poet until it became vital and healing for human health, a cause for the lightening of the human spirit. The poet writes about this:

Ey yuzung bog'i nasimida havoyi navro'z,  
La'li tojing bo'lub ul bog'da bo'stonafro'z.  
[O Navruz in the garden of your face,  
Lali is the crown and is the most beautiful tree in the garden [8.162].]

The unusual song of birds in Navbahor was also in the eyes of the great poet. In particular, Navoi landed on the cypress and sang about the nightingale, who was playing a crazy melody, as the ambassador of Navruz, as a bird in love, wandering in the divine beauty of the red flower.

Qo'nub ul sarv uza bulbul, chekib gul shavqidin g'ulg'ul,

Bu sarv uzra ochilib gul, anga terdin tushub shabnam

[The nightingale landed on the cypress tree, the flower blossomed,

It is a flower that blooms on the cypress, and the dew falls on it [4.393].]

In the verse, the poet created the art of musajja by creating an internal and external rhyme from the words bulbul / g'ulg'ul / gul.

## V. CONCLUSION

In short, the great thinker and poet Alisher Navoi interpreted the miraculous and beautiful Navruz as meaning that the mortal, transient beauty of this world is not superior to eternal beauty, skillfully used as a distinctive artistic medium, symbolic image and emblem.

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# *Economic Justification, Russia Business Regulation and Risk Management in Russian Companies: Limited Liability Company "SSK"*

## *[Экономическое обоснование, регулирование бизнеса в России и управление рисками в российской компании: ПТ. «ССК»]*

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**Abstract** – The Russian government's plan to reduce spending, plan not to extend the stimulus package and have the possibility of raising taxes by 2021 are steps to be taken. One of the objectives of the policy of the Russian Federation is to provide the conditions for complete economic development for all levels of society. This study aims to explain how one company in the Russian Federation in the city of Kazan is related to increasing corporate liquidity and risk management. This study uses quantitative analysis methods with liquidity analysis approaches and corporate risk assessment. The results of this study explain that a company in the Russian Federation in the city of Kazan can develop measures to increase corporate liquidity and risk management. The International Monetary Fund also warned that the Russian government's conservative economic policies could impede an immediate recovery - especially in the context of the second wave of infections that pushed the country's healthcare system to its limits.

**Keywords** – Economic Justification, Business Regulation, Risk Management.

**Аннотация** – План правительства России по сокращению расходов, план не продлевать пакет стимулов и возможность повышения налогов к 2021 году - шаги, которые необходимо предпринять. Одна из целей политики Российской Федерации - создание условий для полноценного экономического развития всех слоев общества. Это исследование направлено на объяснение того, как одна компания в Российской Федерации в городе Казань связана с повышением корпоративной ликвидности и управления рисками. В данном исследовании используется метод количественного анализа с подходом анализа ликвидности и оценки корпоративных рисков. Результаты этого исследования объясняют, что компания в Российской Федерации в городе Казань может разработать меры по повышению корпоративной ликвидности и управлению рисками. Международный валютный фонд также предупредил, что консервативная экономическая политика российского правительства может помешать немедленному выздоровлению - особенно в контексте второй волны инфекций, которые довели систему здравоохранения страны до предела. Контролируемый пакет экономической поддержки Москвы начал ослабевать летом и практически отсутствовал во время второй волны.

**Ключевые слова** – экономическое обоснование, регулирование бизнеса, управление рисками

## I. INTRODUCTION

Policymakers saw Russia's economic performance as a justification for the stability-focused approach adopted in the years following the annexation of Crimea. They include an oil production agreement with the OPEC cartel to manage prices, build a \$ 170 billion sovereign wealth fund, reduce public debt, and "fiscal rules" to cut the vicious circle of low oil prices, and the rapid depreciation of the ruble and the local Flight [1]. Inflation Russia's macroeconomic performance better than most macroeconomics belies the lingering problems the economy has to contend with to get out of the epidemic [2].

In the short term, Russia is stable - low government debt, low external debt, and very high reserves. Elena Rybakova, Deputy Chief Economist at the Institute of International Finance (IIF). The problem is that in the medium term we have all the problems imaginable: the inability to grow. Estimates of what happened after the pandemic confirmed this. The release of vaccines and countries emerging from the corona virus shock, Russia will drop from the top of the economic league table, slipping backwards. The Organization for Economic Cooperation and Development (OECD) projected that Japan and Brazil are the only two members of the G20 that will grow at a slower pace than Russia over the next two years [4;18]. Most projections indicate that the Russian economy will not return to the size it was before the spread of the Corona virus for at least another 18 months [3;7].

Beyond that, long-term disadvantages remain. The International Monetary Fund estimates that Russia's growth potential in the medium term is only 1.6% per year - very low for a country with Russian income levels, which was once seen as an exemplary case of a fast-growing 'transitional' economy on track [4]. Correct to catch up. Several European countries have surpassed their standard of living [5].

### **Theoretical Aspects And Methodology Of The Company's Liquidity And Risk Management Research -Important characteristics of the liquidity and risk management of a company**

In conditions of isolation and economic independence, the business entity must always be able to immediately pay its external obligations, namely. to be a solvent or a short-term obligation, namely to be liquid. Liquidity is an economic concept characterized by the ability to convert a company's assets into cash [6;7]. Liquidity can directly determine the level of solvency and creditworthiness of a company. Solvency and creditworthiness are the ability of a company to fulfill its obligations in a timely and full manner to investors and creditors [7;8].

The liquidity of a company's balance sheet is the company's ability to cover its liabilities to creditors with its assets. In the balance sheet liquidity analysis above, the company's assets and liabilities are grouped according to the level of liquidity[9]. The assets are sorted according to their level of acceptability, for example, if the liquidity of an asset is high, the conversion rate into cash will be even greater. And the company's liability items are valued based on their maturity. These assets include [10]:

- a. bonds and stocks from large joint stock organizations;
- b. government securities;
- c. precious metals;
- d. values that can be quickly realized;
- e. inviolable receivables;
- f. term bills issued by well-known companies.

In order to analyze the liquidity of a company, it is necessary to have a detailed classification of liquidity categories based on various criteria: by level of risk, on a specific date, in relation to standards, etc. The classification of liquidity according to the level of risk is further divided into:

- a. Liquidity with minimal risk (cash, best-selling financial investments);
- b. Low risk liquidity (ordinary accounts receivable, inventory and finished goods);
- c. High risk liquidity (bad debts, finished goods and unsold goods, illiquid assets).

Among these internal factors of bankruptcy, those that were eliminated directly, from the accounting and management co-ops, stood out. It includes [10;11]:

- a. strong capital base;
- b. asset quality;
- c. moderate dependence on external sources;
- d. the conjugation of assets and liabilities depending on time;
- e. competent management.

### **Company Liquidity and Risk Management System**

Liquidity is the ability of value to turn into money. During the analysis of the company's liquidity, the following tasks are performed [12]:

- a. Assessment of the adequacy of funds to cover obligations that have expired in the relevant period;
- b. determine the amount of liquid assets and check their adequacy to cover urgent liabilities;
- c. assessment of the company's liquidity and solvency with a number of indicators.
- d. to develop specific recommendations aimed at a more efficient use of financial resources and increase the solvency of companies.

The analysis of the company's liquidity and solvency is carried out in two stages: The first stage is the grouping of balance sheet assets at the time of transformation into cash, and liabilities - depending on the urgency of payment; The second stage is calculating a number of company liquidity indicators [13]. The first group is Assets (A) Most liquid assets (A1).

Liquid balance if current assets exceed current liabilities. The actual level of liquidity and solvency of a company can be determined based on a balance sheet liquidity analysis. In the first stage of the analysis, a group of assets and liabilities are determined and compared in absolute terms [14]. The balance is liquid if the following conditions for the group's asset and liability ratios are met:

- a)  $A1 \geq P1$ ;
- b)  $A2 \geq P2$ ;
- c)  $A3 \geq P3$ ;
- d)  $A4 < A4$ .

Moreover, if the first three inequalities are met:  $A1 \geq P1$ ;  $A2 \geq P2$ ;  $A3 \geq P3$ , i.e. current assets exceed short-term liabilities of the company, then the final gap must be met:  $A4 \leq P4$ , which confirms that the company has its own working capital. All this means compliance with the minimum conditions for financial stability.

### **Enterprise Risk Management Methods**

One of the main types of financial risk is the company's liquidity risk. Liquidity risk is characterized by two sides - price and quantity [15;16]. The price is determined by the price at which the asset can be sold and the liability received. And quantitative - depending on the availability of assets for sale, and liabilities are offered at any price. When assessing liquidity risk, the following are used:

- a. company balance sheet;
- b. improve the property and financial position of the company;

c. income statement presents company results.

The liquidity risk assessment is divided into 4 zones: risk free zone, acceptable risk zone, critical risk zone and disaster zone. Risk free zone - characterized by high solvency. If the company has high solvency, it does not depend on creditors [10;17;18]. The assessment of liquidity risk depends on the type of liquidity position of the company. How the state of balance sheet liquidity can affect the liquidity risk assessment is seen in these twotable. 1.1. and table 1.2 came from Source: Stupakov V.S., Tokarenko G.S. Risk management: Textbook. allowance. G: Finance and statistics, 2005. - S.156.

Table 1.1 Liquidity Risk Assessment

Liquidity risk assessment	Types of liquidity conditions	Balance ratio			
		$A_1 > P_1$	$A_2 > P_2$	$A_3 > P_3$	$A_4 < P_4$
Risk free zone	Absolute liquidity	$A_1 > P_1$	$A_2 > P_2$	$A_3 > P_3$	$A_4 < P_4$
Acceptable risk zone	Normal liquidity	$A_1 < P_1$	$A_2 > P_2$	$A_3 > P_3$	$A_4 < P_4$
Critical risk zone	Liquidity is disrupted	$A_1 < P_1$	$A_2 < P_2$	$A_3 > P_3$	$A_4 < P_4$
Disaster risk zone	Crisis (unacceptable liquidity)	$A_1 < P_1$	$A_2 < P_2$	$A_3 < P_3$	$A_4 < P_4$

Table 1.2 The Risk Rating Scale Uses Relative Indicators

Risk Assessment	Description
Minimal risk	Ranged deviation 0 – 0,3
Acceptable risks	Deviation 0,03 - 0,6
High risk (critical)	Deviation more than 0,6

Source: Research Results (processed data)

**Federal Law of the Russian Federation Used By LLC "SSK" Companies.**

According to the federal law of the Russian Federation of February 9, 2007 N 16-FZ On transport security, transport infrastructure objects are distinguished, they include: technological complexes, including railways, trams, highways, stations, railway and bus stations, airports , objects of communication systems, navigation and traffic control of vehicles, etc.

Each unit has its own responsibilities. All employees are certified employees, eg. they are tested for compliance with the knowledge, skills and abilities of employees, as well as the level of physical training of certain categories of employees with the requirements of the legislation of the Russian Federation on transportation safety [13;19].

All employees of the LLC "SSK" are certified employees, eg. tested compliance with the knowledge, skills and abilities of employees and personal (psychophysiological) qualities and the level of physical training of certain categories of employees with the requirements of the legislation of the Russian Federation on transportation safety [4;21;22]. Upon approval of the Rules for conducting financial analysis by arbitration managers [20]: [Resolution of the Government of the Russian Federation of June 25, 2003, No. 367] [Electronic resources] // Reference and "Garant" legal system. - Access mode: <http://base.garant.ru> (access date: 15.05.2020).

- a) These Rules determine the principles and conditions for conducting financial analysis by the arbitration manager, as well as the composition of the information used by the arbitration manager when conducting it.
- b) Financial analysis is carried out by the arbitration manager.

- c) When conducting financial analysis, the bankruptcy commissioner, acting as a temporary administrator, uses the results of the annual inventory conducted by the debtor, as an external (bankruptcy) administrator - the results of the inventory, which he conducts when accepting the debtor's property, as an administrator - the results inventory carried out by the debtor during the financial recovery procedure, regardless of whether that took part in it.
- d) Financial analysis is carried out on the several basis.
- e) When conducting financial analysis, the insolvency practitioner must be guided by the principles of completeness and reliability, in accordance with which: in the documents containing the analysis of the financial condition of the debtor, all the data necessary to assess his solvency are indicated; in the course of financial analysis, documented data are used; all conclusions and conclusions are based on calculations and real facts.
- f) The documents containing the analysis of the financial condition of the debtor shall indicate:
- g) When conducting financial analysis, the arbitration manager checks the compliance of the debtor's activities with the normative legal acts that govern it. Information about the revealed violations is indicated in the documents containing the analysis of the financial condition of the debtor.
- h) Copies of materials, the use of which is provided for in paragraphs 3 and 4 of these Rules, are attached to the documents containing the analysis of the financial condition of the debtor.

Appendix N 1 to the Rules of Conducting Arbitration financial analysis manager.

On the forms of financial statements of organizations "- registered in the Ministry of Justice of Russia on 02.08.2010 No. 18023: [order of the Ministry of Finance of Russia dated 02.07.2010 No. 66n (as revised on 06.03.2018)] [Electronic resource] // Reference and legal system" Consultant Plus ". - Access mode: <http://base.consultant.ru> (date of access: 05/18/2020).

Ministry Of Finance Of The Russian Federation. Order Of July 2, 2010 N 66n. About The Forms Of Accounting Reporting Of Organizations [23;24].

In order to improve legal regulation in the field of accounting and financial reporting of organizations (with the exception of credit institutions and public sector organizations) and in accordance with the Regulation on the Ministry of Finance of the Russian Federation, approved by Resolution of the Government of the Russian Federation No. 329 dated June 30, 2004 ( Collected Legislation of the Russian Federation, 2004, N 31, Art. 3258; N 49, Art. 4908; 2005, N 23, Art. 2270; N 52, Art. 5755; 2006, N 32, Art. 3569; N 47, Art. 4900; 2007, N 23, Art.2801; N 45, Art.5491; 2008, N 5, Art.411; N 46, Art.5337; 2009, N 3, Art.378; N 6, Art.738 ; N 8, Art. 973; N 11, Art. 1312; N 26, Art. 3212; N 31, Art. 3954; 2010, N 5, Art. 531; N 9, Art. 967; N 11, Art. 1224), (as amended by the Order of the Ministry of Finance of Russia dated 06.03.2018 N 41n).

## **II. RESEARCH RESULTS AND DISCUSSION**

### **Analysis of Company Liquidity and Risk**

#### **A Brief Description of The Company**

The full name of the company - Limited Liability Company "SSK". The abbreviated company name - LLC "SSK." LLC "SSK" was registered on 22.09.2011 at the official address 117418, Moscow, st. Zyuzinskaya, 6, copr. 2nd floor 2, pom. XIV, room. 31. Company zip code: 420021, Republic of Tatarstan, Kazan, st. Nikolay Stolbova, 2. The head of the company is the director of Alexander Gennadievich Naumov. State registration number and date: INN 1655228858, PSRN 1111690070546, KPP 165501001 has been registered in accordance with the provisions of the Tax Code of the Russian Federation at the Federal Tax Service Inspectorate for the Republic of Tatarstan.

The main activity of the company is the provision of other business support services, not included in other groups. LLC "SSK" also works in 10 other areas, including:

- a. metro activities for passenger transport;

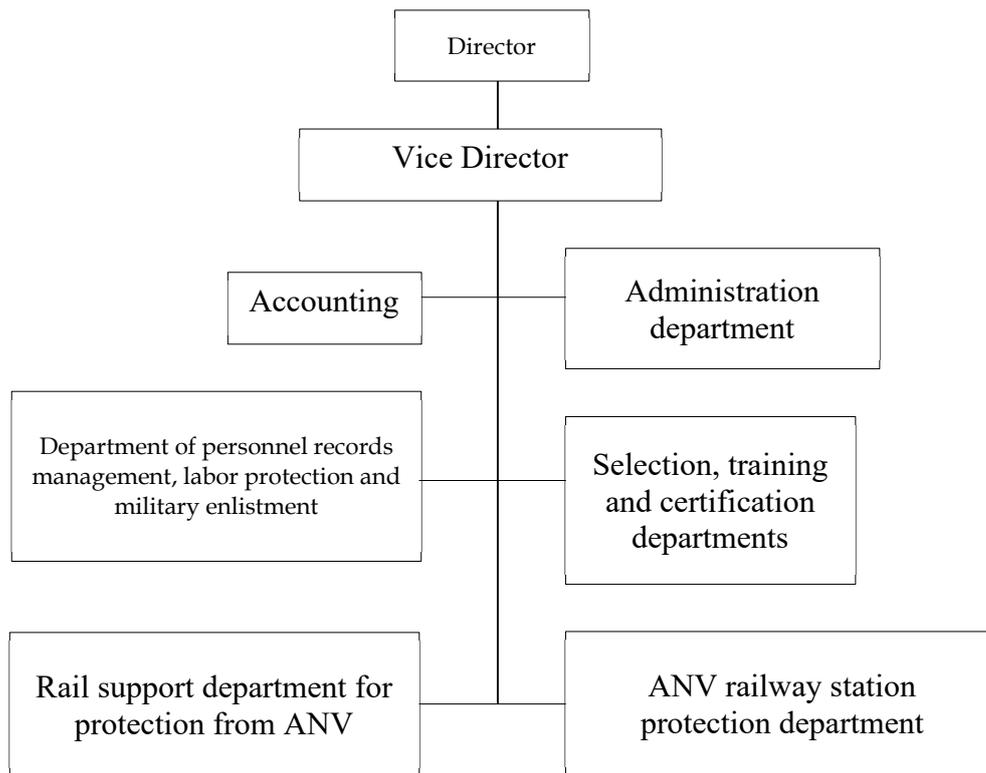
- b. warehousing and storage activities;
- c. additional transportation activities;
- d. additional activities related to rail transport;
- e. activities for bridge and tunnel operations;
- f. handling of goods transportation;
- g. private security service activities.

According to the federal legislation of the Russian Federation of February 9, 2007 N 16-FZ On transportation security, objects of transportation infrastructure are distinguished, including: technological complexes, including trains, trams, highways, stations, train and bus stations, airports, system objects communication, navigation and vehicle traffic control, etc [25]. The main working principles of the LLC "SSK" group of companies are [26;27]:

- a. comprehensive customer service;
- b. maintain the highest quality standards for all types of services provided.

The group of companies has been operating successfully from 2011 to the present, actively developing, expanding its horizons and in 2019 the company employs 254 employees. The company management of the LLC "SSK" is built on the principles of interaction between upper and lower levels to gain experience. The organizational structure of the LLC "SSK" can be seen in Figure 1

Figure 1. LLC "SSK" Organizational Structure



Source: compiled by the author based on LLC "SSK" staffing table

One of the most common and well-known methods for assessing the environment is the SWOT method. According to the analytical method, the following characteristics should be considered: S (strength) - strength; W (weakness) - weakness; O (opportunity) - opportunity; T (threat) - threat. As part of the SWOT method, LLC "SSK" identifies and assesses its own strengths and weaknesses, and also determines the opportunities and threats that exist in the external environment.

a) Strength:

1. highly qualified personnel;
2. years of successful work experience (Registered since 2011 to the present);
3. well-established relationships with credit institutions;

b) Weaknesses:

1. low capitalization;
2. very high costs of doing business;
3. low business profitability.

c) Opportunities:

1. increase the number of subscribers;
2. expansion of the services provided;
3. growth in investment attractiveness of individual insurance companies.

d) Threats:

- 1) the appearance of a large number of competitors in the market;
- 2) inadequate quality of supervision of insurance companies;
- 3) unstable financial position of clients (individuals and legal entities).

### Analysis of The Company's Financial and Economic Activities

The main factor that becomes a consideration in analyzing a company is its financial condition which focuses on the source of company financing and the ability to invest. Analysis of the company's financial condition is based on reporting. When analyzing financial conditions, great attention is paid to the composition and placement of the company's assets and liabilities. Analysis of LLC "SSK" assets for the past 3 years, based on this balance sheet, is presented in the table. 2.1. From the analysis above, you can see changes in the composition and structure of the company's balance sheet.

In 2019, the total volume of non-current assets of LLC SSK increased by 8,400 thousand rubles, and the volume of current assets also increased by 21,787 thousand rubles. compared to previous years. In 2018, the amount of receivables increased significantly compared to 2017, which was a negative change and could be caused by problems related to company service payments or the provision of active consumer loans to customers. However, this indicator fell by 36,813 thousand rubles. in 2019 which shows an increase in the quality of companies with receivables.

Table 2.1. Dynamics of the Asset Volume of the LLC "SSK", Thousand Rubles

Asset balance	Absolute value, thousands of rubles			Absolute profit (deviation), +, -	
	2019	2018	2017	2019/2018	2018/2017
Total non-current assets	9 808	1 408	-	8 400	1 408
Total assets at present	224 825	203 038	8 141	21 787	194 897
Balance	234 633	204 446	8 141	30 187	196 305

Source: LLC SSK's balance sheet for 2017-2019

The company's assets in 2018 increased significantly by 196,305 thousand rubles. compared to 2017 which shows an increase in the company's economic potential, and the 2019 balance sheet also increased by 30,187 thousand rubles. and in the amount of 234,633 thousand rubles. Changes in the dynamics of LLC "SSK" balance during the last 3 years is shown in Figure 2.1.

In Figure 2.1. shows that the dynamics of LLC "SSK" balance sheet has increased every year. The balance value increased in 2018 by 196,305 thousand rubles. and for 30,187 thousand rubles. In 2019, this increase shows that the company has a positive trend. In 2017, the book value of LLC SSK's equity capital was -2,804 thousand rubles, and in 2018 and 2019 it increased. The growth of this indicator during the 2017-2019 period shows an increase in the welfare of LLC "SSK" owners. The book value of equity capital LLC "SSK" was 11,892 thousand rubles at the end of 2019.

**Liquidity Analysis and Corporate Risk Assessment**

One of the most important criteria of a company's financial position is its solvency assessment, which is usually understood as a company's ability to meet its long-term obligations. As a result, solvent companies are companies that own more assets than their liabilities. A company's ability to pay its short-term obligations is called liquidity. In other words, a company is considered liquid if it is able to meet its short-term obligations by selling current assets. For analyzing data on assets and liabilities, LLC "SSK" is grouped according to the following criteria:

- 1) with a decrease in the level of liquidity (assets);
- 2) according to the urgency level of payment (payment of obligations).

A balance is considered truly liquid if it meets the following requirements:

$$A1 \geq P1, A2 \geq P2, A3 \geq P3, A4 \leq P4. (2.2)$$

Which is A1 is the most liquid asset (cash and short-term financial investments);

A2 - assets that can be realized quickly (receivables and other current assets);

A3 - slow moving assets (inventory and VAT on value purchased);

A4 - assets that are difficult to sell (non-current assets);

P1 - most urgent obligations (accounts payable);

P2 - short-term liabilities (short-term loan funds and other short-term liabilities);

P3 - long term liabilities (long term liabilities);

P4 - permanent liability (equity).

Data resulting from the calculation of the asset and liability grouping of LLC "SSK" according to the level of liquidity is presented in Table 2.2 Let's compare the results for the groups given by assets and liabilities:

2017: A1 <P1; A2 <P2; A3> P3; A4> P4;

2018: A1 <P1; A2> P2; A3> P3; A4 <P4;

2019: A1 <P1; A2> P2; A3> P3; A4 <A4.

During 2017-2018 LLC "SSK" balance was not fully liquid, because the absolute liquidity of the balance had not been fulfilled. In 2018 and 2019 only the first condition was not met, namely the most liquid assets did not include the most urgent liabilities.

Table 2.2. LLC "SSK" Grouping of Assets and Liabilities

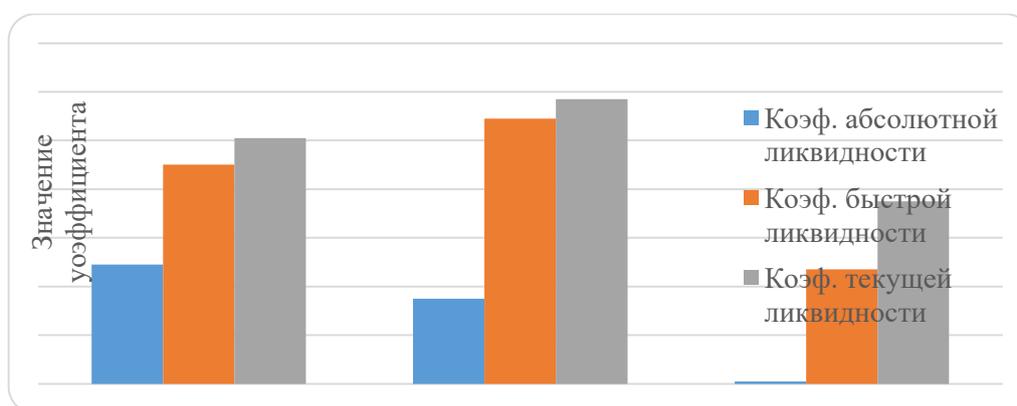
Group indicator	Year				
	in Thousand Ruble				
	2019	2018	2017	2016	2015
A1 – the most liquid asset	109 377	60 934	125	79.5	48647.2
A2 – fast realizable asset	90 759	127 572	4 974	-28.86	2464.78
A3 – assets that can be realized quickly	24 689	14 532	3 042	69.89	377.71
A4 – assets that are difficult to sell	9 808	1 408	0	596.59	0

P1 – the most urgent obligation	178 067	150 139	4 787	18.6	3036.39
P2 – short-term liabilities	44 674	22 967	6 125	94.51	274.97
P3 – long-term liabilities	0	17	17	-100	0
P4 – ongoing commitment	11 525	31 323	(2 788)	-63.21	1123.49

Source: processed by the author based on the accounting records of LLC "SSK" 2017-2019.

For a more visual representation, the main liquidity ratios are presented in Figure 2.2. It can be said that in general the main liquidity ratio of LLC "SSK" reached the recommended value, except for the current liquidity ratio. At the end of the period analyzed, namely in 2019 the fast and current liquidity ratio also decreased compared to previous years.

Figure 2. LLC "SSK" main liquidity ratios for 2017-2019.



Source: processed by the author based on the 2017-2019 SSK LLC Balance Sheet

The negative dynamics of the fast and current liquidity ratio in 2019 compared to 2018 shows that LLC "SSK" is not able to fully fulfill its obligations. The only reason for solvency and liquidity is the company's dependence on debt capital. Thus, it can be said that in general the analyzed financial condition of the companies is considered less stable and normal.

To assess balance sheet liquidity and solvency, the following basic liquidity ratios are used: general solvency ratio (KOP); own working capital (SOS); SOS maneuverability coefficient (KMSOS); Self-Funding Provision ratio (KOSS); equity and debt capital ratio (KS / Z); and the ratio of current and non-current assets (KOA / VA).

### Economic Justification of Measures to Improve Corporate Liquidity and Risk Management

The analysis results show that the LLC "SSK" has a somewhat lower value than the current liquidity indicator. The level of the solvency indicator directly depends on the company's balance sheet structure, as well as the volume, direction and frequency of the company's cash flows. Based on this, the company's overall solvency can be affected by changing the structure of the balance sheet and, thus, the company's cash flow. Since the relative indicator of LLC "SSK" at the end of the analyzed period did not reach the recommended value, the most effective step to improve the company's financial condition is to optimize the balance sheet structure, which implies changes in all balance sheet items. The event was conducted using the balance sheet restructuring algorithm proposed by T.I. Makukha and V.V. Kulikova.

Depending on the situation in the company, each company chooses its own version of the restructured balance sheet. Based on the established liquidity conditions, LLC "SSK" offers direction to restructure the balance sheet in accordance with the second option to increase equity capital and reduce short-term liabilities, as well as reduce non-current assets and increase working capital. From the results of the probability analysis of LLC "SSK" bankruptcy using the two-factor Altman model, the value is smaller than 0 and smaller than the value in 2019 which indicates that the probability of bankruptcy is less than 50%. Thus, it can be concluded that the implementation of the proposed measures will allow the LLC "SSK" to establish solvency indicators at the right level, determine the most optimal and effective reserves to increase the company's future solvency, draw up a plan for future company activities, as well as minimizing the possibility of bankruptcy for the company. Such estimates allow you to evaluate the effectiveness of certain management decisions before their implementation.

### III. CONCLUSION

In assessing from a short-term point of view the company's financial condition, liquidity and solvency indicators play an important role, in the most general form, namely indicators of whether the company is able to pay off short-term and long-term obligations to creditors in a timely and full manner. After studying the essence of liquidity in this final qualification work, we come to the general conclusion that company liquidity is the availability of assets in circulation in sufficient amount to pay back short-term obligations arising during the course of activities, albeit in violation of the due date, agreed in the contract.

Limited Liability Company "SSK" is a transportation security division that has passed special accreditation and provides security services for transportation infrastructure. The group of companies has been successfully operating since 2011 and is actively expanding, expanding its horizons. Today, the "SSK" LLC group of companies has a stable network of branches and a presence in various regions of Russia. The company has 254 employees in 2019.

In this paper, the company analyzes the company "SSK", in particular the company's financial and economic activities. In the course of the research conducted, it turned out that the balance was not liquid, because several asset and liability ratios did not meet absolute liquidity conditions. Also the solvency ratio, i.e. the current liquidity ratio and the equity to debt capital ratio for 2019 are below the recommended values, but all other indicators are within the normal range. In order to "improve the balance", several proposals were put forward, in particular:

- a. increase the sales volume of company services, as well as reduce production costs;
- b. improve the efficiency of the use of working capital;
- c. improve the efficiency of company property management;
- d. increase in maximum profit due to the development of services provided.

Conclusion of work, we can say that liquidity is one of the most important indicators of the company's financial position. Based on this indicator, it is possible to draw conclusions about the development trends of the company, as well as correct the details at one time or another. In addition, a significant advantage of this analysis is the ability to display the probability of bankruptcy, which is very important for the company itself, as well as for corporate investors.

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# *The Validity of the E-Book on Integrated Physics for Earthquake Disaster Mitigation Materials*

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**Abstract—** Physics is a branch of natural science that studies natural phenomena and their changes. Earthquakes are one of the natural phenomena that often hit parts of Indonesia, especially the city of Padang. Earthquakes have an impact on the sustainability of society. The purpose of this study was to determine the validity of the e-book on integrated Physics disaster mitigation materials based on discovery learning. Research and Development / R&D is the method used in this research. Research and development methods are used to produce products and test these products. The validity questionnaire is an instrument used in this study. This validity questionnaire includes five aspects, namely content feasibility, presentation feasibility, language feasibility, graphic feasibility, and media feasibility. Earthquake disaster mitigation needs to be integrated into the Physics e-book considering that Indonesia is a region prone to earthquakes. So that the development of an integrated Physics e-book with valid discovery learning-based earthquake mitigation material is carried out. *E-book* Integrated physics of valid discovery learning-based earthquake disaster mitigation materials can be used in the learning process in schools, to reduce the impact caused by earthquake disasters.

**Keywords —** E-Book, Validity, Earthquake, Mitigation

## I. INTRODUCTION

Indonesia is one of the areas that has a very high earthquake activity. This is because Indonesia is located in the most active earthquake route in the world because it is located on three plate piles, namely, Indo-Australia from the south, Eurasia from the north, and the Pacific from the east [1]. Earthquakes are natural phenomena that are very difficult to predict how and when they occur [2]. Earthquakes are vibrations that spread across the earth's surface. Earthquakes are generally caused by the release of energy generated by moving plates due to pressure [3].

The city of Padang, West Sumatra was again hit by a tectonic earthquake on Wednesday, September 30, 2009 which had a power of 7.6 on the Richter scale. The location of the earthquake was approximately 57 KM Southwest Pariaman with a depth of 71 km. The earthquake caused severe damage, collapsed buildings, and dozens of people were trapped in the rubble [4]. Earthquake disaster mitigation is needed to reduce the impact of an earthquake disaster. Earthquake disaster mitigation according to Law Number 24 Year 2004 Article 47 aims to reduce the risk of earthquake disasters for people living in earthquake-prone areas [5]. This mitigation activity can be carried out in formal education institutions, namely schools.

Schools are formal educational institutions that can become a means of providing knowledge to students about earthquake disaster mitigation. The integration of earthquake disaster mitigation can be provided during the learning process in schools. Based on Government Regulation Number 32 of 2013 concerning the National Education System, it explains that each education unit contains content and learning processes about regional potential, local uniqueness, and regional problems [6]. The consequence of implementing the 2013 curriculum requires the integration of regional potentials into learning. One of the regional potentials in Padang City is the occurrence of an earthquake.

Earthquake disaster mitigation materials can be integrated into Physics subjects. Physics is a natural science that analyzes and describes the structure of events that occur in nature based on cause and effect, which eventually emerge rules or laws in physics [7]. Physics learning can be supported by using teaching materials. Teaching materials are defined as a learning resource used by teachers in the learning process to support the learning process [8]. Teaching materials are also defined as learning resources to support the learning process in schools [9]. Teaching materials are anything that is used to support, facilitate, influence or encourage the achievement of student competencies [10]. E-books are one of the teaching materials that are in accordance with the demands of the 4.0 industrial revolution. E-books are textbooks that are converted into digital format, e-books also have a meaning as a learning environment that contains a database that stores topics in a lesson [11]. In general, the structure of an e-book contains an initial section, a content section, and the end. The initial part of the e-book consists of a title page, a publisher page, a foreword page, a table of contents page, a list of figures page, a table list page, and page numbering. The contents of the e-book consist of core and basic competencies, competency achievement indicators, materials, videos, exercises, and competency tests. The final part of the e-book consists of a glossary, bibliography, and index [12]. Physics e-book developed using a learning model. The learning model is defined as a plan for the implementation of the learning process that is applied by the teacher during the learning process at school [13].

Discovery learning model is a learning model that is in accordance with the 2013 curriculum. Discovery learning model is a learning model that occurs when students are not presented with learning in the final form, but it is hoped that students organize their own knowledge [14]. Physics e-book integrated with earthquake disaster mitigation material based on discovery learning discovery learning which is suitable for use in the learning process is a Physics e-book which has a valid category. Validity comes from the word validity, which means the extent of accuracy and accuracy of a measuring instrument in performing its measuring function [15]. Validity is also defined as a standard measure that indicates the accuracy and validity of an instrument [16].

The validity of the e-book Physics integrated with discovery learning-based earthquake disaster mitigation material is very necessary to reduce the impact caused by earthquake disasters. The formulation of the problem in this study is what is the level of validity of the integrated Physics e-book material on earthquake disaster mitigation based on discovery learning? Based on the formulation of the problem, the purpose of this study is to determine the validity level of the integrated physics e-book on earthquake disaster mitigation based on discovery learning.

## II. METHODS

Research and development / R&D is a research method used in this research based on the problems and objectives that have been stated. Research and development is a research method used to produce certain products, and to test the products that have been produced [17]. Physics e-book integrated with discovery learning-based earthquake disaster mitigation material is a product that is produced and tested.

The stages of developing an e-book on Physics integrated with discovery-based earthquake disaster mitigation materials using the Plomp development model. The Plomp development model consists of three stages, namely the preliminary research phase, the development or prototyping phase, and the assessment phase (Tjeerd Plomp, 2013). However, this research has been limited to the second stage, namely the development or prototyping phase of the expert review section. The instrument used at the expert review stage was the product validity instrument. This instrument is a validation questionnaire. This validation questionnaire is used to determine the validity level of the e-book being developed. This validation questionnaire contains a list of questions covering five aspects, namely content feasibility, presentation feasibility, language feasibility, graphic feasibility, and media feasibility. This validation questionnaire is filled in by expert validators,

This research was conducted in January-June 2020. The product assessment based on a questionnaire that was filled in by expert validators was analyzed to determine the level of validity of the *e-book* that was developed. The validity analysis used a Likert scale

with the following steps. 1) giving a score for each answer item strongly agree (4), agree (3), disagree (2), and strongly disagree (1), 2) add up the scores of each expert validator for all indicators. Giving validity values using the Aiken's v formula, namely:

$$v = \frac{\sum s}{[n(c-1)]} \dots (1)$$

Information :

v = validity value

s = r - I0

r = number given by validator

I0 = the lowest number of validity assessments, namely 4

c = the highest number of validity assessments, namely 1

n = number of validators

Determining the level of validity, that is, the range of "v" numbers obtained will be obtained from 0.00 to 1.00. The following is Table 1, the validity range of the Physics e-book.

Table 1. Validity Category

No.	Achievement Indicators	Category
1	0.6-1.00	Valid
2	<0.6	Invalid

Source: [18]

### III. RESULT AND DISCUSSION

Physics e-book integrated discovery learning-based earthquake disaster mitigation material consisting of an initial section, a content section, and an end section. This is in accordance with the theoretical study that in general e-books must contain a beginning, a content section, and an end. The data obtained in this study is the validity data of the integrated Physics e-book disaster mitigation material based on discovery learning. This validity data consists of five aspects, namely content feasibility, presentation feasibility, language feasibility, graphic feasibility, and media feasibility. The results of the analysis of the validity test for the content feasibility aspect can be seen in Figure 1.

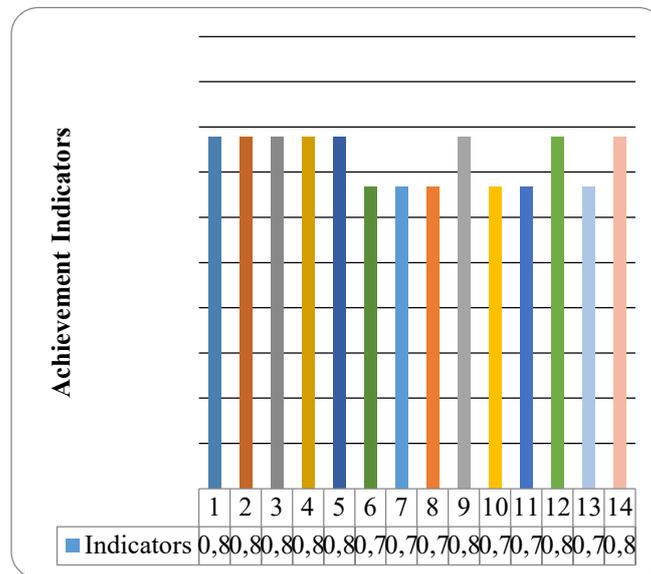


Figure 1. Content Feasibility Aspects

Figure 1 is the result of the analysis of the validity test for the content feasibility aspect. The content feasibility aspect consists of fourteen indicators. The first indicator is the material in the e-book according to the 2013 curriculum with the achievement of the indicator 0.8 being in the valid category. The second indicator is the material in the e-book in accordance with the core competencies

of SMA class XI Physics with the achievement of the indicator 0.8 is in the valid category. The third indicator is the material presented in the e-book in accordance with the demands of the indicators formulated from the basic competencies of 3.8 class XI with the achievement of indicators 0.8 being in the valid category. The fourth indicator is the formulation of competency attainment indicators according to basic competencies with the achievement of indicators 0.8 being in the valid category.

The sixth indicator, namely the cases given is relevant to the daily life of students, living things, and technology with the achievement of the indicator 0.7 being in the valid category. The seventh indicator, namely the facts in the presentation of the problem according to the topic in the material with the achievement of the indicator 0.7 is in the valid category. The eighth indicator is a concept presented in accordance with the applicable definition in the field of physics with the achievement of the indicator 0.7 being in the valid category. The ninth indicator is the procedure that is presented coherently and correctly with the achievement of the indicator 0.8 being in the valid category. The tenth indicator is the earthquake material presented in accordance with the formulation of disaster indicators with the achievement of the indicator 0.7 being in the valid category.

The eleventh indicator, namely the integration of earthquake disaster mitigation material in the e-book in accordance with the Physics material with the achievement of the indicator 0.7 is in the valid category. The twelfth indicator is learning activities in accordance with the discovery learning model with the achievement of indicators 0.8 being in the valid category. The thirteenth indicator is a description of the material presented in the e-book up to date with the achievement of the indicator 0.7 being in the valid category. The last indicator for the aspect of content feasibility is a description of the material presented in the e-book from a reliable source with the achievement of the indicator 0.8 being in the valid category.

The average indicator achievement in the content feasibility aspect is 0.7 with the valid category. This is in accordance with the theoretical study that the Physics e-book is said to be valid in terms of the feasibility of the content having the achievement of indicators > 0.6, so that this Physics e-book is valid from the aspect of content feasibility. The second aspect assessed by expert validators is the aspect of presentation feasibility. The results of the analysis of the validity test for the feasibility aspect of presentation can be seen in Figure 2.

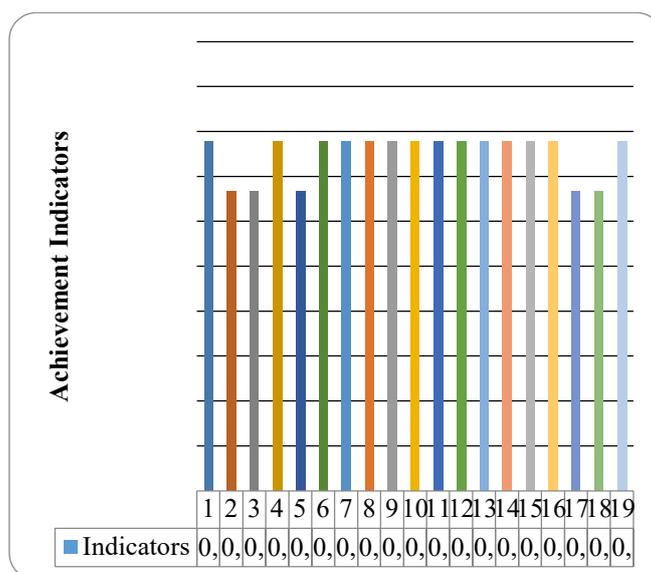


Figure 2. Presentation Feasibility Aspects

Figure 2 is the analysis result of the validity test for the feasibility aspect of presentation. The presentation feasibility aspect consists of nineteen indicators. The first indicator, the concept map, fulfills the relationship between factual, conceptual, and procedural with the achievement of the indicator 0.8 being in the valid category. The second indicator, namely the learning objectives in the e-book, is easy for students to understand, with the achievement of the indicator 0.7 being in the valid category. The third indicator, namely the systematic presentation in each e-book meeting, is compiled consistently with the achievement of the indicator 0.7 being in the valid category. The fourth indicator, namely e-books, helps students learn independently with the achievement of the indicator 0.8 being in the valid category. The fifth indicator is the presentation of a straightforward e-book so that it is easily understood by students with the achievement of indicator 0,

The sixth indicator, namely the presentation of the e-book is equipped with interactive buttons with the achievement of the indicator 0.8 being in the valid category. The seventh indicator, namely the presentation of an e-book, can increase the knowledge of students about earthquake disasters with the achievement of the indicator 0.8 being in the valid category. The eighth indicator, namely the presentation of e-books, can motivate student learning with the achievement of the indicator 0.8 being in the valid category. The ninth indicator, namely the presentation of e-books, can increase the creativity of students with the achievement of the indicator 0.8 being in the valid category. The tenth indicator, namely the numbering of images, is presented in order with the achievement of the indicator 0.8 being in the valid category.

The eleventh indicator, namely the numbering of the formula is presented sequentially with the achievement of the indicator 0.8 being in the valid category. The twelfth indicator, namely the presentation of images and videos in the e-book, clarifies the material of physics and earthquake disasters with the achievement of the indicator 0.8 being in the valid category. The thirteenth indicator, namely the exercise in the e-book, makes it easier for students to understand the integrated physics material for earthquake disaster mitigation with the achievement of the indicator 0.8 being in the valid category. The fourteenth indicator is the evaluation presentation in the e-book in accordance with the integrated physics material for earthquake disaster mitigation with the achievement of the indicator 0.8 being in the valid category.

The sixteenth indicator, namely the e-book presentation, facilitates students to measure their own competency achievements with the achievement of the indicator 0.8 being in the valid category. The seventeenth indicator, namely the e-book, provides a feedback evaluation with the achievement of the indicator 0.7 being in the valid category. The eighteenth indicator, namely the e-book presentation, helps students solve problems in everyday life with the achievement of the indicator 0.7 being in the valid category. The last indicator for the feasibility aspect of the presentation is that the e-book is presented using ICT with the achievement of the indicator 0.8 being in the valid category.

The average indicator achievement in the aspect of presentation feasibility is 0.7 with the valid category. This is in accordance with the theoretical study that the Physics e-book is said to be valid in terms of the feasibility aspect of the presentation having the achievement of indicators > 0.6, so that this Physics e-book is valid from the aspect of presentation feasibility. The third aspect assessed by the expert validator is the aspect of language eligibility. The results of the analysis of the validity test for the feasibility aspect of the language can be seen in Figure 3.

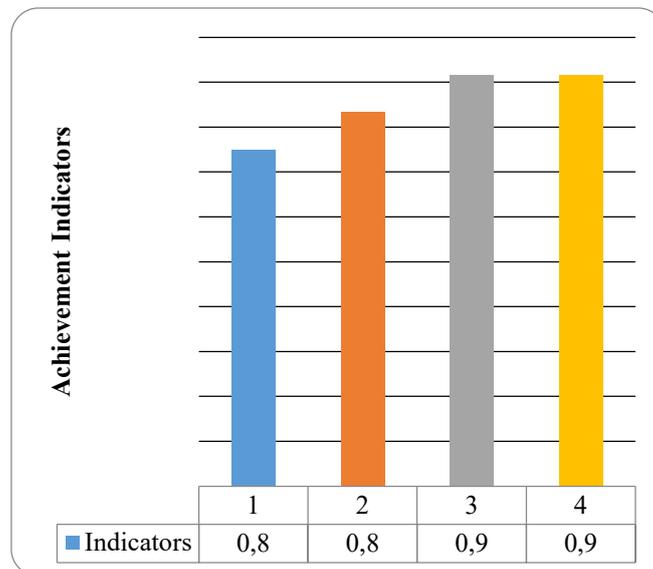


Figure 3. Aspects of Language Eligibility

Figure 3 is the result of the analysis of the validity test for the feasibility aspect of the language. The language eligibility indicator consists of four indicators. The first indicator is that the language used in the e-book is communicative with the achievement of the indicator 0.8 being in the valid category. The second indicator, namely the language used in the informative e-book with the achievement of the indicator 0.8, is in the valid category. The third indicator is the language used in the e-book in accordance with the rules of good and correct Indonesian with the achievement of the indicator 0.9 which is in the valid category. The last indicator

for the feasibility aspect of language is the language used in the e-book according to the rules of Enhanced Spelling with the achievement of the indicator 0.9 which is in the valid category.

The average indicator achievement in the aspect of language eligibility is 0.9 with the valid category. This is in accordance with the theoretical study that the Physics e-book is said to be valid in terms of the feasibility of the language if it has an achievement indicator  $> 0.6$ , so that this Physics e-book is valid from the aspect of language feasibility. The fourth aspect assessed by expert validators is the aspect of graphic feasibility. The results of the analysis of the validity test for the graphic feasibility aspect can be seen in Figure 4.

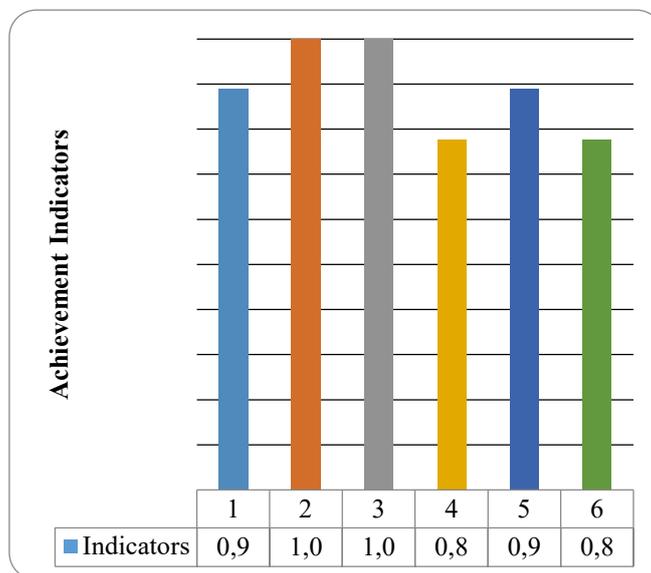


Figure 4. Aspects of Graphic Feasibility

Figure 4 is the result of the analysis of the validity test for the feasibility aspect of the graphic. The graphic feasibility indicator consists of six indicators. The first indicator, the e-book display, has attractiveness with the achievement of the indicator 0.9 being in the valid category. The second indicator, the size of the letters in the e-book, can be read clearly with the achievement of the 1.0 indicator in the valid category. The third indicator, which is the font in the e-book, can be read clearly with the achievement of the indicator 1.0 in the valid category. The fourth indicator, the color of the e-book, has attractiveness with the achievement of the indicator 0.8 being in the valid category. The fifth indicator, the cover, describes the contents of the e-book with the achievement of the indicator 0.9 being in the valid category.

The average indicator achievement in the graphic feasibility aspect is 0.9 with the valid category. This is in accordance with the theoretical study that the Physics e-book is said to be valid from the aspect of graphic feasibility if it has an indicator achievement  $> 0.6$ , so this Physics e-book is valid from the aspect of graphic feasibility. The final aspect assessed by expert validators is the feasibility of the media. The results of the analysis of the validity test for the feasibility aspect of the media can be seen in Figure 5.

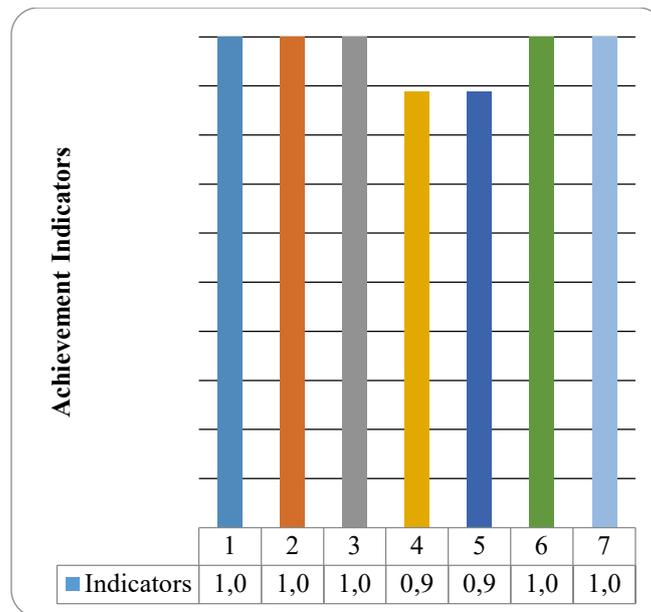


Figure 5. Aspects of Media Feasibility

Figure 5 is the result of the analysis of the validity test for the feasibility aspect of the media. The media feasibility indicator consists of seven indicators. The first indicator, the e-book, can be used at any time with the achievement of the 1.0 indicator being in the valid category. The second indicator, the e-book, can be used anywhere with the achievement of the indicator 1.0 being in the valid category. The third indicator, namely learning e-books in accordance with the development of science and technology with the achievement of indicator 1.0, is in the valid category. The fourth indicator, namely the e-book is easily accessible by learning, with the achievement of the indicator 0.9 is in the valid category. The fifth indicator, namely e-books, can be installed easily with the achievement of the indicator 0.9 being in the valid category. The sixth indicator is the provision of feedback with the achievement of indicator 1, 0 is in the valid category. The last indicator for the media feasibility aspect is the e-book which can be operated easily with the achievement of indicator 1.0 in the valid category.

The average indicator achievement in the media feasibility aspect is 0.9 with the valid category. This is in accordance with the theoretical study that the Physics e-book is said to be valid in terms of the feasibility aspect of the media if it has indicator achievement > 0.6, so this Physics e-book is valid from the aspect of media feasibility. So that the Physics e-book is integrated with earthquake mitigation material discovery learning-based development is declared valid both from the aspects of content feasibility, presentation feasibility, graphic feasibility, language feasibility, and media feasibility, so that e-books can be used in the learning process in schools, to reduce the impact caused by the earthquake disaster.

#### IV. CONCLUSION

Based on the results and discussion in this study, it can be concluded that the integrated physics e-book on discovery learning-based earthquake disaster mitigation material is in the valid category and can be used in the learning process in schools, to reduce the impact caused by earthquake disasters.

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# *An Analysis of Scientific Literacy of Students of SMPN 4 Tanjung Pinang and of SMPN 6 Tanjung Pinang*

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**Abstract** – This study aimed to describe the results of the analysis of scientific literacy skills of students of SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang. This research is descriptive research. The technique of sampling was *purposive sampling*. The data collection technique used the PISA scientific literacy questions of 2015 and was supported by interviews between students and a teacher. The data analysis technique was carried out by calculating the average value of the students' scientific literacy test results. The technique of checking the validity of the data used triangulation. The results showed that the achievement of students' scientific literacy was in the low category. The conclusion of this study is the achievement of the result of the scientific literacy test of students of SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang based on the total score showed that the ability of students of SMPN 4 Tanjung Pinang in answering scientific literacy questions is higher than the students of SMPN 6 Tanjung Pinang.

**Keywords** – 21th Century Education; Analysis; Scientific Literacy; Science.

## I. INTRODUCTION

In this era of 21<sup>st</sup> century, science and technology are thriving; everything can be managed using technology. Students must understand technological developments and be able to use them wisely in order to balance the development of science and technology (Utami, 2018: 24). The 21st century education aims to encourage students to have various abilities as provisions that support students in preparing for the current development and global competition. One of the important abilities that students must have in the 21st century is scientific literacy (Rahmadani, 2018: 184).

Scientific literacy is the ability to use knowledge to identify problems, acquire new knowledge, explain scientific phenomena, and draw conclusions based on evidence related to scientific issues (Wulandari, 2016). According to the Program for International Student Assessment (PISA), scientific literacy is defined as the ability to use scientific knowledge, identify questions and draw conclusions based on evidence in order to understand and make decisions regarding to nature and changes made to nature through human activities (OECD, 2016 : 10).

In PISA (2015), it is explained that scientific literacy is the ability to apply concepts or facts obtained at school with natural phenomena that occur in everyday life. The existence of scientific literacy in schools can make students understand the natural science learning scientifically by providing direct learning experiences.

Scientific literacy is one of the areas of PISA study. The PISA assessment (2015) was carried out from four aspects, namely competence, knowledge, context, and attitude (OECD, 2013). PISA is an ongoing program that offers knowledge for educational policy and practice. PISA also helps to monitor current events in the acquisition of knowledge and skills of students throughout the country and various demographic subgroups in each country (Pratiwi, 2019: 54).

The fact that the PISA survey results from 2000 to 2018 placed Indonesia as one of the countries with a low scientific literacy ranking. The achievement of Indonesia's scientific literacy index in PISA in 2018 was still below the OECD average score. The average science score for the domain of scientific literacy in OECD countries is 489, while Indonesia has only reached a score of 396. (Yosef, 2019: 62).

The measurement data of PISA states that the scientific literacy skills of students in Indonesia are in the low category. The average score of Indonesian scientific literacy based on the results of successive PISA studies from 2000 to 2018 can be seen in Table 1 below.

Table 1. The Achievement of Indonesian Science Literacy Index in PISA Study Results

Year	Indonesia Average Score	PISA Average Score	Ranking	Number of State Participants
2000	393	500	38	41
2003	395	500	38	40
2006	393	500	50	57
2009	385	500	60	65
2012	375	500	64	65
2015	403	500	62	70
2018	396	489	70	78

**Source: (OECD, 2020)**

Based on Table 1, the researcher can conclude that the scientific literacy skills of Indonesian students are still below the average when compared with the average international score. PISA ranking results in 2018 Indonesia is ranked 70th out of 78 countries with a score of 396.

High scientific literacy skills are important for every Indonesian student to have. This is due to the ability of scientific literacy to play a role in determining the progress of a nation. Indonesia ranking, which is still very low in the assessment of world scientific literacy, reflects the Indonesian education system that is currently running (Nofiana, 2017: 82). Scientific literacy is very important to solve various problems related to ethics, morals and global issues due to the thrift in science and technology (Jamaluddin, 2019: 121). Scientific literacy is a skill that needs to be developed in the face of globalization (Astuti, et al., 2016: 126).

Based on the explanation above, it can be concluded that the ability of scientific literacy is a fundamental thing that the students must have in facing the global era for needs of life in various situations. As with other learning, scientific literacy must also be

applied in learning natural science. Natural science is a knowledge that studies living things, natural phenomena and underlies technological development. Natural science is defined as knowledge obtained through data collection by experimentation, observation, and education to produce a reliable explanation of a symptom (Angraini, 2014: 161). The main objective of natural science education is to make a young generation who is fully awake of science a science. The significance in science learning for students can be obtained if students have good scientific literacy skills (Yanti, et al., 2015).

The result of observation for 1 month indicates that science learning in school has been going well and is in accordance with the curriculum, but has not been guided by science literacy-based learning. This can be seen from the many components of scientific literacy that have not been implemented, such as science learning that has not identified scientific issues, explained scientific phenomena, interpreted scientific evidence, identified assumptions, evidence, and the reasons behind conclusion, reflected on the social implications of science and technological developments. Science learning in school tends to be on the content dimension more than to be on the context and competency dimensions.

Based on the problem above, the researcher wanted to analyze the scientific literacy skills of students of SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang by conducting tests adopted from PISA (2015) questions based on translated scientific literacy. The test was carried out in two schools to measure the achievement of students' scientific literacy skills in each school with an A accreditation school status.

It is important to analyze the achievement of students' scientific literacy skills in order to find out the factors that affect the results of scientific literacy and the efforts to improve scientific literacy so that they can provide the right solutions for the problems, especially in science and improving the quality of science learning.

Based on the problem above and considering the importance of scientific literacy for students, the researchers conducted a study entitled "Analysis of the Science Literacy Ability of Students of SMPN 4 Tanjung Pinang and of SMPN 6 Tanjung Pinang".

## II. RESEARCH METHOD

This type of research is a descriptive research with a purposive sampling technique based on the equal status of each school, which is A Accredited School, then two schools were selected, which were SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang.

The data collection technique used the 2015 PISA science literacy questions and was supported by interviews between students and a teacher. Data analysis techniques were carried out by calculating the average score of the students' science literacy test results. The technique of checking the validity of the data used triangulation technique.

## III. RESULT AND DISCUSSION

The data on the achievement of scientific literacy had been collected from research respondents, which were students of SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang. The data were obtained from test conducted on students and supported by interviews between students and a teacher.

The test results showed that the science literacy achievement of students was in the low category. The low achievement of scientific literacy can be seen from the average score obtained based on the total score and scientific competence. The scientific literacy achievement data of students are presented in Table 2 to Table 6.

### 3.1 Science Literacy Test Result Based on Total Score

Table 2. Science Literacy Test Results Based on Total Score.

School	SMPN 4 Tanjung Pinang			SMPN 6 Tanjung Pinang			Total
	IX.1	IX.2	IX.3	IX.1	IX.4	IX.5	
Average Score	53,86	47,96	57,08	36,43	37,08	32,94	45,98
Category	Low	Low	Low	Low	Low	Low	Low

### 3.2 Science Literacy Test Results Based on Science Competency Aspects Explaining Scientific Phenomena.

Table 3. Scientific Literacy Test Results Based on Science Competency Aspects Explaining Scientific Phenomena.

School	SMPN 4 Tanjung Pinang			SMPN 6 Tanjung Pinang			Total
Class	IX.1	IX.2	IX.3	IX.1	IX.4	IX.5	
<b>Average Score</b>	22,57	21,48	23,96	16,07	17,08	14,71	19,93
<b>Category</b>	Low	Low	Low	Low	Low	Low	Low

### 3.3 Science Literacy Test Results Based on the Aspects of Evaluating and Designing Scientific Research.

Table 4. Scientific Literacy Test Results Based on the Aspects of Evaluating and Designing Scientific Research.

School	SMPN 4 Tanjung Pinang			SMPN 6 Tanjung Pinang			Total
Class	IX.1	IX.2	IX.3	IX.1	IX.4	IX.5	
<b>Average Score</b>	7,14	7,04	8,96	7,32	7,08	6,18	7,34
<b>Category</b>	Low	Low	Low	Low	Low	Low	Low

### 3.4 Science Literacy Test Results Based on Science Competency Aspects Interpreting Scientific Data and Evidence.

Table 5. Results of Science Literacy Tests Based on Aspects of Science Competence Interpreting Scientific Data and Evidence.

School	SMPN 4 Tanjung Pinang			SMPN 6 Tanjung Pinang			Total
Class	IX.1	IX.2	IX.3	IX.1	IX.4	IX.5	
<b>Average Score</b>	24,14	19,44	24,17	13,04	12,92	12,06	18,71
<b>Category</b>	Low	Low	Low	Low	Low	Low	Low

### 3.5 Science Literacy Test Results Based on Total Science Competency Aspects.

Table 6. Results of Science Literacy Tests Based on Aspects of Total Science Competence.

Aspect	Total
Explaining Scientific Phenomena	19,93
Evaluating and Designing Scientific Research	7,34
Interpreting Scientific Data and Evidence	18,71
Average Score	15,32
<b>Category</b>	Low

The main cause of low student scientific literacy is that students have not studied the tested material and are not used to working on scientific literacy problems. According to the students, scientific literacy questions are different and more difficult when compared to science questions given by teacher. The student's statement was confirmed by teacher who stated that the material tested on students had never been taught in science learning. Teachers also have not implemented scientific literacy-based learning and evaluation optimally. This is in accordance with the opinion of Anggraini, G. (2014), students are not accustomed to working on scientific literacy questions using discourse. Teachers in the learning process do not support students in developing scientific literacy skills. The teacher in the learning process does not present something that spurs students to think, such as introductory text, pictures, scenarios of a case or examples of problems, or tools and materials that are not yet familiar to students.

The low scientific literacy of students is also caused by the lack of critical thinking skills or students' reasoning abilities. The ability to think critically or reasoning is very necessary in answering scientific literacy questions. According to the teacher, student reasoning is still low. That is, students have not maximally carried out a critical thinking process that thinks about various things in depth to finally determine the right decision from the problems they are facing. The low critical thinking skills possessed by students

illustrate that the process of learning science learning activities has not been carried out. According to Purwani, et al. (2018), explained that although the competency standards in Indonesia's newest curriculum emphasize the need for scientific-based learning that prioritizes higher-order thinking skills, not all curriculum changes are actualized in the teaching process. This causes the inability of most students to make the right decisions as a solution to the problems in the situation they face.

The ability to think critically is not easily possessed by someone. There are many factors that influence whether or not these abilities need to be familiarized in individuals from an early age (Cahyana, et al., 2007; Zubaidah, 2016). There are several components that can build critical thinking skills, namely formulating and analyzing arguments, asking questions and providing answers, assessing the credibility of information sources, conducting and assessing reports on observations, making and assessing deductions and inductions, identifying and assessing identification, identifying, deciding and carry out assumptions, as well as interact with others (Fisher, 2011). It takes habituation in the learning process with using multi-model, multistrategy and multimedia to form students' critical thinking skills (Agnah, et al. (2018); Miharja, et al. (2019); Nurhayati, et al. (2019); Permana & Chamisjatin. (2019); Pratama, et al. (2019); Suraya, et al. (2019).

Another cause of low student scientific literacy is the weak ability of students to read and interpret reading. Students have difficulty filling in answers because they do not understand the questions. According to the students, the scientific literacy questions being tested contained discourses that had to be read first and made students think more deeply to understand the content of the discourse in order to answer the questions. The student's statement was confirmed by the teacher who stated that the willingness and ability of students to read was still low. Based on these statements, it is known that the students' ability to read and interpret reading is still low. This is in accordance with the opinion of Fuadi, H. (2020), one of the obstacles of students in scientific literacy is the low ability to read and interpret reading. Research conducted by the United Nations educational, scientific and cultural organization (UNESCO) in 2016 on 61 countries in the world shows that reading habits in Indonesia are classified as very low. The results of the study, published under the name "The World's Most Literate Nations", show that Indonesia is ranked 60th.

Efforts that can be made to overcome these problems are implementing a scientific literacy-based teaching and learning process by arranging learning tools that contain aspects of scientific literacy. According to Ridho (2018: 53), the application of science literacy-based learning to prepare science literate students can be done by compiling a Lesson Plan which contains aspects of scientific literacy. This is also in accordance with the results of research by Siagian (2017: 176), which states that teachers, schools and education authorities need to make improvements in the learning process to improve students' scientific literacy, such as the application of learning models.

According to Nisa (2018: 161), the application of the Two Stay Two Stray learning model with the help of visual media is proven to increase students' scientific literacy compared to the application of the direct learning model. In addition, the implementation of SETS learning has been proven to be effective in increasing students' scientific literacy. This is in accordance with the results of research by Udompong (2014: 5094) and Ristina (2019: According to Nisa (2018: 161), the application of the Two Stay Two Stray learning model with the help of visual media is proven to increase students' scientific literacy compared to the application of direct learning models. Therefore, the implementation of SETS learning has been proven to be effective in increasing students' scientific literacy. This is in accordance with the results of research by Udompong (2014: 5094) and Ristina (2019: 432), SETS learning is effective in increasing students' scientific literacy in each category, namely science as a body of knowledge, science as a way of thinking, science as a way of investigating, and interacting with science, technology, and society.

Another effort that can be done is to train students to work on scientific literacy problems by applying scientific literacy-based evaluation instruments. This is in accordance with the opinion of Rusilowati (2016: 5726) & Rusilowati (2018: 6), it is recommended that teachers apply scientific literacy-based evaluation instruments in learning to train students to work on scientific literacy problems. According to Pamungkas (2018: 161), one of the evaluation instruments based on scientific literacy that can be applied in learning is to use a metacognitive test based on scientific literacy.

#### **IV. CONCLUSION**

Based on the results of the research that has been managed, it can be concluded that the achievement of the results of the scientific literacy test of students at SMPN 4 Tanjung Pinang and SMPN 6 Tanjung Pinang based on the total score shows that the ability of students of SMPN 4 Tanjung Pinang in answering scientific literacy questions is higher than that of SMPN students. 6 Tanjung Pinang with the low category.

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# *Content And Methods Of Individualization Of Teaching Activities*

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**Abstract** – the article provides information on the innovations in teaching using traditional education systems and modern technologies, and discusses ideas for individualizing learning. The content and methods of individualization of reading are widely analyzed. The opinions of scholars in different contexts are also covered.

**Keywords** – Individualization of teaching, teacher, student, personal approach, pedagogy, individual characteristics, educational process, psychological and pedagogical measures.

## I. INTRODUCTION

Individualization of teaching:

- The teacher interacts with only one student;
- One student interacts only with teaching aids (books, computers, etc.).

In individual teaching, the content, methods and image of the activity are adapted to the characteristics of the student.

When it comes to personal approach:

- The principle of pedagogy, according to which the teacher interacts with individual students according to the individual model, taking into account the individual characteristics of students in the educational process, and based on individual characteristics;
- take into account the individual characteristics of students in the learning process;
- It is understood that not only the development of all students, but also the creation of psychological and pedagogical measures for the individual development of each student.

## II. LITERATURE REVIEW

Individualization of teaching:

- organization of the educational process, in which the choice of teaching methods, image is associated with the individual characteristics of the student;
- A variety of educational, methodological, psychological, pedagogical and organizational-administrative activities that provide an individual approach.

Thus, according to didactic research, the individualization of teaching is organized in such a way that the individual approach and individual form are given priority.

Individualization of teaching is based on the following author's technologies:

- Inge Unt's technology of individualization of teaching;
- A.S. Granskaya Flexible Learning Technology;
- V.D. Shadrikov's technology of teaching on the basis of the plan directed to individuality.

### III. ANALYSIS

Inge Unt's basic concept in the technology of individualization of teaching is that an important form of individualization of teaching in the current situation is the independent work of the student at school and at home.

Inge Unt understands its content and methodology as individual study tasks for independent work, workbooks published on the basis of individualized independent work manual, adapted to the current educational literature.

A.S. Graniskaya notes that it is possible to organize a flexible system of teaching in the classroom, in which the teacher spends 60-80% of his time working with students individually. The peculiarity of A.S. Graniskaya's method is that it organizes the lesson on the basis of a certain unusual device:

- Part One - Teaching Everyone;
- The second part is two parallel processes: independent work of recipients and individual work of the teacher with individual students, i.e. the use of generalized schemes, working as a rotating pair of teachers, flexible multidisciplinary tasks, etc.

According to V.D. Shadrikov, if a child is given the details of complex tasks, offered to motivate the learning process, but the child is given the opportunity to work today, it is believed that students' abilities will develop effectively.

V.D. Shadrikov's methodology is based on a six-level curriculum, program and manual, which allows teaching according to the abilities of each student. By choosing the option that best suits the level of complexity of each subject, students change frequently in the classroom and try to master the curriculum together without losing the scope and content of the subject. Choosing a level of complexity is quick and sometimes impossible. Because the equality of the students in the class depends on their ability. The six levels of complexity allow to focus on virtually all children, to organize the learning process to the best of their ability and tailored to the student's abilities and development.

### IV. DISCUSSION

The general principles behind the individualization of this teaching are based on the author's technology:

- Individualization is a strategy of the learning process;
- Individualization - a necessary factor in the formation of individuality;
- The possibility of using individualized teaching in all subjects studied;
- Integration of individual work with other forms of educational activity;
- Individual study, style. Common features of individualization technology include;
- List the factors that lead to inability to master;
- Ways to correct individual deficiencies in the process of acquiring knowledge, skills and abilities in the process of thinking;
- Recognize and overcome the lack of motivation and lack of willpower in family upbringing;
- Optimizing the learning process for gifted and talented students (taking into account creative activity, classroom and extracurricular activities);
- Giving freedom of choice in the teaching process;
- Development of general learning skills and abilities;
- Formation of students' self-assessment;
- Use of teaching aids, as well as computers.

Teaching individualization technology includes:

Batov system. Developed in the United States, the learning process is divided into two parts:

The first part is the whole class work.

The second part is individual lessons. Such classes are held to ensure that students who feel the need to do so do not fall short of generally accepted norms or are on a par with those who are relatively advanced. The high-ability category is staffed by a teacher, while the relatively low-ability and low-achieving students are assisted by an assistant teacher.

Trump's plan is that the technology is very popular in the United States. It is a system of teaching in which a large audience is combined with individual lessons in small groups.

Highly qualified teachers and professors give lectures in large groups of 100-150 people with the help of modern technology. Small groups of 10-15 people discuss the lecture materials. Individual work is carried out in school classrooms and laboratories. 40% is allocated for lectures, 20% for small groups, and 40% for individual work in classrooms and laboratories. There is no usual class concept, and small groups are not constant.

### V. CONCLUSION

In conclusion, individual education is one of the forms of teaching that has a pedagogical impact on the student. Understands the teacher's activities with the student outside the classroom. Individual education is one of the oldest forms of education and was widely used in ancient and medieval times.

In the history of education in Uzbekistan, individual forms of education have been widely used. Its effects, especially in the applied arts and crafts, have been reflected in teacher-student education. Famous folk masters Toshpolat Arslonkulov, Shirin Murodov, Kadyrjon Khaydarov, Mahmud Usmanov, Hamro Rakhimov were educated in this way. Individual education provides an opportunity to take full account of the individual characteristics of the child's psyche, the natural tendencies of the sciences and professions.

After the independence of Uzbekistan, the focus on individual education has increased significantly. In particular, the introduction of a test system for admission to colleges and universities has led to the development of tutoring in individual education.

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# *Challenges For Increasing Efficiency Of Education*

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**Abstract** – this article provides that, no matter how much the material base, standards, curricula, programs and textbooks are improved in education, the achievement of the expected main result, deep and thorough knowledge, the achievement of high quality mastery is the responsibility of the teacher who conducts direct theoretical and practical training, creativity, inquisitiveness, qualification, pedagogical skills, and in the educational center requires a student body.

**Keywords** – Standards, Curricula, Programs, Textbooks, Theoretical And Practical Training, Pedagogical Skills, Educational Center.

## I. INTRODUCTION

Any education should be focused on the personality of the student, his interests, desires and needs. That is, it is necessary to focus on the individualization of education.

Now what is the individualization of education? Let's answer the question:

- Individualization of the educational process is a method of teaching that takes into account the fact that each student actively participates in the learning process and makes a personal contribution to the learning process;
- The methodological approach, speed, personal characteristics of the student are taken into account in the organization of the educational process;
- In carrying out educational-methodical, psychological, pedagogical-organizational management work, the student is in the personal educational center.

## II. LITERATURE REVIEW

- What is an individual approach?

1. When working in groups, when organizing educational work, when working with each student individually, their personal characteristics should always be in the focus of the teacher.
2. Even when communicating with a student, his / her peculiarities should be taken into account.
3. His abilities should be taken into account in the educational process.

4. In carrying out pedagogical psychological processes it is necessary to consider the level of personal development of the student.

### III. ANALYSIS

Principles of individualized education:

- Individualization is the main strategy of the educational process.
- Personal development is provided through the individualization of the learning process.
- Implementation of each subject through individualization of teaching guarantees the expected result.

Conditions are created for the integration of forms of teaching with individualization.

- Individual education ensures the quality and efficiency of the educational process.
- In individualized education, skills, qualifications, knowledge are based on the interests of the student.
- Ability to work independently develops the student's general reading skills.

Thus, the quality and effectiveness of education depends on the effective engagement of students in independent reading, independent thinking and thinking activities aimed at mastering the content of learning.

It is possible to show the development of the following features in students during the teaching process in interactive methods.

- The student is not taught, he is taught to read independently, to study, to work.
- At the same time, students are taught to master through independent analysis, to think creatively, to think freely on the basis of personal conclusions. We develop the ability to think against foreign ideas, to defend their position.

• The ability to acquire knowledge is formed by searching, finding, processing knowledge in textbooks, the Internet, and various other sources, without imparting knowledge to the student. Through the acquired knowledge, the opportunity to think creatively is created. Pupils are taught to work with textbooks, to read, to study, to write notes, to acquire skills of independent study with the help of additional literature, reference books.

• All students in the class are guaranteed to master at the level of their abilities. At the same time, the student has the skills and abilities to apply the acquired knowledge in life, in practice.

• All students can achieve the same results if all teachers and students learn to work on the basis of interactive methods and incorporate them into their learning activities.

- When organizing the teaching process on an interactive basis:

1. The interaction of the student increases; the skills of cooperation, creativity are formed.

2. Skills of working with the curriculum, program, textbook, standard norms, manuals, the content of the subject are formed.

3. Independent reading, work, mastering the content of education, the text becomes a daily personal affair.

4. The student becomes accustomed to free expression, to defend, to prove, to confirm the opinion.

5. Most importantly, didactic motives are formed in the learning process. That is, the needs, desires and wishes of the student are met. The student's interest in the learning process increases. This situation raises the student to a higher level in achieving learning goals.

What are the advantages of organizing lessons in interactive methods?

Teaching content leads to better mastery;

In due course, educational contacts will be established between students and teachers;

Teaching methods take different forms in the educational process (single, pair, group, large groups).

#### IV. DISCUSSION

The learning process is highly motivated by meeting learning needs.

- Learning material is well remembered through mutual information, reception, processing.
- The student develops the skills of communication, expression, exchange of ideas.
- In the learning process - the student develops self-esteem, critical thinking.
- The lesson becomes interesting for the student, the content of the subject is taught, a creative approach to the learning process, a positive attitude.
- Encourages each student to think independently, to explore, to observe.
- In interactive lessons, the student not only masters the content of education, but also develops his critical and logical thinking.

Of course, the organization of interactive lessons has its drawbacks.

1. The learning process is time consuming.
2. It is not possible to control all students in interactive lessons.
3. When studying very complex materials, students are not able to solve the problem completely and clearly, in such cases, the role of the teacher is low.
4. During the learning process in groups, due to the participation of weak students, strong students also get low scores or grades.

In the organization of lessons in an interactive way, the development of the student's personality should begin with the creation of a self-ground.

That is, the student:

- To acquire knowledge on the basis of independent reading, reading;
- Self-awareness, conscious upbringing;
- To look at their strengths and capabilities with confidence;
- To look at academic work with a sense of responsibility;
- To be able to organize their activities independently, to take advantage of every minute;
- To be able to arouse the desire for academic work;
- Be able to be active in any situation;
- In particular, it is necessary to learn to make effective use of modern sources of information as the main and main goal.

Therefore, the creation of technology for student self-development is one of the most pressing issues in the field of pedagogy, didactics. What is person-centered education among teachers in recent times, and why is interactive teaching necessary? When did this method enter the educational process? What types are there? What is the compositional structure? We are faced with the question of how to bring it into the learning process, how it differs from previous methods. To do this, it is necessary to recall the traditional lessons taught in our schools these days. Traditional teaching was proposed in the 17th century by the Czech pedagogue Jan Amos Comenius. He developed a single classical system of teaching, which he called the class-lesson system. Later this system became widespread in pedagogy. Named after the traditional school classroom system, it has its own traditions:

- Approximately the same or similar level of preparation of children of the same age constitutes a close children's class.
- The class works on the basis of a single plan, program, and lesson schedule.
- Basically, the type of lesson is a single lesson.

- The lesson is based on a specific subject, the same material on the topic.
- Students' activities are supervised by a teacher, who assesses the level of knowledge of each student, and at the end of the year decides whether to transfer students from class to class.
- Textbooks are mainly used for homework. The traditional lesson plan looks like this.

*New Topic -> Strengthening - Monitoring – Evaluation*

Learning Conceptual status of a traditional lesson:

- Scientific
- Adaptability to the nature of the student
- Sequence, structure
- Comprehensibility
- Demonstration
- Relation of theory to practice, ability to apply in practice.

### V. CONCLUSION

Disadvantages of traditional lessons:

- The uniformity of the lesson;
- Basic information is given and the process of mastering it is carried out at home through a plan, task;
- Students do not have passive hearing and independence;
- Students exchange ideas with each other, there is no verbal exchange of ideas;
- Feedback is not established;
- Each activity is based on the approach of the average student;
- The content of education is mainly carried out by the teacher.

The conclusion is that in such an environment, the teacher must have a highly developed ability to think, to observe problems, to be able to solve problems in a timely manner.

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# *Damage Of Zoophil And Sinbovil Flies In Livestock And Their Fight Against Them*

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**Abstract** – The article provides data on the harm of zoophilic, synovyl and synanthropic insects that damage livestock. The results of studying the seasonal dynamics of zoophilic and synanthropic insects are presented, for which the drug Cypermethrin, 25% of Belarus production, was tested and a high insecticidal effect was obtained.

**Keywords** – Damage Of Zoophil, Sinbovil Flies, Livestock.

## I. INTRODUCTION

One of the main obstacles to the animal breeding and livestock production development is pests, especially zoophilic and sinbovil mosquitoes. Among animals, mosquitoes like cattle most of all – they parasitize 30 species of mosquitoes: 17 species in sheep and 15 species (2) in pigs. Even today, the damage caused to livestock by sinbovil mosquitoes is significantly observed. During the mass flight of these insects, the farm animals productivity decreases sharply that is, milk yield decreases by 10–20%, obesity is reduced by 100–120g (3, 4). The sanitary quality of manufactured dairy products decreases. In addition, some sinbovil mosquitoes are intermediate hosts of helminths (telasia, setarius, stefanofilaria, etc.) (3, 4) and spreads pathogenic microorganisms into the environment - pathogens of dysentery, cholera, anthrax, tuberculosis and many other dangerous diseases (4).

Therefore, timely and effective control of these extremely harmful parasites is a topical issue in all livestock farms and pastures.

## II. RESEARCH PURPOSE

The aim was to study the sinbovil and zoophilic insects ecology and their seasonal migration on livestock farms and pastures, to create measures to combat them.

## III. RESEARCH METHOD

In order to study the ecology and phenology of zoophilic and synbovil mosquitoes, the main administrative and laboratory building of Veterinary Research Institute and the farm "Plem Chorvadori" in Payarik district were selected as ecological corners. The glass surface of the ecological corner was disinfected (sprayed) using a sprayer with a 0.025% aqueous emulsion of the insecticide - cypermethrin 25%. During the year, insects that fell into the ecological corner were collected. In zoobiocenoses, insects were captured at different times of the day during the season using an entomological catcher (gauze catcher) and their species were identified using an identifier (1) in the arachnoentomology laboratory of Veterinary Research Institute.

IV. RESEARCH RESULTS

In our study, representatives of zoophilic and synbovil mosquitoes of great veterinary and medical importance, which are common in ecological corners and zoobiocenoses, were studied.

Experiments to study the aqueous emulsion effect of cypermethrin 25% on biodiversity, which is expected to be used in veterinary practice in the fight against parasitic diseases, were conducted in the administrative building Veterinary Research Institute (ecological corner). The inner surface of the Veterinary Research Institute administrative building corridor, where synanthropic, zoophilic, exophilic and endophilic insects are collected, was disinfected. The phenocological condition of the insects was observed daily. As a result, all synanthropic, zoophilic, exophilic, and endophilic insects types that came in contact with the disinfected surface were knocked down and knocked out. At the same time, a 0.025% aqueous emulsion of the insecticide cypermethrin 25% of Tashkent-1 sample was observed to be 100% insecticide (LD100) effective against zoophilic, synanthropic, exophilic, endophilic insects.

In phenological observations, zoophilic, sinbovil, and synanthropic mosquitoes were most common, mainly in June and July. In August, September, and October, their numbers were minimal.

Table – 1. Seasonal dynamics of zoophilic, synbovil and synanthropic (exo- and endophilic insects) species

Zoological taxa - family, family, generation, species names.	The special experimental studies results on the cypermethrin 25% k.s effect universal Belarusian pyrethroid on the zoophilic and synanthropic (exo- and endophilic insects) species diversity								
	Results of post-disinsection observations (migration)								
Biodiversity condition.	Months								
	VI	VII	VII	IX	X	XI	XII	Total (times)	Months
<b>A.DIPTERA</b>									
1. <i>L.irritans</i>	0	+	+	0	0	0	0	2	VII, VIII.
2. <i>S. calcitrans</i>	+	+	0	0	0	0	0	2	VI, VII.
3. <i>M. simplex</i>	0	+	0	0	0	+	0	2	VII, XI.
4. <i>F. scalaris</i> F.	+	+	+	+	0	0	0	4	VI, VII,VIII, IX.
5. <i>F. incisurata</i>	0	+	+	0	0	0	0	2	VI, VII.
6. <i>F. leucosticta</i>	0	+	+	0	0	0	0	2	VI, VII.
7. <i>F. canicularis</i>	+	+	+	0	0	+	0	4	VI, VII, VIII,XI
8. <i>F.barbata</i>	0	+	+	0	0	0	0	2	VI, VII.
9. <i>M. stabulans</i>	+	+	+	+	0	+	0	5	VI, VII,VIII,IX,XI
10. <i>M. assimilis</i>	+	0	0	0	0	0	0	1	VI
11. <i>D.asiatica</i>	0	0	0	+	+	0	0	2	IX,X.
12. <i>C. vicina</i>	+	+	+	+	0	0	0	4	VI, VII, VIII,IX.
13. <i>L. sericata</i>	0	+	0	0	0	0	0	1	VII.
14. <i>P. rudis</i> F.	+	+	0	0	0	+	0	3	VI, VII, XI
15. <i>B. haemorrhoidalis</i>	0	+	+	+	0	0	0	3	VI, VII, VIII.
16. <i>P. hirtipes</i>	0	+	0	0	0	0	0	1	VII.
17. <i>P. albiceps</i>	+	+	0	0	0	0	0	2	VI, VII.
18. <i>Ph. regina</i>	0	+	0	0	0	0	0	1	VI.
19. <i>D. funebris</i>	0	+	0	0	0	0	0	1	VII.
20. <i>Drosophila</i> sp.n.	+	0	0	0	0	0		1	VI.
21. <i>E. tenax</i>	+	+	+	0	0	0	0	3	VI, VII,VIII.
22. <i>M. glabra</i>	0	0	0	+	0	0	0	1	IX.

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23. Phlebotomus sp.n.	0	+	+	0	0	0	0	2	VI, VII.
24. V. crabro	0	0	0	0	+	0	0	1	X.
<b>Total</b>								52	

“Plem Chorvadori” private farms in Poyarik district, cattle infected with parasites, weaned and reared cattle were treated with an aqueous emulsion of Tashkent №1 sample of cypermethrin 25%(1,5-2,0; 2,5-3,0 liters / head of working emulsion was consumed).

The most insect-infested areas of livestock buildings - barns, manure, sewers were disinfected with a 0.025% aqueous emulsion of cypermethrin 25% using a sprayer. The aqueous solution was sprayed on non-absorbent surfaces at 50-100 ml/m<sup>2</sup> rate, on absorbent surfaces at 150-200 ml/m<sup>2</sup> rate.

The study found that all (100 percent) of the cattle on these farms were infested with zoophilic insects. *Lyperosia titillans*, *Lyperosia irritans*, *Fannia canicularis*, *Stomoxys calcitrans*, *Musca domestica* species dominance was observed.

During the experiments, it was found that 0.025% aqueous emulsion of cypermethrin 25% does not adversely affect the physiological state and animals productivity, is 100% insecticidal and larvicidal against zoophilic mosquito imago and larvae.

### V. CONCLUSION

1. 24 species of insects were identified in the ВИТИ "Ecological Corner" and their dominance was observed in June, July and August.

2. A 0.025% aqueous emulsion of cypermethrin 25% preparation against zoophilic, sinbovil, synanthropic mosquitoes showed 100% parasitic and entomocidal efficacy.

3. Timely decontamination and livestock disinsection against ectoparasitoses with 0.025% aqueous emulsion of cypermethrin ensures epizootiological safety of livestock and livestock farms.

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# *Validity of Student Worksheets using Inquiry Based Learning Models with Science Technology Society Approach for Physics Learning*

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**Abstract** – Physics learning aims to develop knowledge and train students' thinking skills. But in reality, students haven't been able to develop because they are less trained to find concepts independently. Student worksheets includes teaching materials that can help students find concepts and apply these concepts. The purpose of this study was to produce student worksheets using the inquiry based learning model with the community technology science approach with criteria valid. Learning using a valid student worksheets can improved student's competence. This type of research is R&D using the Plomp model. The validity assesment is carried out by expert reviews, then analyzed using Aiken's V formula. The results of validity of student worksheets meet the valid criteria of 0.79. Based on the results of the study, it can be concluded that the student worksheets uses the inquiry based learning model with a science technology society approach valid for use in Physics learning.

**Keywords** – Sudents worksheets, Inquiry Based Learning, Science Technology Society Approach.

## I. INTRODUCTION

Physics learning aims to develop knowledge and train students' thinking skills. But in reality, students have not been able to develop it because they are less trained to find concepts independently. One of the tasks of educators is to develop learning tools, namely all components that support the implementation of learning. Simple learning tools consist of Syllabus, Learning Implementation Plan (RPP), and Learning Materials for students. Teaching materials are defined as all forms of materials used to help teachers / instructors in carrying out teaching and learning activities in the classroom<sup>[1]</sup>. The teaching material in question can be written material or unwritten material so as to create an environment / atmosphere that allows students to learn.

Student worksheets are included in printed teaching materials that function to help students learn independently, actively and creatively. Student worksheets contains sheets of paper containing material, summaries, and instructions for implementing learning tasks that must be done by students, both theoretical and practical, which refers to the basic competencies students must achieve in learning<sup>[2]</sup>. The tasks contained in the LKS can encourage student active participation and train students' literacy skills in the learning process<sup>[3]</sup>. Therefore, the use of student worksheets is expected to help students improve their knowledge and skills.

Based on the observations, it was revealed that learning Physics in High School was not yet in accordance with the prevailing National Education Ministerial Regulation. The obvious problem is the use of student worksheets during the learning process which is considered less optimal to use. Furthermore, in the learning process it appears that there is still a teacher center and the teacher has not used a varied learning model in accordance with the 2013 Curriculum. Whereas Physics Learning is effective in achieving all competencies simultaneously, there are training to apply concepts to real problems (knowledge), training independent planning activities (attitudes), and training the use of certain instruments (skills) are practicum activities<sup>[4]</sup>. Therefore, student worksheets is needed which can make the learning process become a student center and make students active in practical activities in the laboratory.

One learning model that can lead to activeness and creativity of students in solving problems is an inquiry based learning model. Inquiry based learning is a series of learning activities that involve maximally all the ability of students to search for and investigate problems systematically, critically, logically and analytically so that they can formulate their own findings with trust self<sup>[5]</sup>.

There is research related to inquiry based learning model which is a learning model that can make learning contextual to improve students' thinking and literacy skills<sup>[6]</sup>. One of the advantages of the inquiry based learning model is that students can acquire investigative knowledge because they are directly involved in the discovery process, can understand scientific concepts and ideas well, and can form and develop self-concept of students<sup>[7]</sup>.

In order for the problematic situations that arise in learning to be in accordance with real life, the approach that can realize this is the science technology society approach. The science technology society approach is seen as a learning process that is always in accordance with the context of human experience. In this approach students are invited to enhance creativity, scientific attitude, use concepts, and science processes in everyday life<sup>[8]</sup>. The science technology society approach also links the concepts understood in technology applications. So it is hoped that learning physics using this approach can also provide a strong basis for technological advances<sup>[9]</sup>.

The use of inquiry based learning models with science technology society approach makes students able to understand science concepts and ideas well in the process of problem solving so that learning becomes more meaningful and can improve students' learning competencies. By using an inquiry based learning model with a science technology society approach to learning, students can act as learning centers because students will be able to develop their own concepts. By following the steps of the inquiry based learning model and the science technology society approach contained in the student worksheets, students become more active in building knowledge and developing attitudes and skills<sup>[10]</sup>. Therefore, the inquiry based learning model with science technology society approach is very suitable to be delivered using student worksheets teaching materials because one of the functions of the student worksheets is to minimize the role of educators, but to activate students<sup>[2]</sup>.

Based on the description that has been delivered, the researcher develops the student worksheets using the inquiry based learning model with science technology society approach to Physics learning. The purpose of this study was to determine the level of validity of the developed student worksheets.

## II. METHOD

The type of research is development research using the Plomp model. Design research according to Plomp (2013) includes the systematic study of designing, developing, and evaluating educational interventions. Where the Validity is at the development stage. The purpose of LKPD validation is to look the truth of concepts, forms, look and grammar used in LKPD and the impact indicators developed. The main parts of the LKPD that are validated are the suitability of KD, indicators, correctness of concepts, language and graph used. Validation is said to be complete, if the validator states that it is valid for LKPD and practical tools so that it is ready to be tested. The input of the validator is used to revise the developed LKPD<sup>[11]</sup>.

The validity assessment of the student worksheet use an inquiry based learning model with a science process skills approach carried out by experts who are experienced in their fields. Validity analysis uses a Likert scale with steps (a) Giving scores for each answer item strongly agree (4), agree (3), disagree (2), and strongly disagree (1), (b) Add the total score for each validator for all indicators, (c) Granting validity values using the Aiken's V formula like equation (1).

$$V = \frac{\sum s}{[n(c-1)]} \quad (1)$$

with:  $s = r - lo$ ,  $lo$  = the lowest validity score (in this case = 1),  $c$  = the highest validity score (in this case = 4),  $r$  = the number given by the validator. Validity categories can be seen in Table 1.

Table 1. Category Validity

Value	Category
$\geq 0,6$	Valid
$< 0,6$	Invalid

(Source: Azwar, 2015)

Based on Table 1, it can be seen the criteria of the value of agreement validity obtained. This validity is done using the Aiken's V formula and is categorized on two values, namely valid and invalid. The developed student worksheet can be said to be valid when the value obtained exceeds or equals 0.6.

### III. RESULT

Validation was carried out by 3 lecturers from UNP who were experts in the fields of Physics, language and development, namely Festiyed (FY), Fatni Mufid (FM), and Amali Putra (AP). The validation results are described as follows.

#### 1. Result of Instrument Validity

Before conducting product validation, validation of the instrument used to validate the product being developed is done first. The instrument validation was conducted by supervisors and examiners namely Yulkifli (YL), Desnita (DS) and Yerizon (YR). The results of instrument validation can be seen in Table 2.

Table 2. Result of Validity Instrument Assessment Sheet

Instrumen	Aiken's V Value	Category
Instrument for Validity of student worksheet	0.86	Valid
Instrument or Validity of RPP	0.92	Valid

Based on Table 2 it can be stated that the instrument has been developed in the valid category, where the value of V is greater than 0.6. Thus this instrument can be used.

#### 2. Result of Student Worksheet Validity

The validity test of the LKPD is conducted after the instrument validity test. Appraisal of instruments uses a validation sheet which includes the following indicators: clarity of instructions for filling in the validation sheet, statements made in accordance with the indicators, objectives to be achieved, not containing double meanings, using a simple and easy to understand assessment format, and the language used according with good and correct Indonesian language rules. The validity of the student worksheets uses the inquiry based learning model and the community technology science approach consists of four aspects, namely the content aspect, construction aspects, language aspects, and graphic aspects. The results of the student worksheets validity can be seen in Table 3.

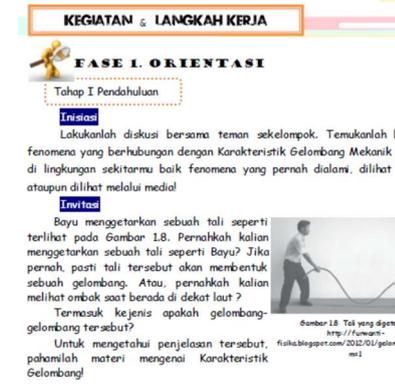
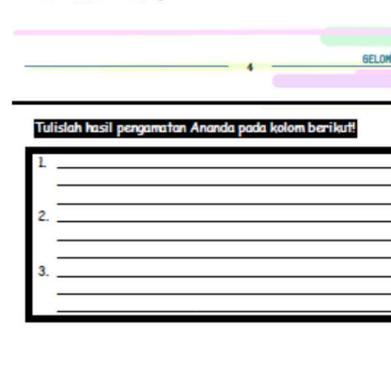
Table 3. Result of Validity of student worksheet

Component Validity	Aiken's V Value	Category
Content	0,78	Valid
Construction	0,72	Valid
Language	0,75	Valid
Graphic	0,92	Valid
<b>Average</b>	<b>0,79</b>	<b>Valid</b>

Based on Table 3 it is stated that the developed student worksheets is in the valid category with an average value of 0.79, where in the aspects of content, construction, language, and graphics the value of V is greater than 0.6. Thus this student worksheets can be used in the learning process. Based on the results of the validity that has been done, it is obtained that the product developed is

included in the valid category, but there are some suggestions given by the validator. The suggestions given by the validator can be seen in Table 4

Table 4. Result of Validity of student worksheet

Before Revision	After Revision
<ol style="list-style-type: none"> <li>1. There are several ineffective sentences and ambiguous sentences.</li> <li>2. The material should not be widely presented at the student worksheets, but constructed by students through the stages of inquiry based learning model and science technology society approach</li> <li>3. In the orientation phase, the illustration image displayed must be more than 1 as a comparison and as a direction for students to formulate problems and hypotheses.</li> </ol>	<ol style="list-style-type: none"> <li>1. The corrected sentence becomes effective and not ambiguous.</li> <li>2. Reducing the material presented.</li> <li>3. Add illustration images in the orientation phase.</li> </ol>
	
<ol style="list-style-type: none"> <li>4. In the orientation phase there is a column of results of the activities of students.</li> </ol>	<ol style="list-style-type: none"> <li>4. Add columns to student activities in the orientation phase.</li> </ol>
	
<ol style="list-style-type: none"> <li>5. The conclusion phase is more led again according to the material / concept.</li> </ol>	<ol style="list-style-type: none"> <li>5. Provide a reference to the conclusion phase so that students are more focused on the material / concept.</li> </ol>

Before Revision	After Revision
<p>Berdasarkan hasil penyelidikan, tuliskanlah kesimpulan Anda!</p> <p>Apakah hasil yg diperoleh sesuai dengan hipotesis yang telah dikemukakan sebelumnya? Apakah hipotesis tersebut dapat diterima/ditolak karena telah/tidak sesuai dengan hasil penyelidikan?</p>	<p>Bagaimana kesimpulan Anda mengenai penyelidikan karakteristik dari gelombang mekanik yang telah Anda lakukan?</p> <p>1. Gelombang pada tali disebut _____ karena _____</p> <p>2. Gelombang pada slinki disebut _____ karena _____</p> <p>3. Besaran fisika yang terdapat pada gelombang tali adalah _____</p> <p>4. Besaran fisika yang terdapat pada gelombang slinki adalah _____</p> <p>Apakah hasil yg diperoleh sesuai dengan hipotesis yang telah dikemukakan sebelumnya? Apakah hipotesis tersebut dapat diterima/ditolak karena telah/tidak sesuai dengan hasil penyelidikan?</p>

Several revisions have been made to the prototype according to the validator's suggestion. The revised results from this stage can be used in physics learning which will see the level of practicality and effectiveness in learning.

#### IV. CONCLUSION

The results of validity of student worksheets using the inquiry based learning model with the community technology science approach meet the valid criteria of 0.79. The components of student worksheet validity include content, construction, language, and graphics. Based on the results of the study, it can be concluded that the student worksheets uses the inquiry based learning model with a science technology society approach valid for use in Physics learning.

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# *Metaphor In The Scientific Discourse*

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## Abstract

There was investigated the role of metaphor in the scientific discourse. The possibility to get clear and laconic information with metaphoric transfer was studied.

The goal of this article was to determine the features of the metaphors in the scientific style texts.

The scientific novelty was to determine the role of metaphor in the scientific texts and the possibility its use as a scientific term.

**Conclusion:** 1) metaphor is an integral part of the scientific style texts and terminology systems of science, 2) it is an instrument of enrichment of the scientific language (the appearance of new terms, etc.), 3) almost all types of metaphor and metaphorical transfer are represented in the scientific style texts, 4) the evaluative-expressive metaphors are completely absent in the scientific texts, 5) figurative metaphors are used to convey scientific information in a more accessible and easy-to-understand form, 6) metaphor serves as a vector for the further development of scientific knowledge.

**Keywords** – Metaphor, Scientific Discourse, Anthropocentrism, Scientific Knowledge, Semantics.

## I. INTRODUCTION

The development of the world scientific disciplines gives rise to new requirements for the language, for the trend of its development and for the appearance of completely different views on its structure. The emergence of the latest trends such as cognitive linguistics, cultural studies, psycholinguistics, computational linguistics, semiotics categorically require the removal of any restrictions between cognition and language, turning it into a heuristic tool in the scientific and theoretical knowledge, because language is a product of all complicated cognitive, psychological, social processes that take place in the individual or in a society. A person always learns on the basis of comparing the new with the already known, the abstract with the concrete, etc., one of the instruments for learning and coding new information in the language is a metaphor.

**The goal** of this article is to determine the features of the metaphors in the scientific style texts.

## II. MATERIALS AND METHODS

To carry out this study, methods such as random sampling, definitional analysis, semantic analysis, interpretative analysis, and quantitative counting were used. As research materials, the texts on medicine, history, linguistics, economics, etc., as well as encyclopaedic dictionaries, magazines, manuals and mass media were used.

**The scientific novelty** is to determine the role of metaphor in the scientific texts and the possibility its use as a scientific term.

The status of a metaphor is becoming the subject of special consideration in the modern linguistics. This is due to the fact that began in the middle of the 19th century, the boom of the theoretical interest in the problem of language functioning, awareness of the special role of metaphorical formations in various types of discourse and different spheres of culture, with the formation of an interdisciplinary science of metaphorology, which will allow studying the nature of metaphor in the unity of all its aspects - linguistic, cognitive, logical-semantic, semiotic, psychological, stylistic, etc.

As you know, until the middle of the last century, basing on the scientific theory laid down by T. Hobbes and J. Lakkof, according to which knowledge from the field of our experience - the source-area (source) - is transferred to another, less familiar area - the target-area (target) and serve as a key for understanding it [9, B.1], scientists considered about the incompatibility of scientific theories and definitions with the metaphor. However, anthropocentrism, which took a leading role in the learning of language, led to a general change in the attitude towards metaphor and a revision of the traditional image of science, and the assessment of the role of metaphors in the scientific field has also changed. "It revealed that the achievement of the desired ideal of accuracy and unambiguity of terms and expressions ultimately entails the mortification of the scientific language, a sharp decrease in its epistemological and heuristic capabilities" [14].

Starting with Aristotle, metaphor has been studied primarily as a linguistic phenomenon, a figure of speech, a linguistic method based on the transfer of one object properties to another. In the traditional direction, developing within the framework of linguistics, rhetoric, literary criticism, the main functions and properties of the linguistic metaphor are described (A.A. Potebnya, R. Jakobson, A.F. Losev). In the 60s and 70s. XX century against the background of the development of interdisciplinary research, the discussion of the problem of metaphor is transferred into a cognitive-logical paradigm: questions of its epistemic status are being developed, descriptions of metaphorical formations in various types of discourse are being carried out, its cognitive and communicative functions are studied (N.D. Arutyunova, V.N. Telia).

Metaphorical mechanisms based on an intuitive search for analogy in the already existing experience of an individual constitute the basis of epistemology. "The epistemological function of a metaphor is more significant than an expressive one, due to the fact that the metaphorical model allows you to transfer the structures of already existing knowledge and experience to new unknown fragments of reality" [12, B.282]. Philosophical comprehension of metaphorical mechanisms induces us to re-evaluate the metaphor in the language: linguistic metaphors are primarily created for cognitive purposes. In the initial presentation of the new model in science, the same mechanism is used as in the metaphor: "Metaphor lengthens the hand of the intellect," says H. Ortega-e-Gasset [13, B.72].

In the wide meaning, the term "metaphor" implies any variants of the use of words in an indirect meaning [1, B.193]. The word "metaphor" in Greek means "transfer": it transfers meaning from one area of reality to another. According to the author's definition, a metaphor is the transfer of an individual's experience from one area to another through the meaning of the word.

Scientific style represents the scientific sphere of communication and speech activity associated with the realization of science as a form of social consciousness; reflects theoretical thinking, acting in a conceptual and logical form, which is characterized by objectivity and abstraction from the concrete and random, logical evidence and consistency, presentation. The purpose of a scientific speech is to introduce new knowledge about reality and to prove its truth. In this case, the transfer of knowledge occurs in a convincing and accessible form [15]. The stylistic features of scientific texts are abstract generalization, logicity and sequence of interpretation, accuracy, clarity and objectivity. These characteristic features correspond to the goal of science – to thoroughly present factual information about objects, phenomena and processes of reality. Moreover, this information must be reliable and objective, which is achieved thanks to an established system of linguistic and extralinguistic means. However, science admits "an intuitive, grasped by fantasy, creative component" [11, B.464]. This leads to another feature of the scientific text - dialogicity. Despite the fact that a scientific text is traditionally characterized as a monologue, it is characterized by an orientation towards the addressee. This is due to the function of the scientific text – the transmission of information. The goal of the author of any scientific text is not just to inform the reader the necessary knowledge, to draw his attention to the most significant parts of the text, but to achieve from him the most complete and adequate understanding of the stated. Achievement of this goal implies the presence of common background knowledge between the author and the addressee, the conjunction in a certain extent of their scientific and national world pictures. The characteristics listed above determine the selection of linguistic means for the scientific-style texts. And since the scientific style is primarily presented in the form of written texts, lexical units and syntactic constructions play an important role. Any scientific text is the result of scientific knowledge. The process of cognition is always based on already existing knowledge, which a scientist transforms in an act of scientific creativity in accordance with his views, beliefs and hypotheses [6, B.35]. The results of research must be understandable and accessible to the addressee, which means that they must be verbalized in such a way that a fragment of experience known to the addressee is present in the semantic structure of the new term.

Any cognition is anthropocentric, since it is carried out by man through the prism of his sense organs and characteristics of thinking. In the center of cognition, including scientific, is a man who makes himself a measure of all objects, phenomena and processes of reality. Thus, objective reality is not mirrored in a language, but is interpreted and encoded in a language through a

certain prism of worldview. Exactly these features of cognition and verbalization its results make metaphor an effective instrument for fixing in the language of scientific knowledge [15].

Thus, metaphor is one of the most productive means of creating a scientific linguistic picture of the world. "Figurative means, and above all, metaphorical rethinking, are essential components of the linguistic picture of the world" [16, B.146].

Of course, a linguistic metaphor is more characteristic for the scientific style, i.e. a metaphor formed, like any other metaphor, by transferring the properties of one object to another on the basis of a common feature to both compared members. But, it is well known, the linguistic metaphor loses its figurativeness, has no emotive-evaluative connotation and, as a rule, is clichéd and often reproduced [15]. The area of penetration of such a metaphor into the scientific style texts is unusually wide. Of course, special attention is attracted by the terms appeared as a result of the semantic transfer of the meaning of the literary language words. Such terms appear as a result of regular metaphorical transfers observed between the terms of the national scientific picture of the world and certain categories of words in the linguistic picture of the world, i.e. as a result of semantic derivation between members of different lexical systems. This includes such well-known terms as toque strength, electric field, light wave, which interpret abstract, invisible phenomena in the concrete and well-known concepts [8].

The development of science and technology has led to the appearance of new terms in various fields of science. Today, one of the vivid examples is the medical field with the new appeared concepts in its terminological system as stand, shunting, as well as the field of computer technologies: virus, mouse (pointing device), port (connector), programming language, desktop etc. The main languages of medicine are Latin and Greek served as the basis for the development of the terminology system in this sphere. But it should be noted that the nomination of new medical terms is less and less based on them. And the main language of computer terms is English: mouse, address, link, language, key, access point, network and etc.

Since cognition is anthropocentric, many terms in the scientific fields appeared as a result of such a metaphorical transfer as a person → object: artificial intelligence, wall of the intestine, gall bladder, computer memory, programming language. These are ontological metaphors that make it possible to interpret the interaction with inanimate objects through the prism of human states. Many modern technologies built on the principle of artificial intelligence and self-learning capabilities are called smart or thinking technologies: smartphone, smartsensors, smartcard, smartcar, smarhighway, etc. The conceptual metaphor of human life, generational change is demonstrated in such concepts as lifecircle, generationofcomputer 3, generationofmobilephone 3, digitalgeneration [15]. Of course, the terms formed as a result of metaphorical transfer are devoid of any figurativeness, but in the scientific style texts there are also words that, expressing new concepts, have not completely lost their figurativeness: lethal outcome, silent death, fight against disease, price war, capital leak, "shadow" economy, "gray" wages, etc.

The given examples show that the figurative metaphors make up an insignificant part (about 2%) of the total number of metaphors present in a scientific text. The main types of the scientific style metaphors are identifying metaphors (mouse, key, channel, bug), cognitive (electron cloud, cloud storage, programming language, atomic nucleus) [15]. It should be noted that evaluative metaphors are a special phenomenon in a scientific text: they are devoid of imagery due to the requirements of the scientific style, clear and unambiguous, but at the same time retain the connotation of evaluation in their meaning, since the anthropocentric factor is involved in the mechanism of their formation. The above examples from the fields of medicine and economics demonstrate a negative assessment, since "war" from the point of view of a person is a negative phenomenon. The metaphors "shadow economy" and "gray wages" based on one of the basic oppositions light / darkness also have a negative evaluative connotation, since, inherent in the naive language picture of the world, the absence of light (darkness) for a person was dangerous and even destructive. Naturally, there are no evaluative-expressive metaphors in the scientific style texts, due to the fact that the scientific style requires objectivity, logic and unambiguity in its structure [15].

The typology of metaphorical transfers in the scientific style is quite wide and is represented by such types of regular metaphorical transfers as: object → object (flow of electrons, nucleus of an atom), object → abstraction (brain blocks, source of attraction (psycho), person → object (computer memory, program language). Various types of metaphorical transition are presented in the terminology system of zoology: man → insect (rider (parasitic insect), woodcutter beetle, gravedigger beetle, cardinal butterfly), animal → insect (bear, scoop, filly), object → insect (dead head butterfly, needle fish, swordfish, hammerhead fish) [20]. In the modern philosophy of science, two leading strategies have been identified for the analysis of metaphorical formations. The first, scientifically oriented consists in identifying metaphors in the structures of scientific knowledge, clarifying their heuristic role (nomination, description, modeling, restructuring, hypothesis building, etc.) and their subsequent translation into the language

of logical-discursive thinking. The purpose of this strategy is by means of logical reducing procedures (explication, interpretation, verification, introduction and exclusion of abstractions, etc.) to carry out the reduction of conceptual constructions that carry the projection of the individual values of the researcher to such conceptual structures that correspond to the standards of scientific knowledge. [5, B .75-76].

Sociocultural analysis of science demonstrates that metaphor is a connecting link between everyday interpretations and theoretical constructs and, at the same time, a point of epistemological break, from which the movement towards theorization and rational construction begins.

### III. CONCLUSION

We can say that: 1) metaphor is an integral part of the scientific style texts and terminology systems of science, 2) it is an instrument of enrichment of the scientific language (the appearance of new terms, etc.), 3) almost all types of metaphor and metaphorical transfer are represented in the scientific style texts, 4) the evaluative-expressive metaphors are completely absent in the scientific texts, 5) figurative metaphors are used to convey scientific information in a more accessible and easy-to-understand form, 6) metaphor serves as a vector for the further development of scientific knowledge.

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# Mixture Problem for Abstract Policalorical The Equations

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**Abstract** – In article the incorrect task for abstract polycaloric the equation is studied and a stability assessment according to Tikhonov is given.

**Keywords** – Polycaloric, Spaces, Self-Conjugate, Linear, Unlimited, Dense, Operator, Theorems.

## I. INTRODUCTION

The following is considered Problem. It is required to find the decision abstract policalorical the equations.

$$K_+^n u(t) \equiv \left( \frac{d}{dt} + A \right)^n u(t) = 0, \quad 0 < t < T, \quad (1)$$

Satisfying to following conditions:

$$\left\{ \begin{array}{l} u|_{t=l} = u(l), \\ \frac{du}{dt}|_{t=l} = u'(l), \\ \dots\dots\dots \\ \dots\dots\dots \\ \frac{d^{(n-1)}u(t)}{dt}|_{t=l} = u^{(n-1)}(l) \end{array} \right.$$

Where  $u(t)$  - abstract function with values in Gilbert space  $H$ .  $A$  - constant, positively defined, self-interfaced, linear, unlimited with everywhere dense range of definition.  $(D(A^n), DCH)$  the operator operating from  $H$  in  $H$ , and  $u(l), u'(l), u''(l), \dots, u^{(n-1)}(l) \in H$ .

The theorem 1. If  $u_1, u_2, \dots, u_n$  - the decision calorical the equations function  $u = u_1 + (t-l)u_2 + (t-l)^2 u_3 + \dots + (t-l)^{n-1} u_n$  is the decision (1) and back, for everyone set abstract policalorical functions  $u$  are such functions  $u_1, u_2, \dots, u_n$  that equality takes place

$$u(t) = \sum_{k=1}^n (t-l)^{k-1} u_k(t) \tag{3}$$

The proof. The theorem proof is spent by an induction method.

1. If  $u_1, u_2, \dots, u_n$  - the decision kalorical the equations  $u$  there is a decision policalorical the equations.

$$\begin{aligned} K_+ u &= K_+ [u_1 + (t-l)u_2] = K_+ u_1 + u_2 + (t-l) \frac{du_2}{dt} + A(t-l) = u_2 = \\ &= K_+ u_1 + u_2 + (t-l) \left( \frac{du_2}{dt} + A \right) u_2 = K_+ u_1 + u_2 + (t-l) K_+ u_2 = u_2, \end{aligned}$$

As  $K_+ u_1 = 0, K_+ u_2 = 0$

Hence, applying  $n-1$  time operator  $K_+$ , considering, that  $K_+ u_1 = 0, K_+ u_2 = 0, \dots, K_+ u_n = 0$ , we will receive

$$\begin{aligned} u(l) &= u_1 \\ K_+ u &= u_2 \\ K_+^2 u &= 2u_3 \\ K_+^3 u &= 6u_4 \\ &\dots\dots\dots \\ &\dots\dots\dots \\ K_+^{n-1} u &= (n-1)! u_n \end{aligned}$$

$$K_+^n u = \sum_{k=1}^n (k-1)! (t-l)^{k-1} u_k(t)$$

Let at  $k = n$  it is true, i.e, equality takes place.

Let's prove, that the statement is true for  $k = n + 1$ ,

$$K_+^{n+1} u = K_+ K_+^n u = K_+ \left[ \sum_{k=1}^n (k-1)! (t-l)^{k-1} u_k(t) \right] = \sum_{k=1}^{n+1} (k-1)! (t-l)^{k-1} u_k(t).$$

So, we will receive equality

$$K_+^{n+1} u = \sum_{k=1}^{n+1} (k-1)! (t-l)^{k-1} u_k(t).$$

2. If  $u$  the decision policalorical the equations will be such kalorical functions  $u_1, u_2, \dots, u_n$  that  $u = u_1 + (t-l)u_2 + (t-l)^2 u_3 + \dots + (t-l)^{n-1} u_n$ .

For the proof of this statement it is enough to establish possibility of choice  $u_1, u_2, \dots, u_n$ .

Let's put:  $u_1 = u - (t-l)u_2 - (t-l)^2 u_3 - \dots - (t-l)^{n-1} u_n$ ,

$$u_2 = K_+ u,$$

$$u_3 = K_+^2 u,$$

.....

.....

$$u_n = K_+^{n-1} u.$$

$$\begin{aligned} K_+ u_1 &= K_+ u - K_+ (t-l)u_2 - K_+ (t-l)^2 u_3 - \dots - K_+ (t-l)^{n-1} u_n = \\ &= K_+ u - u_2 - (t-l)K_+ u_2 - 2K_+ (t-l)u_3 - (t-l)^2 K_+ u_3 - \dots \\ &- \dots (n-1)u_n - (t-l)^{n-1} K_+ u_n = K_+ u - K_+ u - (t-l)K_+ u_2 - \\ &- 2(t-l)u_3 - (t-l)^2 K_+ u_3 - \dots - (t-l)^{n-1} K_+ u_n = 0, \end{aligned}$$

From here  $K_+ u_1 = 0$ .

Hence,  $K_+ u_2 = 0, K_+ u_3 = 0, \dots, K_+ u_n = 0$ .

The theorem 1. It is completely proved.

By means of representation (3) decision of a problem (1) - (2) can be reduced to the decision following  $n$  problems:

$$\begin{cases} \frac{du_1}{dt} + Au_1 = 0, \\ u_1|_{t=l} = u_1(l), \end{cases} \begin{cases} \frac{du_2}{dt} + Au_2 = 0, \\ u_2|_{t=l} = u_2(l), \end{cases} \dots \begin{cases} \frac{du_n}{dt} + Au_n = 0, \\ u_n|_{t=l} = u_n(l), \end{cases} \quad (4)$$

Where

$$u_1(l) = u(l)$$

$$u_2(l) = u'(l) + Au(l)$$

$$u_3(l) = \frac{1}{2}(u''(l) - 2Au(l) + A^2u(l))$$

.....  
 .....

$$u_n(l) = \sum_{k=1}^n \sum_{i=0}^{n-1} C_{k-1}^i A^{k-i} u^i(l)$$

$$C_{k-1} = \frac{1}{(k-1)!}$$

These problems in classical sense are incorrect. Them we will investigate on a conditional correctness on Tikhonov [1].

Problem Koshi for the equation (1) is considered and investigated in [2]. The multidot problem for the equation (1) is investigated in [3].

Let's prove the theorem characterising an estimation of stability of the decision of problems:

$$\begin{cases} \frac{du_1}{dt} + Au_1 = 0, & (5) \end{cases}$$

$$\begin{cases} u_1|_{t=l} = u(l), & (6) \end{cases}$$

Problem (5) < (6) at  $0 < t < l$  uncorrect in classical sense, at  $l < t < T$  in classical sense are correct.

The theorem 2. For any decision of a problem (5) - (6) the inequality is fair

$$\|u_1(t)\| \leq \begin{cases} \|u(l)\|^{\frac{t}{l}} \|u(0)\|^{1-\frac{t}{l}}, & 0 \leq t < l, \\ \|u(l)\|, & l \leq t < T \end{cases} \quad (7)$$

The proof. We will consider function [1].

$$\varphi(t) = \|u_1(t)\|^2 = (u_1, u_1)$$

Differentiating it, we will receive

$$\varphi'(t) = 2(u_1', u_1) = 2(Au_1, u_1)$$

$$\varphi''(t) = 2(u_1', u_1) + 2(u_1, u_1'') = 2(Au_1, Au_1) + 2(u_1, A^2u_1)$$

As operator  $A$  self-interfaced  $(A = A^*) (u_1, A^2u_1) = (Au_1, Au_1)$  and, means,

$$\varphi''(t) = 4(Au_1, Au_1)$$

Now we will consider function

$$\psi(t) = \ln \varphi(t)$$

Differentiating it, we will receive

$$\psi''(t) = \frac{1}{\varphi^2(t)} \cdot [\psi''(t) \cdot \psi'^2(t)] = \frac{4}{\varphi_{(t)}^2} [(Au_1, Au_1)(u_1, u_1) - (Au_1, u_1)^2] \geq 0 \tag{8}$$

Owing to a known inequality Bunjakovsky the inequality (8) will mark, that function  $\psi(t)$  is turned bend upwards, whence follows, that function  $\psi(t)$  on piece  $[0, l]$  does not surpass the linear function accepting on the ends of a piece the same values, as  $\psi(t)$ .

$$\psi(t) \leq \frac{l-t}{l} \cdot \psi(0) + \frac{t}{l} \psi(l) \tag{9}$$

From (8) follows

Potential an inequality (9), we will receive

$$\varphi(t) \leq [\varphi(0)]^{1-\frac{t}{l}} [\varphi(l)]^{\frac{t}{l}}$$

Whence

$$\|u_1(t)\| \leq \|u(l)\|^{\frac{t}{l}} \|u(0)\|^{1-\frac{t}{l}}$$

Now we will consider problems

$$\begin{cases} \frac{du_2}{dt} + Au_2 = 0, & (10) \end{cases}$$

$$\begin{cases} u_2|_{t=l} = u_2(l), & (11) \end{cases}$$

Where

$$u_2(l) = u'(l) + Au(l), \text{ as } u(t) = u_1 + (t-l)u_2.$$

$$u'(t) = u'_1(t) + u_2(t) + (t-l)u'_2(t)$$

$$u_2(t) = u'(t) - u'_1(t) - (t-l)u_2(t), \quad u'_1(t) = -Au(t)$$

At

$$t=l, \quad u_2(l) = u'(l) - u'_1(l) = u'(l) + Au(l)$$

Problems (10) - (11) at  $0 < t < l$  it is incorrect in classical sense, at  $l < t < T$  in classical sense are correct.

Similarly investigating problems (10) - (11) on a conditional correctness on Tikhonov as problems (5) - (6), we will receive

$$\|u_2(t)\| \leq \begin{cases} (\|u'(l)\| + \|Au(l)\|)^{\frac{t}{l}} \cdot \|K_+ u(o)\|^{1-\frac{t}{l}}, & 0 < t \leq l, \\ \|u'(l)\| + \|Au(l)\|, & l \leq t \leq T. \end{cases}$$

stability estimations.

Hence,

$$\|u_3(t)\| \leq \begin{cases} \left( \|u''(l)\| + \|Au(l)\| + \|A^2u(l)\| \right)^{\frac{t}{i}} \cdot \|K_+^2u(0)\|^{1-\frac{t}{i}} & 0 < t \leq l \\ \|u''(l) + \|Au(l) + \|A^2u(l)\|, & l \leq t \leq T \end{cases}$$

Repeating this procedure  $n$  of times, we will receive the following theorem.

The theorem 3. For any decision of a problem (1) - (2) it is fair

$$\|u(t)\|_H \leq \sum_{k=1}^n \sum_{i=1}^k C_{k-1} \begin{cases} \left( \|u^{(i)}(l)\| \cdot \|A^{k-i}\| \right)^{\frac{t}{i}} \cdot \|K_+^{i-1}u(0)\|^{1-\frac{t}{i}}, & 0 \leq t \leq l, \\ \|u(l)\|, & l \leq t \leq T \end{cases} \tag{12}$$

Let's notice, that from an inequality (12) uniqueness of the decision of a problem (1) - (2) and a conditional correctness of this problem in a class follows

$$\left\{ u : \|K_+^{n-1}u(0)\| \leq M \right\}.$$

This towers is proved by a method of logarithmic camber [1].

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# *Find A General Solution Of An Equation Of The Hyperbolic Type With A Second-Order Singular Coefficient And Solve The Cauchy Problem Posed For This Equation*

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**Abstract – This paper presents a general solution of a hyperbolic type equation with a second-order singular coefficient and a solution to the Cauchy problem posed for this equation.**

**Keywords – Singular, coefficient, characteristic equation, canonical equation, Cauchy problem.**

Consider an equation of the hyperbolic type with a second-order singular coefficient,

$$-(-y)^m u_{xx} + u_{yy} + \frac{\beta_0}{y} u_y = 0 \quad (1)$$

$$m > 0, \quad y < 0, \quad -\frac{m}{2} \leq \beta_0 < 1$$

To make the equation look canonical, we find its characteristics,

$$\begin{aligned} & -(-y)^m dy^2 + dx^2 = 0 \\ & \left( dx - (-y)^{\frac{m}{2}} dy \right) \cdot \left( dx + (-y)^{\frac{m}{2}} dy \right) = 0 \\ & \xi = x + \frac{2}{m+2} (-y)^{\frac{m+2}{2}} \quad \text{Ba} \quad \eta = x - \frac{2}{m+2} (-y)^{\frac{m+2}{2}} \quad (2) \end{aligned}$$

New  $\xi$  and  $\eta$  We calculate the products involved in equation (1) by entering the variables:

$$u_{xx} = v_{\xi\xi} + 2v_{\xi\eta} + v_{\eta\eta}$$

$$u_y = -(-y)^{\frac{m}{2}} v_{\xi} + (-y)^{\frac{m}{2}} v_{\eta}$$

$$u_{yy} = (-y)^m v_{\xi\xi} + (-y)^m v_{\eta\eta} - 2v_{\xi\eta} (-y)^m + \frac{m}{2} (-y)^{\frac{m-2}{2}} v_{\xi} - \frac{m}{2} (-y)^{\frac{m-2}{2}} v_{\eta} = 0$$

Substituting the findings into Equation (1), we obtain the following canonical equation.

$$v_{\xi\eta} - (-y)^{-\frac{m+2}{2}} \left( \frac{m+2\beta_0}{8} \right) v_{\xi} + (-y)^{-\frac{m+2}{2}} \left( \frac{m+2\beta_0}{8} \right) v_{\eta} = 0 \quad [1] \quad (3)$$

In Equation (3) we make the following notation,

$$a = \frac{m+2\beta_0}{2(m+2)}, \quad 0 < a < 1 \quad \text{ва} \quad \xi - \eta = \frac{4}{m+2} (-y)^{\frac{m+2}{2}}$$

After the notation, the appearance of the equation becomes as follows: Euler-Darbu.

$$v_{\xi\eta} - \frac{a}{\xi - \eta} v_{\xi} + \frac{a}{\xi - \eta} v_{\eta} = 0 \quad (4)$$

$$u_{xy} - (-y)^{-\frac{m+2}{2}} \left( \frac{m+2\beta_0}{8} \right) u_x + (-y)^{-\frac{m+2}{2}} \left( \frac{m+2\beta_0}{8} \right) u_y = 0 \quad (5)$$

$$u_1(x, y) = \int_x^y \Phi(\xi) (\xi - x)^{-\alpha} \cdot (y - \xi)^{-\beta} d\xi \quad (6)$$

$$u_2(x, y) = (y - x)^{1-2a} \int_x^y \Psi(\xi) (\xi - x)^{a-1} (y - \xi)^{a-1} d\xi \quad (7)$$

$\Phi(\xi)$  and  $\Psi(\xi)$  - is an arbitrary continuous function that satisfies equation (5).

$\xi = x(1-t) + yt$  If we make the substitution, the general solution of equation (4) can be found in the following form:

$$v(\xi, \eta) = (\eta - \xi)^{1-2a} \int_0^1 \Phi[\xi + t(\eta - \xi)] t^{-a} \cdot (1-t)^{-a} dt + \int_0^1 \Psi[\xi + (\eta - \xi)t] \cdot t^{a-1} \cdot (1-t)^{a-1} dt \quad (8)$$

(8)- In equation (8)  $\xi$  and  $\eta$  Substituting Equation (2) for

$$u(x, y) = \left[ -\frac{4}{m+2} (-y)^{\frac{m+2}{2}} \right]^{1-2a} \int_0^1 \Phi \left[ x + (1-2t) \frac{2}{m+2} (-y)^{\frac{m+2}{2}} \right] \cdot t^{-a} (1-t)^{-a} dt + \int_0^1 \Psi \left[ x + (1-2t) \frac{2}{m+2} (-y)^{\frac{m+2}{2}} \right] t^{a-1} (1-t)^{a-1} dt \quad (9)$$

(9) - equation (1) - general solution of equation.

Cauchy issue.

Such a function  $u(x, y) \in C(\bar{D}) \cap C^2(D)$  as, Equation (1) and the following

$$\lim_{y \rightarrow 0} u(x, y) = \tau(x) \quad (10)$$

$$\lim_{y \rightarrow 0} (-y)^{\beta_0} u_y(x, y) = v(x) \quad (11)$$

**Find A General Solution Of An Equation Of The Hyperbolic Type With A Second-Order Singular Coefficient And Solve The Cauchy Problem Posed For This Equation**

Find a solution that satisfies the conditions. Here  $\tau(x)$  and  $\nu(x)$  - given features,

$$\tau(x) \in C[-1;1] \cap C^2(-1;1)$$

$\nu(x) \in C^2(-1;1)$  belongs to the class.

$\nu(x)$  function  $x \rightarrow \pm 1$  can suddenly achieve a small specificity.

Substituting Equation (9) into Condition (10), we obtain

$$\Psi(x) \cdot \int_0^1 t^{a-1} \cdot (1-t)^{a-1} dt = \tau(x) \quad (12)$$

$$\psi(x) = \frac{\Gamma(2a) \cdot \tau(x)}{\Gamma^2(a)} \quad (13)$$

If we set equation (9) to condition (11),

$$\Phi(x) = \frac{\left[ \frac{4}{m+2} \right]^{\frac{2\beta_0-2}{m+2}} \Gamma(2-2a) \cdot \nu(x)}{(\beta_0-1) \cdot \Gamma^2(1-a)} \quad (14)$$

we have equality.

If we reduce the findings to equation (9), we get the solution of the Cauchy problem for equation (1),

$$u(x, y) = 2 \frac{1}{\beta_0-1} \frac{\Gamma(2-2a)}{\Gamma^2(1-a)} (-y)^{1-\beta_0}$$

$$\int_0^1 \nu \left[ x + \frac{2}{m+2} (-y)^{\frac{m+2}{2}} (2t-1) \right] \cdot t^{-a} (1-t)^{-a} dt + \frac{\Gamma(2a)}{\Gamma^2(a)} \cdot \int_0^1 \tau \left[ x + \frac{2}{m+2} (-y)^{\frac{m+2}{2}} (2t-1) \right] \cdot t^{a-1} \cdot (1-t)^{a-1} dt \quad (15)$$

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# *Causes And Consequences Of Floods And Floods In The Safety Of Life, Measures To Protect The Population And The Territory*

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**Abstract – This article is aimed at improving the existing system for preventing floods and landslides in Uzbekistan, increasing its efficiency using modern information technologies based on innovative approaches, protecting the life and health of the population from possible emergencies.**

**Keywords – Floods, mudslides, floods, material damage, danger, human casualties, damage to the environment, destruction.**

## I. INTRODUCTION

One of the urgent tasks in the country is to protect against the risk of floods. Therefore, potentially dangerous areas have been surveyed, special maps and legal regulations have been developed. The number of people living in dangerous areas is being determined and measures are being taken to relocate them temporarily and permanently. Floods and floods leading to natural disasters are one of the most frequent events in the country. Flooding refers to the flooding of a river, lake, canal, or sea as a result of rising water levels. They are more often observed in the spring and pose a high risk not only to human life, but also to housing, production facilities. Therefore, it is advisable to take measures to prevent floods and reduce their impact.

In order to ensure the timely implementation of such measures in the country, legal and regulatory documents have been adopted.

The history of human development is associated with natural disasters and man-made disasters. The interests of man, his dignity, health and safety - are relevant, priority and important in all aspects of our daily lives.

Various emergencies lead to human casualties, damage to their health or the environment, serious material damage, and disruption of people's living conditions.

Of the possible natural disasters in our country, we pay special attention to floods, mudslides, avalanches and landslides, as the geographical location and climatic conditions of the territory of Uzbekistan create the basis for floods, avalanches, mudflows and floods.

## II. THE MAIN PART

Since the dawn of humankind, natural disasters have always threatened his life. Man and nature are inextricably linked.

The floods have always caused panic among people living in mountainous and foothill areas. In the past, people have interpreted it as the work of magicians, the evil deeds of ghosts, the wrath of the gods. They also knew that an earthquake, a volcanic eruption, a torrential downpour in the mountains, or a sudden melting of snow in the summer months would signal the beginning of muddy currents coming from the mountains. The flood passes at the speed of a herd of wild wild horses, destroying everything in its path — fields, pastures, villages, and entire cities. Where the flood passes, only the desert remains.

Arabic flood, tuberculosis, seilyun - heavy mountain stream, English mudflow, mudavalanche, rocmudflow - mud stream, rock mud stream, French torrents, mure - mountain stream, German - wildbach, mure - wild stream, mud stream, Japanese yamatsunami - mountain This type of natural disaster, which means a wave, is not alien to our republic.

On Earth, such events are repeated every year, leading to many devastations and human deaths.

Almost all mountainous and foothill areas of the Republic of Uzbekistan are at risk of flooding. Floods are more frequent in Tashkent, Surkhandarya, Jizzakh, Fergana and Namangan regions than elsewhere.

According to the Center for Emergency Monitoring and Forecasting, 27% of flood activity occurred in April, compared to 33% in May and 17% in June. In the Fergana Valley, even in August, there is a risk of flooding.

Specialists of the Uzhydromet Center have studied and developed special maps of dangerous areas in the country, which are likely to be flooded. From this map we can see that such risks are high in Andijan, Jizzakh, Kashkadarya, Surkhandarya, Navoi, Syrdarya, Namangan, Samarkand, Fergana and Tashkent regions. Therefore, in order to prevent and safely prevent floods and mudflows that may occur in these regions, every year the work is carried out to clean the banks of rivers and streams and strengthen their banks.

When the time comes, it can be said that there should be maps with a large ratio of 1: 5000 and 1: 10000 in areas where there is a risk of flooding, especially in small economy facilities. Through these maps, it is necessary to develop measures to combat, prevent, predict and mitigate floods, and to conduct advocacy work among all segments of the population.

No matter where in the country floods occur, their composition, direction and damage are almost identical.

Therefore, it is time for all citizens to take an active part in the positive measures taken by our government, to implement them as soon as possible and to be responsible for the implementation of security measures. not until it rises from the memory of our compatriots. At that time, a sharp rise in temperature caused the snow to melt quickly, followed by a flood of 200 m<sup>3</sup> per second. The floods killed 104 people prematurely. 15 km of gas mains, 14 km of roads, 4 bridges, 3 km of drinking water, 3 km of power transmission lines, 34,741 m of telephone lines were out of order. 14,200 people had to be relocated to safer areas.

Areas where floods occur or are likely to occur are referred to as floodplains. The main indicator of the occurrence of floods is the hydrometeorological conditions. As a result of long-term rains and short-term rapid melting of glaciers, the amount of water in river basins will increase sharply. Many destructions occur in the lower parts of the field as a result of the occurrence of a large force current. For this reason, floods are divided into two groups

Flood currents are divided into turbulent and structural types according to the nature of the movement.

Turbulent floods occur in the direction of the valley along the river, as a result of an increase in the amount of water in rivers and streams, according to the law of flow movement [3].

Structural floods occur as a result of massive infiltration of various rock fragments across the entire slope across the area.

Unlike normal currents, a flood acts not as a continuous flow but as separate waves. It also brings with it hundreds of tons, in some cases millions of cubic meters of sticky mass. The size of some stone fragments reaches 3-4 meters in cross section. Once the floodwaters hit the barrier, they overflow and become stronger [5].

Causes of floods. Heavy and continuous rainfall, active melting of snow and glaciers as a result of temperature rise, large-scale landslides in riverbeds, earthquakes and human activities are the causes of floods. (Table 1)

Table 1. Causes of floods

Type	The primary reason	Distribution and occurrence
It's raining	Rain, heavy rain	It is associated with the washing of rocks and the formation of landslides
Icy	Sudden melting of snow and ice	It is associated with melting glacial waters in high mountainous areas
Seismogen	Strong earthquakes	In highly seismically active areas
The direct effect of man	Accumulation of man-made rocks, poorly constructed dams	Washing and displacement of man-made rocks, destruction of dams
Indirect human impact	Deterioration of soil, vegetation	In areas where forests, meadows are joined, rocks and streams are washed away

Protective measures. The sheer number of factors involved in flood formation makes it difficult to predict in a timely manner. Nevertheless, the timing of the onset of the flood season can be predicted. Almost all flood-prone areas are well known to experts and indigenous peoples. Each region has its own statistics on the causes of floods. For example, floods in mountainous areas are caused by rain and rain (85%), melting snow (6%), flooding of mountain lakes (5%), and bursting of natural dams (4%) [3].

Population movement. As noted above, since floods are a seasonal process, it is important to adhere to certain requirements for operating in areas at high risk of flooding during these times. In many cases, a certain part of the population tries to spend their leisure time in mountainous areas, along rivers. This is not in vain, of course. But before setting up a temporary tent on the river, it is necessary to think about the natural conditions of the place, the relief, the structure of the environment, and then determine the place of stopping. This is the first sign that the location of the gradual increase in precipitation needs to be changed immediately. This is because the increase in the amount of water in rivers and streams is of great concern to vacationers. In such a case, if the sign of flood currents is noticeable, it is necessary to quickly climb as far as possible from the riverbed to a higher slope.

Currently, two main methods are used to strengthen the banks of water bodies in the country:

- Reinforced concrete construction;
- Gabion construction.

Reinforced concrete construction has a special place in shore protection.

Physico-mechanical properties, frost resistance and other operational properties of concrete are directly related to the micro and macrocomposite structure. Reinforced concrete is divided into monolithic and prefabricated structures according to the method of preparation. Monolithic reinforced concrete structures are made directly on the construction site, while precast concrete is brought and laid. This provides quality and reliable durability of the coast, but makes it economically valuable [2]. According to UNESCO, floods have dried up the pillows of nearly 9 million people in the last hundred years. The material damage they caused is also enormous. It is natural for people to avoid this disaster. For effective protection against floods, it is necessary to accurately predict them in a timely manner. According to our scientists, the accuracy of this prediction is now close to 100 percent. Flood protection can be active (construction of dams, dams, diversion canals, reservoirs, regulation of riverbeds) or weak (informing and evacuating the population, occupying areas where they are unlikely to be flooded). Information about the rules of behavior of people in such situations, which give an idea of this type of natural disaster, should be widely disseminated [4].

Of course, if precautionary measures are taken in an organized manner, the losses and damages from any tragedy can be reduced. However, in most cases, negligence is tolerated by the population.

It is very important that people know these rules, follow the recommendations of experts in a timely manner after receiving a warning of an impending disaster.

Natural disasters, especially floods, can cause certain casualties in a short period of time. Therefore, appropriate measures should be taken in the flood zone.

In particular, a flood report usually provides information on the expected time of the emergency, its boundaries, recommendations to the population and evacuation, and if a person living in the area is likely to fall into the flood zone, then:

- Shutdown of gas, electricity, water networks;
- Transportation of valuables to the upper floors;
- Close windows and doors and cover with boards or plywood;
- If evacuation is announced, documents, money and securities, three-day food and medical aid box should be prepared

[1].

In the event of a sudden rise in water, it is necessary to quickly climb to the top. You have to stay on the upper floors, on the trees, or on the hills until help arrives. If you have to go into the water, then you can use barrels, barrels, planks, doors, pieces of wood, car cameras. Without these, plastic bottles, even balls, can keep you afloat.

First of all, any unsanitary situation in the area and the area where any natural disaster occurs. As a result, humans, living organisms can be affected by infectious diseases. To get out of this situation, it is advisable to limit yourself to consuming only boiled water and dry foods for a certain period of time. If necessary, when moving to another place, and then return, it is necessary to carefully examine the condition of the house, the surrounding corridors. Never rush into the house. Due to the flood, the walls of the houses are eroded, the tolerance of the structures exceeds the norm, and as a result, the buildings may collapse under the influence of a small external force. It is necessary to create walkways by creating separate corridors from the places where water collects [2].

### **III. CONCLUSION**

It should be noted that without a full solution to the problems listed above, it is impossible to prevent floods and landslides in a timely manner, to minimize the negative consequences.

Therefore, taking into account the experience of foreign countries, it is necessary to improve the existing system of prevention of floods and landslides in Uzbekistan, to increase its efficiency using modern information technologies based on innovative approaches, to improve the lives and health of the population. for protection purposes are as follows

### **IV. SUGGESTIONS**

Continuous organization and strengthening of control over the cleaning of rivers, canals, streams and shore protection of rivers and canals, which are on the balance of regional and district khokimiyats.

In cooperation with the Ministry of Emergency Situations, ministries, agencies and other non-governmental organizations to protect the population and territories from emergencies, to take preventive measures to prevent them and to ensure regular training exercises in all regions.

Based on the experience of European countries, the creation of a 3D format of floods and their introduction in the protection of the population and the region from emergencies.

Improving the notification system (Equipping with communication facilities).

In the period of possible floods, to organize the broadcasting of videos, advertisements and presentations on the protection and warning of the population from flood-related emergencies through the media on all television channels.

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# *The Impact Of Optimizing The Composition Of Arable Land On The Fruit And Vegetable Complex In The Innovative Development Of Agriculture*

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**Abstract** – In the given article described results of effectiveness of reforms and perspectives in agriculture in example of fruit and vegetable complexes.

**Keywords** – Economic Reform, Optimization, Government Programs, Intensive Gardening, Food Security, Exports, Export Potential.

## I. INTRODUCTION

After the independence of Uzbekistan, the radical economic reforms implemented in agriculture became the basis for sustainable development of the industry. One of the main directions of the reforms was the optimization of the composition of agricultural crops, increasing the productivity of lands, increasing the area under food crops. As noted in the book "Serving for the happiness and great future of our country - the highest happiness," These issues have always been and will remain in the center of our attention."<sup>[1]</sup>

## II. MAIN PART

It is not in vain that he intends to raise the structural changes in the agricultural sector to a qualitatively new level, as well as to further strengthen the food security of our country.

Cotton, as well as optimization of irrigated lands of cereals, target placement of agricultural crops on irrigated lands of cotton and cereals until 2020 approved and integrated development of agriculture, further improvement of selection and seed production, introduction of advanced intensive agro-technologies, the implementation of specific measures for the introduction of methods of storage and primary processing of products. In particular, 170,500 hectares of irrigated land will be irrigated by reducing cotton production by 350,000 tons, and 50,000 hectares will be irrigated by optimizing the area under cereals. It is planned to plant vegetables and potatoes, including fodder crops, oilseeds and other crops, as well as gardens and vineyards.

## The Impact Of Optimizing The Composition Of Arable Land On The Fruit And Vegetable Complex In The Innovative Development Of Agriculture

According to Table 1, in such regions as Syrdarya, Jizzakh, Kashkadarya, Samarkand, more land is occupied by cotton, which can be explained by the natural climate and geographical structure of these regions. Because in the mountainous areas of these regions and in the vicinity, the yield of cotton is low, on the contrary, it is possible to get high yields from fruit trees. In Uzbekistan, it is possible to grow two or more vegetables a year on open land. In the future, due to the sharp increase in vegetable production, it will be possible not only to meet the needs of the population, but also to export large quantities of vegetables to the world market.

If we look at the types of crops that are placed in the optimized crop areas, most of the areas are set aside for vegetables. 91,000 hectares of land are allocated for the cultivation of vegetable crops, which is more than 41% of the land under the optimization program.

Table 1. Final forecast indicators for the optimization of arable land in the country in 2025

Regions	Total optimization area, (thousand ha)	Including crops		Types of crops to be placed in optimized crop areas					
		Cotton fields	Aqueous grain fields	Potatoes	Vegetables	Intensive gardens	Forage crops	Oilseeds	Other crops
The Republic of Karakalpakstan	7,0	7,0		1,5	2,2	0,5	0,7	0,9	1,2
Andijon	15,2	11,2	4,0	2,8	6,4	1,6	2,6	1,1	0,7
Buxaro	15,0	10,0	5,0	2,4	7,1	1,2	3,1	0,8	0,4
Jizzax	27,5	22,5	5,0	4,0	11,0	1,5	7,8	1,6	1,6
Kashkadarya	22,4	18,4	4,0	2,3	9,7	1,8	5,1	1,8	1,7
Navoi	3,4	3,4		0,5	1,4		1,0	0,5	
Namangan	15,1	10,1	5,0	3,0	6,8	1,6	2,1	0,8	0,8
Samarkand	22,2	16,2	6,0	4,2	8,3	2,0	6,3	0,7	0,7
Surxondaryo	19,3	14,3	5,0	3,0	8,7	1,8	4,0	1,2	0,6
Sirdaryo	27,7	22,7	5,0	3,8	10,1	1,6	8,8	2,1	1,3
Tashkent	19,4	13,4	6,0	4,0	7,5	2,3	4,0	1,0	0,6
Fergana	17,5	12,5	5,0	4,1	7,0	1,8	3,3	0,6	0,7
Khorezm	8,8	8,8		0,4	4,8	0,3	1,5	0,9	0,9
Jami	220,5	170,5	50,0	36,0	91,0	18,0	50,3	14,0	11,2

Source: Annex to the Resolution of the President of the Republic of Uzbekistan dated December 29, 2020 No PP-2460 "On measures to further reform and develop agriculture in 2020-2025" [2].

This can be explained by the fact that the products obtained from vegetable crops are one of the most essential blessings for man. According to medicine, a person needs to consume an average of 150-160 kg of vegetables per year for normal development. In Uzbekistan, there are all the conditions for growing vegetables: sunlight and its heat allow you to grow vegetables with a lot of vegetation throughout the year.

In addition, it is planned to plant potatoes on 36,000 hectares, intensive orchards on 18,000 hectares, and fodder crops on more than 50,000 hectares.

In short, as a result of optimization of arable lands and the introduction of modern agricultural technologies, "by 2025 to increase grain production by 16.4% to 8.5 million tons, potatoes by 35%, vegetables by 30%, fruits and grapes by 21.5%, meat It is planned to increase production by 26.2%, milk by 47.3%, eggs by 74.5% and fish by 2.5 times "[3].

To date, Uzbekistan has exceeded the level of providing the population with the required amount of fruits and vegetables. This will allow exporting large quantities of surplus products from the domestic market. In the current situation in the world fruit and vegetable market, Uzbekistan is becoming one of the leading exporters of these products. "In 2024, 592,000 tons of fruits and vegetables worth \$ 1.2 billion were exported, while 19.7 million tons were exported. tons of fruits and vegetables, potatoes, melons and grapes, of which 1.4 mln. tons of products and 3 bln. dollars "[4]. This represents 53% of the regional export program for 2025, or more than half.n bnb

### III. CONCLUSIONS

As one of the fastest growing industrialized countries in the world, Uzbekistan is becoming a prestigious and powerful member of the international community. Reforms in agriculture, first of all, will be the basis for the well-being and development of the rural population, the country's population, and the demand for food will increase accordingly. Uzbekistan will continue to strengthen its position in the world market with its fresh fruits, vegetables and grapes.

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# *A Way To Increase Student Activity In The Organization Of Lectures*

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**Abstract – At the heart of the great work carried out in the field of education in our country is the important task of training highly qualified specialists in the national economy, educated in accordance with modern requirements. Solving this problem requires a number of important tasks for university professors. The organizers of this task are to educate students on the basis of modern pedagogical technologies, to form the ideological immunity of young people, to ensure the formation of a harmonious and mature person. Special attention should be paid to these aspects, especially in the training of engineers who are planned to work in the leading plants of the country after graduation. Therefore, increasing the effectiveness of training future engineers in all aspects is an urgent task today.**

**Keywords – Lecture, pedagogical technology, theoretical mechanics, independent preparation, question-answer, quality of education, summarizing, crossword puzzle.**

## I. INTRODUCTION

The basics of the method under study and the initial results of its application are detailed in the works [1,2]. In the given works [4,5] the examples of application of the Venn diagram in the organization of lectures on theoretical mechanics are given. The importance of the effective use of the cluster method in the teaching process is also described in [3].

## II. MAIN PART

At the Department of "Resistance of Materials and Mechanics" of the Institute for students of most disciplines, the subject of theoretical mechanics is taught to future engineers at a high level. Below we would like to share some ideas about the elements of advanced pedagogical technology and the results of their application in the lectures on theoretical mechanics in the field of construction of buildings and structures, construction of engineering communications and electrical engineering.

Students of the specified directions of study study the subject of theoretical mechanics in 1-2 semesters. Several methods can be used to teach students the basics of science in lecture sessions. The author uses a number of methods to increase student activity. One such method is the independent preparation for the lesson and the question-and-answer method. To use this method, at the beginning of the semester, the lecturer provides students with detailed information about the rating system, intermediate and final control, as well as the criteria for obtaining their scores. From the second lesson, the student reads each new topic independently at home several times, summarizes the topic based on what he / she understands and composes 5-10 questions on the topic. The session begins with a question-and-answer session based on a new topic prepared at home. The oldest, fair student or group leader in the group is assigned to record the results of the question and answer participants. The student brings the topic to the attention of his / her classmates and one of the students in the group answers it, then moves on to the next question after making sure that the answer

is correct. If no one can answer the given question, then the student who asked the question answers his own question. The teacher's involvement in the audience in this case is passive management of the process. Within 15-20 minutes, the repetition of the new topic at the level understood by the students is completed and the teacher assigns points to the students who actively participated in the lesson [1,2]. Then the professor begins to explain the new topic. He dwells less on the part of the new topic that the students understand better, explains in detail the part of the subject that is less clear to them, explains the lesson to the students with problematic situations and questions. At the end of the lesson, the speaker announces the topic of the new lesson and gives his methodological recommendations on how to prepare for it, what features to focus on, which sites to use on the Internet.

A number of positive aspects of this method of organizing lectures are based on the results of pedagogical experience. The faculties of construction and power engineering allow us to draw the following conclusions from the results of this experiment in the lectures conducted by the author in the field of education:

- The student develops the ability to study science independently and develops the skills of independent learning.
- The student has the experience of summarizing the basics of science.
- The student develops the ability to ask questions on some parts of the subject.
- As a result of the student's participation in the question-and-answer discussion, he develops the skills to express his opinion and defend it.
- The teacher will be able to assess students more during the lesson. These assessments then serve as the basis for the intermediate and final evaluation scores.
- The fact that the student makes a syllabus makes it possible not to waste time for students to write in class and to provide additional materials during this time.
- This method gave the best results when there were 40-50 students in the stream.
- In some separate groups of 20-25 students, the use of this method gave high results.
- As a result of using this method in the classroom, student mastery was 15-20% higher than in other groups.
- There are some shortcomings in the application of this method to all subjects of science.

Here it was possible to draw much broader conclusions than in the previous [1,2] studies.

Thus, the question-answer method develops students' independent thinking skills, encourages them to study the subjects in advance, teaches them to formulate questions from the subject, teaches them to express their thoughts with questions, develops students' skills of independent work with science and leads to increased student activity.

Some shortcomings of this question-and-answer method have also become apparent. In particular, the use of this method in lectures with groups of 70-90 students is much less effective. Because some students around 10-20 percent do not actively participate in the lesson. Some 25-30 percent of students are very active. Therefore, after a certain session, the teacher should try to add inactive students to the list of active students. Active students are given individual assignments that go deeper into the basics of science, include them in the list of gifted students, involve them in science circles, teach them the basics of research. Inactive students can be added to the ranks of activists by preparing for a given topic in advance. In this case, the student is given a homework assignment to prepare for an easier topic of their choice, and it is listened to in the next lesson.

In order to increase the level of knowledge of students in the subject, the teacher suggested them to create a "crossword puzzle" consisting of key words and phrases of theoretical mechanics. This method is characterized by the fact that students strive for independent research, require more advanced knowledge in all areas of science, fully mobilize their intellectual potential.

The author used this method for students of the above areas of study from the end of the semester of the academic year. As a result, 25-35% of the students in the group successfully completed the crossword puzzle and handed it to the teacher. If we take into account that 20-35% of students in the group master well and excellent grades, then it turns out that the crossword puzzle is formed mainly by students with high grades [1,2]. In practice, it turned out to be the same.

### III. CONCLUSIONS

In short, as a result of students' independent preparation for the lesson and the use of question-answer method, the level of knowledge of the trained specialists will increase in quality, gain in-depth knowledge, and he will become a comprehensively mature specialist.

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# *Digitalization Adoption in Shipping Business Services.*

## *Case study: Libya*

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**Abstract – In last decade, the increasing number of failing digitalization initiatives is alarming, and the insufficient attention paid to the risks of electronic business (e-business) issues and their management continues to be a key element of these project failures. While number of practical developments in e-business applications is increasing, the increase of implementation processes failures continues to be at an alarming level. This process requires a clear plan to ensure the successful implementation of e-business applications. The study aims to analyses the necessary progress and steps needed for successful digitalization processes implementation in business organizations. The main scope is the minimization of e-business risk. The approach taken is to identify and minimize the potential risks and to define a strategy of pre-arrangement progress in digitalization projects based on Frank's Model. A unified framework and empirically tested using collected data from field study involved participants from Shipping Service Enterprise in Libya, represented by senior managers in core company management processes. The case findings suggest that people, process and technology dimensions are considered to be the key issues of digitalization adoption in the shipping services sector in Libya. An implementation strategy developed centered on HEEK's model concluded with suggestions as to how digitalization processes can better support e-business management and implementation. The contributions of this paper include the identification and description of critical digitalization barriers and develop an implementation strategy for organizations grounded on the understanding of different roles of key dimensions with strategic alignment role of technology, people and processes.**

**Keywords – Information systems, e-business, strategy, Libya, shipping services, Process, Innovation.**

## I. INTRODUCTION

Most organizations in developing countries are struggling to realize the benefits of successful digitalization processes implementation and better management performance [1]. Furthermore, Argue that the outcome of successful implementation plan depends on several issues: one of the most important fundamental issues is to develop an implementation strategy that should be formalized in a unified framework, this approach can confidently support the concept of e-business innovation [2]. The organizations adopting digitalization strategy in order to minimize the risk of e-implementation failure [3]. Within the scope of this paper, the aim to focus on the significant role of key digitalization dimensions in ensuring a scientific involved approach in e-business implementation to support major limitations faced by current daily process [4]. The remainder of this paper is organized as follows; begin with a literature review of digitalization based on e-business, organizations and e-business deployment, explain the research methods, which uses a case study methodology. Next the cases are described and analyzed based on an HEEK's framework. The findings are presented through a discussion of the different roles of key implementation dimensions. The paper concluded with

contributions for current research. The addressed question is seeking how do shipping companies in Libya identify and manage activities that are the root cause of failure problems in digitalization projects?

## II. THEORETICAL BACKGROUND

The wider concept of digitalization process that including all electronically facilitated information connections, both within an organization and with external stakeholders, for a range of business processes support [5]. The term therefore is taken to include the use of all information systems and related technologies, irrespective of whether they use the internet or is accessed via web technologies. The design of digitalization projects in the developing world stated that circumstances of developed world organizations may not meet an organization's requirement in developing world [6]. The results of IT/IS application implementation in developing world context suggests to focus on organization's key transformation dimensions[6] [7]. The key dimensions are mainly linked to technology, which represents infrastructure, ICT/IS and existing information; processes and management method; people capabilities and so on. There is still no agreement on a single specific approach that has been carefully chosen for digitalization projects in organizations in the developing world [9]. For example, e-business project among organizations in the developing world still seeking specific models based on requirement meets the nature of local organizations' environment [10]. However, there is a need to identify and map the potential risks of digitalization processes implementation as well as innovative tools for foundation and investigative tool for potential success implementation strategy and demand for appropriate evaluation models to be in place[11]. However, this variety of technologies and their applications makes it conceptually challenging to define digitalization. Building on prior definitions and adopted understanding of the field, the study will adopt the digitalization definition as 'use of digital technologies to innovate a e-business model and provide new revenue streams and value-producing opportunities in industrial ecosystems'. This definition holds at its heart the view that digitalization is much more than just the application of various digital technologies[12].

## III. THEORETICAL FRAMEWORK

Frank's model argued that the development of e-business strategy could begin with the assessment of the actual organization's circumstances; the framework helps to support the assessment of an organization to capture its digitalization implementation barriers, drivers and readiness to accept new potential digitalized solutions. A fundamental is needed for the classification of three main elements for digitalization opportunity. These key elements are: Process, Technology and People Figure 1. Illustrates the elements of frank's model.



Figure 1 Digitalization Framework based on Key elements development processes Adapted by the authors from Frank (1997)

The Frank's model also supported by Heek's model [6], who argued that approaching an appropriate decision of digitalization implementation is depended on an organization's capacity to perform it and to an analysis several core key dimensions. The standard nature of the Heek's theory is based on technological aspect for the evaluation of current and designed systems in an organization's attempts to transfer to e-business processes. It is comparatively easy to measure the organization's existing technology state, which is stated as "the actuality". The outcome categories were identified as following: Total Failure where the initiative fails soon after the deployment is completed or later; Partial Failure when some benefits have been achieved but the central goals of the initiative are unachieved, or there may be unwanted outcomes; the last is Success of an Initiative situation of most significant desirable outcomes and the expected key goals are achieved. Heek's theory investigated and shaped the understandings into what often drives

deployment initiatives' success or failure as a blueprint for digitalization processes implementation. Aligning with Frank model theory, Heeks mode, formed the transformation between the professional knowledge (design) and the (actuality) organization's current circumstances as illustrated in figure 2.

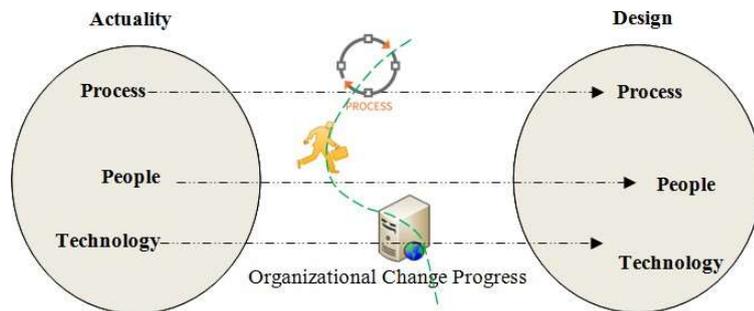


Figure 2 key dimensions of Digital Transformation Adapted from Heeks model [6]

Even with appropriate time for planning, analysis and design work, the initiative may not be applicable in a business environment designed to work in Heek's model [6]. However, to achieve the targeted goals of a transformation plan, several stages were indicated at the level of current e-business process. There is a growing interest in the analyses needed to track the details of risk that can lead to the failure of implementation process. In the case of Libya, currently, the failure keeps organizations in shipping services sector in Libya on the incorrect side of e-business. Thus, implementation success possibilities emphasis the way of how e-business can be designed and implemented within the daily companies' work processes framework [1]. However, a number of Business models have been developed to establish how an organization can move to an advanced level of comprehensive ICT/IS applications towards digitalization approach.[13], thus, there is no single proofed strategy for organization advantage achievement on the digital application. However, the shipping companies in Libya need to assess its current particular business process environment, identifying opportunities, overcoming barriers, and could also designing and implementing digital tools and applications that advantage to the organization itself, their business partners and their stakeholders [14].

#### IV. THE PROPOSED MODEL

Number of studies argue and developed models for assessment of the elements of digitalized business change in a developing world context; the model has been used for empirical studies on e-business maturity assessment in organizations in particular higher education sector in Libya based on joined critical factors [15]. The model will be adopted in this study and centered on three key concepts of digitalization which are: Technology; People; and Process concepts describes the footsteps of implementation strategy in shipping business sector in Libya. The transaction stages are involved in review of significant digitalization dimensions as key concern in implementation strategy. The study will adopt the model [15] which presents five stages of implementation phases contributing to continuous organizational readiness, people skills, and process and technology enhancement as illustrated in figure 3.

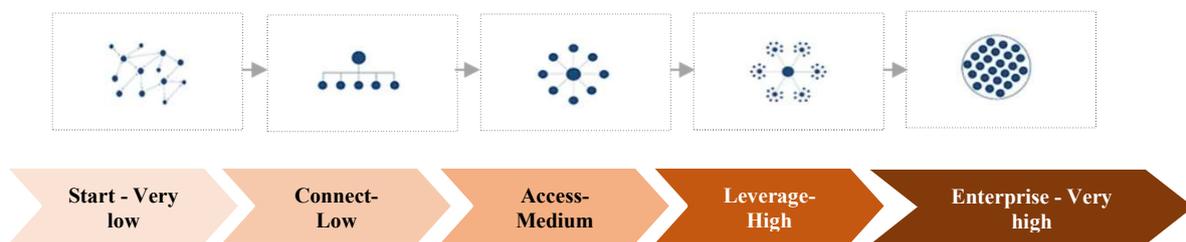


Figure 3 Framework of Digitalization progression assessment among shipping sector in Libya

From the above discussion, the strategy scenarios are based on two concepts: firstly, from the digitalization dimensions in each business process (dimensions harmonization), and targeting the lowest level of digitalization maturity which is considered as key critical processes for implementation development process. Secondly, once the allocated core organization process which is

considered as the most valuable process by the top managers, the implementation progression should focus the company's most valuable processes, and ensure that e-business development efforts should be taken at an organizational level, not at an individual or departmental level. However, the engagement of both above scenarios could support digitalization processes harmonization that could lead to better development of digital transformation in less risk of failure and generate initial e-core process implementation activities. Both scenarios will be performed and demonstrated on shipping services company in this study.

## **V. METHODOLOGY**

A case study approach was adopted to scope detailed and intensive knowledge about digitalization in the selected case in context of shipping services sector. The approach aims to provide opportunity to gain a rich understanding of the research context and enabling answers of research question [16]. In addition to provides a deeper insight and understanding of the conceptual relations in explaining the existing situation. A key participant selected to be a person knowledgeable about current ICT and business processes in the RWD case shipping company and key process managers such as IT manager, records operation manager, and finance manager are the interviewees. However, for the present implementation strategy development research, RWD company was the selected case for data analysis, and in particular focusing on the development of CRM, business records management process as an established important process in this paper. However, based on the data collected from the study, a primary study was developed and conducted between the periods of (September 2020 to December 2020) in to selected case.

**The Case study:** RWD Case Shipping Agency is one of the largest companies operating in Libya in the field of maritime shipping and has four branches distributed in four Libyan cities with the largest sea ports in Libya. The company has been working in this field for more than 20 years. And it has more than 150 employees for various jobs. The company seeks to develop the quality of its services through digital transformation and the automation of its procedures. The main operations on which the company's system relies are summarized in operating and financial operations and tracking and following up the movement of containers.

## **VI. FINDINGS:**

The study investigated how do shipping companies in Libya identify and manage activities that are the root cause of failure problems in digitalization projects? While there is evidence of satisfactory digital application readiness level and awareness at staff's management level of the importance of digitalization development, the implementation framework has already helped classify a number of issues which affect most process areas to some degree that need to be addressed at RWD company. Based on the case outcome, the emerged issues of critical digital implementation strategy barriers have been defined.

Based on the analyses of the Frank's and Heek's models outcomes, the emerged issues of critical digital implementation barriers have been defined. The barriers were based on the dimensions categories. Process barriers; (1) lack of clear reliable plan for digitalization processes management; (2) lake of clearly defined allocated budget; (3) lack of electronic based process and lack of top-level enforcement; (4) fragmented company's geographical location based on sea ports locations. Technology barriers are; (1) instability of the power electricity; (2) lack of reliable internet connection; (3) lack of reliable networks and infrastructure; (4) lack of structured electronic data and web-applications. People barriers are; (1) lack of training programs; (2) lack of people's e-skills; (3) lack of awareness of digitalization benefits; and (4) lack of digital strategy knowledge and interest.

However, the general manager shows high interest in adopting digital applications and readiness for starting digitalization strategy, but with lack of knowledge on the implementation approaches, the RWD company seriously need to adopt clear plan and take into account the above barriers for potential maximum benefits of digitalization project. These barriers were taken into consideration during the development of implementation framework strategy to be feed to an implementation plan of digitalization in RWD shipping company. The finding outcomes illustrated the possible high success of digital implementation at RWD shipping by identifying and managing the activities that possibly cause failure problems in digital implementation projects. While the most valuable processes assigned by the top-level managers at RWD shipping agency, operation management process has been selected for the demonstration of the digitalization strategy. Based on the assessment findings and, the highest level of implementation at the operation processes management was at the stage three (Access) in terms of Technology deployment and clarity of procedures, but, no clear plan for documentation was in place. The lowest potential digitalization level was at second phases (connect) as the company's staff and employees e-skills and awareness are still not enough for the high success adoption of the digitalization process. However, the proposed urgent implementation action should be started on the people dimension first and to be aligned with the process and technology available in the current situation. The required digitalization implementation phases in RWD operation

management process in are illustrated in figure 4.

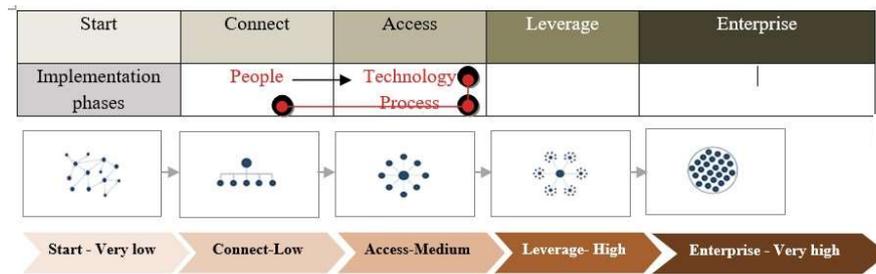


Figure 4 Digitization phases at Business Record Management (BRM) in RWD case



People Skills Development



Technology and Processes development

According to the RWD case results, the potential risk was in the people dimension. Therefore, the targeted development priority for digitalization should focus on the people domain where lower digitalization impact and skills were low compared to other two dimensions in order to maintain the harmonization. This progress is part of the whole development of implementation strategy process for starting a digital business development. As a result, the priority scenario for BRM process in RWD case is to develop its business domains harmonization starting from the view of people dimension. Figure 4 emphasizes the assessment of e-business maturity in the six key UOMS process based on scale framework.

## VII. CONCLUSION AND IMPLICATIONS

The study has identified risks that threaten the success of digitalization adoption approach and has highlighted its effects on business development strategy decision. The study framework can be adopted as a useful analytical tool to study digitalization risks and its emergence, as well as demonstration of how the impact of digital business dimensions and related barriers are mediated through decisions or actions taken to solve risk problems. Future studies could focus on other contexts in organizations in the sector to release other internal and external dimensions and aspects related to digital applications adoption and successful implementation strategy.

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# *Socio-Psychological Characteristics Of A Modern School Leader And A Program Of Continuous Professional Development*

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**Abstract – In today's rapidly changing and developing information and communication technologies, competition is intensifying, and the level of competence of leaders and professionals is becoming a key factor in science, technology and industry. In order to bring up a young generation with independent thinking, intellectual potential, deep knowledge and a modern outlook, able to take responsibility for the fate and future of the Motherland, it is necessary to professional development in the continuous professional development of the school leader is at the same time important and relevant.**

**Keywords – Modern Leader, Professional Development, Curriculum Plan.**

## I. INTRODUCTION

Undoubtedly, the activities of leaders play an important role in ensuring the socio-economic development of the country, training spiritually mature and competitive professionals. Especially in the system of general secondary education, the effective formation of management skills based on the improvement of effective technologies of professional development in the continuous professional development of the school leader is at the same time important and relevant.

A modern leader is required to be independent, to have a comprehensive outlook, deep thinking, intellectual potential, professional competence, antiseptic and reflexive ability, to be inquisitive, enterprising, entrepreneurial, organized, demanding and determined.

In the image of a modern leader and his portrait, a special place in the socio-psychological qualities of the leader, especially organizational skills:

- ❖ First of all, the ability to create a working atmosphere in the team, all
- ❖ dealing with workers;
- ❖ Second, the ability to perform their duties;
- ❖ Third, to treat everyone fairly, regardless of their position;
- ❖ Fourth, to be polite in dealing with colleagues and employees and to be able to effectively manage themselves;
- ❖ Fifth, to be able to adequately assess their own behavior and to be critical of themselves.

## II. MATERIALS AND METHODS

The intellectual, ethical qualities of management activities on the one hand, and the orientation and will of the leader on the other hand ensure the effectiveness of management activities. Here are some simple ways to strengthen a leader's will:

- Stable transition to a new mode of operation.
- Focus on just one topic.
- Solve complex problems without escaping.
- Never give up and never give up until you have mastered a new way of working
- Not to miss the “next trip”.
- Take every opportunity to make a new decision.

To achieve work efficiency, the manager should plan his / her working time and pay attention to the following in order to use it effectively (time management):

- Analysis of the use of working time.
- The main issues necessary for the activities of the current period of the leader
- to feel that it is a duty.
- Develop an individual (personal) activity plan (monthly, quarterly and yearly).
- Monitor the implementation of the employee's own plan.

In order to organize the work of the leader on a scientific basis, he must follow the following basic principles:

- Ability to set goals.
- Be able to divide the work into parts.
- Eliminate things you don't need.
- Select the most appropriate methods for the activity.
- Learn the best ways to do the activity.
- Study of rational methods of work of employees.

One of the most important features of a leader is the introduction of innovations. To do this, the manager must inform all employees about this work, create conditions for them to master the novelty. To do this, pay attention to the following:

- Ability to involve staff in innovation planning;
- Be able to establish mutually beneficial relations with employees;
- Taking into account the habits and traditions of the team;
- Explain how useful the innovation will be for the organization and thereby prepare employees financially and psychologically to implement it.

Adherence to the above characteristics will increase the effectiveness of leadership activities.

In this regard, the effective formation of management skills based on the improvement of effective technologies for professional development in the continuous professional development of the leader, directly dependent on socio-psychological factors, effective in-service training technologies should be developed in this area. The urgency of ensuring effective management performance through the improvement of these mechanisms is characterized by the following factors, including:

- ❖ Rapid socio-economic development of the country;
- ❖ The dependence of the improvement of the quality and content of all types of education on the effective demonstration of management skills based on the improvement of effective training technologies in the continuous professional development of the leader based on direct and indirect implementation;
- that they are an important factor in the formation and training of competitive leaders;
- the need to take into account the specific ethno-territorial and ethnopsychological features of the socio-psychological image of the leader;
- The effectiveness of socio-economic spheres depends on the effectiveness of the school principal;

- The need to conduct special research on the problems of socio-psychological mechanisms and technologies for improving the effective technologies of professional development in continuous professional development.
- Clarification of individual-social-psychological barriers that negatively affect the formation of management skills, based on the improvement of effective technologies of professional development in the continuous professional development of the school leader,
- development of technologies and mechanisms of this activity and criteria for its evaluation,

### **III. RESULTS AND DISCUSSIONS**

One of the most important socio-psychological scientific tasks today is the development of effective programs and technologies of personal development for the effective formation of management skills to ensure the achievement of the above.

Scholars have explored two aspects of leadership development:

- specific features that allow the leader to meet his material and spiritual needs and serve as a guide in his social and professional activities aimed at achieving socially significant humanitarian goals;
- The system of intellectual activity, which serves as a tool and a link between the norms governing pedagogical activity and the emerging social worldview in the field of education and pedagogical activity.

The individual-personal system of professional development of the leader includes:

- Values related to the individual's self-expression both in society and in the professional environment (the social significance of the leader's work, the prestige of the leader's activity, the recognition of the profession by those close to him);
- values that meet the needs of spiritual and enlightenment communication and expand its scope (communication with students, teachers, colleagues, officials, kindness and care for children, exchange of spiritual values, etc.); spiritual and enlightenment values aimed at the development of creative intellectual individuality of the individual (opportunities for the development of professional and creative abilities, awareness of world culture, hobbies, the pursuit of constant perfection, etc.);
- Values that allow to mobilize oneself for work (creative nature of the leader's work, emotional richness and interest of the leader's activity, ability to help those in need of social protection, etc.);
- Values that allow to satisfy pragmatic (practical) needs (work guaranteed by the state and society, wages, vacations, promotion, etc.).

In today's globalization system, it is important for the leader to work on himself and improve himself on the basis of effective programs of personal development in the process of modernization of the system of continuing education, raising leadership skills and competence, especially in the education system.

Self-development is the ability of an individual to independently organize practical actions on the basis of clear goals and well-thought-out tasks in order to improve professional experience, skills and abilities.

A number of studies have suggested that an "Individual Development Program" can be helpful in the self-development of a specialist, including a leader. Individual Development Program (IRD) is a program of individual-personal-practical nature, developed on the basis of the needs of each person or specialist (leader) in the formation and development of certain qualities, knowledge, skills, professional competencies, in which the formation of professional competence qualities and development periods are set.

As any specialist, the leader must be able to develop a "program of individual development" of a personal-practical nature, on the basis of which to effectively improve the management.

The "Personal Development Program" developed by the leader in the education system can consist of the following components:

- Pedagogical knowledge;
- Psychological knowledge;
- Specialty knowledge;
- Management knowledge;

- Didactic skills;
- Skills in organizing educational work;
- Professional qualities and personal qualities of the psyche;
- Goals of self-development;
- Assignments for self-development;
- Management skills.

#### IV. CONCLUSION

Self-development tasks are defined through self-analysis and self-assessment. In particular, self-study is as follows:

- Improving professional knowledge, skills and abilities;
  - Critical and creative approach to activities;
  - Achieving professional and creative cooperation;
  - Development of business skills;
  - Elimination of negative habits;
  - Development of positive qualities;
  - Mastering the qualities of effective management

It should be noted that the work of the leader on himself takes place in several stages. They are:

- ❖ Identify strengths and weaknesses based on research into their own performance.
- ❖ Enrichment of achievements and elimination of shortcomings.
- ❖ Look for ways to effectively organize practical action on this decision.
- ❖ Try not to repeat mistakes and shortcomings.
- ❖ Regular monitoring of the consistent implementation of the decision.

It is also important for a leader to be able to self-analyze in order to improve his or her leadership skills through consistent, effective work on himself or herself. Self-analysis is the study of the essence of one's own practical actions organized by the leader in the activity

Through self-analysis, the leader will be able to make an objective self-assessment. After all, it is also important for a leader to have the qualities of professional competence, as well as their self-assessment skills.

Self-assessment is a person's self-assessment through self-analysis, and self-assessment provides the subject with an account of his or her personal abilities, an objective self-assessment, and self-satisfaction.

Through self-assessment, a leader helps his or her own abilities to emerge on their own. Self-assessment is difficult, but it is possible to prepare a person directly for it. As with any professional, a number of factors affect a leader's ability to effectively self-assess.

Factors of effective self-assessment:

1. Self-understanding (having clear information about oneself).
2. Understanding one's self-worth as a person (gathering positive information about oneself).
3. Self-control (the conformity of a personal opinion about oneself to the value given to it by others).
4. Be able to analyze leadership activities and correct mistakes.

The level of self-esteem determines whether an individual is self-satisfied or not. At the same time, self-assessment indicators should be commensurate with the individual's capabilities. Self-increase or decrease leads to inaccurate self-assessment indicators. Adequate self-assessment is an important trait.

Thus, the need to withstand strong competition in the labor market in the context of market relations requires and motivates every leader to improve their professional competence, skills and moral qualities on the basis of an individual development program.

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# *Toponyms Formed On The Basis Of Nation Names*

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**Abstract** — Ethnonyms are the sources that can demonstrate the history, way of life, national language, belief, cultural and spiritual life, worldview of each nation. To explore ethnonyms both gives information about the history of the nation and contains crucial linguistic information. The role of ethnonyms is important in order to comprehend the features of contemporary national language and express its linguistic possibilities. In Bukhara region there are a lot of toponyms that are appeared on the basis of ethnonyms. These ethnotoponyms show the life of people living in the area, cases of mixture with indigenous people and the region has had a long process of development. First of all, ethnotoponyms showcase the spread of Turkic tribes, geography of their areal stretch or the extension over the area. Furthermore, they express how other peoples and tribes appeared in the area of the region and their mixture with indigenous people. The following article draws some views about ethnotoponyms which are formed on the basis of nation names in Bukhara region and are used presently as names of a place among local people. Ethnotoponyms can be apparent as means that provide the existence of ethnic unity of the separate region.

**Keywords** — language of the nation, name of the nation, Bukhara region, Arab, Mongol, Kazakh, Turkmen, Afghan, ethnonym, Rural Citizens' Assembly (RCA), Makhalla Citizens' Assembly (MCA), ethnic group.

## I. INTRODUCTION

Ethnonyms are linguistic units that inform people of different ethnic groups living in a given region at a given time. Ethnographic names are used to identify areas and territories where people and tribes live. Thus, the collection and research of an ethnonym is not only valuable information for linguistics, history, ethnography, archeology and geography, but also plays an important role in conducting comprehensive research in various areas of our culture and spirituality. In Uzbek linguistics, numerous research works have been carried out to study the ethnonym continuing to this day. S. Qoraev “Etnonimika” [1], A. Otadzhonova “Khorezm ethnographic names and their vocabulary” [4, p. 24], Y. Ne’matova “Namangan viloyati etnooykonimlari xususida” [8, p. 103-105], A. Ergashev “Areal – onomastic study of ethnotopony Andijan region” [10, p. 40] and other studies show that this area is developing further.

## II. LITERATURE REVIEW

Ethnonym is a name that was born naturally for many centuries. Their creators are ordinary people. Ethno-toponyms, on the one hand, help to clarify the history of the people, if the well-known name of a particular object is a very ancient word. The names of the nation, which are still alive as an ethnonym, also reflect the material and spiritual ties of nations. Ethnic names are formed on the basis of national names.

The names of peoples that exist today as an ethnos reflect the material and cultural ties of peoples. An ethnonym based on ethnic names not only carries historical information, but also influences native languages. We can observe such ethnotons in the Bukhara region.

For example, Turkon (Bukhara region, Kuchkumar RCA, Turkon MCA, Yurinbolo RCA), Uzbek (Alatta region, Uzbekon-Bukhara region Kushkhod MCA, Shergiron MCA, Ramitan region, KuyiUzbekon – 64 – Atbazar RCA, Uzbekabad – Kagan region). We can find ethno-names derived from the names of several nations, such as the Public Association Otbozor (Uzbekabad – Kagan District).

In addition, we also find countries that have migrated to Uzbekistan because of their historical context and have become part of the nation. One of them is the Arab nation.

Ethnic names formed on the basis of Arab nationality. Arabs are the peoples of Asia, the Persian Gulf and the Mediterranean and speak one of the Somali languages in North Africa [2, p. 50].

In the VI-VII centuries, some Arab peoples united and the Arab Caliphate was founded. As a result of the invasion, they spread to other nations. One of them is the Central Asian Arabs.

They lived in the area and were an ethnic group calling itself an Arab whose ancestors came from the 7th to 14th centuries. This is part of the Uzbek, Turkmen and Tajik peoples. Most Arabs in Central Asia live in the Bukhara, Samarkand and Kashkadarya regions of Uzbekistan, as well as in the northeast of the Ferghana Valley [5, p. 388-389].

### III. DISCUSSION

Any ethnocultural communication will be reflected in the language. Due to the long ethnic migration of Arabs to Central Asia and especially to the territory of Bukhara, the ethnic formation of the region's population has become more complicated, and the Arabic language has begun to change.

Arabon – the city of Bukhara Jalal-Ikromiy MCA No. 9, Romitan region;

Arabs – Mirzion MCA. Zhondor district, Shafirkan district, Gijduvon district;

Arabhana – Sufikorgar RCA of Bukhara region; Turcon MCA, Guliston MCA, Vobkent district – Oromgoh MSH; Kagan city, Friendship of MCA, Olot district, Zhondor district, Romitan district.

Katta Arablar (large Arabs) – Vobkent district;

Katta Arabhona (large Arab house) – Shafirkan region;

Arabsaroy – Vobkent district, Zhondor district;

TarobArabhona – Zhondor district;

Arabguzar – Zandane IFF Peshku area;

Arabdiyor – Holbor IFF Peshku area;

Arababdul is like the Shafirkan region.

Ethnic names formed on the basis of the Mongolian ethnonym. According to B. Karmishevsky, Nafasov said that the Mongols were one of the oldest Turkic tribes, which later became part of the Uzbek people. It is noted that the settled Turkic tribes in Uzbekistan were called by the Mongols as a separate ethnic unit [5, p. 173].

As a result of ethnic differences, some parts of modern Uzbekistan were settled by the Mongols. Locals began to call their people, and this was later applied to the place where the Mongols lived. The place where the Mongols began to be called by this name, and although today there are no indigenous inhabitants in this area, the public name has been preserved as an ethnonym. These include:

Mogulon – Gijduvan district;

Mugolon – Kavola Mahmud RCA of Bukhara region;

Mughilan – Olot district, Shafirkan district, Peshku district, Zandane MCA.

In ethnonyms, the plural represents the plural. This application corresponds to the plural form in Uzbek.

Ethnic names formed on the basis of the Kazakh nation. Kazakhs today are the indigenous peoples of the Republic of Kazakhstan, the name of the peoples speaking one of the Turkic languages [3, p. 583]. Their ethnogenesis was characterized by prolonged intervention of various nomadic tribes. The ancient Kazakh ancestors were represented by Saxons, stones, Albanians,

Vikings and others. In the VI-VII centuries, the tribes living in the southeast of Kazakhstan were part of the Western Turkic empire. At the beginning of the 12th century, the Chinese invaded the territory of Kazakhstan and mixed with the local population. In the thirteenth century, Kazakhs, led by Naiman, invaded Mongolia and Russia in addition to modern Kazakh lands, forming the largest imperial state on the Golden Horde. The state of the Golden Horde collapsed in the mid-fifteenth century. At the beginning of the XVI century, Kazakh tribes united in the Kazakh Khanate (Uzbek tribes, previously inhabited by the Kazakh Khanate, headed by Sheybani Khan, are sent to modern Uzbekistan). Kazakh tribes have historically been divided into 3 groups living in separate areas. They are called yuzes (zhuzes) (large, medium, small) [6, p. 46].

We can say that the Kazakh nation began to survive in Uzbekistan and other parts of Central Asia as a result of political fragmentation, so we can say that in the Bukhara region ethnic Kazakhs also formed ethnic groups. The following forms of ethnic names are distinguished:

Kozokon – Zhondor district;

Kozokovul – the city of Kagan Beruniy MCA.

The first ethnonym is the plural, as mentioned above. The second ethnotoponym is a complex notion drawn up in [ethnonim + aul]. Oulmoul and Turk are ancient words, also, sayl-cathedral of peoples, family, house, black house, plot. [5, p. 189].

Ethnic names formed on the basis of the Turkmen nation. As a result of the political process, Turkmens also came to our region. Local residents, as well as investors, tribal unions, and partly the inhabitants of ancient Margian, Parthia and Khorezm, took part in the ethnogenesis of Turkmens. In the middle of the first millennium, there were Turkic tribes in the steppes of the Caspian Sea, and in the 9th century – Oguzes. They played an important role in the ethnogenesis of the Turkmen. The main group of Oguzes came from the northeast in the 11th century and mixed with the local population. In the 15th century, the Turkmen nation was formed.

Until the 20th century, the Turkmen were divided into tribes. The largest of these are takas, yovmuts, ersari, solurs, sariks, gyoklan and choudors. Currently, Turkmens live in Uzbekistan, the North Caucasus, in the province of Atrahan and in several cities of the Russian Federation, Afghanistan, Iran and Turkey [7, p. 668].

In particular, in some parts of the Bukhara region, data on the Turkmen population can be found in the surviving ethnic groups. As a result of our research, we transmitted the following ethnological understanding based on the Turkmen nation:

Turkmens – 20th MCA, Mirzo Ulugbek in Bukhara; Kagan district; Gijduvan district.

Turkmen coals – RCA Yangi – Hayot, Kagan district.

Ethnic names based on Karakalpak ethnicity. The earliest ethnogenesis of Karakalpakstan is associated with the Saxo-Massagetan tribes of the 7th-4th centuries BC in the Amu Darya delta and in the desert of the Aral Sea and the Caspian. In the VI-VIII centuries, the Turks partially mixed with local tribes.

In the VIII-X centuries, the Karakalpak environment began to form among the bijanaks and owls. The occupation of Genghis Khan turned the oasis into a desert, which led to a large influx of people living around the Amu Darya downstream. Karakalpaks migrated to the west, Volga and Ural regions. There they were part of the Golden Horde. They are called "qavmi kulohi siyoh" in the work of Rashididdin. Most of the Karakalpaks lived in the middle and lower reaches of the Syr Darya in the middle of the XVI and XVIII centuries, and some in the Aral Sea region.

Karakalpakstan is one of the Turkic peoples. The Uzbek people were also a Karakalpak root. One of the seeds in Kenagasis also called Karakalpak [5, p. 388]. An ethnonym formed on the basis of this ethnonym is found on the territory of the Karakalpak MFJ of the Peshku region of Bukhara region.

Ethnotoponyms based on the basis of the Afghan nation and nationality. Historically, the territory of Afghanistan has been unstable and politically fragile, and the daily lives of people living in the area have been accordingly unstable. The historical fate of the Afghan is closely connected with the Uzbek, although they do not belong to the same race or ethnicity.

Since ancient times, economic and cultural ties between the two nations have developed. Taking into account the above factors, Afghans moved to Uzbekistan, influencing the local population and settling in these areas. As a result of mutual trade, the

migration of Uzbeks to Afghanistan and the transition of Afghans to Uzbeks increased at different periods of history. You can get information that representatives of this nation also visited the Bukhara region under the following ethnonym: Afghanistan (Bukhara region Amirabad Gulistan, IFF).

Ethnic names are formed on the basis of Chinese ethnonyms. T. Nafasov [9] gives the following information about the Chinese ethnonym: the name of the village is not connected with the Chinese word, i.e. Chinese People's Republic. China is a Turkic, Mongolian tribe, and its shape has changed. The ancient form is kidar \ kidon \ kidan. Khitan \ Khitan are descendants of the ancient Huns; they conquered the Kashkadarya region in the fifth century AD. The Mongols – Kurds / Kidon \ Khitan – were divided into several Turks, including the Uzbek, Kazakh, Karakalpak, Kyrgyz and Bashkir peoples. Kazakhs, Karakalpaks and Kyrgyz had nations like: Kytai / qtai, others htai / argyn, ktai / kypchak, khypchak / ktai, kuzgun / qatai, karach / hita, katy, khytai, kytai, hita, ktai, hta. The common Turkic ethnonyms are reserved only as the name of the place (village, mahalla, guzar, street, river, hill ...) but also of other places.

Residents of these villages have forgotten their ethnicity. Hitoyon is a Chinese (kidar \ kidon \ kidan) tribal village. In the territory of the Bukhara region, a Chinese ethnonym is observed in the Istikbol RCA in the Bukhara region in the form of the Chinese language. We can say that in the region there are many ethnic names. They appear at different times and under different conditions and are still used today in our language.

#### IV. CONCLUSION

Consequently, ethnological understanding based on ethnic names, along with information on historical environments and contexts, influence the vocabulary of the nation, and when the names representing the ethnic composition of the indigenous population – ethnic groups, are lost in the development of society. It remains in toponymic vocabulary as a special name for the population. These days, linguists have found out the way of analyzing the languages and the ethnic names with their exact numbers of use by means of electronic language corpora [11; 12]. In the near future this option can be applied in the field in the future.

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# *Agrotechnology Of Growing Medical Salvia (Salvia Officinalis L.) Seedlings Under The Influence Of Mineral Fertilizers In Tashkent Region*

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**Abstract – In this article, it was found that different standards of mineral fertilizers used to accelerate the medicinal salvia cultivation in the soil and climatic conditions of Tashkent region affect the plant seeds yield. The N<sub>90</sub>P<sub>60</sub>K<sub>40</sub> norm gave good results for the plants rapid growth when fed with different norms of applied mineral fertilizers. In this case, the data on the cultivation technology of seed seedlings of salvia plant are given.**

**Keywords – Salvia, Agrotechnology, Mineral Fertilizers, Raw Materials, Soil, Care, Productivity, Growth And Development Rate.**

## I. INTRODUCTION (TOPIC RELEVANCE)

For the industrial plantations establishment of medicinal plants, it is necessary to develop agrotechnologies for the varieties selection and cultivation adapted to local soil and climatic conditions, as well as to create sufficient conditions for the plants biological potential manifestation.

It should also be noted that due to the limited reserves of naturally growing medicinal plants, the growing demand of the pharmaceutical industry for raw materials for medicinal plants in the future can be met mainly through the medicinal plants cultivation.

As stated in the Resolution of the President of the Republic of Uzbekistan on April 10, 2020 PR No-4670 "On measures for the protection, cultivation, processing and rational use of available resources of wild-growing medicinal plants" in recent years, consistent reforms have been carried out in the medicinal plants protection field, rational use of natural resources, the establishment and processing of plantations where medicinal plants are grown [1].

The resolution of the President of the Republic of Uzbekistan "On measures to expand the scope of scientific research on the cultivation and processing of medicinal plants, their seed production development" (PR 4901, 26.11.2020) was adopted. According to the resolution, "Agrotechnology of medicinal plants cultivation" direction will be opened in all colleges and technical schools specializing in agriculture[2].

## **II. RESEARCH OBJECT AND METHODOLOGY.**

The object of study was the medicinal plant salvia (*Salvia officinalis* L.). Commonly used methods were used in the studies. B.A.Dospekhov. [3],( Borisova, Beydeman, Ponomarev, Zaytsev, Yarosh, Terekhin, Torikov V.E. and etc.) [4]. During the study, the yield of medicinal salvia seeds was studied. The research was conducted in 2020 in the experimental field of Chatkal branch of the Saksonota state forestry enterprise, Tashkent region. The experimental field soils were typical gray soils, and according to the agrochemical analysis of the soils, the humus content in the tillage layer was 1.54%, total nitrogen 4.75%, total phosphorus 35 mg/kg, and potassium 204 mg/kg [5].

## **III. RESEARCH RESULTS AND THEIR DISCUSSION**

$N_{30}P_{60}K_{40}$ ,  $N_{60}P_{60}K_{40}$  and  $N_{90}P_{60}K_{40}$  mineral fertilizer norms were applied in order to accelerate the cultivation of medicinal salvia plant seed seedlings. Fertilizer free field was obtained as a control option. In each variant, protective rows, observable model plants (at least 10) were identified, phenological observations of the medicinal salvia plant, biometric measurements were carried out (Fig. 1).



Figure 1. General view of medicinal salvia seed seedlings in the experimental area

### **A. The mineral fertilizers effect on medicinal salvia seedlings**

In the second year of the study, when a single model of medicinal salvia seeds was applied according to the mineral fertilizers norms for the plant, it was as follows: in the fertilizer free control variant, the number of branches was 13, the leaves number was 265, the root length was 218 cm and the leaf surface was 12.5 cm<sup>2</sup>. In the second variant, these figures were 14 branches, 283 leaves, 252 cm in root length and 13.7 cm<sup>2</sup> in leaf area. In the third variant, the branches number was 16, the leaves number was 341, the root length was 284 cm and the leaf surface was 15.8 cm<sup>2</sup>. In the fourth variant, these figures were 17 branches, 17 leaves, 334 cm in root length and 18.2 cm<sup>2</sup> in leaf area. The branches number relative to the control was 1.3; leaves number and root length 1.5; increased the surface area of the leaf by 1.4 times, or 145%. (table1).

Table 1. The effect of mineral fertilizers on the medicinal salvia plant.

Options	For a single model plant			
	number of leaves, pcs	number of branches, pcs	root length, cm	* Leaf surface, cm <sup>2</sup>
Control	265	13	218	12,5
N <sub>30</sub> P <sub>60</sub> K <sub>40</sub>	283	14	252	13,7
N <sub>60</sub> P <sub>60</sub> K <sub>40</sub>	341	16	284	15,8
N <sub>90</sub> P <sub>60</sub> K <sub>40</sub>	419	17	334	18,2

\* in determining the leaf surface was carried out by A.V.Nichiporovich method (1972).

### B. Yield indicators of seedling development of Salvia plant

The diagonal method was used to determine the yield in medicinal salvia seedlings in the experimental fields. The medicinal salvia seedlings yield was collected on the basis of 4 variants of 3 returns per 1m<sup>2</sup> and measured wet. After determining the wet weight of the raw material, it was dried and re-measured and the yield was determined for 1 kg/ha average.

The salvia seedlings effect on variants in the different norms application of mineral fertilizers was determined. In this case, the dry mass of raw material of medicinal salvia seeds per 1 m<sup>2</sup> (leaf) was 233.5 g in the control variant, 2335 kg per hectare, in the fourth variant per 1 m<sup>2</sup>, 300.7 g per area; 3007 kg/ha. Compared to the control, the dry mass of the plant increased by 1.2 times, or 128%.

The dry mass of flowers is 85.2 g, 852 kg/ha under control in 1m<sup>2</sup> area; in the variant applied by the mineral fertilizers norms N<sub>90</sub>P<sub>60</sub>K<sub>40</sub> was 123.4g per 1m<sup>2</sup>, 1234 kg per hectare. It was observed that the dry mass of flowers was 1.4 times higher than the control, which was 144% higher.

Cultivated salvia seeds 42.5 g per 1m<sup>2</sup> of control, 425 kg per hectare; in the second variant 46.0 g, 460 kg per hectare; in the third variant 52.5g, 525 kg/ha; in the fourth variant it was 61.5g, i.e. 615 kg/ha (Table 2).

Table 2. Yield of medicinal salvia seeds per 1 m<sup>2</sup> of area (leaves), raw materials for flowers and seeds

Options	Dry mass of leaves		Dry mass of flowers		Seeds	
	In 1m <sup>2</sup> ,g	kg/ha	In 1m <sup>2</sup> ,g	kg/ha	In 1m <sup>2</sup> ,g	kg/ha
Fertilizer free	233,5	2335	85,2	852	42,5	425
N <sub>30</sub> P <sub>60</sub> K <sub>40</sub>	246,1	2461	92,8	928	46,0	460
N <sub>60</sub> P <sub>60</sub> K <sub>40</sub>	285,3	2853	105,5	1055	52,5	525
N <sub>90</sub> P <sub>60</sub> K <sub>40</sub>	300,7	3007	123,4	1234	61,5	615

### IV. CONCLUSION

In order to accelerate the medicinal salvia seeds cultivation in the soil and climatic conditions of Tashkent region, various standards application of mineral fertilizers increased the number of plant branching by 1.3 times, leaf count and root development by 1.5 times, i.e. by 151%, leaf level by 1.4 times that is, it increased by 145%.

N<sub>90</sub>P<sub>60</sub>K<sub>40</sub> norms Application of mineral fertilizers in medicinal salvia plant yield increased by 1.2 times, i.e. 128%, compared to the dry mass control of raw material per 1m<sup>2</sup> area (leaf).

It was observed that the dry mass of plants flowers and seeds was 144% higher than the control per 1m<sup>2</sup> area.

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# *The Impact of Behavioral Finance on Lebanese Investors' Decision Making*

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**Abstract – The inability of the traditional expected utility maximization of rational investors (within the efficient markets Framework) to explain many empirical patterns; was the main stimulus beyond the appearance for another track to resolve and analyze this inconsistency; through combining behavioral and cognitive psychological theory together where Behavioral Finance is known mainly as the irrational part that deals with investors' Sentimental side. Furthermore it can be agreed on that behavioral finance is considered as "Subjective judgement" where ideas and decisions cannot be transmitted to other's knowledge, as each one acts from his own point of interest; unlike conventional finance paradigm. Therefore, this paper seeks to determine the main behavioral errors or biases that are faced mainly by the Lebanese individual investor during decision making process. Results obtained by analyzing 211 questionnaires through SPSS software to develop a Structural equation model. Findings prove that Over Confidence and regret aversion are the main behavioral biases that control the Lebanese individual investors' decision making.**

**Keywords – Behavioral Biases, Heuristics, Prospect Theory, Structural Equation Model.**

## I. LITERATURE REVIEW

"Behavioral Finance is becoming an integral part of decision-making process as it heavily influences the investors' performance" (Banerjee, 2011). Parikh has recalled also in 2011 that "An understanding of how our emotions result in irrational behavior is indispensable for any investor". As a result in-depth education regarding the different biases that may be faced is very needed to all investors, in order to know how to face them whenever they have been surprised with, to obtain a more effective and efficient work. Furthermore; investors usually do lots of mistakes without recognizing, a simple example regarding what is mentioned previously is when investors holds on for a long period of time while facing big losses, not to regret or waiting for any happy news that would reverse all the situation. Parikh (2011) had discovered a global key that helps investors to take the right decision which lies in combining both sound intellect with emotional discipline, and so they get the aimed rational behavior.

Numerous Theoretical and Experimental works for the two important psychologists Daniel Kahneman and Amos Tversky (1970), who shared their psychological literature that served as the main foundation; giving life to a new paradigm in 1980s that was well known by Behavioral Finance. The latter "studies how people actually behave in a financial setting. Specifically; it is the study of how psychology affects financial decisions, corporations, and the financial markets". (Nofsinger, 2001)

Bernstein (1998) stated that the "Decision making evidence reveals repeated patterns of irrationality, inconsistency, and incompetence when human beings are faced with decisions and choices during uncertainty".

From 1969 till 1972, Slovic was interested in studying all the people that deal with stock markets from investors till brokers...moving to Tversky and Kahneman (1974) that talked in details about heuristics and biases that may happen whenever faced with decision making under uncertainty, in addition to that, Researches continued to discover the prospect theory in 1979, that lead them at the end to earn Nobel prizes in 2002 regarding economics.

Nevertheless; to be more specific Kahneman has been interested in studying the human judgment decision making under uncertainty, whereas Smith has been more interested in studying alternative market mechanism through experimental research. At that era, it was the first time where a psychologist was awarded the Nobel Prize and has been involved in playing the main role in convincing and confirming the mainstream financial economists that investors may behave in an irrational way.

Subsequently, academics have started to discover certain foggy cases and behaviors where traditional theories didn't find clear explanations for them. The main and most popular examples are The January effect, where it was noticed that the stocks in financial market increases in this month without a scientific reason; similarly for the day of the week where stock prices increase by Friday afternoon to decrease on Monday morning (Rozeff and Kinney,1976).

According to Sinha (2012), a new crisis appeared in the form of Sovereign debt which was originated in Europe and then spread all over the world, hitting all the financial markets consequently. "Volatility" has been the most famous word that controlled the prices of the financial markets starting since 2008; horrible movements have taken place in prices due to the extreme fear and anticipation of the investors, which turned the life for all kind of investors upside down. As a result; markets started getting back day after day, thus understanding the irrationality in the behavior of the investors has been clearer and the reasons beyond it has become well known. Nevertheless, the main problem lies in various numbers of psychological biases that are affecting the behavior of all the investors leading them to irrational thinking during taking their decisions.

During 2008, lot of studies toward this issue started to appear, starting from the business students (Chira, Adams and Thornton) that had the curiosity to know how certain biases would influence them; as there were about 68 surveys that were distributed to undergraduate and graduate business students at Jacksonville University- USA. Thus, they obtained that students are less subjected to behave in overconfident and excessive Optimism, but on the contrary objectivity has controlled their decisions.

At the Nairobi Stock Exchange; Waweru, Munyoki, and Uliana (2008) have studied how institutional investors have been affected by certain behavioral factors such as Herding, representativeness, overconfidence, Anchoring, loss aversion and availability bias during taking their investment decisions using a Questionnaire.

Thus the main key to investors' success is to recognize their emotional indiscipline and face it, so that it will not be repeated. That's to say Warren Buffet make it clearer by saying "It is only when you combine sound intellect with emotional discipline that you get rational behavior" (Parikh, 2011).

Therefore the main difference between these two paradigms is that "Under the paradigm of traditional financial economics, decision-makers are rational and utility maximizing; In contrast, cognitive psychology suggests that human decision processes are subject to several cognitive illusions, those caused by heuristic decision" (Nofsinger, 2008).

## II. IRRATIONALITY IN DECISION MAKING

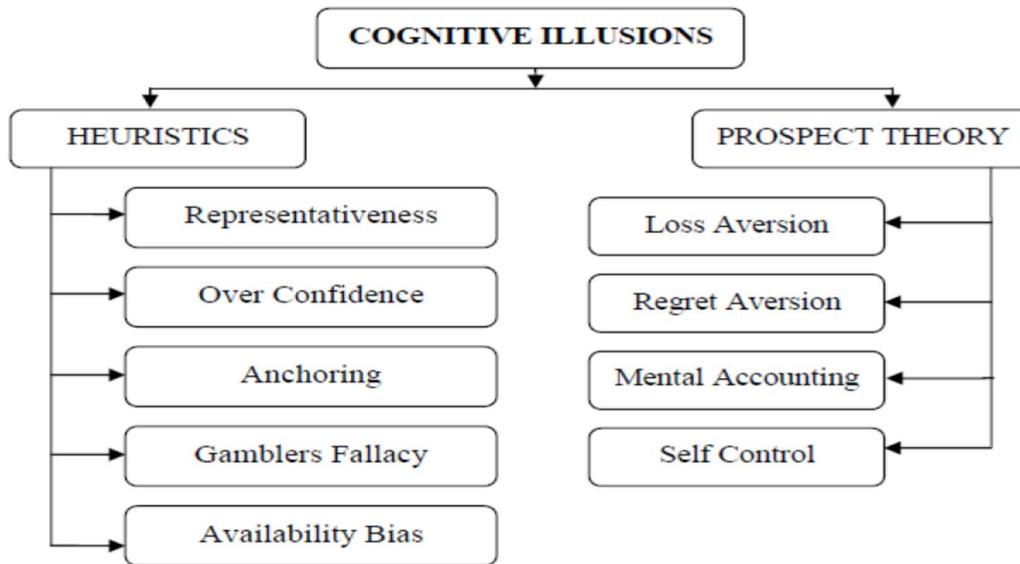
"Behavioral Finance is becoming an integral part of decision-making process because it heavily influences the investors' performance", Banerjee(2011) in addition to that as Parikh recalled in 2011 : "An understanding of how our emotions result in irrational behavior is indispensable for any investor", for that the in-depth education regarding the different biases that may be faced is very needed to all of the investors in order to know how to face them whenever they have been surprised with them in order for their work to be more effective and efficient; because unfortunately investors are doing a lot of mistakes without recognizing , a simple example regarding what we have talked about is when investors holds on too long while facing big losses and this is just not to regret or waiting for any happy news ,but according to Parikh (2011) ,he had discovered a global key that helps in the success of investors which is facing all of his emotional in disciplines in order not to repeat them again and to be more clearer he had tell that "It is only when you combine sound intellect with emotional discipline that you get rational behavior" .

## III. BEHAVIORAL BIASES

Whenever we say traditional finance, rationality will shine directly in front of our eyes, but on the other side modern finance nowadays lies on certain considerations that an investor believes that they are true, but usually they are considered inconsistent, to

be more clearer irrational thinking is going to control an investor's mind and this may lead him to decide based on certain cognitive illusions which can be divided mainly into two groups and they are presented in the figure below:

Figure 1: Classification of Cognitive illusions



Source: Kahneman and Tversky (1974)

- **Heuristic decision process**

Under the heuristic decision process falls certain biases where investor may face; which leads him to certain irrational behaviors and this is due to the use of certain methods like the rule of thumb and trial and error which have been used in uncertain environments and during taking complex

### **3.1-Heuristics**

investors gather a lot of information before taking decision, but unconsciously his emotions will play an important role in the decision that he's going to take so far, to a certain extent it may be good for him to involve his feelings but most of the times it may leads him to big fail and losses. Here are some of these heuristic decisions

#### **3.1.1-Representativeness**

Debont (1998) have found that representativeness falls under taking certain stereotyping decisions which is based on his past and previous experience and we can't deny that his decision is targeted and biased with respect to his previous success or failure and by how much he earns or loose however, he also take his decision affected by the majority of his peers.

#### **3.1.2-Anchoring**

kahneman and Tversky(1974),tell that certain investors take their decision based on certain estimations and calculations from previous studies and they just make certain adjustments for them...but this idea didn't enter into the mind of kahneman and Tversky as they have tell that "adjustments are typically insufficient" for an investor to take an accurate decision.

#### **3.1.3-Over Confidence**

Over confidence is a positive trait for a certain extent, but unfortunately, investors sometimes overestimate their knowledge and skills, as they enter into decisions which may be a result of over optimism due to their past success, mostly this kind of bias leads

to enter in more and more trading activities but in reality it may lead to severe losses because the outcome will not be as they have expected before.

### **3.1.4-Herding**

Usually herding exists when most of the investors follows what the majority tell and take the same decision as they have took and not as what he believe thinking that the majority will be true; but if the contrast has happened a, huge losses are going to happen specially to investors that relies mostly on how others think and follow them and they keep on holding even a loose stock waiting for good news always because they can't compose their own view regarding the issue.

### **3.1.5-Cognitive Dissonance Bias**

Pompian (2006) said that investors could be exposed to this bias when they tend usually to take decisions that doesn't fit their own beliefs, so they avoid every new information that would stand in front of what they have been thinking all along their investment life; for that they usually tend to justify their decisions even though they realize that they are wrong in reality.

### **3.1.6-Gambler's Fallacy**

Investor's may face this bias especially when they have been winning for several times after each other, as a consequence they tend to take a reversal trajectory path most of the times ,but this thing will usually leads them to face several losses so far

### **3.1.7-Availability Bias**

Investors are exposed to this bias usually when they take wrong decisions but it was in reality based on information which was available in front of them just, and this may lead to losses.

## **3.2-Prospect theory**

Daniel Kahneman and Amos Tversky (1979) have worked hard in order to discover this kind of theories which helps in modifying how investors avoid the previous theory and violate it ;this theory has born when they discover that investors tend to prefer certain outcome on other and this is what has happened when they were been asked to choose between certain lottery events, but it's not the case in the utility theory where individuals must not have the tendency to choose differently between the cases.

On the other side, there were also another views toward prospect theory where the "value function" stands also for prospect theory but differs from utility function where in the expected utility theory, since it was due to a certain reference point and this latter was determined by the subjectivity of different individuals; as we can tell that in the graph of the utility theory below, we can notice that all the point are concaved upward that's to say with respect to different wealth levels they are not changed, but the case differs when we are talking on the value function, because there is a certain reference point that we cannot ignore, to be more clearer we can notice that on the graph of this theory we notice that there are certain points which are below the reference point thus these investors are risk

Seekers and the function is upward sloping, whereas when they are above investors are risk averse and its downward sloping; note that the reference point may differ from one individual to another as each one can determine it as a comparison point.

As a result, under this theory there were a lot of state of minds that may impact the decision that an investor can take so far, from the most important biases that an individual investor could take were:

### **3.2.1 .Loss aversion**

When face with this bias investors could be either risk seekers when they feel themselves faced with losses, and risk averse when faced with gain under the prospect theory.

**3.2.2- Regret Aversion**

This kind of bias could be face when we notice that there are certain investors which have the tendency to hold on even a lose stock for a long period of time just not to regret later on if they have sold it, especially when they were capturing it and working on it for a long period of time so that latter will have always the fear of regretting whenever he sell it.

**3.2.3 Mental accounting**

When we hear in Mental accounting we link it directly to the mind; that's to say an investor's mind is able to divide and organize each event that may happen with, and usually certain investors are able to forget their losses directly whenever faced with profits in the next round ; this bias mainly holds three kinds of operations; the first one refers to know how the outcomes were received and perceived, the second one refers to matching each activity that was done with its account, and the third and last operation refers to the frequency of evaluating accounts.

**3.2.4 Self-control**

According to Thaler and shefrin, each investor is exposed to certain temptations that could lead him to over consume and fall in big losses so far; for that they must find different ways in order to separate and organize their outcomes on one side and their expenses on the other side, thus they must be self-controlled in order to avoid exaggerations in consumptions.

Nevertheless,below is a table that summarizes the main biases faced when taking decision unconsciously, in addition to their effects and consequences.

**Table 38:** Biases,effects on Investors and Consequences

NAME OF BIAS	KEY EFFECTS ON INVESTOR	CONSEQUENCE
<b>Overconfidence</b>	Too many trades, too much risk, failure to diversify	Pay too much brokerage and taxes, chance of high losses
<b>Representativeness</b>	Tendency to associate new event to a known event and make investments based on it	Purchasing overpriced stocks
<b>Herding</b>	Lack of individuality in decision making	Bubbles, and bubble bursts
<b>Anchoring</b>	Tendency to consider logically irrelevant price level as important in the process of decision making	Missed investment opportunities, or bad entry timing into the market
<b>Cognitive Dissonance</b>	Ignore new information that contradicts known beliefs and decisions	Reduced ability to make rational and fair investment decisions
<b>Regret Aversion</b>	Selling winners too soon, holding losers too long	Reduced returns
<b>Gamblers' Fallacy</b>	Taking too much risk after a lucky win	Chance of high losses
<b>Mental Accounting</b>	Low or no diversification	Irrational and negative effects on returns
<b>Hindsight</b>	The tendency to feel that a past event was obvious when it really was not, at onset	Incorrect oversimplification of decision making

After observing different kinds of biases that are faced when making a decision it is insured that, it's not necessary for an investor to face all of the above biases, but on the contrary according to the situation faced and to the different variables that play an important role where bias could be committed ; for example the experienced investor is likely to face less herding or representativeness bias from that unexperienced one, but on the other hand experienced one's are more likely to face overconfidence or gambler's fallacy; for that investors must find different ways to minimize from their exposure to these biases in order to improve their decision making process and avoid losses , especially when being faced by various choices where uncertainty controls all over.

However, with respect to investment decision making and Within psychological and sociological domains a new concept has appeared lately in finance which is linked to the "taste of investors" as Prodhon (1995) stated that the 'unethical practices in the finance domain have become a common occurrence in the late twentieth century, reflecting the spirit of the times where Many private investors as well as institutional investors want to counteract such developments and seek to combine their financial and social interests all together" as a result Social responsibility investments has started to take place.

#### **IV. THE IMPACT OF BEHAVIORAL FINANCE ON LEBANESE INDIVIDUAL INVESTORS EMPIRICALLY.**

Any research study is not considered appreciated until it meets the Quality requirements

that a business research should acquire. Furthermore a Structural model is built in the following, to verify the relationship between the different psychological errors and their impact on Lebanese decision making.

##### **4.1-Structural Econometric model methodology**

Structural econometric models are portrayed as models that join both Statistical models together with explicit economic models. In different terms, behavioral sciences regularly tend toward utilizing the structural modeling for being a general Statistical modeling tool. Basically, this model utilizes both Statistical and economical presumptions, where amounts from the joint thickness of financial information can be effortlessly perceived. Furthermore, the methodology of the Structural equation model clarifies the convenience of any financial suppositions by drawing causal monetary derivations from the dispersion of monetary information which is known as economic data.

Various multivariate techniques, as (discriminant and factor analysis...) are mainly used in the Structural equation modelling, which makes these models a proper base for Statistical analysis. Normally, every one of these models is unique by itself; and characterizes a special economic phenomenon. Meanwhile, the main targeted Objectives for the agents as utility maximization, loss aversion profit maximization... and from the other side the different constraints like budget constraints, constraints on information processing and imperfect markets... are considered as the major elements which constitute a structural model.

However; other elements have also contributed in being as the main components in this interactions' model between agents; and can be indicated as the heterogeneity concept which defines how preferences, constraints and beliefs differ across agents; second the Agents' reactions regarding uncertainty and their beliefs about uncertain consequences and finally, the above listed elements specification concerning the invariance properties towards economic environment changes definitely.

Furthermore, Structural model is mainly divided into two main forms which fall under Statistic structure that explains why data cannot be perfectly explained by the economic theory; thus it's usually added by a modeler and affects the researcher's choice that's to say by used quantities and estimation method. From the other side, Economic Structure that includes deterministic data, which allows the researcher to understand the impact of any economic behavior on a specific economic conditions and outcomes.

However, three main assumptions (Statistic and economic) must be taken into account by the modeler himself while implementing various choices; first of all assumptions that reflects mainly the economic reality ,then different assumptions related to data generation which would perfectly explain and rationalize it and finally the different assumptions that are linked to estimation simplification. Nevertheless, lots of modelers argue that it would be fine to modify the structural model in order to facilitate the estimation process; others say that it should just follow a certain specified stochastic economic model.

##### **4.1.1-Advantages of constructing a structural model**

The main reason that lies behind constructing a structural model refers to the ability of predicting alternative results, by assuming certain changes in the model itself (Counterfactual testing); which would help the researcher in making all the assumptions and checking them in order to anticipate all kinds of economic phenomena and behaviors. Second, regarding the unobserved parameters

that lies under “behavioral parameters” and being estimated by structural models; Moving to the third reason that leads to compare between numerous ways of combining both stochastic and economic primitives in order to discover the combination that fits better the collected data.

### **4.2- Data Source and collection**

The main goal of our research was targeting mainly individual investors, since they usually tend to have limited knowledge about the application of certain behavioral theories in decision-making, as a result they will be more exposed to a lot of psychological errors. Moreover, we have created this sample profile basing it on different judgment criteria: age of the respondent, years of investment experience, most preferable market, range of prices preferred mostly.

The study targets individual investor (males and females) aging 18 and above since usually individual investors could be either young which are still fresh, and mature one's that have experience in this domain ;to know the difference between them and how would years of experience affect the individual's investor decision taken and would he be exposed to biases as the young ones that have no experience. 211 complete questionnaires from various individual investor were received.

### **4.3- Questionnaire Structure**

The survey was divided into three parts: first demographics questions, second Investment basics and other questions that indicates us about different biases that might be faced by different individual investors in Lebanon.

### **4.4-Statistical Methods**

Data analysis for this study was applied, descriptive statistics (frequency, means, and standard deviations) to all the questions and cross-tabulation to gain an understanding of the nature of responses. However, inferential statistics like correlation, factor analysis and regression analysis was used to understand the relationship between variables. The results were examined and analyzed by using SPSS software.

### **4.5-Hypotheses under study**

H1: All types of Lebanese individual investors are affected by certain behavioral biases during decision taking.

H2: most of the Lebanese investors tend to be more overconfident and excessive optimism while taking decisions regarding their portfolios .

H3: Most of the investors tend to face representativeness bias.

H4: Most of the investors tends to face Herding bias during decision making.

H5: Lebanese Investors usually feel in fear to get out from their investment even if they knew that it's a losing one.

H6:All types of individual investors tend to face Mental accounting bias.

H7:Most individual investors tends to face cognitive Dissonance bias.

### **4.6- Quality Criteria**

Studying the basics criteria which support the keys of a scientific research is essential. Reliability and Validity are studied, in addition to other tools; to investigate the real impact of behavioral finance on Lebanese individual investors. However “Validity is expressed through measurement validity, internal validity, external validity and ecological validity whereas reliability is assessed through the stability, internal reliability and inter-observer consistency.

**4.6.1-Reliability Test results**

**Table 1:Reliability Statistics-BF**

<b>Cronbach's Alpha</b>	<b>Cronbach's Alpha Based on Standardized Items</b>	<b>N of Items</b>
<b>.604</b>	<b>.688</b>	<b>25</b>

The reliability test presented in table 30, shows 68% reliability which is an acceptable percentage and considered reliable in most of the cases but on the other side it can also be considered as Questionable to certain extent, and this is very normal in our case, since usually cronbach's alpha measures the internal consistency of the scale, and it's used mostly when when our study contains a questionnaire which is based on likert scale questions and the researcher wishes to test if the scale used is reliable or not. However, in our study there various response format such as the five-likert scale and the three-likert scale and others were closed-ended ...so it's very normal for the Cronbach alpha to be questionable in our case due to the absence of unification of the likert scale so ar all over it.

**4.7-Statistical sample discription**

A description of the sample's characteristics in terms of age, educational level, investment basics and other questions related to certain behavioral biases that might be used ,will be presented hereafter. (Source: The author)

**4.9-Frequencies**

**Table 2: Gender-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	117	55.5	55.5	55.5
Female	94	44.5	44.5	100.0
Total	211	100.0	100.0	

According to the test results presented in table 31; 55.5% of the respondents lies under Male (individual investor), whereas 44.5% of female individual investors.

**Table 3:Age category-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 22-29	18	8.5	8.5	8.5
30-39	69	32.7	32.7	41.2
>40	123	58.3	58.8	100.0
Total	211	100.0	100.0	

Regarding table 32, the respondents' age varied from 22 years to more than 40 years old, with 8.5% between 22-29 years, 41.2% between 30-39, and 58.8% 40 years old and above.

**Table 4: Education-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid high school	26	12.3	12.3	12.3
University	185	87.7	87.7	100.0
Total	211	100.0	100.0	

As for the respondents' educational level obtained in table 33, we have got 87.7% with a University level.

**Table 5: Historical record-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	199	94.3	94.3	94.3
No	2	.9	.9	95.3
neutral	10	4.7	4.7	100.0
Total	211	100.0	100.0	

94.3% of the investors presented in Table 34, thinks that they can sometimes predict the Future value of their stock after a detailed analysis for the past performance.

Table 6: Years of Investment-BF

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	2	.9	.9	.9
3	2	.9	.9	1.9
4	6	2.8	2.8	4.7
5	11	5.2	5.2	10.0
6	21	10.0	10.0	19.9
7	19	9.0	9.0	28.9
8	15	7.1	7.1	36.0
9	14	6.6	6.6	42.7
10	6	2.8	2.8	45.5
11	4	1.9	1.9	47.4
12	10	4.7	4.7	52.1
13	10	4.7	4.7	56.9
14	12	5.7	5.7	62.6
15	13	6.2	6.2	68.7
16	14	6.6	6.6	75.4
17	13	6.2	6.2	81.5
18	6	2.8	2.8	84.4
19	5	2.4	2.4	86.7
20	3	1.4	1.4	88.2
21	5	2.4	2.4	90.5
22	5	2.4	2.4	92.9
23	1	.5	.5	93.4
25	5	2.4	2.4	95.7
26	1	.5	.5	96.2
27	3	1.4	1.4	97.6
28	2	.9	.9	98.6
30	2	.9	.9	99.5
31	1	.5	.5	100.0
Total	211	100.0	100.0	

According to the results that have been expressed in table 35, it can be notice that 9% have been investing for 7 years, 6.6% for 16 years, and 2.4% for 25 years; in addition to others that are presented in the table above.

**Table 7: Regret Aversion-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
no	132	62.6	62.6	62.6
yes	69	32.7	32.7	95.3
never	10	4.7	4.7	100.0
Total	211	100.0	100.0	

Regarding the question of disinvesting when being faced with a continual loss, 62.6% which are the majority do so in order to avoid more and more losses.

**Table 8: Holding on waiting for good news-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	100	47.4	47.4	47.4
No	27	12.8	12.8	60.2
sometimes	84	39.8	39.8	100.0
Total	211	100.0	100.0	

The results in table 37 shows that 47.4% of the investors hold on their investment; expecting always new and favorable information release in order to preserve their decision.

**Table 9: Past performance effect-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	159	75.4	75.4	75.4
No	6	2.8	2.8	78.2
Sometimes	46	21.8	21.8	100.0
Total	211	100.0	100.0	

75.4% of the investors presented in Table 38, thinks that they can sometimes predict the future value of their stock after a detailed analysis for the past performance.

**Table 10: Mental Accounting-BF**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	100	47.4	47.4	47.4
No	54	25.6	25.6	73.0
sometimes	57	27.0	27.0	100.0
Total	211	100.0	100.0	

The majority of the investors (47.4%) given in table 39 are able to forget their losses after being faced by win opportunities after it.

Table 11: Criticism effect-BF

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Self-Confident	157	74.4	74.4	74.4
change your decision	33	15.6	15.6	90.0
Disappointed	21	10.0	10.0	100.0
Total	211	100.0	100.0	

According to the results presented in table 40 ; 15.6% are going to change their decision if they have been criticized for investing in a losing stock or for selling off a winning stock that doesn't fit their beliefs, whereas 74.4% will keep it and be self-confident and just 10% will be disappointed.

### V. RESULT ANALYSES

A detailed analyses regarding the results obtained from different Tests applied on the gathered Data is obtained and analyzed.

#### 5.1-Correlations

When studying the correlation between the dependent variable (Portfolio investment Decision) and the independent variables (Over confidence,Representativness,Herding,Anchoring,Regret aversion,mental accounting,and Cognitive dissonance...) the results were as follow:

Over confidence &excessice optimism was highly correlated with the individual's decision taking at the level of 0.01,the pearson correlation between them came out to be equal to 0.673 significant at 0.01 (positive correlation).

Representativness has a negative correlation with the dependent factor which is decision taken (-0.348) and was significant at 0.01,thus they work in an opposite direction that's to say representativeness doesn't play a big role during taking a decision in reverse with overconfidence.

The correlation between herding bias and the decision taken was also positive but not too high(0.229) and significant at 0.05,thus we can tell that an individual investors takes his decision following expert's opinions ,even if he had different valuation he based his decision on his opinion.

Regret Aversion and the dependent factor had also a positive correlation (0.438) and its Significant at 0.01,as most of the individual investors hold on their investments expecting always new and favorable information, thus regret aversion bias affects to certain extent individual's decision making.

The correlation between mental accounting and individual's decision making was positively correlated (0.350) and significant at 0.01,thus we can tell that individual's ability to forget directly the loss after a win and being able to divide his mind ,one from the biases that affects the decision's taken .

Finally, with respect to cognitive dissonance bias we notice that it affects also in a positive way an individual's decision taken (0.476) which is significant at 0.01,thus it can be said that individual investor will directly change his decision regarding his portfolio, whenever he had been criticized for investing in a losing stock that contradicts his beliefs.

#### 5.2- Factor Analysis

Before proceeding in this step, it is essential to know that factor analyses is mainly based on "Correlations" above; for that a multicollinearity and singularity check is done, In order to know which biases must be included and which should be excluded.

The test done has showed that, there was no factors that are highly correlated or perfectly correlated; thus we can tell that all as an initial look all factors can be included except for representativeness and herding that were poorly correlated with the dependent factor.

In this research, factor analysis is used in order to explore the data for patterns, confirm the hypotheses understudy, and reduce the many variables to a more manageable number; in addition for knowing to which extent the variables grouped are related or express the Determinant.

**Table 12: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.869
Bartlett's Test of Sphericity	Approx. Chi-Square	696.467
	Df	28
	Sig.	.000

Usually the KMO and bartlett's test varies between 0 and 1, Kaiser(1974) said that values above 0.5 must be accepted in order for factor analysis to yield reliable factors; and values below 0.5 leads the researcher to either collect more data or to rethink more in the variables included.

In the following case, as presented in the table above kaiser's value is 0.869 which is considered "Great" Hutcheson and Sofroniou(1999),Therefore we should be very confident that the factor analyses is very appropriate for our data.

Moving to Bartlett's which test the null hypothesis, and it is recommended for this test to be significant (<0.05) ,For the collected data regarding this part; it appears that Bartlett's test is highly significant (p<0.001),thus we can tell that factor analyses is very appropriate for our study.

**5.3- Regression (Model Building)**

As a second step a linear regression was done between the independent factors (over Confidence, representativeness, Herding, Anchoring, Regret aversion, Mental accounting, cognitive Dissonance) and the dependent factor (investment's decision taking).

**Table 13: Model Summary-BF**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.721 <sup>a</sup>	.521	.490	.71418944	2.092

a. Predictors: (Constant), Cognitive Dissonance, Herding, excessive optimism and over confidence, Mental accounting, regret aversion, representativeness b.Dependent Variable: decision taken

**Table 14: ANOVA <sup>b</sup>-BF**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.054	6	8.676	17.009	.000 <sup>a</sup>
	Residual	47.946	94	.510		
	Total	100.000	211			

a. Predictors: (Constant), Cognitive Dissonance, Herding, excessive optimism and over confidence, Mental accounting, regret aversion, representativeness  
 b. Dependent Variable: Decision taken

As shown in table 42; the adjusted R square is =to .490 which means that 49% of the total variance in supporting the individual's portfolio investment decision making is explained. Moreover having the F significant at less than 0.05 suggests a linear relationship among the variables and indicates the overall significant of the model used.

Table 15: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.759	.071		.000	1.000
Over confidence	.556	.082	.556	6.737	.000
Herding	-.091	.092	-.091	-.995	.322
Representativeness	-.037	.105	-.037	-.353	.725
Regret aversion	.201	.100	.201	2.007	.048
Gambler's fallacy	.232	.066	-.117	-2.013	.053
Mental accounting	.079	.086	.079	.927	.356

a. Dependent Variable: decision taken

Based on the factor analysis results presented in table 44; a negative Relationship between two biases is noticed, except for four which are mentioned below but we have made the regression in order to confirm our results. Beta expresses the relative importance of each independent variable in standardized terms. First, we find that excessive optimism, regret aversion, cognitive dissonance, and mental accounting are Significant with the dependent factor (portfolio investment decision making) ... The Coefficient table helps conclude the equation, it is found that over confidence and excessive optimism has higher impact than that of regret aversion which has a higher impact than cognitive dissonance which in turn higher than mental accounting but if we take a look at the T test column, we notice that just excessive optimism and regret\_aversion are significant while the others are not (beta=0.556, and beta=0.201)\_respectively for overconfidence and regret aversion.

**5.4-Model estimation**

Thus from all the proceeding; the relationship between the independent variables and the dependent variable which is individual's portfolio investment decision is addressed upon:

$$Y=2.749+0.566Overconf+0.201RegretAversion$$

This result indicates that two main independent variables (Over confidence/excessive Optimism and regret Aversion) affect significantly the Lebanese individual investors' decision making (Dependent variable) ; while all the other biases are not significant so far. "Over Confidence/excessive optimism" bias affects mostly the Lebanese individual investors' decision making, where responses of investors in the blind survey shows that the majority around 73% of the respondents anticipate correctly the future after making a detailed analysis; in addition for 47% with almost a right decision making record.

Various questions were asked, but the main ones that constitute this variable (Over Confidence/Excessive optimism bias) were:

My investment decision has proven to be almost right; 47.5% answered by yes ;furthermore predicting the future correctly after making a detailed analysis for the historical record,73.3% answered by yes. Nevertheless, Questions related to "Regret Aversion bias" were extracted mainly from questions whether Lebanese investors end up sticking with a losing stock/project (wrong investment decision) for too long, expecting always new and favorable news; 47.4% of the respondents were yes that's to say the majority of Lebanese investors' fears from giving up and regretting especially when they have been working on the project for too long.

### 5.5-Summary for Findings

- ✓ Hypothesis one (H1) was accepted, as we have seen that all types of individual investors are exposed to behavioral biases during taking decisions regarding their portfolios ,where we have noticed while studying whether individual investor have heard about “behavioral finance”, we have noticed that the majority of them which record 35.6% has a poor knowledge toward this concept.
- ✓ Hypothesis two(H2) was also accepted, as we have found that 47.5% have been taking so far the right decision in their decisions and 73.3% build their portfolios according to its past performance, in addition to that this factor was the main contributor that has appeared when building our model .
- ✓ Hypothesis three (H3) regarding facing herding bias was rejected .
- ✓ Hypothesis four(H4) that was related for facing Regret aversion had highly appeared in Lebanon, thus it was strongly accepted.
- ✓ Regarding hypothesis five(H5) and six(H6),that talks about mental accounting bias and Cognitive Dissonance tends to be not significant( $P>0.005$ )so these two hypotheses were rejected and excluded.
- ✓ A multicollinearity and singularity check was performed to see if any of the biases had very high or very low correlations with the dependent factor(Decision taken). The initial test suggested that there are no multicollinearity or singularity issues for our data.
- ✓ Overconfidence(excessive optimism) and regret aversion appeared to be as the main biases that individual investors in Lebanon are mostly exposed to according to the gathered data and results accomplished .

$$Y=2.749+0.566\text{Overconf}+0.201\text{RegretAversion}.$$

### VI. CONCLUSION

In this context it seems very urgent and important to understand the irrational behavior of the individual investors that deserves to gain wider importance. Nevertheless “Behavioral finance - a relatively new field that came into relevance in the 1980s – studies the effect of psychology on financial decision-making; to be more clearer it tends to study how such individual investors that have limited knowledge tend to interpret and analyze signals that are send from the release of new information and depend on it in order to obtain the most adequate decisions under uncertainty.

However, it appears that “The science does not try to label traditional financial theories as obsolete, but seeks to supplement the theories by relaxing on its assumptions on rationality and taking into consideration the premise that human behavior can be understood better if the effects of cognitive and psychological biases could be studied in context where decisions are made” (kahneman,1970).

However, it has been very interesting to check whether individual investors think rationally or they are driven by various emotions that complicate their way of thinking and lead them to take wrong decisions ; as a result our thesis has been seeking deeply behind the Lebanese individual investors mainly in order to check whether they are affected by such biases or they think rationally. For that we tended to take seven main behavioral biases which were: “Overconfidence, Representativeness, Herding, Anchoring, Regret Aversion, Mental Accounting and Hindsight Bias” to see if these Lebanese investors are faced with during their decision taken; through the help of a Structured questionnaire; nevertheless 211 respondents were obtained.

Various tests were done and through a structural modelling for Lebanese individual investors; it seems relevant to say that these investors are facing these biases during their decision taken in different ways but factor analyses technique have helped us to reduce these variables ,thus we have noticed that a Lebanese individual investor faces mainly “over confidence& excessive optimism’ and “Regret Aversion” during their decision taking and from these our model had been constructed.

Furthermore, it is highly recommended to study the individual decision making process from both sides combined together; that’s to say from the conventional point of view and behavioral finance side to see the impact of them combined together; in addition for investigating which one has a higher effect on Lebanese individual investors so far.

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# *EPIZOOTOLOGY Vovicolosis (Бовиколаларининг) OF CATTLE* *(Қорамол Бовиколалари Ва Уларнинг Эпизоотологияси)* *(Бовикола – Vovicola Деб Ёзилади)*

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**Abstract – The article provides information on the common ectoparasites epizootiology among cattle.**

**Keywords – Dynamics, Intensive, Biting Lice, Extensive, Ectoparasite, Endoparasite**

## I. INTRODUCTION

Today, due to the growing demand for livestock products around the world due to the coronavirus pandemic, large-scale reforms are being carried out in our country. At the same time, adequate satisfaction of the population's demand for milk, meat, eggs and other livestock products in food security depends in many respects on the animal breeding development and increase its efficiency. Difficulties in providing livestock with medicines, insecticides and other drugs in recent years, increased animal migration, as a result of the sanitary conditions deterioration in livestock buildings, there has been a sharp increase in the number of ectoparasites among cattle, especially biting lice. This is a serious obstacle to increasing the livestock productivity and meeting the population's demand for quality and environmentally friendly livestock products.

Biting lice is the most common ectoparasite among cattle, causing severe persistent discomfort in cattle, hair loss, skin dermatitis and hyperkeratosis, appetite decreases, resulting in young cattle lagging behind in growth and development, milk yield of dairy cows decreases by 30-50 percent, and sometimes stops milking altogether. In addition, they are carriers of many pathogens, namely viral, bacterial, fungal and helminthic, and have even been reported to pass into the human body.

At present, in all countries, the epizootiology disease identification, modern methods development of treatment and prevention is an urgent scientific and practical problem.

## II. RESEARCH STYLE

The types of insects collected were identified in the laboratory of arachnoentomology using manuals and identification tables, as well as other specialized literature («Keys to the biting lice (Mallophaga) of domestic animals. Fauna of the USSR. M.,-L.: ed. ANSSSR, 1940; Biting lice. Part 1. ed. ANSSSR, 1959, D.I. Blagoveshensky).

### III. RESEARCH RESULTS

In the livestock farms of the country, biting lice, i.e. *Bovicola bovis* - occurs throughout the year in cattle, in poor sanitary conditions, in the cold season, it covers about 90-100% of cattle. Biting lice is the most common persistent ectoparasite among cattle all over the world, belonging to the *Arthropoda* type, *Insecta* class, *Mallophaga* family, *Trichodectidae* family, *Bovicola* family, *Bovicola bovis* species.

*Bovicola bovis* – 1.0-2.0 mm small, wingless, elongated oval, flat, brownish-yellow insect, the oral apparatus is the rodent type, consisting of upper and lower lips as well as upper and lower jaws, and has small teeth at the jaws. The eyes are not well developed, the chest has three joints, three pairs of edges are joined by small legs (claws), the claws end tips with one or two claws, the abdomen is elongated oval, segmented, unique with wool and feathers, ie covered with each type, consists of 8-9 joints and six pairs of airways (Fig. 1).



Figure 1. Microscope view of biting licening *Bovicola bovis* imago and larvae

*Development cycle.* It is an insect that lives in the host's body all its life, from the egg to the imago phase, and the imago forms live for 31-41 days, during which time the female biting lice and attaches 20-100 eggs to the wool root of cattle at a height of 1-3 mm. After 12-16 days the larvae emerge from the egg and begin to feed, the larvae hatch three times and after 19-22 days the adult form - imago. The overall developmental cycle is 4-5 weeks.

*Pathogenesis.* Biting lice crawl on the surface of cattle skin and feed on epidermal tissue with their strongly developed jaws, while tickling the nerve fibers of the skin causes intense itching, resulting in hair loss, skin dermatitis and hyperkeratosis (Fig. 2). In addition, biting lice release saliva into the wound during feeding, which is toxic to the cattle organism and prevents blood clotting.

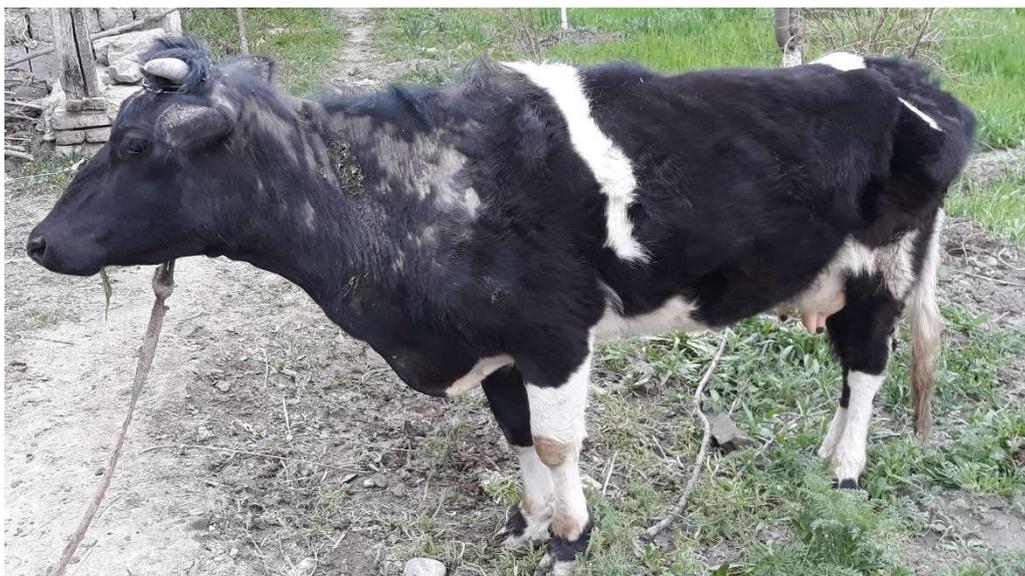


Figure 2. Cattle infected with biting lice *Bovicola bovis*

It was found that the biting louse of cattle is more common mainly on farms where sanitary-hygienic, feeding and storage conditions do not meet the requirements. During long-term transportation of cattle, ie from one state to another (migration), the spread of biting lice was also observed through wool, leather raw materials and water (during bathing and drinking).

According to our research, biting lice are more common in cattle of all ages and on farms with poor sanitation (up to 90-100 percent) and occur throughout the year. However, their extensive and intensive damage levels varied depending on environmental factors. Therefore, the epizootiology of cattle biting louse was studied during 1997-2020. As a result, in all decades, months and seasons of the year, in different geographical zones and farms, animal species and ages (including breed and sex), the seasonal distribution of biting lice, the dynamics of breeding, the emergence of different phases (eggs, larvae and imago) duration, levels of intensive and extensive damage with biting lice were determined (Figure 1). The high humidity and comfortable temperature in the building, the lack of sunlight in the winter months, the longness of the animal's fur, their poor nutrition and intensive storage create favorable conditions for the development and rapid spread of biting lice. During the summer months, when the animals went out to pasture, their numbers decreased sharply due to sunlight and drought, as well as due to the shedding of animals.

As a result, biting lice occur in the body of cattle in all months, but the intensity and intensity of the invasion varies with the season, ie the damage is maximal in December-January-February-March-April-May, minimum in June-July-August-September, October-November observed to be in average condition in the months.

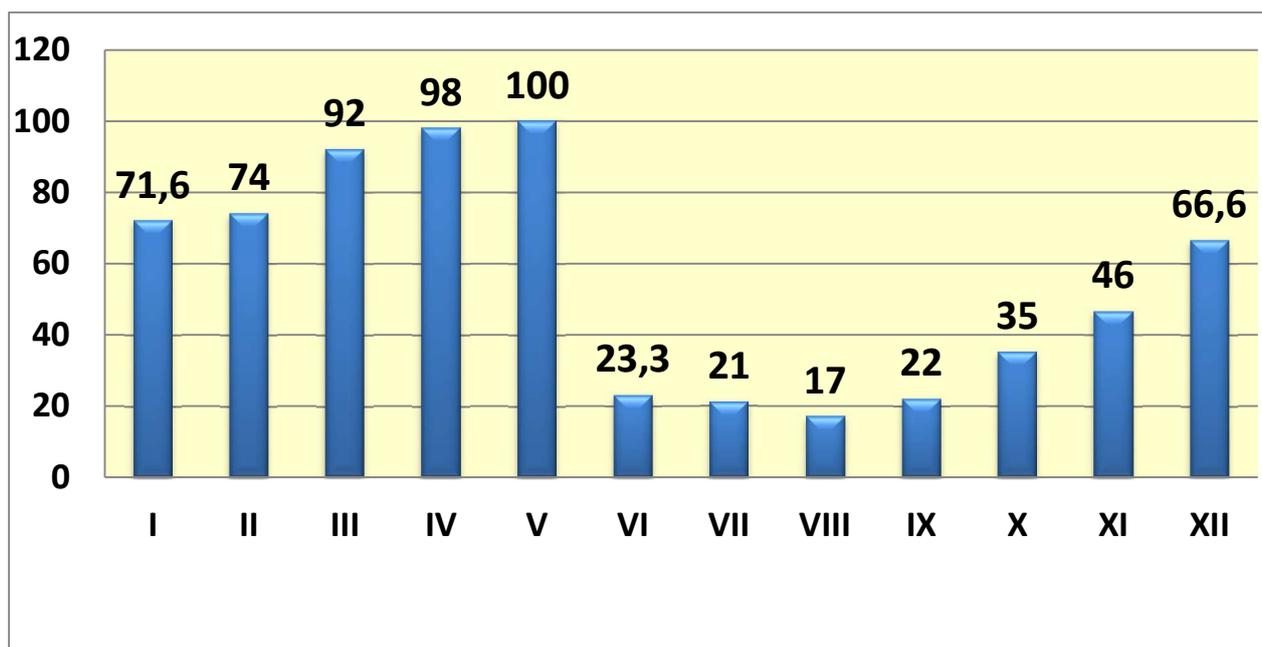


Diagram 1. The rate of damage by months with biting lice of cattle

Extensive damage (ED) rate with seasonal liceing of cattle in the study of calves up to 5-6 months, in cattle aged 18-20 months and older - in the winter - up to 69.0-72.0 percent, the intensity damage (ID) rate ranges from 677-963 copies per 100 cm<sup>2</sup> of skin surface, in the spring, the ED level is 95.0-98.0 percent, and the ID level is 1003 to 1224 copies per 100 cm<sup>2</sup> of skin, in the summer, the ED level ranges from 18.0 to 23.0 percent, and the ID level ranges from 7-9 copies per 100 cm<sup>2</sup> of skin surface, in the autumn, the ED level was found to be 31.0-37.0 per cent, and the ID level was found to be 94-242 copies per 100 cm<sup>2</sup> of skin surface, and young cattle were more severely damaged than older cattle (Diagram 2).

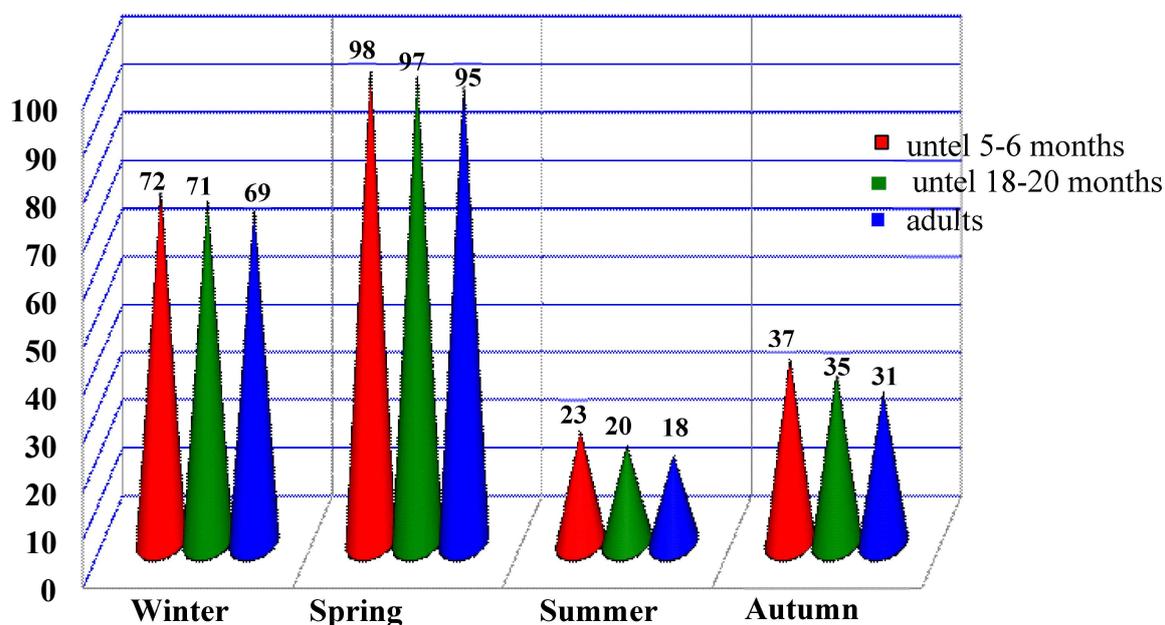
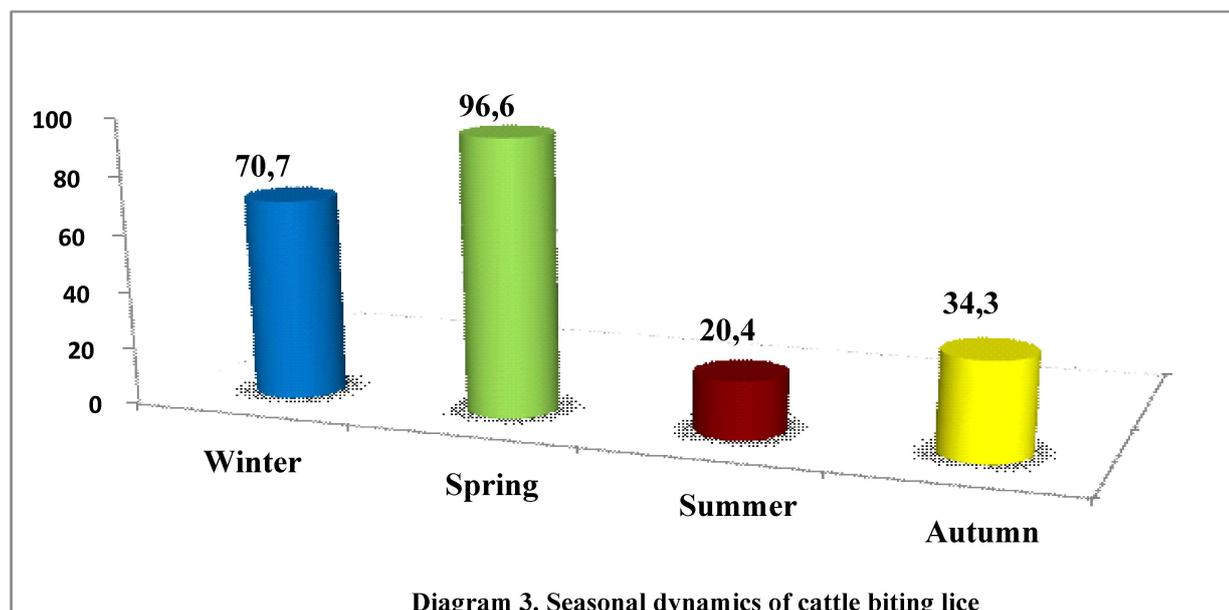


Diagram 2. Seasonal dynamics of biting lice in cattle of different ages

These indicators were summarized and the seasonal average extensive infestation rate was determined by biting lice of total age cattle (Diagram 3).



Thus, when we determine the seasonal distribution dynamics of biting lice in cattle, the most extensive damage peak falls in the spring, The average number of cattle was 96.6%, 70.7% in winter, 20.4% in summer and 34.3% in autumn and biting lice was observed in the epizootic form.

#### IV. CONCLUSION

1. Among cattle, biting lice from ectoparasites is the most common and affects cattle of all ages, especially on farms with poor sanitation, covering about 90-100 percent of cattle during the cool seasons.

2. Biting lice occurs in cattle in all seasons. However, the extent and intensity of the invasion varies with the season. At the same time, the damage is maximum in December-January-February-March-April-April-May, minimum in June-July-August-September, and moderate in October-November. In seasonal dynamics, epizootics are observed at a maximum in winter and spring, a minimum in summer and an average in autumn.

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# *The Literary Image Of The Historical Personalia In The Story Of “The Shadow Of The Death” By Temur Qurbon*

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**Abstract – In the following article the diverse viewpoints of the Temir Qurbonov appearing in his story “The shadow of the death”. The contemporary writers’ ideas on the literature regarding the historical personalia is reconsidered. The historical review of the prominent scholars and statesmen is conducted**

**Keywords – “The shadow of Death”, “Baburnama”, Andijan, Umarshaykh Mirzo, Z.M. Babur, Transoxania.**

## I. INTRODUCTION

Although the genre of the story is compact and small in shape compared to other genres, the genre has a wide range of possibilities in creating an artistic interpretation of historical reality in literature. As X.Do’stmuhammad has mentioned: “any genre in the artistic literature has its own role, its own interests, significance. But thanks to the opportunities inherent in the genre of the story, it is always created relatively a lot, a lot is announced, consequently, each national literature has its own unique daily breath, its making steps, the position is more manifested in the story”. [6.58]

One of the main tasks of literature is the revitalization of events that occurred in its history, the creation of works dedicated to historical figures who lived in the near or distant past. [7.180-193] By the years of independence, our literature began to reflect in different forms and tones. Subsequent years of truly creative work in literature, to say the truth, the truth developed in the world wide coverage. [8]

In the Uzbek storytelling of the period of independence, several stories reflecting the image of historical figures and their authors came to the square. In the sentence of such stories, we can include the work of Timur Kurban “The shadow of death”. In the story “The shadow of Death”, which belongs to the pen of Temur Kurban, the events related to the fourth son of the Temurid Prince, Abu Said Mirzo, the governor of Andijan region, the king and poet Zahiriddin Muhammad Babur and his father Umarshaykh Mirzo are taken into the pen.

Muhammad Babur gives the following information about his father’s death in the work of Baburnoma”: “on this occasion it appeared a strange event, I was present, the Akhsi Kurgan was high, the voke was on the cliff, the buildings situated on the banks of the cliff. On this date, on Monday at four o'clock in the month of Ramadan, the umarshayh Mirzo jardin pigeons and pigeons were deliberately flying and so on. He was thirty-nine years old. [2.15] The story begins with a dream motif. In the story “The Shadow of death”, the writer uses the dream motif to reveal the spiritual state of the hero of the work, to illuminate his mood, internal senses, to psychological analysis, to correlate the events of the work, to estimate the integrity of his form and content, thereby introducing the reader with various problems that surround the hero, mental torture and suffering The event described in the story enlivens the political situation of that period even before the eyes of the reader. The historical fact and artistic texture of

the work served to harmonize and enhance the charm of the work. Asarda tarixiy fakt va badiiy to'qima uyg'unlashib asar jozibasini oshirishga xizmat qilgan. The historical fact and artistic texture of the work served to harmonize and enhance the charm of the work. All images in the story are historical figures. As the writer creates a work, he takes historical events and historical ones as a material for his work. In the story “The Shadow of death”, the author clearly and vividly describes the character of historical figures. This is evidenced by the fact that the author has accurate information about the story and the period in which it was told. The historical fact and artistic texture of the work served to harmonize and enhance the charm of the work. All images in the story are historical figures. As the writer creates a work, he takes historical events and historical ones as a material for his work. In addition to Umarshayh Mirza, the story also provided information about such historical figures such as Karakuzbegim, Hofiz Muhammadbek doldoy, Khoja Husaynbek, Sheikh Mazidbek, Ali Mazidbek, Hasan Yaqubbek, Qasimbek qavchin, Babakuli Baba Alibek, Ali Dostbek (taghoyi), Mir Ghiyas, Ali Darvesh, Qanbar Ali moghul in the work of Babur “Boburnama”.

According to the Boburnama, Umarshaykh Mirzo was a low-growth, shaggy beard, round-faced, full-fledged, laconic person. He was a man of Hanafi sect, pure prudence, he was able to perform five prayers at the time. Khoja ahror considered the Custodian to himself and took part in many of his conversations. Umarshayh Mirzo is a kind, generous and courageous person. As for Karakuzbegim, she was Umarshaykh Mirzo's young and beloved wife, Babur said about him: “another Karakuzbegim was a later wife, then he was brought, she was a son. Mirzo's flattering lineage w's ripe by the Manuchihr mirzo, the inquiry by Sultan Abusaid Mirzo.” The author enriches in the story such historical data with artistic textures.

One of the historical figures mentioned in the story is Hofiz Muhammadbek do'ldoy, who was the son of Sultan Malik Qashgari, the brother of Ahmed Hojibek. It is quoted in the book of Boburnoma that after the death of Khudoyberdibek, Hofiz Muhammadbek sends do'ldoy as a concierge. After the events of Sultan Abusaid Mirzo, he could not go out with Andijan Princes, but went to Samarkand to the service of Sultan Ahmad mirzo. When Umarshaykh mirzo arrives on the Uratepa with the aim of Samarkand, Umarshaykh Mirzo is transferred to the disposal of Umarshayh mirzo and entered his service. Umarshaykh Mirzo gave him Andijan. Babur Hafiz Muhammadbek doldoy” in the “Baburnoma” had to go to the audience of Sultan Mahmudkhan. They found Mirzo Khan and gave him the string. I became a conscious thinker of the Indian way, after invading Kabul went to the pilgrimage of Mecca earlier by means of Indian routes! On the way he surrendered to the disposal of Allah. Fadir and humble and vigorous as the man has melted” he gives information.

The author is based on this very historical plot, which is presented in the Book of Boburnama in the story “The shadow of death”. “Khoja Husaynbek was humble and poor man. [2.15] This info is expressed as following”. This plot is an artistic reflection of the following in the story: “mirzo from the pale face of Khoja Hussainbek, apparently does not even look like bek, who always dresses as a poor person, could not read any sign”. [4.97]

Also mentioned in the story about Sheikh Mazidbek and Ali Mazidbek in the “Baburnama” are such information: “another Sheikh was Mazidbek, the manga was first made of atka of Bek. Conqueror and tuzuki Was much more brilliant. Babur had served to Mirzo. Under the auspices of Umarshaykh Mirzo he was a magnificent beg. [2.15] The wicked man was melted, the chuhra was sax”. [2.15] “Another Ali was Mazidbek qavchin, two were executed: on one career Axis, another career in Tashkent. The hypocrite and the wicked and the unclean and the naughty man melted”. “Both these images are described in the story” The Ghost of death “as an illusory, treacherous and treacherous image. In the story, also about Hasan Yaqubbek “another was Hasan Yaqubbek. A little solitude, good cheerfulness, chust and chaspon man melted. This is a bayt of his:

*Boz oy, ey humoyki, beto'tii xatat  
Nazdik shud ki zog' barad ustukhoni man.*

He was a brave man. He shot arrow well. The rider played well. The ad hoc pallani melted good scatters. After the Umarshayh Mirzo incident, the owner at my door was voluntary ul. The Hollow was narrow and less wattle and plot, shorter man”. [2.15]

In the story “The Shadow of death”, the author describes the above facts about Ali Mazidbek and Hasan Yaqubbek literary as follows. “How can one of these princes, who sees his every word as obligatory in his command, destroy Mirzo? Is Ali Mazidbek, who has gone bad not one but two times?! Or how brave is Hasan Yaqubbek, who is revenge for such a conspiracy?!” In revealing the character-feature of these images, the author relies on historical data. The combination of historical facts and artistic texture in the story does not inspire the reader.

The combination of historical facts and artistic texture in the story does not inspire the reader. The author reliably delivers the historical facts. The writer's skill is exactly that, too. If the reader does not believe in the events of the work with an inner feeling, the cost of this work will decrease. Another of the historical images mentioned in the story is the image of Qosimbek qavchin. About Qosimbek qavchin in the “Boburnoma” writes with one respect to some of the princes. He asserts that he is one of the Lords of the ancient Andijan Army. “After Hasan Yahbek, that Sahib voluntary was at my door. Until the end of his life, voluntary and prudent increased and did not grow. He was a brave man” This historical plot about Qosimbek qavchin was reflected in the story. “The suspicion of loyalty Zahir Qosimbek qavchin was not arrogant, it would be a foolishness of the mind.”

In the story “The Shadow of death”, the author makes appropriate use of the information presented in the Book of “Boburnoma”. However, in this way, one should not draw the conclusion that the story is a repetition of the information, which is written in historical and literary sources that have reached us about Babur. The story reveals the author's style and originality. The author studied the existing informations and managed to create a new and original work. It belongs to the pen of Timur Qurbon.

In the literary work, the most important of the objects described outside man is nature, it is considered a play in scientific literature. In truly artistic works, the image of nature (landscape) is often encountered. First of all, it expresses in the composition of the work, of course, a clear ideological goal:

a) shows the natural environment in which the hero moves;

b) serves to open those or those facets of the character of the hero; c) gives a historical-concrete natural hue to the event-event described in the game, and the khokazo. In the story “The Shadow of death”, the author manages to reveal the spiritual state of Umarshaykh Mirzo through the image of nature.

In addition, special care is given to the image of the animal world in the artistic work. The image of the animal, as well as the landscape, serves to open those or those sides of the human character. In this place, the Boychibor in the epic “Alpomish”, It is enough to remember the descriptions of the Ch.Aytmatov's flower in the narrative “Farewell, Gulsari”, Qahhor's two horses in the story “*Squirrel*”. The author points out in the story the tragic fate of the hero through the horse and elk. And the puzzle at the beginning of the story is logically solved at the end of the work.

The story “The Shadow of death” fully meets the requirements of the historical work. In the story, the question of space and time is solved on the basis of historical logic. He skillfully uses historical artifacts and artistic textures to reveal the speech, character of the heroes. Psychological images have led historicity to artistry. In addition, the author avoids a dry statement when describing the events of the work. In the story, the mental state of Umarshaykh Mirzo is skillfully revealed.

It is known that in Uzbek literature such writers like P.Kadyrov, B.Baykabilov, X. Sultanov created works on the life and work of Bobur Mirzo. Each creator interprets the image of Babur, proceeding from his worldview and opportunity. However, by creating this embodiment, first of all refers to “Boburnoma”. Because “Boburnoma” is also considered a historical and artistic work and is an important source of study not only of the Babur but also of the entire history of Transoxania.

According to the literary scholar T. Boboyev, the artistic image should arouse in the reader, an album, some kind of aesthetic sensuality (emotionality). Indeed, if the artistic image that reflects the ugliness in life evokes hatred in the reader, the image that expresses beauty gives aesthetic pleasure. The writer describes his aesthetic ideal through the artistic image: the ideal is expressed directly in a positive image, indirectly in a negative image. The writer must passionately approach each image, find in it an active attitude. Accordingly, when we read this or that work, we can not even look at the activities of the artistic image indifferent: we either enjoy them or hate them.[1.145]

Even if the name of the space in which the events depicted in the game can occur is a tissue, then the signs of a concrete space are impregnated anyway. The reason why the story “*The Shadow of death*” has become a mystery of historical stories is that the place where the events took place is historically accurate. Place names like Akhsi, Andijan, Tashkent are mentioned as historical places where the events of the work took place. And this is the basis for the emergence of elements of historicism in these stories.

It also depends on how long the “Time” covers itself, from the author's creative intention. Literary work can be found that the events of the plot take place in one or several years and even in one day. Sometimes, if a large novel contains an event that happened in one day, then the events that sometimes lasted several years are described in one game. Here the genre options will also have an

important place. In the story “The shadow of death” we witness that the author refers to historical sources, since the images of the appearance of the heroes.

In the story “The Shadow of death”, Temir Kurban, the author skillfully used the language capabilities in giving the period coloration. As we study this work, we will witness the history of nation of literature nation and Homeland, the life and fate of our great ancestors in a full, artistic way based on documentary sources.

## **II. RESULTS**

At such a time, it is natural that writers who have worked on the historical subject will face some difficulties. It is natural that the author has a lot of hands on words and phrases that are characteristic of the period chosen for the purpose of maintaining the color of the period in the work, but now considered archaic, the reader has difficulty understanding this work. In particular, as the well-known scientist Akram Kattabekov mentioned “...in the people's language, the law of synharmonism is dominant. Let's say that it is customary to say “not one”, “borgon“, “put”, “not putting”. The several words, which are now extinct, are also in use. Nevertheless, ilik (hand), cherik (soldier), like and so on. The use of certain words and phrases, which are understandable in every tin text and which deliberately do not have to be seen in the dictionary, brings closer to the spirit of the Times and increases the persuasion power of the work”.

## **III. CONCLUSION**

In the story “The Shadow of death”, the author Temir Kurban, skillfully used the language capabilities in giving the period coloration. As we study this work, we will witness the history of nation of the citizen Homeland, the life and fate of our great ancestors in a full, artistic way based on documentary sources.[5.] That's why the efforts should be directed at the study of these literature legacy.

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# *Compliment As One Of The Forms Of Phatic Communication*

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**Abstract** – Today, thanks to the development of pragmalinguistics, interest in the study of speech genres is growing. The term “phatic”, introduced into science by Bronislav Malinovsky, also attracts the attention of linguists as a form of speech. Fatika is a short conversation on a topic that is not directly related to the transmission of information (data) related to the purpose of communication, a type of verbal communication that serves only to maintain verbal communication between interlocutors. A compliment, which is a form of fatal communication, is also considered a separate communicative level of speech etiquette. This article focuses on fatal communication issues and its functions, compliments reflecting the content of sincere praise and respect, and its impact on the conversation process.

**Keywords** – Language Functions, Communicative Function, Communicative Function, Communication, Speech Communication, Phatics, Phatic Genres, Compliment, Service, Flattery

## I. INTRODUCTION

In modern linguistics, the multifunctionality of language-which helps to fulfill several functions is a common characteristic that is universally accepted by all linguists. The role of language is what it serves, how important it is to the individual who owns it and how important it is to society. In this case, the nature and structure of the language, how or what its units are, the methods of their interaction and the results of their interaction. Like hundreds of other tables (language edges), focusing only on that side-language functions.

## II. PURPOSE OF THE RESEARCH

The purpose of the solution to the problem presented in this article is to expose the nature of phatic as a representation of verbal communication. It is our task ahead to decide the compliment is the manifestation of phaticism.

## III. RESULTS AND ACHIEVEMENTS

In linguistics, different views are expressed about the functions of language. In Western linguistics, Vladimir Aurorin's "Problems of studying the functional side of language", Karl Buhler's "Structure of language", Yunus Desheriev's "Social linguistics", Alexei Leontev's "Language, speech, speech activity", Natalya Slyusaryova's "The role of language", and “Functions of Language”, Yuri Stepanov’s “Semiotic Structure of Language (Three Functions of Language and Three Different Systems of Means)”, Roman Jacobson’s “Linguistics and Poetics”, “Language’s Relation to Other Means of Communication”, Boris Norman’s “Fundamentals of Linguistics” In the works of a special large chapter entitled "Functions of Language", this issue has become a source of special research.

More than 20 definitions of language cited by Vladimir Zveginsev are the result of a similar approach. Boris Norman's above-mentioned book, entitled The Functions of Language, in a special chapter of about 30 pages, lists 15 of its various functions: being a means of communication (communicative task), thought formation (cognitive task), and enlightenment (accumulative) task. ,

naming / naming (nominative) function, motivational (regulatory) function, robitasozlik (fatik) function, etc., each with a few pages of description [1], concludes the statement with the following words: "In addition to the functions specifically described above, can distinguish a number of other socially important functions. In particular, in addition to certain functions such as ethnic, aesthetic, which express a simple text / information into a work of art, emotional-expressive, which unites a certain people, language also has a magical function.... But these are not all manifestations of the social status of language." [2] It is clear from this that the functions of language are so varied and varied that it is impossible to list them all.

Communication is a process of sharing information, communicating with each other, understanding others, establishing and developing communication between people on the basis of their mutual needs. Antoine Saint-Exupery, the great French writer, wrote, "Communication is such a blessing that one loves it." Communication is inherent in all living things. For example, in animals, the object of communication is to motivate another living being to take some action, to warn them not to take this or that action. Or the mother may warn her child of danger with her voice or gesture. But communication has the most advanced level among human beings, and of course this process is understood through speech. Speech is a powerful factor in a person's mental maturity, in his formation as a person. Without verbal communication, the formation, upbringing and development of the intellect of a person is impossible. This is why treating people helps them to organize and work together. It is impossible to imagine the development of a person, the formation of an individual as a person, his relationship with society without communication. All our social behaviors in the objective world are reflected in our speech activities. Verbal communication is the pronunciation of a particular sentence in a specific communication environment. The formation of the content of verbal communication is the result of "enrichment" of the meaning of the spoken word by the speaker and the listener in relation to the text of communication. Because of verbal communication, people organize a variety of different practical and theoretical activities. In addition, the exchange of information, as well as other processes, also occur due to verbal communication. It also helps build relationships between individuals and put them into practice.

The basic purpose of all communication, including verbal communication, is to ensure that the interlocutors understand each other. It begins with the greeting of the Uzbeks with an open face. Moreover, another purpose of verbal communication is to prepare a person for this or that activity.

Bronislaw Malinowski (1884-1942), a Polish English scientist and founder of functional anthropology in ethnography, introduced the term 'fatika' to science in 1928. Roman Jakobson pays particular attention to this notion of Bronislaw Malinowski, which is new to linguistics-the use of language for conversation with no definite purpose, almost linked to the conditions of speech and the activities of the communicators, without imposing any responsibility on them, the passing of time, the verbal communication between the interlocutors gave it a much wider scope, attributing it to a greater extent and on this basis distinguished the "phatic" function (PF) of language. The separation of language / PF / by Roman Jakobson separately - even to the extent that it is equal to / CF / - is also can be seen as following:

- First, the main task of language is to convey information - to influence the interlocutor - the problems that arise in the interpretation of / CF / - the contradictions [10],

-secondly, in linguistic research, the shift of attention from structuralism (from the decolonized system-structure-linguistic / systemic possibilities of language) to pragmatics / pragmalinguistics,

- Increased interest in the study of speech genres with the development of pragmalinguistics,

-Fourthly, in the speech process / text / discourse, due to the fact that essentially non-informative information is quantitatively superior to real informational information, after the 60s of the XX century the attention to fatika, fatik speech genres became much stronger, in Western linguistics and literary studies. directions) not hundreds, but thousands of studies. Naturally, in the world of science of ancient language (assuming that the real focus on fatika and the fatic function of language began after Roman Jakobson's interpretations, i.e., the 50s of the twentieth century), such a lively interest in an essentially newly discovered edge - / FF / could not be unreasonable. It turns out that fatalism is very important in communication: fatal and non-fatic communication is given by the author in the form of a two-volume book and page text (thesis) by Albert Einstein's theory, and both have the ability to provide scientific innovation (ie literally new to the expert-reader). m i y a x b o r o t), as well as the requirement that each work, which is an age-old picture in scientific research, include short passages such as an introduction and conclusion (modern fasci / abtast and resume / summary), each it is possible to compare the dissertation with the possibility of giving the scientific novelty of his work on only one page. If in the process of communication the volume delivered by the addressee to the addressee (resp. Author's

specialist-reader / reader) without fatikas is compared with the new a x b o r o t i thesis, conclusion / resume..., this information / F / and the expression of language used / FF // conclusion is a complete statement from the point of view of the author / addressee as an independent work. We hope that this will sufficiently explain the reason for the interest in the comparative / F / study.

One of the manifestations of verbal communication is phatic communication. The general purpose of phatic communication is a short conversation between the interlocutors (communicators) on topics not directly related to the information related to the purpose of communication, which serves the tasks of creating a dialogue → storage → closure. In this case, the introduction of communication means the preparation of communicators for the media course, the maintenance and continuation of communication under the term of communication, and the end of communication means the communication speech related to the process of communication. The phatic function of communication has its own meanings. We can also call this a phatic genre. For example: 1) kindness, compliment, compliment, 2) praise, 3) expression, 4) gratitude, 5) humor, 6) abduction / flirtation, etc. The sole purpose of phatic communication is to maintain communication. It is not the result of intellectual reasoning, where language does not function as a means of conveying thought.

Manifestations of phatic communication, such as entering into communication, maintaining communication, and ending communication, are immensely diverse and diverse. But they have not yet been studied in Uzbek linguistics.

Politeness and complimenting are forms of 'phatic' communication. The concept of "compliments" in Russian linguistics NI Formanovskaya (1989), OS Issers (1985), Serebryakova (2001); in English linguistics, VI Karasik (1992) and ES Petelina (1988) considered it to be a manifestation of etiquette and a form of specific etiquette.

LE Bezmenova interprets the concept of "compliment" as a special communicative level of speech etiquette, while ES Petelina points out that, in contrast to laziness, the concept of " compliment " reflects the content of sincere praise and respect.

The Uzbek Explanatory Dictionary defines the word "Mulozamat-politeness" as follows: "Mulozamat - [Arabic - to be together, inseparable; to follow together; determination] a compliment shown to win a man's heart; e'zoz-ikram, takalluf"[9].

The word "iltifot-compliment" is "compliment [Arabic - to turn, turn; grace, attention, blessing] blessing, generosity, attention, good attitude. Complimenting (or showing off) is a good consideration". Both concepts are used to praise someone. It should not be equated with flattery. There is a big difference between flattery and compliment: it is sincerity. The Explanatory Dictionary of the Uzbek Language defines the word "khushomad" as follows: "Khushomad - [Persian - to greet, to greet; nice word; flattering praise] to serve someone greedily, to be polite, to praise, etc .; flattery, laziness.

To flatter - 1) to treat with flattery, to be lazy. 2) "Addressing someone with expressions of satisfaction, such as" friend ", " bless ", " be your victim".

On the basis of the explanations given in the Uzbek language, the compliment is a phatic dialog which has been studied in the context of a general strategy of behavior aimed at expressing positive feelings towards the person. The basic function of compliment is to create a generally pleasant environment for verbal communication. For this reason, compliments can affect the feelings, thoughts and actions of the interlocutor. Complimentary affects human emotions. It can therefore be considered as a "emotional tool" that affects conversational behavior.

Compliment as a means of communication ensures the success of the process at all stages of the establishment of speech communication - the establishment, maintenance and completion of speech communication. Let's pay attention to the compliment given in order to establish a dialogue:

- Welcome to our village, guest, may your steps blossom!

Alexander did not lose the secret again.

- Thank you, elder... [4]

It is a characteristic feature of the Uzbek people to welcome the guest with special respect. People are very sensitive to compliments because they feel a special pleasure listening to kind words. The aim of the dialog between businessmen may be to initiate or continue cooperation in the future. Gender differences in the types of compliments are also evident. It 's important for a woman to appreciate her appearance, her personal charm. Men, on the other hand, are sensitive to compliments on intelligence,

socio-economic status and resilience. Women are asking for more compliments than men. The compliment to the children's language comes with a special resonance and sincerity:

"Grandpa, honey on your tongue!" My eyes and my face were opened by your words! [5]

Compliment is different from other ways to say kind things to the interlocutor. Praise, for example, can also be a positive assessment of an opinion shared by an elderly person or a supervisor. Exaggeration is a deliberate exaggeration of the successes of the interlocutor. As a consequence, this is far from accurate and is more likely to be denied. The compliments reflect the authenticity of the dignity of the interlocutor:

- "I don't need anything, as long as you're alive," said Onabibi, sticking her fingers in his thorny mustache. [6]

Compliments as a fatal tool can vary by gender:

"I have a lot of power in your arms, my lord!" Without Sherpanj. It is no coincidence that His Majesty called you Babur. Babur means lion in Arabic! [10]

Or:

- Yes, mother, dear companion of my life, you were born for good, I saw a lot of good in you .... [7]

Separate from modern linguistics and literature as a new form of artistic image and speech genres, we can infer from a thorough analysis of phatic communication and its forms that phatika is one of the most special and important aspects of artistic image and provides new knowledge on communication), but it is of great importance, under many cases, to reveal the identity of the communicants, their state. In certain instances, the writer often communicates the concept of making a work through a phatic dialog that exposes the identity of the communicators Phatics, therefore, is not a superfluous, ridiculous, unintentional part of the structure of the novel, but an artistic means that serves to expose the concept of the author, which has a special place in it. It is better to call Phatics by the word "phatical contact" by means of our own language, for it helps to coordinate and maintain communication between communicators. Some elements of fateful contact are related to national culture, customs and rituals. In pragmalinguistics, which opens the door to communicative phatic communication, verbal communication, regarded as the beginning of speech communication (BSC) in terms of greeting, question, appeal phatic communication / PC/, may be called the end of communicative communication. These two types of phatic communication are related to tradition, ritual and national customs. Even then, the situation and the situations make their own corrections and can take uncommon forms. The presence of communicative contact not only helps to establish communication between communicators, to remove silence that is deemed ethically unpleasant, but also to convey the personality of the addressee. In many cases, the appearance of phatism in communication reveals the identity of the communicators, and the author, ironically, raises very important social issues.

Examples of oral communication in Togay Murad 's works (especially in the novel "You Can't Die in This World") can be cited as an example of phatic communication. After all, almost all of these conversations, which are our pitching, are not real communicative conversations, but a means of informing the satirical-humorous pitching of its time, exposing its flaws:

*Botir looked at the corpses lying on the "firqa" (A sect is a group of people who have a particular opinion on one or more issues of the Islamic faith; school, community) ... recited the Fatiha inside, recited the Qur'an inside.*

*Cursing, rising. He went to the police.*

*"You're pale, aren't you?" said the commander.*

*"No, why am I afraid, no ..." muttered Botir "firqa".*

*"Is your complexion pale?" Again, are you stumbling?*

*"Yes, now ... patriotism, comrade commander, patriotism." Isn't it your own country? It's getting a little tired.*

*"Comrade Chairman, there is an order on this, an order!" said the commander.*

*"Command!" Order of the Soviet government! The will of the Soviet government!*

*Or are you dissatisfied with the Soviet government?*

*At that moment, the Botir faction shook. By glimpsing right and left he became more and more confused.*

*"Don't say that, don't say that ..." he muttered. "After all, I'm ... a 'firqa', a 'firqa'!"*

*- If you are a "firqa", why do you hesitate?*

*The brave "firqa" suddenly ... straightened up. omatini adl-adl. He held his head upright.*

*"Long live the Soviet government!" said Tantanavor. -*

*Glory to the Soviet government!*

*The Botir "firqa" of this sheep stood firm. Mijja also did not stumble. He couldn't breathe!*

*"That's another story!" said the commander.*

*After Anaglan, the Botir "firqa" felt ... human. He felt free. He breathed like a man. [15]*

#### IV. CONCLUSION

In conclusion, it should be noted that "phatics" is a brief dialog on issues not directly related to information related to the purpose of communication in order to create, sustain and terminate communication between communicators. As a type of "phatic" communication, compliment takes the form of improving or worsening (fun) the attitude of the communicators and "small talk" in the form of "phatic" communication without intent (congratulations, introduction, gratitude). Complementary appearances in speech are linked to national culture, customs and rituals. A type of 'phatic' communication aimed at communicating positive feelings towards a person-the 'phatic' purpose of compliment-is to create a comfortable atmosphere for verbal communication. That's why we can call it a 'emotional tool' that affects conversational behavior.

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# *Experimental Test Of Effectiveness Of Electric Courses In Higher Education*

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**Abstract** – The article examines the experience of higher education institutions in the transition to distance learning, the widespread implementation of electronic science and special e-courses in the context of modernization of modern education. Based on the modified Xi square table and formula, the empirical value of the three-category questionnaire answers consisting of four options was calculated. The effectiveness of the study was tested on the basis of the dynamic changes in the attitude of students of the "Elective Course" to the culture of healthy living, specially organized in the field of physical culture education Turan wrestling and its teaching methods.

**Keywords** – Healthy living culture, healthy thinking, elective course, critical value, empirical value,  $\chi^2$  criterion, xi square, zero hypothesis, alternative hypothesis, confidence level, reliable correlation.

## I. INTRODUCTION

At present, according to the medical and demographic characteristics of the population of Uzbekistan, the level of health of students is one of the most important social indicators. There is empirical evidence that any disease in the context of a pandemic of globalization is directly related to higher education, as well as a decrease in the effectiveness of future careers (Y.P. Lisitsyn, 1999, 2004; V.A. Medik, 2003; M.Y. Abrosimova 2005, O.A. Naumenko 2005, A. S. Tverdoxlebov, 2005).

Based on the sources studied in the context of the problem, it should be noted that the urgency and practical importance of promoting, popularizing and modernizing the culture of healthy living in educational institutions is growing [1, 2, 3].

Scientific research in the CIS countries has studied health technologies, tools and methods of forming a culture of healthy living in students, the laws of the level of development of knowledge about healthy lifestyles and a specific research methodology in this area [7, 9].

Especially in the early stages of education, students are the most vulnerable part of the youth, as they face a number of difficulties arising from the workload, flexibility, low physical activity, social and interpersonal communication problems in the primary education environment [1].

## II. LITERATURE REVIEW

Recent decades have seen a downward trend in the health of young people and their physical fitness. This is due not only to changes in the economy, ecology, working and living conditions of the population, but also to the neglect of the majority of young people to the health and educational activities taking place in society. According to data provided by experts in the field of physical

culture and sports in the CIS countries, 76% of students have low physical activity and 15-20% are overweight. The system of special tests used in the study of this problem (for example, the Cooper test) revealed the low physical fitness of most students [2].

In the case of separate sampled collections (higher education institutions), empirical observations showed that 37.7% of students had a general medical condition and 1.5% lower than the number of referrals during the three-year period. It summarizes the trend of chronic diseases by 1.6 times and the deterioration of health in the later stages of higher education. Especially due to the sometimes drastic economic, social, psychological changes of the globalization environment, the health of students in relation to stress is declining [2,3].

In the context of globalization, the pedagogical process of self-health of students involves the organization and improvement of educational content with modern technologies in practice through the joint and integrated organization of knowledge, skills, abilities and professional competencies aimed at health [4, 5, 6].

### III. ANALYSIS

It is known from foreign experience that in the context of modernization of modern education, electronic science, special e-courses are being widely implemented.

The elective course "Healthy Lifestyle Culture (HLC)" on the subject "Turan national struggle and its teaching methods" was introduced in the distance learning system of Bukhara State University in 2020-21 academic years as an important component of comprehensive personal development in the field of pedagogical education. Elective courses are based on the choice of students, along with the disciplines taught in the field. The e-learning process is based on the idea of forming a healthy thinking and health care thinking shared with the knowledge, skills and competencies of the formation of a culture of healthy living through the development of individual abilities of students based on the learning resources of the planned and remote electronic system [9]. The purpose of the elective course HLC for students of "Physical Culture" is to maintain and strengthen the health of students through the integration of socio-cultural, practical and valueological values of the basic discipline "Turan national struggle and its teaching methods", healthy thinking and self-awareness, aimed at creating a modern electronic environment for the formation of health care thinking.

**Tasks** of the elective course HLC through Turan national sports:

- To understand the role and pedagogical social significance of the national sport of Turan as a tool for personal development and preparation for future professional activities;
- To know the scientific-biological, pedagogical and practical-methodological bases of a healthy lifestyle through the national sport of Turan;
- To get accustomed to regular physical development and physical culture and sports (including the national sport of Turan) and to develop a motivational-value attitude to a healthy lifestyle, physical culture;
- Orientation to the development and improvement of personality traits and characteristics, psychophysiological abilities, psychological stability, maintenance and strengthening of health through the acquisition of practical skills and abilities through the national sport of Turan;
- To have personal experience in improving physical mobility and functional capabilities, to provide general and practical physical training in the conditions of future professional activity and life;
- Creating a basis for the use of scientifically and methodically based physical education and sports in order to achieve a more effective lifestyle and professional activity.

According to the purpose of this study, the main disciplines taught in the field of "Physical Culture" and in-depth study of these subjects, the organization of modern informative e-courses as a means of health care to solve the problem of forming a culture of healthy living the effectiveness of modern practice of enhancement requires experimental verification.

### IV. RESEARCH METHODS

In the research process (beginning, end) the questionnaire method was used to study the attitudes of elective students to the formation of healthy thinking and self-care thinking. "No" or "don't know" answers are required. The "zero hypothesis" and

$\chi^2$  criterion were used for statistical analysis of the responses of the individual questionnaire series consisting of four options [7]. Admittedly, the specialized literature contains the xi square table and formula for only two categories. According to the essence of the research, the xi square table and formula were modified for statistical analysis of the answers of the three categories (Yes, No, I do not know) of the questionnaire series.

The zero hypotheses is actually an event that assumes that there is no difference between the two observed events i.e. the survey results recorded at the beginning and end of the study, but is true until the feedback (existence of a difference) is proved. The main task of modern science is to scientifically prove the invalidity of the zero hypothesis, that is, to determine the reliable relationship between two events (elective course students  $n = 72$  at the beginning of the experiment and  $n = 77$  at the end of the experiment) and events. Mathematical operations performed in the requirements of science can only refute the hypothesis ( $N_0$ ) based on assumptions, with its specific conditions.

In many cases, there are assumptions that there is no statistical correlation (difference) between the variables under study, and no difference in distribution parameters between two or more selections. The  $N_0$  sign is used to express the **zero hypothesis**. In statistical inference, the researcher  $N_0$  performs a sequence of actions depending on the invalidity of the hypothesis, inconsistency with the available empirical data, i.e., rejection of the hypothesis. In other words  $N_0$  - an alternative hypothesis that rejects the  $H_1$  hypothesis must be accepted.

When comparing the results in percentage (%) before (after) any pedagogical effect, the  $\chi^2$  criterion was used by the researcher to determine if there was any difference between the choices, which was noticeable at first glance. In particular, in order to prove the effectiveness of the pedagogical impact of theoretical and practical training conducted during the elective course, as well as the positive change in the attitude of students to the health of the experimental group, it is necessary to determine the trend of statistically significant change. A number of differentiation criteria can be applied in the study of similar pedagogical situations. The  $\chi^2$  criteria are considered in the following order.

There are different categories in the content of the questionnaire (for example, "YES"; "NO", "I DON'T KNOW"). Based on all the answers recorded at the beginning and end of the experiment, a modified table was formed (example: 1 - see table).

Table 1. General calculation table according to the  $\chi^2$  criteria of the survey options

Experimental groups	Category №1 "YES"	Category №2 "NO"	Category №2 "I don't know"	Summary of answers
At the beginning of the experiment $m=72$	1300	2152	88	1300+2152+88 = 3540 ( $m$ )
At the end of the experiment $n=77$	3531	553	305	3531+553+305 = 4411 ( $n$ )
Total:	1300+3531	2152+553	88+305	$m + n=N$

To test this statistical hypothesis, we first determine the level of significance by comparing the empirical value with the ( $\alpha$ ) critical value. In pedagogical research, the value of ( $\alpha$ ) is limited to 0.05. Second, reliability is the difference or difference. In our case  $1 - (\alpha) 0.05 = 0.95$  (i.e. 95% confidence level).

The critical value of  $\chi^2_i$  is  $\alpha = 0,05$  given (see Table 2).

Table 2. The critical value  $\chi^2$  of when  $\alpha = 0,05$

$M \square 1$	1	2	3	4	5
$\chi^2$	3,84	5,99	7,81	9,49	11,07

The “xi square” table of the survey results was calculated empirically with a probability of 95% based on the following formula (in Excel).

$$X^2_{emp} = \frac{N (B_{t.b.} \cdot K_{t.o.} - K_{t.b.} \cdot B_{t.o.} - K_{t.b.} \cdot C_{t.o.} - C_{t.b.} \cdot K_{t.o.} - \frac{N}{3})^2}{m \cdot n \cdot (B_{t.b.} + B_{t.o.}) \cdot (K_{t.b.} + K_{t.o.}) \cdot (C_{t.b.} + C_{t.o.})}$$

Here,  $m$  - the number of students at the beginning of the experiment,  $n$  - the number of students at the end of the experiment, total,  $N = m + n$ ,  $B_{t.b.}$  - "yes" at the beginning of the experiment,  $K_{t.b.}$  - "no" at the beginning of the experiment,  $C_{t.b.}$  - "I do not know" at the beginning of the experiment,  $B_{t.o.}$  - "yes" at the end of the experiment,  $K_{t.o.}$  - "no" experience at the end,  $C_{t.o.}$  - "I do not know" at the end of the experiment - were created (see Table 3).

Table 3. Student response options by questionnaire categories

Questionnaire categories	At the beginning of the experiment $m = 72$			At the end of the experiment $n = 77$			Questionnaire categories
	Yes	No	I don't know	Yes	No	I don't know	
1 $m = 1224$	345	627	252	1075	82	152	$n = 1309$
2 $m = 1080$	265	727	88	821	307	27	$n = 1155$
3 $m = 1008$	330	458	220	932	70	76	$n = 1078$
4 $m = 792$	360	340	92	703	94	50	$n = 847$
<b>Total: 4104</b>	1300	2152	652	3531	553	305	<b>Total:4389</b>

V. RESEARCH RESULTS

According to the table below, the answer options for students in the questionnaire categories are as follows: at the beginning and end of the experiment  $1300 < 3531 = \text{"YES"}, 2152 > 553 = \text{"NO"} \text{ and } 652 > 305 = \text{"I DON'T KNOW"}$  was.

VI. DISCUSSION

An experimental value was calculated based on the above formula to refute the initially proposed hypothesis  $N0$  and to accept the accepted alternative hypothesis  $N1$ , i.e. to prove that there is a true statistical difference between the results of the pre-experiment and post-experiment questionnaires (see Table 4).

Table 4. Comparative analysis of indicators to determine the relationship of HLC in e-course students

№	Questionnaire categories	Before the experiment ( $m = 72$ )			After the experiment ( $n = 77$ )			Critical threshold value 0.95% based on	Empirical value 0.95% based on
		“Yes”	“No”	“I don’t	Yes”	“No”	“I don’t		

				know ”			know ”	probabil ity	probabil ity
1	Determining students' attitudes to the basics of healthy living culture (17 questions)	345	627	252	1075	82	152	5,99	6,11
2	To determine the level of formation of students' desire to engage in physical culture and sports (15 questions)	265	727	88	821	307	27	5,99	9,78
3	Assessment of students' attitudes to learning activities, motivational parameters (14 questions)	330	458	220	932	70	76	5,99	9,14
4	The culture of healthy living in the eyes of students is an "elective course" determine the attractiveness (attractiveness) (11 questions)	360	340	92	703	94	50	5,99	6,15
Total:		1300	2152	652	3531	553	305	5,99	7,09

In the experiment, since  $M = 3$ , from Table 3.3 -  $M-1 = 2$ , and we obtain the corresponding  $X_{0,05}^2 = 5,99$  critical value.  $X_{emp}^2 \geq X_{0,05}^2$  was right. According to the data in Table 4, there is a reliable difference at the end of the experiment between the response categories, critical and empirical values for all questionnaire categories. The empirical (7.09) value of the general questionnaire series is greater than the critical (5.99) value, i.e.  $7.09 > 5.99$  (Table 4).

During the experiment, changes in the ratio and percentage between the response options of the questionnaire series were noted (see Table 5).

Table 5. Ratio and percentage change of questionnaire categories

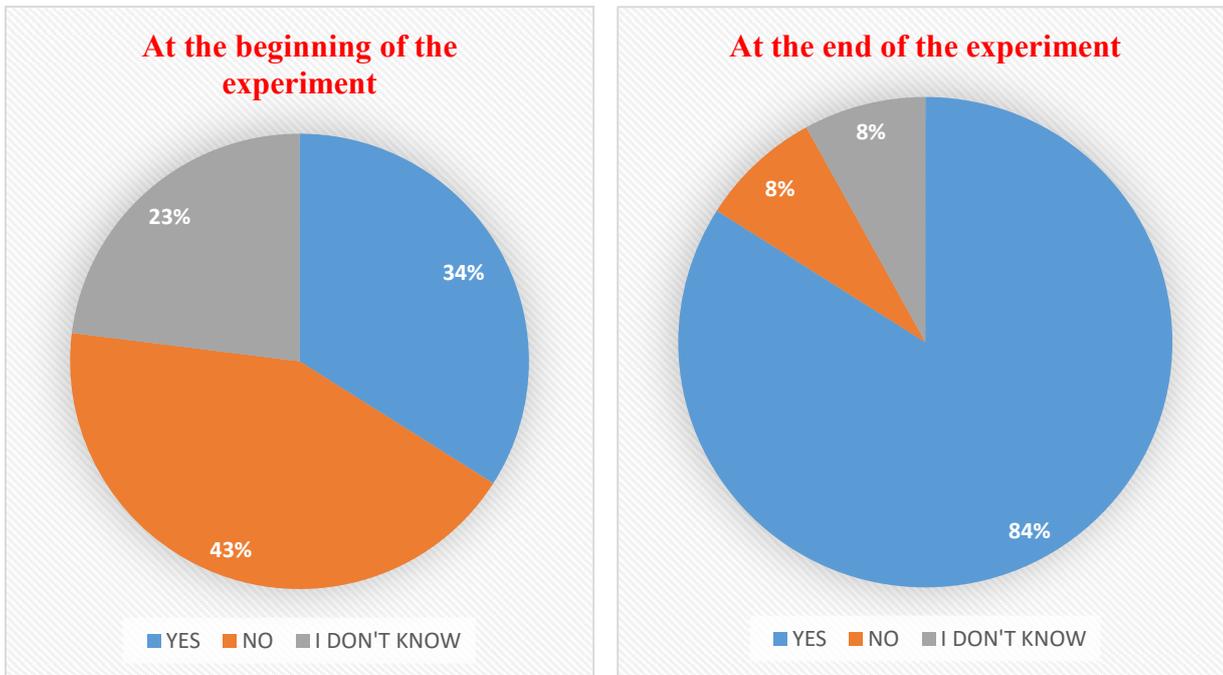
№	Questionnaire answer options	At the beginning of the experiment		At the end of the experiment	
		Number of answers	% change	Number of answers	% change

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1	Yes	1300	34	3531	84
2	No	2152	43	553	8
3	I don't know	652	23	305	8
4	<b>Total</b>		4104		4389

**% Change in number of answers % in**

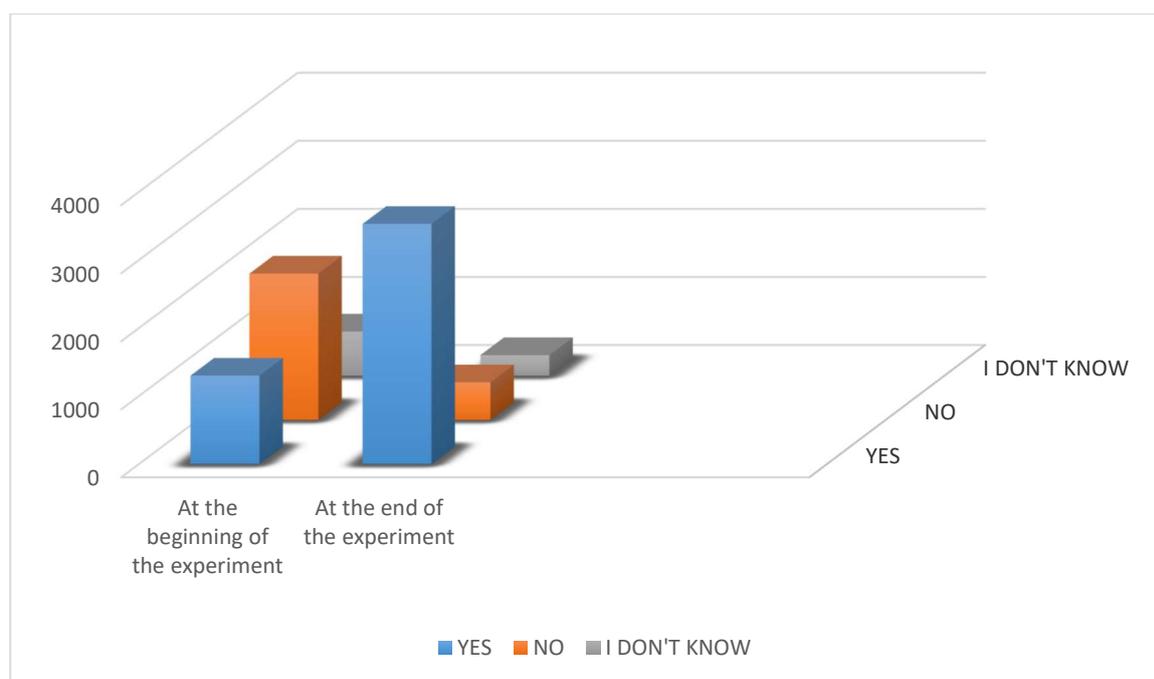
Figure 5.1. Ratio and percentage change of questionnaire categories



According to the results of the percentage change in the answer options of the student questionnaires: at the beginning and end of the experiment 34% <84% = "YES" increased, 43% > 8% = "NO" decreased and 23% > 8% = "I DON'T KNOW" decreased; with a predominant tendency to change the positive attitudes of students towards a healthy lifestyle (see Figure 5.1).

Hence, the electronic resources used in the elective course process: with the effectiveness of theoretical and practical-methodical lessons, students show positive changes in their culture of healthy living, which makes it possible to accept  $H_1$  hypotheses (see Figure 5.2).

Figure 5.2. The dynamics of positive changes in their attitudes toward HLC in e-course students



## VII. CONCLUSION

As a result of the study of the effectiveness of the elective course HLC on the subject of Turan wrestling and its teaching methods, statistical analysis of individual answer options received from students on the questionnaire series:

- Empirical (6.11) value at the end of the experiment of answer options on 17 questions to determine the attitude of students to the basics of healthy living culture;
- Empirical (9.78) value at the end of the experiment of answer options on 15 questions to determine the level of formation of the desire of students to engage in physical culture and sports;
- Empirical (9, 14) value at the end of the experiment of the answer options on 14 questions to assess the attitude of students to learning activities, motivational parameters;
- At the end of the experiment, the answers to 11 questions on determining the attractiveness (interest) of the "Elective Course" Healthy Living Culture in the eyes of students were confirmed to be a reliable difference from the critical value with empirical (6.15).

It can be seen from these tables that the empirical indicators for all of the above survey options are greater than their accepted critical value. Hence, from the hypotheses put forward: (N0) hypothesis is rejected, (N1) is an alternative (alternative) hypothesis, i.e. the statistical difference between the results of the pre-experiment and post-experiment questionnaires has been proved. The research conducted in the e-course group demonstrates the effectiveness and the formation of a positive attitude of students towards HLC.

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# *The Policies That Can Be Implemented To Stop The Value Of UZB Som From Falling*

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**Abstract – The objective of this paper is to analyze any details about currency devaluation in Uzbekistan. In particular, it tries to analyze possible reasons why the government of Uzbekistan depreciated its national currency Som(UZS) and the goals of the government from devaluating Som. The methodology also offers findings positive and negative impacts caused by the depreciation of Som.**

**Keywords – UZS (Uzbekistan Som); USD (United States Dollar); depreciation; devaluation of the currency; Two-tier system.**

## I. INTRODUCTION

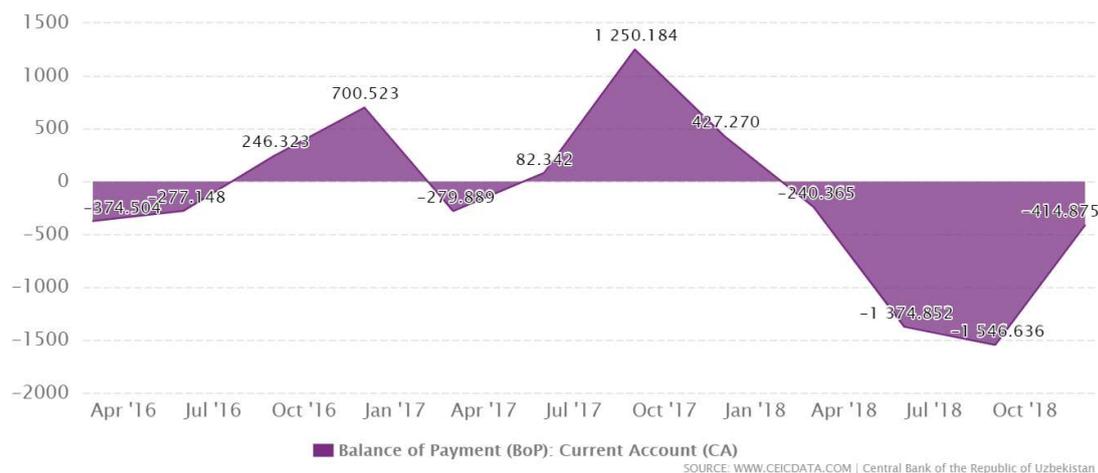
Currency depreciation is an important topic which has been drawing the interest of the economists in recent years. The issue has been a topic of numerous international economic and financial researches and studies. This economic phenomenon is defined by the decrease of the value of a country’s currency relatively to another currency. When claiming another currency, it is mainly referred to the currencies used as floating exchange rate, in most cases it is US dollar. When occurred, theoretically it can lead to some unlikeable consequences including cheap exports, expensive imports, high rates of inflation. On a more practical matter, currency depreciation causes large trade deficits in the economy and reduces money availability for government spending. Moreover, it may result in very low investment opportunities including low FDI in a country and therefore, slowing down the economic growth and leading to poor living standards. There are several reasons and situations which cause currency rate fluctuations. Therefore, it is an absolute urge to find out and define policies that help stop or at least, slow down the devaluation of the currency. In this essay, specifically, different policies which can be implemented to keep UZB soum from devaluation will be critically analysed and discussed in the context of the current condition of the global economy. All the data used in this paper is taken from World Bank and the official information resources of the government of Uzbekistan.

## II. PRIMARY AND SECONDARY FACTORS

To begin with, there are certain factors which determine the appreciation/depreciation of a currency in small open economies. Being first of those factors, inflation rates have an undeniable impact on exchange rates in a country. Keeping inflation rates on low levels provides appreciation in the value of a currency. Therefore, one will see a very small growth rate in prices of goods and services as well as a growing value of a currency in a country with relatively low inflation rates. On the other hand, higher inflation rates exhibit devaluation of a currency leading to high interest rates which is the second determining factor. Interest rates and inflation are very closely correlated to each other. A rise in interest rates makes the country’s currency appreciate as it offers

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increased rates to lenders, thus attracting high FDI flows. Specifically, when considering the economy of Uzbekistan, inflation and interest rates are said to be secondary determinants of exchange rate as their impact on exchange rates is not as significant as of those factors which will be discussed later on. Study conducted on determinants of exchange rates in Uzbekistan by Jamshid Mamasalaev (2018) showed an insignificant relationship between inflation, interest rates and exchange rates. As Mundell-Fleming model states, higher interest rates equal to higher demand for money. High money demand means that more investment and foreign capital is attracted. As a result, the value of a currency appreciates in currency exchange market. Moving on, country's current account of payments is a significant primary factor influencing exchange rates. This account represents balance of trade and earnings from FDI including all the transactions which consist of exports, imports and remittances. If the account of payment is reflecting a deficit because of country's spending more on importing than earning from exports, country's currency is most likely to depreciate. Conversely, trade surplus is expected to cause an appreciation in the value of a country's currency. Let's look at the Balance of payments account of Uzbekistan for the period from 2016 to 2018:



As it can be seen from the graph, BoP account showed a surplus of 1,250 on October 2017 and the biggest deficit of -1546 on September 2018. Relying on this information, it is reasonable to suppose that exchange rate in Uzbekistan encountered appreciation in 2017 and depreciation in 2018. Furthermore, central bank, in turn, can also affect exchange rate by conducting expansionary monetary policy increasing/decreasing money supply. Increase in the supply of money is supposed to directly lead to the depreciation in the value of the currency. The research conducted on money supply and exchange rate dynamics by Jay H. Levin (1997) concludes that money supply growth has not immediate but eventual tendency to cause devaluation of the currency. The result of this research is confirmed by empirical analysis conducted by Jamshid Mamasalaev (2019) on exchange rate determinants in Uzbekistan stating that one percent increase in money supply causes one percent depreciation of Uzbek som relative to US dollar. From Keynesian model, it is known that the interest rates are determined by money supply and money demand. That is why increasing money supply causes less demand in a currency. As a result, the value of exchange rate currency tends to fall on a market. Therefore, it is reasonable to justify that money supply is one of the primary determinants of exchange rate and should be considered when applying policies to control exchange rates. Another factor which greatly impacts exchange rate fluctuation is government debt. It is a national debt which represents amount of money owned by central government of a country. Any country with big national debt or sometimes referred as public debt, is not likely to attract foreign investment which, in turn, may result in inflation. It is followed by depreciation of the value of exchange rate currency of a country. According to official mass media information source (kun.uz), the government of Uzbekistan has taken measures to attract up to \$ 1 billion in external borrowing from international financial institutions through soft loans and other sources to support the budget in 2020. In this case, one should anticipate depreciation in exchange rate currency due to the expected national debt of the country in the current year.

### III. EXOGENOUS FACTORS

All of the above mentioned factors are considered to be endogenous determinants of exchange rate depreciation/appreciation. The impact of exogenous macroeconomic shocks on exchange rates are equally as important. Different unexpected situations and conditions occur on global economy which are out of human control and they have undeniable effect on a country's overall economy

as well, including exchange rates. Let's consider the case of recent pandemics of COVID-19 which started in January 2020 in China. The virus outbreak is absolutely unprecedented and exchange rate markets fully reflect its influence on the economy. Every single walk of the economy is impacted by the COVID-19 and its effect can primarily be categorized as following: Demand Shock, Supply Shock and Financial Shock. Outbreak is followed quarantines, border closures, and travel bans which has direct impact on goods and services within a country. Moreover, people stay at home which means they will tend to save money rather than spend or invest. Consequently, a shock is caused in goods market or often referred as Investment-Saving. Moving on, many businesses, factories and enterprises temporarily stop operating because of the situation with the virus. As a result, supply chain is continuously distracted without clear resolving time. Furthermore, roughly all enterprises are threatened by lack of cash flows and liquidity in economic situation where the overall financial condition of a country is under pressure. Shigeru Iwata (2003), in his research conducted on macroeconomic shocks and the foreign exchange risk premiums, concludes that macroeconomic shocks directly influencing output and inflation are responsible for fluctuations in exchange rates. The results are also applicable in Uzbekistan case: because of the closure of many goods manufacturing and service centers, the output in the economy is negatively impacted. Moreover, extraordinary increased demand for the goods of certain industries such as healthcare consumption, food and etc., makes price levels of those goods rise. If this situation is going to continue for longer periods of time, the depreciation in the value of UZB soum is most likely to happen. Uzbekistan is considered to be a small open economy; hence the assumptions of Mundell-Fleming model are applicable in this case. As, economy's interest rate ( $r$ ) is determined by world interest rest ( $r^*$ ) plus exogenous risk premium ( $\theta$ ), rise in  $\theta$  causes shift to the left in  $IS^*$  and shift to the right in  $LM^*$ . As a result, change in nominal exchange rate is negative which means depreciation in the value of the currency. In order to avoid the devaluation of the currency central bank should decrease money supply moving  $LM^*$  to the left. According to official mass media information source of Uzbekistan (kun.uz), the government is going to allocate 200 billion soums to fight unemployment during quarantines due to the COVID-19 outbreak. This basically means increase in government expenditure which is supposed to alleviate the negative impact of the pandemics on the goods market and the overall output. This, in turn, will to some extent prevents the value of the UZB soum from falling.

#### IV. CONCLUSION AND RECOMMENDATIONS

All in all, under the current circumstances in the global economy, the value the UZB soum most likely will be impacted in one or other way. In the short run, necessary should be taken by the government to stop or at least alleviate the impact of exogenous factors on the value of the currency. As an open small economy, the supply of money should be decreased by the central bank of Uzbekistan so that the change in the value of the exchange rate is positive. Moreover, all the loss suffered by people working in small businesses, educational enterprises, government jobs and all of those who stopped operating because of the quarantine should be compensated by the government to avoid the crisis, at least to some extent. The central bank of Uzbekistan should discreetly control the amount of money being supplied in the economy as it has a direct influence on the value of exchange rates. When it comes to the long run maintenance of the currency value, government should take care of growing the domestic market productivity level as well as much more vivacious participation in international trade. In my point view, these two policies will provide appreciation of the UZB soum and, more stable and healthier economy for the country as well in the long run.

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# *Problems Of Developing The Most Important Didactic Tool For Activating The Learning Process Of Students In The Educational Process*

Akmal Shavkatovich Aminov, Avaz Ruziboevich Shukurov, Dilfuza Islomovna Mamurova

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**Abstract – Even today, the development of cognitive activity is one of the pedagogical problems, the optimal solution of which is to increase the effectiveness of education of students. An analysis of the current situation shows that in the practice of drawing education, students do not pay enough attention to the content of this important activity.**

**Keywords – Cognitive Activity, Pedagogical Problem, Student, Education, Drawing, Practice.**

It has been known since ancient times that students' cognitive activity helps them to get deeper into the essence of things, processes and events, and strengthens memory. In the works of medieval thinkers who lived and worked in the Near and Middle East, serious attention was paid to the fact that the type, principles, structure, criteria of scientific knowledge are related to human mental development and perfection.

Beruni talks about measuring space and identifies six aspects - the directions of measurement. Then the plane, straight line, angles, their types, circles and lines in them, sine and cosine, triangle, its types and lines in it, types of rectangles, parallel straight lines, Describes the angles, inclinations, internal and external shapes formed when cutting a straight line, as well as the rules for determining the surfaces of straight lines, the length of the circle and the calculation of the surface of the circle.

The stereometry section of the work contains rules for determining the cube, prism, cylinder, cone, sphere, ball pieces, spherical shapes, their surfaces and volumes. This chapter also contains information on the formation of second-order curves consisting of conical sections, ie the formation of a circle, ellipse, hyperbola, parabola and straight line in the section when the cone is intersected by planes of different positions.

According to Abu Rayhan Beruni, education should be consistent, demonstrative, goal-oriented and systematic. According to him, exhibitionism makes education more convenient, clear and interesting, develops observation and thinking.

Ibn Sina's scientific legacy covered all areas of natural and social knowledge. He developed the didactic principle that "education should go from easy to complex." Principles such as "taking into account the inclinations and abilities of children", "exercises should be at the level of the child's ability" and "education should be combined with exercise" play an important role in the didactic views of Ibn Sina.

For example, in the chapter on geometry in Ibn Sina's Encyclopaedia, the procedure for performing problems with geometric tools, such as a compass and a ruler, is explained. In the chapters on mechanics, the structure of simple machines, such as pulleys, blocks, levers, screws, pins, is described, and they are clearly shown in drawings and graphics. It is noteworthy that the clear image

of the bell, screw, pona, etc., is shown in the projection, which is very close to the axonometric, ie frontal-dimmetric projection. Block columns, etc., are depicted in perspective, combined with axonometric projection. In this play, Ibn Sina, in addition to a vivid description of the mechanisms, also describes their drawing in a diagram. For example, when depicting the connection of wheels and screws, as well as wheels, screws and blocks, at the same time show them in the drawings. These are prefabricated drawings, reminiscent of modern kinematic schemes.

One of the important pedagogical principles of Ibn Sina is that it affects the life and destiny of the human mind, which differs from the animal in that it has a mind, that is, the ability to understand its own actions. Ibn Sina's views on the leading role of the environment in a child's cognition are important in his pedagogical views.

Even today, the development of cognitive activity is one of the pedagogical problems, the optimal solution of which is aimed at increasing the effectiveness of teaching students. The analysis of the current situation shows that in the practice of drawing education, students do not pay enough attention to the content of this important activity.

For the learning process to be productive and efficient, students must have a certain level of cognitive activity. Education should be both a goal and a tool for developing students' learning. Therefore, the school is tasked with educating an active, creatively inquisitive person.

Therefore, the development of cognitive activity is necessary not only for the successful completion of educational tasks, but also for the performance of educational tasks, which should develop students' intellectual abilities, respect for work and foster enthusiasm. The problem of developing cognitive activity is related to the development and application of specific methods and techniques.

In traditional education, the teacher explains the material, poses a problem, finds a solution, and the student repeats the actions of the teacher after the teacher. In this method of teaching, the teacher is active and the students are limited to performing a slow executive role. A number of studies have been conducted to improve traditional approaches. In the practice of teaching drawing, students' independent work is formally considered, and opportunities for the formation and development of their independent work are not taken into account. In pedagogical practice, students' independent work is not adapted to the didactic tasks at different stages of the lesson, but instead focuses on the reproductive movements of students - copying, drawing, geometry, instead of developing thinking skills.

The urgency of the problem of developing students' cognitive activity is due, firstly, to the lack of consensus among pedagogical scholars on the definition of this topic, and secondly, the methods of development are also interpreted differently in the scientific and methodological literature.

The urgency of the problem is exacerbated by the fact that for many years, didactic and textbooks on the subject of drawing have not paid enough attention to methods and techniques that activate students' cognitive activity and develop their thinking. The analysis of the above scientific research shows that there are three main directions of the problem:

The first direction is to accelerate learning to a certain extent by conducting exercises and practices that determine the knowledge of more students.

The second direction in the concept of developing students' cognitive activity is related to the formation and development of cognitive activity, which focuses on such qualities as activity, independence, initiative, creative activity and independent learning.

The third direction is to create the necessary conditions for the development of cognitive activity. In our opinion, these directions in the concept of the development of cognitive activity do not negate each other, but are inextricably linked with each other. However, because all three areas of the problem are so broad and multifaceted, researching them should be a priority, identifying the main areas that will develop students' cognitive performance.

Thus, the development of cognitive activity in the teaching of drawing means, first of all, the active work of students in the process of making different levels of image exchange. Indeed, the development of thinking plays a leading role in the cognitive activity of the learner.

Since the most important factor in the development of students' cognitive activity is figurative and logical thinking, its development can be given priority. This work should be combined with important qualities of the student's personality - intelligence,

activity, independence, initiative, creative approach to work, curiosity, independent learning, which can meet the tasks of shaping the personality of students.

At the same time, the most important didactic tool for activating the learning process should be considered the rotation of students in the educational process. The goals of cognitive activity are objective. It is not invented by humans. On the contrary, the purpose of cognitive activity depends on the development of society, the development of science and technology, art and literature, and therefore it is determined by the requirements of social experience. If the goals of learning activities are formed on the basis of the need to acquire knowledge, skills, abilities, the goals of learning activities are based on broader, more meaningful events. Such phenomena include the student's desire to understand his place in society, the desire to think with classmates and peers, the struggle for good qualities, habits, the desire for one of the subjects in relation to others, the interest in it.

Any activity consists of a set of conscious actions aimed at a specific goal, which in turn consists of individual operations.

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## *Bukhara Registan: Past And Present*

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**Abstract – . This article is devoted to the emergence and formation of the Bukhara Registan, as well as historical monuments that are part of it .There is information about the existence and functional functions of historical monuments that have not survived to us, but played an important role in the formation and life of society.the city of Bukhara also had its own register, but has not survived to us.**

**Keywords – Registan ark, feces, Devon, Vihara, tokairin, socialare, Fund, stock, madrasah,home, Chargah, sandy spot, the intersection of rust .**

### I. INTRODUCTION

The name of Bukhara was first mentioned in the IX century by the historian Narshakhi. Many historians and linguists believe that the word Bukhara comes from the Sanskrit word "Vihara", which means "fortress".

Based on the results of archaeological excavations, scientists have concluded that this city played an important role in the economic and cultural life of the territory in the period before our era. Bukhara is located at one of the most important intersections of the great silk road leading from China to Rome.

In the eighth century, the religion of Islam was introduced here as a result of the Arab conquest. Gradually, Bukhara became the most important religious center and more often became known as "Bukhara Sharif".

The main object is the Bukhara Registan. Its formation and location. Registan is located to the West of ark and was formed in the period before the Arab conquest . Until the XVI century, Registan square was occupied by administrative buildings-Chancery and palaces of nobles .It was replaced by market traditions .

Starting from the 16th century,rastai Toki Tirgaron (Tok of armourers) was built at the entrance to Registan,Toki ord Furushon (Toki unfurushlar) was built in the center, and Toki selling hats and cotton fabrics were built around it.

The extant monument on the territory of Registan is the Bolakhovuz complex, Dating back to the XVIII century. [1]

Registan was known for a large number of trade bazaars and markets in Bukhara. During the pre-Islamic and post-Islamic periods, Registan housed administrative, military, and civil buildings.

The extant monument on the territory of Registan is the Bola hovuz complex, Dating back to the XVIII century.[1]

Registan was known for a large number of trade bazaars and markets in Bukhara. During the pre-Islamic and post-Islamic periods, Registan housed administrative, military, and civil buildings.

Buildings that are part of Registan square

Poyanda-Dance

Atalik Mosque

Madrasah Bazar gusfand

Madrasah Dor ush-Isfahan

Khoja Nihal Madrasah

Bala-Khavuz mosque and madrasah Shodim-Biy



Picture .of the General plan. Ark Bukhara and the Registan

It is not known what the area was called in the pre-Islamic era. It is known that in the II-III centuries BC it was called Registan.

The word "Registan" means "sandy place". It is not known why the square in front of the castles was called "Registan".

The area of the register according to the documents of the Foundation, the border of the register was small. The data on its borders (6GB; 233x270 meters) are as follows: from the North, the borders of Registan are adjacent to the master Rukh madrasah and Gusfand Bazaar, as well as to the North-Western corner of the arch. Arkaga from the East, Khoja Rostock from the South next to the madrasah and the former people's house next to it.

It is adjacent to the Shodim-Biy madrasah and Bolo-Hauz mosque from the West.

From Narshakhi's narratives, it is known that the area of the register was larger than indicated in the funds. The square that started at the Western gate of the arch and ended at the mabad gate (later Imam's gate) was called Registan.

In the pre-Islamic and post-Islamic periods, administrative, military and civil buildings were located on the territory.

During the time of the Samanids, administrative buildings were located on the territory: various offices, Devons. Nasr Ibn Ahmad named ten Devons that he built; dozens of Devons were built in Registan, such as devoni vizier, devoni Mustafi, devoni Abdumalik, devoni Shukhrat, devoni muayaan, devoni Sharaf, devoni Mamlakai Hossa, devoni Muhtasib, devoni Ukov, devoni kazo .

There is no information about the restoration of the Registan in the period from the Karakhanids to the Sheibanids. The Sheibanids made Bukhara the capital of their state, after which the political and cultural status of Bukhara began to grow. They did

not survive to the present day (except for Bolo-pond), and most of them were destroyed, finally destroyed under Soviet rule. The old buildings in Registan date back to the Sheibanid era and subsequent dynasties.[2]

In 1924, there was a breakdown of the square on Registan square and V. I. decided to erect a monument to Lenin. Later V. I. On a granite pedestal was a bust of Lenin. On the sides of the roof-inscriptions in the Uzbek language, made in Arabic script.

Overview of registered buildings in the Middle ages .Under Abdullakhan 2 (1557-1598; ruled until 1583 under the name of his father-Iskander Khan), Bukhara changed beyond recognition. He built a market, warehouses, and baths that became the basis of his madrasah. Some of them were located in Registan. So they built warehouses, grain market (grain market), baths, shops . These buildings were located on the Eastern and southern sides of Bukhara. The main building of Toki Torgoron streams was located at the intersection of the current Registan highway.[3]

Poyanda-Biy Atalik mosque one of the emirs of Imam Khon (1611-1642) Poyanda-Biy Atalik Turkmen son of Qasim-Biy in the South of the Turkmen Ark, near the gate of the quarter, the Islamic Friday mosque (Cathedral mosque, Juma mosque) was built. Poyanda-Biy Atalik mosque took the second place in Bukhara after Kalon mosque (40, 5x62, 5 meters). Ten nurseries in the mosque the name "otalik mosque and madrasah" was mentioned in the founding document that was drawn up in favor of this building. The mosque was restored several times over the course of three centuries . Despite this, the facade at the beginning of the XX century remained in poor condition.



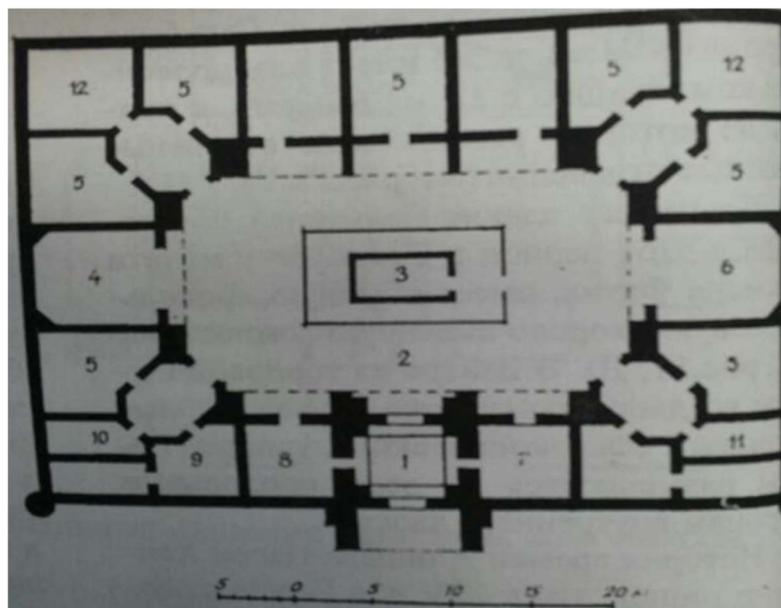
2-picture. Payandabi mosque

Restoration required a lot of money, and so in 1927 the Executive decided to demolish the premises and build a garden on the site.

Bazar gusfand madrasah was a two-story madrasah built by Abdulaziz Khan (1645-1681) in the North of Registan. It was built in 1669 and consisted of 72 kennels, one mosque and one gate. The exterior facade (verandah) was high and majestic. External and internal arches that once had mosaics. The madrasah was destroyed during operation Buxoro in the 1920s and demolished in the 1930s.

Dor ush-Shifo madrasah is located in the West of Registan, which was of great scientific importance in the past. When subhanguli Khan (1681-1702) came to power, after establishing stability in the country, he began to engage in science and education. He paid attention to medicine and mathematics. He paid great attention to medicine and in 1696 built a healing madrasah. The madrasah consisted of 18 cells.

From the point of view of architecture, it was of no interest, but served not only as an educational institution in medicine, but also as a hospital and outpatient clinic. There was also a European-style pharmacy that provided free medicines. On the basis of this madrasah , part of the income was made up of medical students, and part was intended for the treatment of patients.



3-picture. Dor-ush-healing Madrasah tarkhi. 17-th century

Its founder, Subhankuli Khan, gave the Foundation 7,000 acres of land for these and other purposes. [2]

The founder of the madrasah, Subhonkul Khan, was the author of several works on medicine and astrology.

He had a knowledge of medicine, he was a doctor himself. His work on medicine "subhankuliyevu revival of medicine" ("Ixia At-TIB Subhani") is written in the Turkic language of Central Asia, devoted to the description of diseases, their recognition and treatment. One of the lists of the manual is kept in the Budapest library. Subhanguli Khan's treatise on astronomy was called " the essence of the phases of the moon in predicting the happy hour" ("Lubb al-lawaih al-Qamar Fi-l-istiyorot"). Subhonkul Khan was kind to the poem and wrote a poem with the nickname Nishani.

Khoja Nihal madrasah another building that has not been preserved in Registan to this day was built - Khoja Nihal madrasah. One of the last emirs of ubaydullah Khan 2 (1702-1711) was built by Khoja Nihal. The exact date of construction is unknown. After Ubaidulla-Khan 2 coikisda in the same year was killed by one of his faithful emirs, Hoja Nihal.

Bolo khauz mosque and madrasah-Bukhara Registonida is an architectural ensemble, the mosque is an architectural ensemble consisting of towers and a swimming pool. The Bolo khovuz mosque served as the main Friday mosque of Bukhari before the revolution. The Emir of Bukhara prayed in it. The winter mosque and pool were built in 1712, and the facade of the winter mosque was painted in 1917. in the same year, the minaret was built according to the project of the architect shirod Muradov. The mosque is built like a large block mosque, has a winter and summer parts.



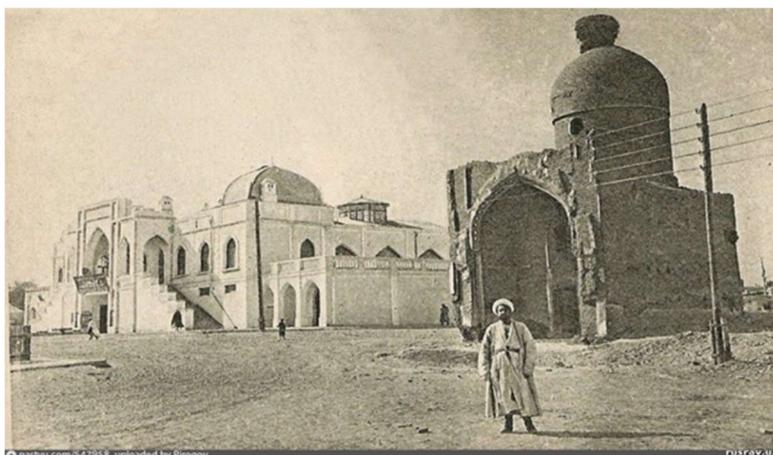
4-picture. Bolo khauz with mosque minaret (current position)

The winter part is also a four-column hall with several entrances. The summer part is a sign from the veranda that surrounds the winter hall of the mosque on three sides. The verandah columns are made of wood.

It serves to support the porch ceiling, so they are fixed to the concrete Foundation.

The columns located on one of the last sides of the verandah are specially prepared-they form the main entrance to the verandah, and then the winter mosque. The interior design is typical for the beginning of the XIX-XX centuries.

The Shodim Biya madrasah was located South of the Bolo pond mosque. The time of construction is unknown. So far, Shodim-Biy is one of the ashtarkhanid emirs. The madrasah is two-storeyed, the first floor, the second floor is wooded. Because it is in poor condition, the bnsr's stock Department orders the madrasa to die in 1923.



5-picture. Shadimbiy mausoleum

The arch is built on a hill up to 20 meters high, with an area of 4 hectares . The arc walls, which have a rectangular shape, are reinforced with stone, burnt and untreated wedges, mowed at different times . Especially the collapsed sections of the originally tried out of mud bricks.

In the 16th century, a field road and a huge gate were built, which were raised to the West of the ark . The ark gate is still located in the Eastern part of the ark . Two sides of the goal post

from the "guldaस्ता" (Burj) and they have 3 floors in the range

the building is well preserved .

12 on the left wall of the long dacha corridor leading inside the Ark, 13 on the right wall are tahmontochas . Some shelves on the left side have doors leading to Obhan. At the bottom are placed guldasta Sachs and the air Dim Artola .

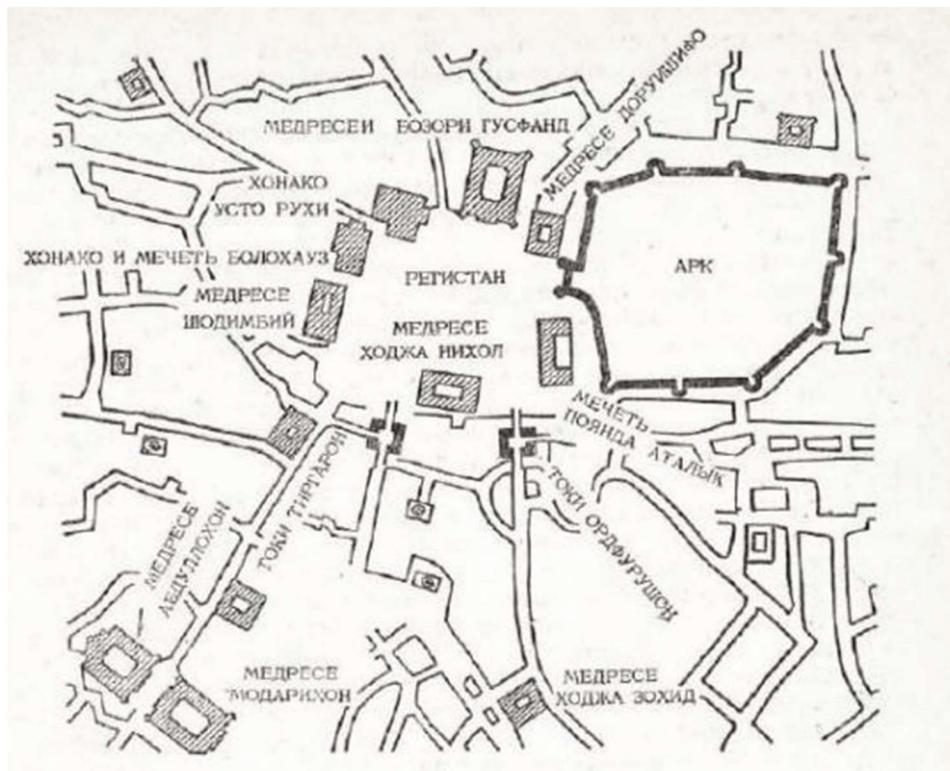
On the middle shelf to the right of Dalon, lights were lit on the Navruz holiday for the soul of the legendary hero Sievush . The Amir stables were also entered through this staircase. At the exit from the field was the yard of the artillery (the chief of the Palace guard, commander of the Amir's troops during the war), which we did not reach until ertula was standing under the porch.

At the end of the XVII century, the Peyvon



6-picture. Appearance of the Ark (current state)

Mosque was built in the corner of the Western Wall, and verses of the Koran were inscribed among the decorations on the inner side of its gates, bars, and walls .The ceiling of the terrace is decorated with intricate garlands.



7-picture Registana ensemble at the end of the XX - beginning of the century

In the Northwest corner of the ark was the armorer's house and the room of the official who oversaw the repairs . On the Eastern side of the mosque there is a kitchen on the back-engraving, in the North-East engravings-jewelry store, in the South-Cabinet devonbegi and buildings overlooking the Emirate of beraberagi.[1]

## **II. CONCLUSION**

The historical city of Bukhara in present past, and we have monuments how much historical, which have not survived until now, solar Bukhara region is also an integral part of the city is the area that was brought to the city by the eye, as well as the conservation and preservation of modern ancestors from the past. Together with their storage, we must adhere to the principle of preserving steps, which are becoming the norm from our ancestors who recover after independence. Because ancient buildings built in the Middle ages were built strictly in accordance with the proportions of geometric shapes.

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# *The Development Of The Tourism Object In Baloli Village, Masamba, North Luwu*

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**Abstract – Community participation in the management of the tourism sector is highly important in supporting the economy of the people of Baloli Village. This study discusses the process of community participation in Baloli Village in improving the economy through the tourism sector. In this study, the researcher applied the descriptive qualitative method. Data were collected through interviews, field studies, and documentation. Informants in this study were selected using a purposive sampling technique. In general, the selected informants were those who understand the problem studied. Those informants were the Village Secretary, the Head of the Community Welfare, Service, and Empowerment Section, visitors, and local people. The results indicated that community participation in tourism development, such as decision making, activity implementation, and utilization of results, is good. However, their participation in monitoring and evaluation is still not optimal. Furthermore, the potential of the tourism objects in Baloli Village is not developed maximally, such as many supporting facilities that have not been fully ideal.**

**Keywords – Participation, Community, Tourism, Baloli Village.**

## I. INTRODUCTION

Tourism is one of the sectors that can increase the country's original income apart from oil and taxes (CessarioSutrisno, 2013). Currently, the Indonesian government continues to carry out tourism promotions to attract foreign and domestic tourists (Wolah, 2016). Essentially, the tourism sector plays an important role in improving the Indonesian economy after the role of oil and gas weakens.

The tourism sector affects not only the economic sector but also other sectors, such as the cultural and political sectors (RobiCahyadi, 2015). Nowadays, tourism is a very promising industry economically so that it needs serious efforts from the government and the local community to develop the possessed tourism objects (Hasan Basri, 2019).

Efforts to increase income and people's welfare through the tourism sector certainly require the availability of tourism objects. It is not enough to take advantage fully of the tourism objects that have been shaped by nature. The government and all concerned parties must develop these tourism objects. Essentially, development in the tourism sector is developing and exploring tourism potentials by utilizing natural resources, human resources, and man-made resources possessed in a certain area (Ika Setiawan, 2016). Tourism development is expected to be able to empower people which will improve economic independence and promote poverty alleviation (BteRusdin&Winda, 2020).

Successful tourism development is the development carried out jointly, including developing a tourism object by involving the local community so that the tourism object can provide benefits economically, socially, and culturally for the local community (Setijawan, 2018). The process of involving and empowering the local community in tourism development will also improve the village's original income which will be used for village development. Therefore, one of the approaches that can be used for community-based tourism development is a participatory approach (Rusyidi&Fedryansah, 2018).

In essence, the tourism sector is an economic activity that can provide benefits not only to improve the welfare of local communities but also to increase local revenue. However, it is sometimes forgotten that the development of social aspects that are not given special attention may cause problems.

Tourism is an activity that involves all levels of society so that it has an impact on the existence of the local community. The impact of tourism concerning the relationship between the local community and tourists is the commoditization and commercialization process due to the hospitality of the local community (Pitana& Gayatri, 2005).

Community participation in the development process is the main requirement that becomes the basis for the success of a regional development process. In the development stage, community participation is a demand to solve problems faced in the development process, such as the problem of sustainability and outcomes that have not been achieved in many regional developments. Community participation is an important element in the implementation of development because development is an activity carried out by the local people. Community plays not only as of the object of development but also the subject of development in the frame of community participation. This can be seen from several opinions formulated by many experts. According to Jnanbrota Bhattacharyya, participation is taking part in joint activities (Ndraha, T, 1990).

Furthermore, community participation is an important element in the implementation of development because development is an activity carried out by the local people. People are not only the object of development but also the subject of development. To obtain an overview of community participation, we can see the following opinions expressed by some experts. The importance of participation in development is as follows.

1. Community participation is highly important to obtain information related to community attitudes towards the presence of successful or failed programs.
2. The community is highly needed to be involved in every development program starting from the planning process to the evaluation process so that there is a sense of responsibility in succeeding the program.
3. Involvement in a nation's development is the right of every citizen. (Conyers, 1991)

Pasaribu & B. Simanjuntak (1982: 27) stated that the types of participation are:

1. Participation in thoughts,
2. Participation in skills,
3. Participation in strength,
4. Participation in property, and
5. Participation in money.

C. Ericson (in Slamet, 1993: 89) stated that the types of community participation can be classified as follows.

- a. Participation in the development stage
- b. Participation in the implementation stage
- c. Participation in the infrastructure supervision stage

Furthermore, Keith Davis stated that the term 'participation' is defined as a person's mental and emotional involvement in a group situation as a vehicle to contribute to group goals and to share responsibilities within them (Davis & Newstrom, 1990).

Furthermore, the opportunity for people to participate in tourism development in Baloli Village is quite good. People's participation in developing the tourism object in the Salu Kula river, Baloli Village, North Luwu is one of the opportunities possessed by the local community to participate starting from the decision-making stage to the implementation activities, monitoring, and utilization of results. At the decision-making stage, the local community has the capacity and authority to participate in deciding which tourism potential will be maximized at the Salu Kula river, Baloli Village. The opportunity for the local community to participate in the implementation stage of tourism development activities is also quite good. However, the results of these tourism development activities still have many shortcomings. These shortcomings are as follows. The first is the lack of facilities and infrastructure. For example, road access to the tourism object is inadequate. The road is still in a damaged condition and needs widening so that tourists who come to this tourism object will feel more comfortable. Meanwhile, the second is the lack of facilities for visitors. For example, the parking area is still inadequate so that visitors occasionally use the roadside as a space to park their vehicle. In these problems, the local community and the village government must increase their cooperation to be able to develop the tourism object in Baloli Village to become the preferred tourist location.

There are 3 actors who play an important role in increasing the tourism sector. They are the community, government, and private sector. In this context, the community is people who live around the tourism object as the legal owner of various resources that may serve as tourism capital, such as culture. Community leaders, youth, intellectuals, related groups, and the mass media are also part

of this community. Furthermore, the private group consists of entrepreneurs engaged in the tourism sector, while the government groups are those who lead the areas administratively and possess authority on the areas (Pitana & Gayatri, 2005).

North Luwu possesses many interesting tourism objects to visit. One of them is the Salu Kula river in Baloli Village, Masamba, North Luwu. The tourism attractions offered in this location are river tubing and flying fox. However, the development of tourism objects in Baloli Village still has problems, such as the lack of facilities and infrastructure to support tourism activities.

With the development of tourism objects in Baloli Village, more supportive facilities and infrastructure are highly needed to support to increase tourist visits to the area of Baloli Village so that tourism development can run well. Therefore, it is necessary to have facilities to support the needs of tourists who want to visit the location, such as more detailed tourism information and better facilities in the tourism object. If the existing facilities around the tourist object are adequate, it will be a strength and opportunity for this location to be visited by many tourists. However, if the supporting facilities are inadequate, it will become a threat or weakness for this location.

Baloli Village, as one of the tourist destinations in South Sulawesi, especially for Masamba, has natural resource potential which essentially has sufficient natural potential to increase regional development and improve community welfare. Tourism development is certainly inseparable from the local community around the tourism object. Community participation is highly needed in tourism development because the community is the first element in tourism development itself. This community participation is influenced by two factors: internal and external factors. The internal factor that exists in community participation is inner values combined with things that can be perceived by the five senses in the process of seeing, feeling, smelling, hearing, and touching. The development of the tourism sector must be supported by internal factors, such as gender, age, education, occupation, income, origin, gender, and economic status from the local community. Meanwhile, external factor covers the social and physical environment of the tourism object.

The participation of the local community greatly helps the success of community-based tourism development. The description above shows that there are still problems found in the tourist object developed in Baloli Village, Masamba, North Luwu. Furthermore, to construct the discussion in this study, the researcher applied 4 aspects proposed by Totok Mardikanto in which community participation is voluntary community involvement in the process of decision-making, activity implementation, monitoring, and utilization of results (Mardikanto, 2012). Based on a study conducted by Sefira et al. using a qualitative descriptive method, they concluded that the tourism sector should be able to provide an increase in community welfare, which is not utilized properly by the government of Nganjuk Regency. In fact, this regency has many potential tourist objects, such as mountainous landscapes, waterfalls, and recreational parks. However, these objects have not been managed optimally (Sefira et al., 2013).

The purpose of this study is to find out to what extent the community participation in tourism development in Baloli Village, Masamba, North Luwu.

## **II. METHODS**

The type of this study was qualitative research. According to Moleong, qualitative research is research related to understanding the phenomena experienced by research subjects. In this study, the researcher applied the descriptive method. According to Moleong (2012) again, the descriptive method is to provide an overview of social phenomena. In the context of this study, the defined social phenomena were community participation in the implementation of the tourism object development and the factors that support and hinder the implementation of this development. Data obtained in this study came from existing data from the government of Baloli Village. Furthermore, the selected informants in this study were people who deeply understand the research phenomena. To obtain direct data and information, informants were selected using a purposive sampling method by deliberately selecting people who are expected to know the problem to be studied and based on the criteria of the research objectives.

## **III. RESULTS AND DISCUSSION**

This section discusses community participation in tourism development in Baloli Village, Masamba, North Luwu. To find out to what extent community participation in tourism development in Baloli Village, several indicators are used as the references in this study. As stated by Totok Mardikanto, community participation essentially covers 4 aspects: decision making, activity implementation, monitoring, and utilization of results.

### ***A. Participation in Decision Making***

Participation is active involvement, either inside or outside from the entire process of the activity. Participation in decision making is conducted by fostering community participation through meetings that involve the local community in the decision-making process related to programs that will be carried out in the region. In the making-decision process, the local community is expected to participate by providing suggestions or criticism during the meetings.

Community participation is highly needed as a form of concern and awareness. It is also a sense of responsibility for the sustainability of development aimed at improving the standard of living of the community. This means that, through the participation

given, people in the community truly realize that development activities are not only an obligation that must be carried out by the government (state apparatus) but also require local community involvement in which the local community is the object of the development.

In general, the government of Baloli Village, in developing and arranging tourism management, gets support from village youth and the local community. Therefore, in this study, the village government facilitates in forms of procurement tourist equipment, such as river tubing and flaying fox equipment. Meanwhile, the local community works together in developing tourist objects. In the process of determining the mechanism of developing the tourism object, the village government and the management of the tourism object receive input and collaborate with the local community to obtain good results for tourism development in the village.

Community participation in decision making, especially in tourism development, is quite good. It is because all elements of the local community participate through meetings held by the village government to find input and support related to the development of the tourist object. In addition, people in the village also maintain the cleanliness of their environment as a form of awareness for the development of tourist objects.

As a tourist object, the Salu Kula river has been worthy of being made a mainstay tourist attraction. It is because the scenery around the tourist object highly supports it. The most important thing for tourists to be considered is the location that can be easily accessed. This village is not far from the district capital. Therefore, this makes visitors feel more comfortable and safer.

Community participation is the voluntary involvement of the community including decision-making. Based on the reality found in the field, community participation in decision making is a right that needs to be used by someone to get better results for the development of his/her surrounding environment. The people of Baloli Village voluntarily participate in making decisions regarding the development of the tourist object.

### ***B. Participation in Activity Implementation***

Participation in the activity implementation is the equalization of community contributions in the form of labor and cash corresponding to the benefits received by each member of the community. It is because, to carry out an activity or work, it is necessary to have community involvement in the form of labor, money, or various other forms of involvement that is equal to the benefit that they will receive.

The activity implementation has gone quite well. However, it does not work well because of the limited economic resources of the local community. The village government and the local community have made efforts to improve facilities needed but still experience some shortcomings, such as the parking lot is not well-organized and road access to tourist objects is still damaged. Therefore, the cooperation between these two elements is not enough. Support from the regional government through the regional revenue and expenditure budget is highly needed by allocating some funds on this implementation.

Community participation in implementation can also be seen in terms of maintaining security and involvement in the development process. Activities carried out in terms of developing tourist objects are quite good. However, in terms of promoting tourist objects, it has not been carried out well. In spite of that, the local community will try to make this tourist object more recognized and visited by foreign and domestic tourists.

In terms of activity implementation in the tourist object, it would be better if it was added with new activities so that visitors can feel more comfortable. Visitors hope that the government and local community will provide places to stay so that when visitors who come from outside the region can rent the place, thereby increasing local community income. The activity implementation is highly important in the development process because, in carrying out an activity, the activity will not run without a good implementation stage.

### ***C. Participation in Monitoring***

Participation in monitoring is the participation carried out in order to obtain suggestions and input so that the objectives of the activity can be achieved as expected. This is also to discuss obstacles found during the development implementation process.

In monitoring the development process of this tourist object, some obstacles still occur. In spite of that, the local government together with the management of the tourist object will try to provide the facilities needed at the tourist object.

In developing a tourist object, it needs monitoring and evaluation to get the expected results. From the result of this study, it can be seen that there are still some obstacles in terms of monitoring and evaluation. It is expected that the problem from the development process of this tourist object can be identified and addressed quickly.

Monitoring and evaluation related to the process of community participation in developing this tourist object are considered insufficient. The obstacle found in this study is the absence of clear management of the tourist object so that there is an opinion in the local community that the evaluation of the development of the Salu Kula river as a tourist object is left to the regional government.

#### **D. Participation in the Utilization of Results**

Participation in the utilization of the results is the participation to improve the quality of life of the local community by utilizing the results of the developed program. Therefore, it will stimulate the will and participation of the local community to always participate in every development program that will come.

The utilization of results in tourism development has a more positive impact on the government and local communities. Local people can increase their economic income by selling, renting river tubing equipment, or renting out gazebos. This is then maximized by the energy from the younger generation in the village. With the presence of this tourist object, it can lead to more positive activities. In addition, because of this development, this village, which is previously inaccessible, currently can be accessed by four-wheeled vehicles. The presence of a tourist object in Baloli Village also can increase the economic income of the local community and make the community more participating in developing tourism by providing rental facilities, such as equipment for river tubing or anything else.

The utilization of results greatly affects the development of tourist objects for both the government and the local community. With this utilization of results, the local community and the government can further develop this tourist object for being better as what is expected. By utilization of results from this tourist object, local people can improve their quality of life and more increase their participation in further development projects.

#### **IV. CONCLUSION**

This study was carried out through observations and interviews in the field. This study focused on community participation in tourism development in Baloli Village based on Totok Mardikanto's theory. In the theory, there are 4 aspects that need to be considered in building community participation: decision making, activity implementation, monitoring, and utilization of results.

The conclusion in this study is that the community participation in Baloli Village in tourism development is running well in terms of decision making, activity implementation, monitoring, and utilization of results. This can be seen from community participation in various tourism development activities. The local community is involved starting from the decision-making stage, namely at the beginning of the development of the tourist object. They participate in determining what to do. They also contribute in the form of ideas or thoughts. Furthermore, from the activity implementation, the local community also participates in developing tourist objects, such as cooperating in the development process and maintaining cleanliness around tourist objects. However, in the process of monitoring, the local community does not participate fully. Therefore, they leave this to the village government. Community participation in the utilization of the results can be seen from the activities carried out around tourist objects, such as renting river tubing equipment, selling food and drinks, and other kinds of activities that have an effect on improving the local people's economy.

In community participation, the supporting factor for local people to be willing to participate in this tourism development is the emergence of self-awareness as a community that understands the importance of development and wants to contribute to it by giving what they have and what they can do. Meanwhile, the obstacle factor in community participation is the lack of knowledge and understanding of tourism, thereby making the community sometimes still depend on the village government. Therefore, there are still many things that must be improved further so that the tourism development process can run as expected.

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# *An Analysis Of Current Scenario Of COVID-19 In Malaysia*

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**Abstract**—The advent of Coronavirus-19 (COVID-19) has created a new threat in terms of economy and life. Frankly, the adverse effects of COVID-19 can put our life at risk if we are contaminated. The recent promising cases in Malaysia have certainly intensified from day to day, going from bad to worse. The primary factor that causes the raising problem of COVID cases is the absence of cooperation between Malaysian and government. This research aims at visualizing the current situation of COVID-19 and thus raising consciousness among Malaysians to solve this dilemma. To fulfill the objectives, there are two stages of processes need to be performed. Using the dataset from Internet, the first section would use Microsoft Excel to create visualization tools such as a pie chart and a line chart. Next, the second part will scrap the Twitter data to explore how Malaysians are aware of COVID by using “Twint” function in Python software. The finding reveals that current COVID situation in Malaysia is in a severe stage since the chart shows that it has an exponential growth. Moreover, the Twitter activity has indicated that the people are not paying attention to the COVID topic shared by Malaysia Ministry of Healthy (MOH) Consequently, the new positive cases increase dramatically after September 2020 in Malaysia. In conclusion, the people are more concern to the COVID news from MOH during the implementation of MCO and CMCO. The people lose concern when the number of cases dropped or the MCO and CMCO is ended.

**Keywords**—COVID-19; Awareness; Visualization; Statistics

## I. INTRODUCTION

Our current world is now experiencing a pandemic caused by a new infectious strain of virus outbreak which known as Coronavirus Disease 2019 (COVID-19). By 20 January 2021, it has already hit on 96.1 million of people’s life and lead to 2.05 million of death in the whole world. COVID-19 is a virus that attack to the human respiratory system and make the victim suffered from breathing in the fresh air. According to World Health Organization (WHO), COVID-19 has the same family as virus of Severe Acute Respiratory Syndrome (SARS).

Patients who get infected from COVID might experiencing mild to moderate symptoms such as fever, flu, cough, dizzy, loss of taste and difficulties in breathing. In some severe cases especially for the older adults, they have a higher mortality rate compared to the younger people [1]. Researchers claims that a healthy adult has a mortality rate of 2 to 3% whereas the risk of elderly is three times higher [2]. Moreover, diabetics people are found to be more vulnerable in becoming critical with the virus [3].

Typically, the virus is spread from infected patient to healthy person by the respiratory droplets (saliva and nasal mucus). This can be happened when the patient cough and sneeze in the public, causing all the droplets to be transmitted in the air. Moreover, touching the virus-contaminated surface increase the chance of healthy person to get COVID when they touch their face before

sanitizing their hands. In order to prevent transmitted from COVID, it is compulsory to wear a surgical face mask, practicing a good personal hygiene and social distance between people. Moreover, usage of sanitizer with 75% of alcohol is strongly encouraged to destroy the virus [4][5][6]. The figure below shows the poster by Ministry of Health Malaysia on several measures to prevent transmitting virus to other people.



Fig 1. Simple ways to prevent transmitting virus to others (MOH,2020)

To date, [7] discussed that there are only two countries are reported free of Coronavirus in the world, namely Turkmenistan and North Korea. Figure 2 shows the map of COVID-infected areas.

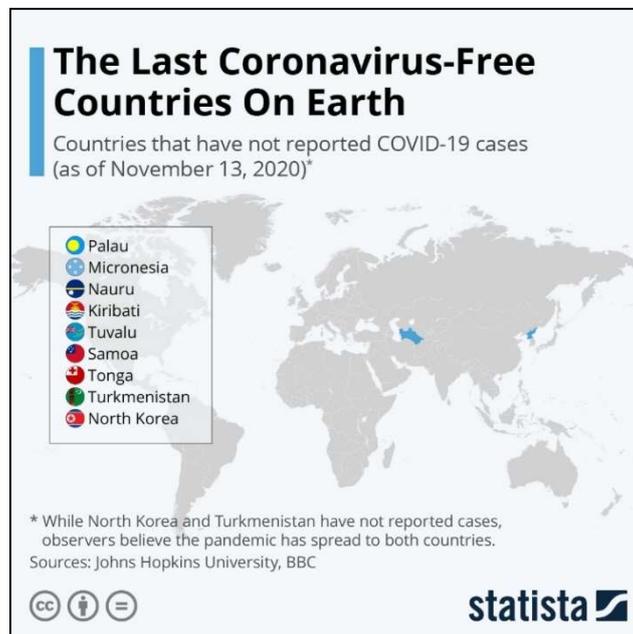


Fig 2. World map showing COVID-19 infected areas

The top five countries which mark the highest number of deaths are United States, India, Brazil, Russia, and United Kingdom. Whereas for Malaysia, the country is now entering the 4<sup>th</sup> wave of COVID-19 outbreak in consequences of the celebrations and

mass gatherings in the past two weeks. By 20 January 2021, COVID-19 has already infected 162,000 of people and cause 605 deaths in Malaysia. From Ministry of Health (MOH) Malaysia, the rapid increasing in the number of COVID-19 cases follow a  $R_0$  value of 1.1.  $R_0$  value is a measurement to determine how widespread the infectious virus can be [8]. Figure 3 shows the Susceptible-Exposed-Infectious-Removed (SEIR) model which is very useful in forecasting the COVID cases in the months later.

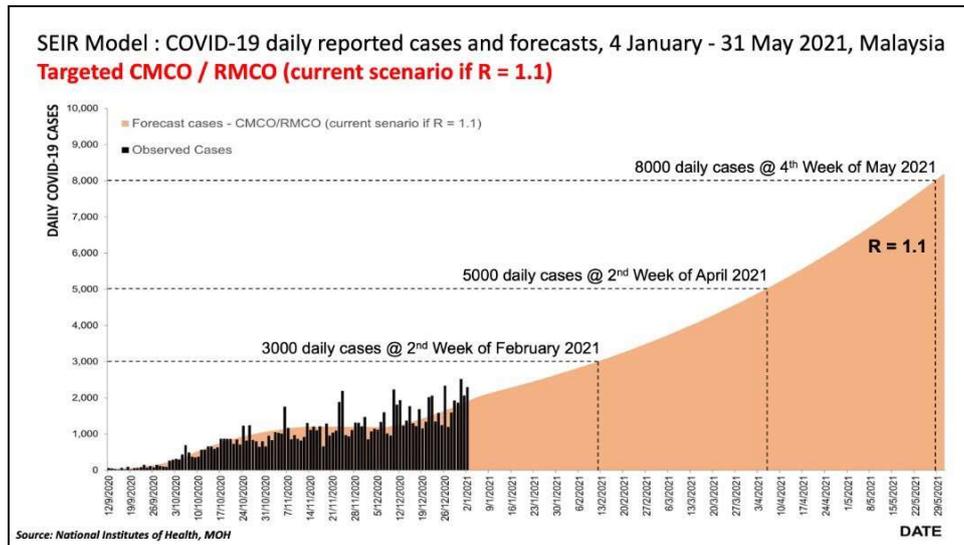


Fig 3. SEIR Model (MOH,2020)

From Fig 3, it is observed that the estimated infected cases on February 2021 is around 3000 cases daily, 5000 cases daily in the second week of April 2021 and 8000 cases daily in the fourth week of May 2021. If the trend of infected cases is still following the  $R_0$  value, the number of patients will increase rapidly as stated in the developed model.

In order to slow down the rate of transmission, preventive measures are vital to be the current strategies. Malaysia government have been implemented a lock down referred as Movement Control Order (MCO), Conditional Movement Control Order (CMCO), and Recovery Movement Control Order (RMCO). During this duration, people are restricted to travel more than 10 km from their house and most sectors except essentials sectors are forced to close. However, it was observed that the execution cannot stabilize the number of COVID cases happened in Malaysia due to lack of cooperation from people [9][10]. Therefore, this study aims to visualize the current scenario of COVID cases in Malaysia and hence raise the awareness among Malaysian.

## II. METHODS

In this study, we will divide the work into two phrases in order to make readers more understand with the actual situation of COVID pandemic in Malaysia.

### 1. First Phase

The first phase of this project is to visualize the current statistic of COVID cases. There are four main steps in achieving the goals namely data collection, data transformation, data visualizing and interpretation and analysis. Figure below shows the steps in first phrase.



Fig 4. Steps in First Phase

(a) Data collection

An online dataset [11] is extracted to be used for the first phrase in this study. The dataset covers data starts from 25 January 2020 until 24 January 2021.

(b) Data transformation

The attributes found in the dataset are “Date”, “Total cases”. “Total discharged”, “Total death”, and “ICU”. Table I shows the attributes and description found in dataset.

TABLE I. ATTRIBUTE AND DESCRIPTION OF DATASET

Attribute	Description
Date	Date of the data published by MOH
Total Cases	Total positive cases at the date
Total Discharged	Total discharged at the date
Total Death	Total death at the date
ICU	Current number of cases ICU at the date

Based on the existing attributes, there are another four attributes have been derived for further analysis. Table II shows the derived attributes and description from the existing attributes.

TABLE II. DERIVED ATTRIBUTES FROM COVID CASES DATASET ATTRIBUTES

Attribute	Description
New Cases	New positive cases at the date
New Discharged	New discharged at the date
New Death	New death at the date
Differences	Active Cases = Total Cases – Total Discharged

(c) Data visualization

The main core of the study is the visualization of the data obtained. In presenting the data, Microsoft Excel is used to explore the data pattern and trend by developing the line charts.

(d) Interpretation and explanation

After undergoing the three main steps, the last step is interpretation and explanation of the result obtained. Hence, a detailed discussion will be reviewed for each result.

2. Second Phrase

Next, the second phase in this project aims to visualize the reaction of Malaysian towards Twitter tweets by MOH during the one-year period since the first positive COVID case has been discovered in Malaysia. There are four main steps in achieving the goals namely data collection, data cleaning, data visualizing and interpretation and analysis. Figure below shows the steps in second phrase.



Fig 5. Steps in second phrase

(a) Data collection

The data is collected from Malaysia Ministry of Health (MOH)'s official Twitter. The data will be linked together with Malaysian's awareness towards COVID-19 in Malaysia. Previously, there are researchers link the Twitter user's response to study the emotions faced together with the virus outbreak [12]. Moreover, the researchers also used Twitter data in investigating the people's top concern during COVID pandemic [13].

(b) Data cleaning

Since the data in Twitter is massive, Python software is used to extract the useful information. The Tweets are scraped by using the "Twint" library in Python. Next, the selected attributes used are "date of tweets posted", "replies\_count", "retweet\_count" and "likes\_count" only. The data is grouped by monthly, quarterly, and yearly. Table below shows the attribute name and description for the attribute.

TABLE III. DESCRIPTION FOR EACH ATTRIBUTE

Attribute Name	Description
Date	Date of tweets posted
Tweet	Tweet contents
Replies_count	Number of replies to the tweet
Retweets_count	Number of retweets of the tweet made by MOH
Likes_count	Number of likes to the tweet

(c) Data visualization

This section is similar with the previous section in first phrase. To present the data, Microsoft Excel is used to explore the data pattern and trend by developing the pie-chart and histogram.

(d) Interpretation and explanation

After undergoing the three main steps, the last step is interpretation and explanation of the result obtained. Hence, a detailed discussion will be reviewed for each result.

### III. RESULT AND DISCUSSION

This section discusses about the result and discussion for phrase 1 and phrase 2.

#### 1. Phrase 1

Malaysia currently has discovered 183801 total positive cases and 678 total death until 24 January 2021. The data shows that the COVID-19 death rate is only 0.04%. The virus mainly has severely attack on the old people, and those who having the chronic disease. In contrary, the total number of recovered patients who discharge from hospital is 141446 people which occupies 76.96% of total positive cases. Hence, those daily data are transformed into a line plot which shows the relationship between positive cases, discharged cases, death cases and ICU cases. Figure 6 shows the line charts for the positive cases, death cases and ICU cases.

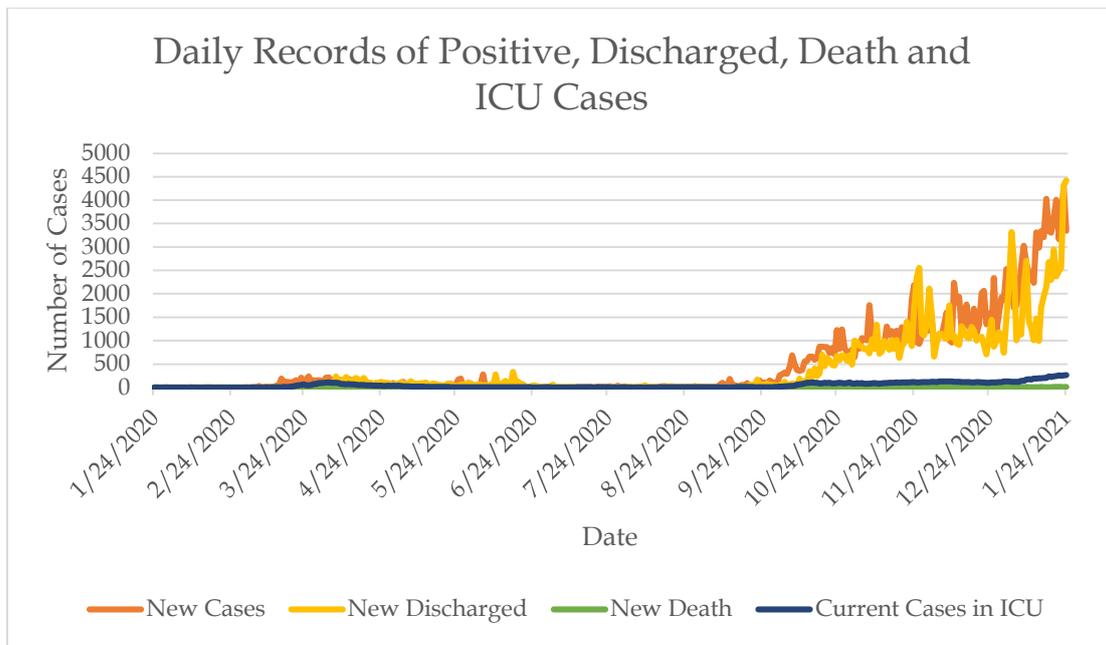


Fig 6. Daily Records of Positive, Discharged, Death and ICU Cases

From Figure 6, it shows that the total number of new cases at the beginning of year 2020 are just below 500 cases. The new positive cases and current cases in ICU has been showing an increasing trend since September 2020. The highest number of new cases is 4427 on 24 January 2021. The reason of having this trend is due to the new clusters formed by crowd gathering. At the same time when the new positive cases and new discharged cases increase, it is observed that the new positive cases are slightly higher than new discharged cases. The situation can be shown in the figure below.

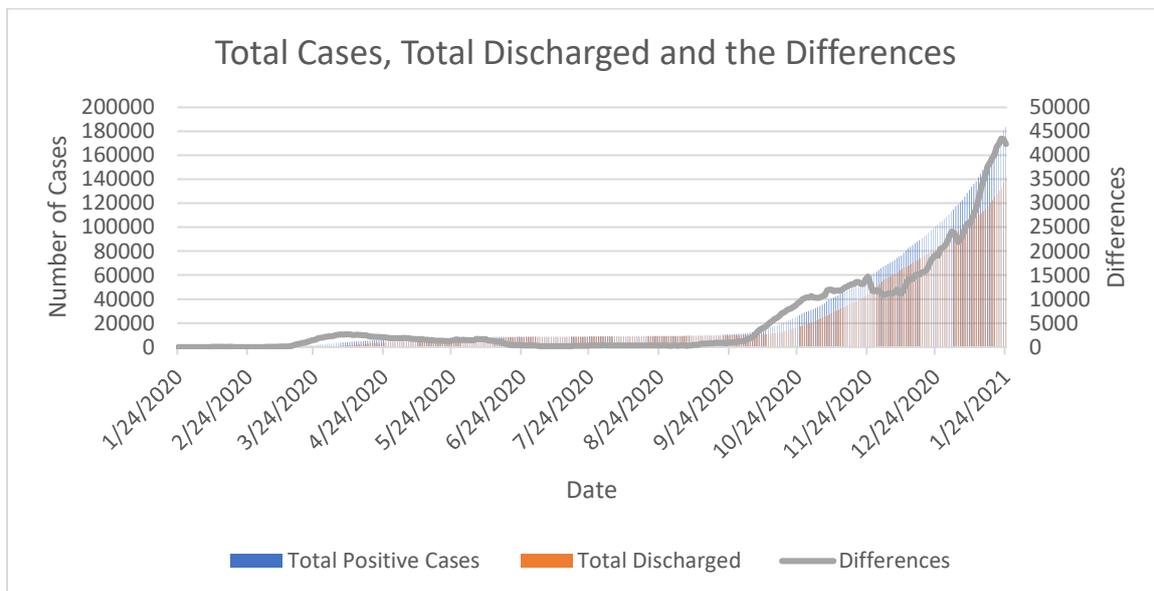


Fig 7. Graph of differences between total cases and total discharged

Based on the figure above, it has shown that the differences between total positive cases and total discharged are increasing since the end of September. However, the number of new positive cases are more than the number of patients discharged. The highest difference is 43474 on 22 January 2021.

2. Phrase 2

The result for second phrase is focusing on the Twitter users’ responses towards the Malaysia MOH’s COVID-19 posts. The Tweets activities includes retweets (repost of forward the post), replies (comment on the post) and like by users. Figure 5 shows the chart for total number of replies, retweet and likes. Figure 5 below shows the chart for sum of replies, retweets, and likes in one year.

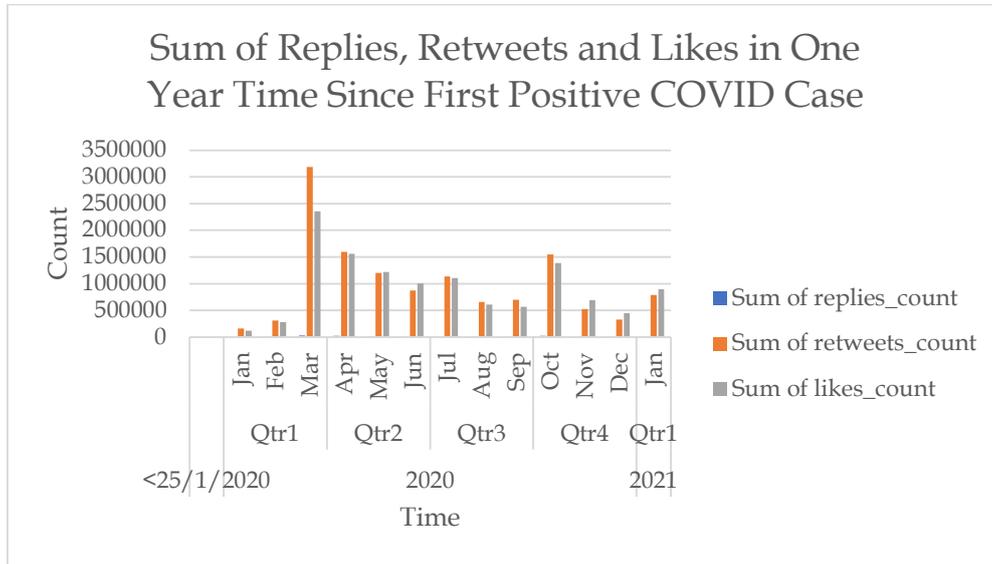


Fig 8. Chart of Replies, Retweet and Likes for Twitter

Fig 8 illustrated that the Tweets reaction is highest during March 2020, where the first MCO is executed. It is mainly caused by the first outbreak of COVID cases in Malaysia. Other than that, it also because of the people feel bored at home and focus on social media site during their whole day, as most of the economy activities are not allowed to operate during the first MCO. We can observe that January and February 2020 have the lowest Tweets activity because that time MCO is not yet implemented. The trend of Tweets is decreasing from March to September 2020. It is caused by the operation of Recovery Movement Control Order (RMCO) which people can travel out of house and spend less time in the social media sites.

Consequently, we can observe that the number of positive cases rise exponentially after September 2020 (as show in Figure 3). When people pay little attention towards COVID-19 post, they are not aware of the danger surrounding them. Therefore, there is a significant relationship between Malaysian’s consciousness towards COVID and the number of positive cases happened in Malaysia.

Starting from January 2021, when the MCO 2.0 starts again, the Twitter activity also shows an increasing trend again. Tables below show the highest number for three categories of Tweet activity.

TABLE IV. HIGHEST RETWEETS

Date	Tweet	Replies count	Retweets count	Likes count
18/3/2020	We beg you to stay at home and protect yourself and your family. Please	420	81934	52857
25/3/2020	Tempoh Perintah Kawalan Pergerakan dilanjutkan sehingga 14 April 2020. – YAB PM, Tan Sri @MuhyiddinYassin	594	55495	29270
10/4/2020	Perintah Kawalan Pergerakan (PKP) dilanjut lagi dua minggu bermula 15 April – 28 April 2020. – YAB PM Tan Sri @MuhyiddinYassin	373	51364	32297
26/5/2020	Kita masih dalam Perintah Kawalan Pergerakan Bersyarat (PKPB) sehingga 9 Jun ini. Saja nak ingatkan, 179ungkin ada yang terlupa.	347	49052	40705



	ðŸŽˆKita ulang dan akan terus ulang ucapan terima kasih dan tahniah kpd pasukan perubatan KKM. ðŸŽˆ <a href="https://t.co/dgPUIksReP">https://t.co/dgPUIksReP</a>			
2/10/2020	Terkini. 2 Okt. Kes baharu #COVID19 hari ini paling tinggi dalam sejarah iaitu 287 dan semua kes tempatan. Tertinggi, Kedah (129), Sabah (113), Selangor (31). Dua kluster baharu di Selangor, Seri Anggerik (Hulu Selangor) dan Seri Setia (Gombak). Tiada kematian.	639	39214	20713

From Table VI the highest replies post is “Dari awal lagi KKM telah nasihatkan orang ramai elakkan perhimpunan ramai...” (1462), followed by “Jika PKP tidak dilanjutkan selepas 14 April, KKM menasihatkan orang ramai tidak menyertai perhimpunan awam...” (1206), “Terkini. 5 Okt. Kes baharu #COVID19 hari ini 432 - (429 tempatan, 3 import) tertinggi...” (813), “TERKINI: Bilangan pesakit #COVID19 yang berjaya disembuhkan...” (650), and the post with the least replies is “Terkini. 2 Okt. Kes baharu #COVID19 hari ini paling tinggi dalam sejarah iaitu 287...” (639).

Based on the three tables, it is observed most Malaysian are concern on the MCO or CMCO, the new cluster and the advice from MOH which asked the people to stay at home and avoid gathering. It is also noticeable that the highest number of retweets, likes or replies are falls on the date when MCO or CMCO is implemented.

#### IV. RESULT AND DISCUSSION

In conclusion, the concern of Malaysian is tied with the MCO and followed by number of cases. It is observed that when the COVID cases dropped and MCO or CMCO is end, the Malaysian will lose their awareness towards COVID pandemic. However, the decline in the number of COVID cases or the end of MCO or CMCO does not mean the COVID pandemic has gone, it only implies that the scenario is getting slightly better. Hence, this research is done to urge all Malaysians to stay aware of the COVID pandemic, be cooperated with the government and MOH all the time. The war against this virus requires the help from every Malaysian to win.

#### V. ACKNOWLEDGMENT

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# *Water Quality And Benthic Macroinvertebrates Of Tropical Forest Stream In South-West Region, Cameroon*

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**Abstract** – A study was carried out in Ndongo stream, located in Buea, from May to October 2017, to assess the water quality and evaluate the structure of benthic macroinvertebrates. Physicochemical analysis showed that water from Ndongo was well oxygenated ( $82.21 \pm 6.59$  %), slightly acidic ( $\text{pH}=6.82 \pm 0.22$  UC) and alkaline with low quantities of nitrogen compound ( $2.9 \pm 3.57$  mg/L  $\text{NO}_3^+$ ;  $0.02 \pm 0.02$  mg/L  $\text{NO}_2^-$  and  $0.89 \pm 1.78$  mg/L  $\text{NH}_4^+$ ). Regarding the biology of macroinvertebrates, a total of 2058 individuals were collected and identified into 4 phyla, 5 classes, 11 orders, 32 families and belonging to 44 genera. The Shannon & Weaver and Pielou evenness reveal that the benthic macroinvertebrates were more diversified in upstream.

**Keywords** – Ndongo stream, benthic macroinvertebrates, water quality, diversity.

## I. INTRODUCTION

Water is a natural resource necessary for any form of life on earth. It is necessary for Man's domestic needs as well as agro-pastoral and industrial activities [1]. Water covers about 71 % of the terrestrial surface with a volume of about 1.4 thousand million  $\text{km}^3$  [2] ; [3]. Despite its abundance, only 1% of freshwater is available for the human population through streams, rivers and lakes [4].

In developing countries and notably in Cameroon, urban streams are used to collect various waste such as household and industrial wastes and wastewaters [5]. These activities have greatly contributed to water pollution causing a decrease in aquatic wildlife and flora [6] ; [7], which are useful in maintaining the integrity of freshwater. The evaluation of water integrity is based on measuring the physicochemical parameters coupled with the collection of organisms [8].

Although many aquatic organisms are involved in assessing the health status of these ecosystems [9] ; [10], benthic macroinvertebrates occupy a prominent place because of their taxonomic diversity, their abundance, their relative long life cycle (up to 3 years), their sedentary life style, their ability to bioconcentrate heavy metals and to colonize several environments [11] ; [12].

The present study aims to determine the benthic macroinvertebrate population structure in relation with the physicochemical quality of Ndongo stream, and tropical forest stream in the South-West Region, Cameroon. To achieve this main objective, (i) Some



## 2.2. Sampling and Analysis of Variables Physicochemical

The evaluation of physicochemical parameters was done monthly, following the recommendations of [18]. Thus, the temperature (°C), the dissolved oxygen (%) and the pH(UC) were measured *in situ* using a portable multimeter HANNA HI 991301.

In the laboratory, the orthophosphates, mineral form of nitrogen and turbidity were determined by colorimetry using the HACH DR 2800 spectrophotometer, followed by dissolved CO<sub>2</sub> and oxidability by volumetry. The results were expressed in mg / L and NTU.

## 2.3 Sampling of the Benthic Macroinvertebrates

Collection of benthic macroinvertebrates was done monthly from May to October, according to the multi-habitat approach [19], using a kick-net (30 cm x30 cm side, 400µm mesh size). Thus, in each station, 20 drags of kick-net were done in different microhabitats, corresponding to a surface of 3m<sup>2</sup>. The contents of each sample were introduced into polyethylene vials containing 10% formalin. In the laboratory, samples were rinsed with tap water using a 400µm sieve and all specimens caught were identified under a binocular stereomicroscope WILD M3B, using appropriate literature of [20], [21], [22], [23], [24], [25], [26].

## III. RESULTS

### 3.1 Physicochemical Parameters

The temperature of water varies from 22.4 °C (station ND1) to 28.4 °C (station ND2), with an average of  $24.06 \pm 1.51$  °C. The saturation rate fluctuates between 65% (station ND3) and 95% (station ND1), for an average of  $82.21 \pm 6.59$  % (Figure 2). About the space level, the Kruskal Wallis test shows that on the space plan, stocks of both parameters differ significantly ( $p < 0.05$ ).

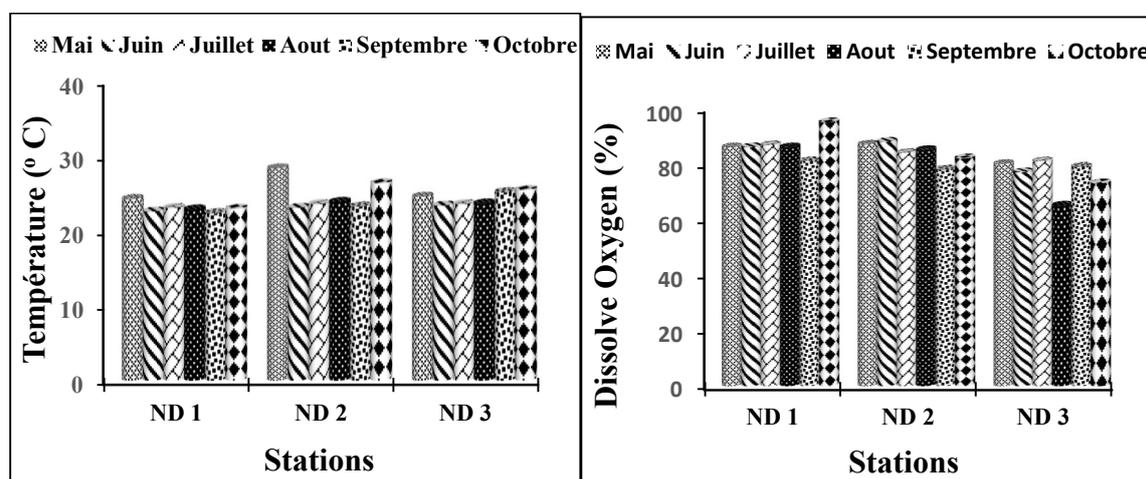


Figure 2 : Spatial variation of the temperature and dissolved oxygen in Ndongo stream during the study period.

The pH values range between 6.54 UC (station ND2) and 7.33 UC (station ND3), with an average of  $6.82 \pm 0.22$  UC. The ammoniacal nitrogen water content is relatively weak, with an average of 0.89 mg/L. The nitrites ions content varies from 0.006 mg/L to 0.095 mg/L, with an average of  $0.02 \pm 0.02$  mg/L. The nitrates offer the values spreading from 0.01 mg/L to 13.7 mg/L with an average of  $2.9 \pm 3.57$  mg/L. As for orthophosphates, data range between 0.02 mg/L and 11.7 mg/L, with an average of  $1.26 \pm 2.71$  mg/L (Figure 3). These five variables do not show a significant difference on the spatiotemporal plan ( $p > 0.05$ ).

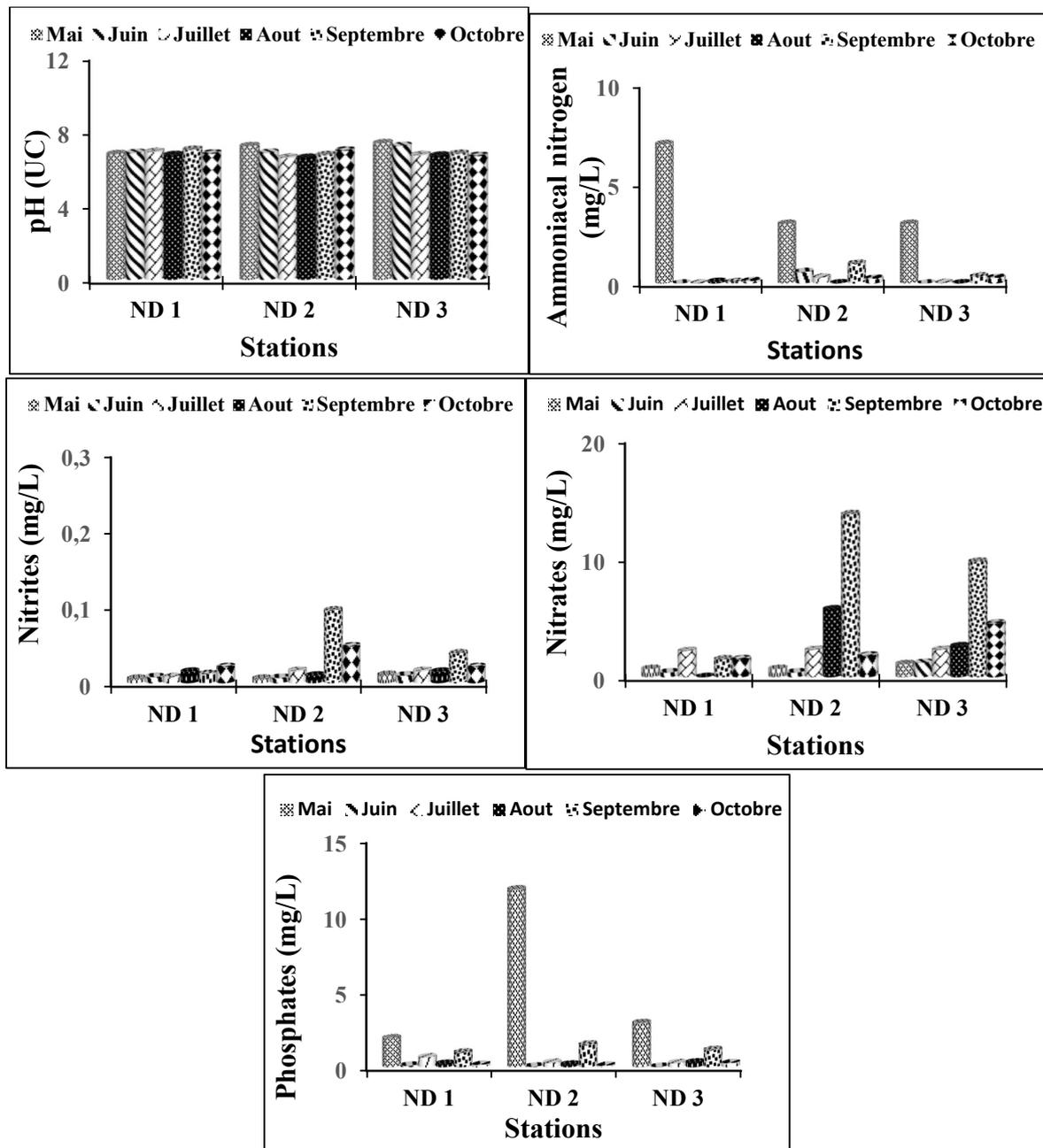


Figure 3 : Spatial variation of pH, nitrites, nitrates, ammonium and phosphates in Ndongo stream during the study period.

### 3.2 Benthic Macroinvertebrates

A number of 2058 benthic macroinvertebrates were collected, identified and divided into 4 phylums, 5 classes, 11 orders, 32 families and more than 44 genera. The Arthropods represent 83.87 % of relative abundance followed by Molluscs (15.45 % of relative abundance), Annelids and Plathelminthes with respectively 0.58 % and 0.1 % of relative abundance.

Among the arthropods phylum, the class of insects dominates with 81.10 % of relative abundance and count 6 orders, 23 families and more than 33 genera, followed by the class Gastropoda with 15.45 % of relative abundance and 1 order, 3 families and 5 genera. Then, comes the class of Shellfish with 2.77 % of relative abundance and divided into 2 orders, 4 families and 5 genera and lastly, the classes of Oligocheta and Annelids with respectively 0.58 % and 0.1 % of relative abundance (Figure 4). The order of Odonata dominates with 811 individuals and 39.40 % of relative abundance, followed by Ephemeroptera with 394 individuals and 19.14% of relative abundance, Mesogasteropods with 318 individuals and 15.45 % of relative abundance and Heteroptera with 245

individuals and 11.90 % of relative abundance. The 7 other orders (Diptera, Decapoda, Trichoptera, Coleoptera, Isopoda, Lumbriculida and Triclada) represent 14.09 % of total abundance. Among the 32 families, 6 belong to the order of Ephemeroptera, 5 to the order of Coleoptera, 4 to the order of Heteroptera. The order, of Diptera, Mesogasteropoda and Trichoptera count each 3 families, Decapoda, Isopoda and Odonata 2 families and Lumbriculida and Triclada one family (Figure 5A). The taxonomic richness shows that, the station ND1 is more diversified (26 families), followed by stations ND2 (16 families) and ND3 (15 families) (Figure 5B).

Furthermore, the station ND1 is dominated by the orders of Heteroptera (32.48 % of relative abundance) and Ephemeroptera (27.52 % of relative abundance), the Diptera and Oligocheta being absent. The station ND2 is characterized by the predominance of Odonata (74.61 % of relative abundance), followed by Ephemeroptera (9.95 % of relative abundance) and Diptera (6.51 % of relative abundance). The station ND3, is dominated by the Odonata (36.67 % of relative abundance), Gastropods Physidae (27.16 % of relative abundance) and Ephemeroptera (18.89 % of relative abundance) and 5 families, with two families (Caenidae and Baetidae) counting 2/3 of individuals.

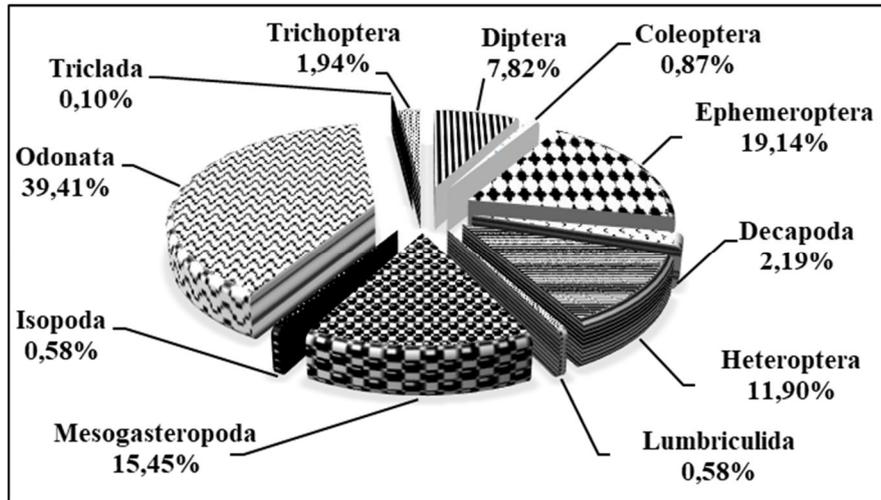


Figure 4 : Relative abundance of benthic macroinvertebrates orders collected in Ndongo stream

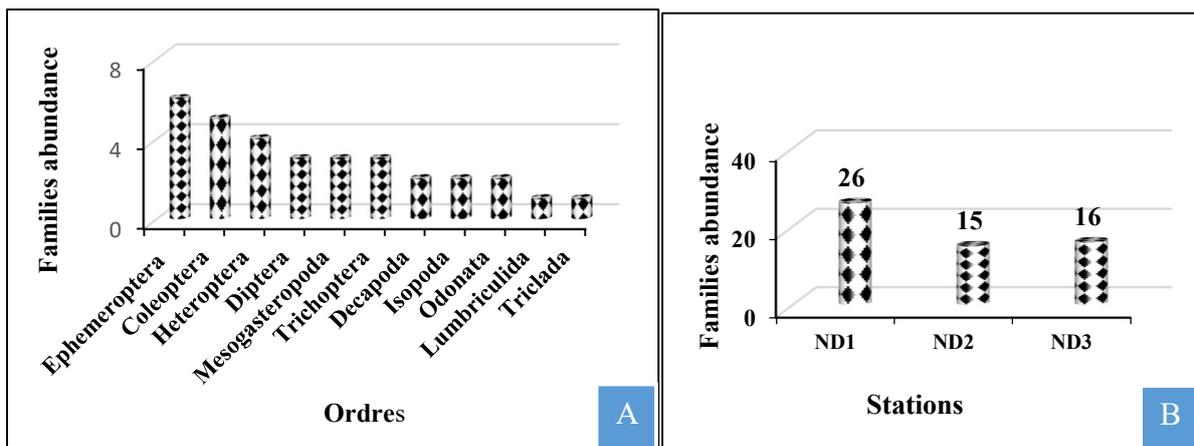


Figure 5 : Relative abundance of benthic macroinvertebrate families per order (A) and per station (B) in Ndongo stream during the study period.

The diversity index of Shannon & Weaver ( $H'$ ) shows a low value (1.96 bits / ind.) at the station ND2, and a high value (3.69 bits / ind.) at the station ND1. Also, the evenness index of Pielou varies in the same meaning with a relatively low value (0.45 bits/ind) at the station ND2 and a high value (0.75 bits/ind) at the station ND1 (Figure 6).

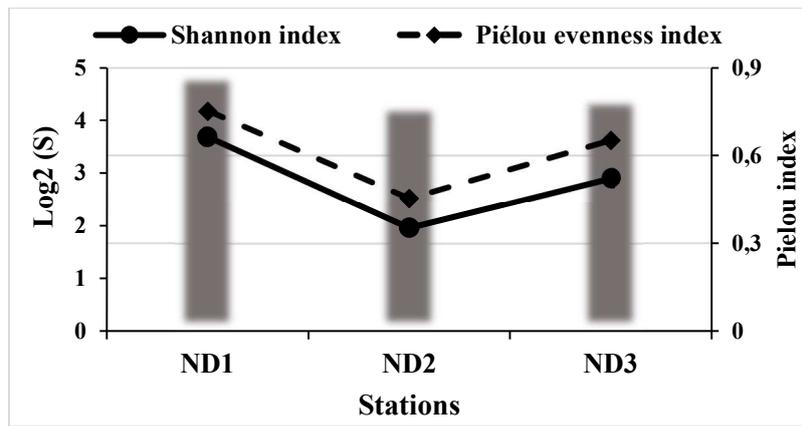


Figure 6 : Shannon & Weaver index and Pielou evenness in Ndongo stream during the study period.

The EPT index varies from 6 families at the stations ND2 and ND3 to 9 families at the station ND1 with an average of  $7 \pm 1.73$  families. The EPT density/Chironomidae density oscillated between 1.29 at the station ND3 and 1.89 at station the ND2 with an average of  $1.04 \pm 0.94$ . These values are higher than 1.00 and showing a perturbation of the environment.

### 3.3 Principal Component Analysis (PCA)

The Principal Components Analysis (PCA) was used with the aim of discriminating the stations and to correlate affinities between the environmental factors and some organisms. The correlation index organizes the stations into three groups. The first group (N1) found around the station ND1, is colonised by the polluosensitives organisms as Veliidae, Thiaridae, Atyidae, Ephemerellidae, Hydropsychidae and Leptophlebiidae. Water here is characterised by a high rate of dissolved oxygen and low ammonium concentration. The second group (N2) organized around the station ND2, is dominated by the family of Coenagrionidae which show an adaptation to high temperatures in water and poor in nitrites and nitrates. The third group (N3) formed around the station ND3, includes polluosensible (Baetidae and Caenidae) and polluotolerant organisms (Physidae and Chironomidae) (Figure 7).

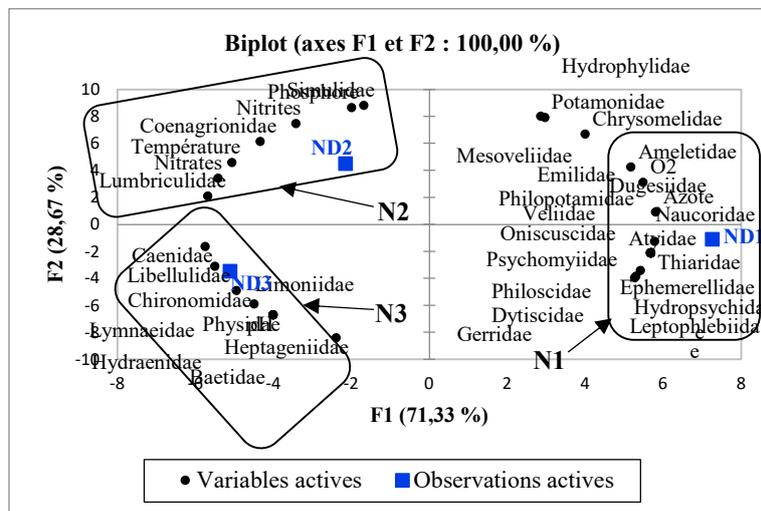


Figure 7 : Principal Components Analysis (PCA) of physico-chemical and biological parameters in Ndongo stream during the study period.

## IV. DISCUSSION

### 4.1 Physicochemical parameters

The low temperatures obtained at different stations of Ndongo stream could be explained by the important vegetable cover which would constitute a great barrier reducing the sun's rays impact on the water. These observations follow those of [27], [11]

who noticed that in the forest streams, temperatures are low because of the influence of the canopy. Furthermore the high value of temperature (28.4°C) raised at the station ND2 is due to its opening to sun's rays. These observations are similar to those of [28], [29] who suggested that there is a linear relationship between the temperature of the water and the air temperature. The rate of dissolved oxygen obtained along the stream (> 70%) can be explained by the important vegetable cover which maintains a natural ventilation upstream [30], [11], [12] and also by the presence of rocky blocks involving a high turbulence of water and oxygenizing it [31], [32]. The relatively acid values of the pH (6.82 CU) would be related to the volcanic soil [33]. Similarly, the degradation of the organic matter or the respiratory activity could involve the acidification of the water [34], [35]. The low value of mineral nitrogen (NH<sub>4</sub><sup>+</sup>, NO<sub>2</sub><sup>-</sup>, and NO<sub>3</sub><sup>-</sup>) indicates the high rate of dissolved oxygen and low mineralisation activity of the water [30], [11], [12]. [36] mentioned that the nitrites are maintained in the watercourse only when the medium is not well oxidized. On the other hand, the high value of nitrates observed in September at the station ND2 and the high orthophosphates value recorded in May and September would be due to runoff of rains. A similar observation made by [37] which notices that runoff induces great variations of phosphates, nitrates, ammoniacal nitrogen, and decomposition of the organic matter specially after the rains.

The low concentration of the organic pollution indicator parameters (Nitrates, Ammonium), the high value of dissolved oxygen and the low temperature of water show the low anthropogenic activity and leads to a good ecological quality of Ndongo stream, favourable to the development of the aquatic communities [30].

### 4.2 Biology

The taxonomic richness of benthic macroinvertebrates collected in the Ndongo watercourse is low compared to those of Mah Fontie [38], and Abumucchui [39]. Nevertheless, the domination of the insects could be explained by their genetic plasticity, their cosmopolitanism and thus their aptitude to colonize the heterogeneous ecological zones [40], [41]. Besides, the abundance and the diversity of this group testify the little anthropized character of the Ndongo stream [21], [42].

The prevalence of Heteroptera followed by Ephemeroptera at the station ND1 would involve a good ecological quality of water of this portion of the stream. Indeed, Ephemeroptera constitutes one of the polluosensible faunistic groups [20], [42]. Also, the absence of Diptera and Annelida in the same station would be an indication of a very low pollution of the station ND1. These results are different to those of the station ND3 which is characterised by the predominance of Odonata, followed by Gastropoda, Physidae and Ephemeroptera. This shows that the station ND3 is subjected to an organic pollution due to anthropic activities.

In fact, [21], [42] reveal that in the polluted hydro systems, the benthic macrofauna is largely dominated by saprophil and saprobiont taxa such as Physidae, Hydrobiidae, Tubificidae, Chironomidae. The coexistence of the polluosensible organisms (Ephemeroptera : Baetidae and Caenidae) with the polluo-resistant organisms (Physidae) observed at the station ND3 could be explained by the low polluosensible character of the Ephemeroptera which develops tendencies to the tolerance. This coexistence is seen between Baetidae, Caenidae and molluscs Physidae [20], [42].

### 4.3 Biocenotic Index

The values of Shannon & Weaver index and Pielou evenness show a diversification and tendency to the equi-repartition of the species. Furthermore, the low values of Shannon & Weaver index and Pielou evenness observed at the station ND2 indicated a low diversity and population of benthic macroinvertebrates dominated by Coenagrionidae *Coenagrion sp* of relative abundance of 70 %. These observations are similar to those of [43] and [44], which indicated that Shannon & Weaver diversity index decreases with very high relative abundances.

In general, Ndongo stream contained a great number of sensitive organisms which require good health conditions to their development. At the station ND1, the predominance of Heteroptera (Veliidae) and the Decapods (Athyidae) are observed. Some authors consider that these groups are not sensitive to pollution. These observations are not similar to our results. Indeed, Veliidae and Athyidae are generally collected in stream of good ecological water quality. [45] showed the order of Decapoda which would be assimilated to average tolerance taxa are more sensitive in our environment. Also, [46] notices that Coleoptera and Hemiptera are sensitive and should be considered as water quality bioindicators in Cameroon. On the other hand, at the station ND3, we observe the predominance of the polluosensitive organisms belonging to EPT group (Ephemeroptera, Plecoptera, Tricoptera) notably Baetidae and Caenidae, and polluo-tolerant organisms. This cohabitation shows that Baetidae and Caenidae are more polluo-tolerant than polluosensitive. Some observations were made by [20], [42] which give these organisms a weak indicating capacity as polluo-tolerant organisms (Chironomidae and Physidae).

## V. CONCLUSION

The Ndongo stream water is well oxygenated, slightly acid, with low tenors of mineral nitrogen. The benthic macroinvertebrates population is rich, diversified and balanced. A total of 2058 individuals was collected and divided into 4 phyla, 5 classes, 11 orders, 32 families and more than 44 genera. The Arthropod phylum is more abundant and dominated by the class of Insects, followed by Gastropoda and Shellfishes. The dynamics of the benthic macroinvertebrates population vary from upstream to downstream. Ndongo stream has good ecological water quality, upstream characterized by a high diversity of benthic macroinvertebrates and low anthropic activities. However, the diversity decreases from upstream to downstream, due to the proliferation of pollutotolerant taxa. Also, the Baetidae and Caenidae families although belonging to the EPT group (Ephemeroptera, Plecoptera Tricoptera), would be more pollutotolerant than pollutosensible

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## *Morpho Functional Indicators Of Girls Involved In Athletics*

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**Abstract – Exercise makes high demands on the body, especially the female, due to its physiological characteristics. The article contains a study of the impact of athletics on the female body. Athletes 16-19 years old were studied somatometric (height, body weight, chest circumference, dynamometry of the hands) and physiometric (vital lung capacity, heart rate, blood pressure) indicators.**

**Keywords – Athletics, Female Body, Somatometric And Physiometric Measurements.**

### I. INTRODUCTION

Athletics is a sport that includes several types of exercises: walking, running, jumping, throwing. Each of these species has a versatile effect on the human body. They develop qualities such as strength, speed, endurance. These exercises increase the functionality of the body and ensure high performance.

Systematic physical culture and sports activities significantly affect many morphological and functional characteristics of the body, depending on age and gender. [1,3]

In this regard, it is important to study the physical activity of the female body, taking into account the characteristics of development.

It is known that the female body is significantly different from the male in its morphological and functional indicators. First of all, these are differences in body size, height, functional indicators for physical activity. These rates are lower in women than in men, which is associated with lower performance and lower heart and blood volumes. [6.9]

Of particular interest is the study of physiological and anthropometric indicators and the adaptation of systems to the functional loads of the female body involved in various sports.

The aim of this study was to study the effect of physical activity on the physical development and functions of the cardiorespiratory systems of the body of girls aged 16-19, who go in for athletics.

### II. METHODOLOGY

The study involved girls attending the Olympic Reserve Sports College in Andijan. The functional state of the organism of girls aged 16-19 years was studied, in each group there were 25 people. Anthropometric measurements were carried out in all subjects: height, body weight, chest circumference at rest, during inhalation and exhalation. Measurement of the chest circumference in all these conditions was carried out at the level of the armpit, the level of the nipples of the mammary glands and the level of the xiphoid process of the sternum. In addition, the strength of the muscles of the hand was determined by the dynamometry method. [2]

To study the functional parameters of the girls' bodies, the heart rate (HR) was measured, blood pressure (BP) was measured by the Korotkov method and the vital capacity of the lungs (VC) by the spirometric method. [2]

As a control group, we studied similar indicators of students of secondary schools of the same age in Andijan.

The data obtained were statistically processed by the Student-Fisher method.

### III. RESEARCH RESULTS AND DISCUSSION

Exercise is an important part of a healthy lifestyle. One of the indicators of health and physical development is body weight and length. The study of body growth is necessary to assess other signs of physical development, and body weight is the most sensitive parameter with the fastest dynamics of change.

Exercise leads to an increase in muscle mass and therefore an increase in maximum muscle contraction force. [7.8]

According to our data, the body weight indicators of female athletes of 16 years old averaged  $53.2 \pm 1.8$  kg, 17 years old -  $60.6 \pm 2.3$  kg, 18 years old -  $59.8 \pm 2.1$  kg, 19 years old -  $61.1 \pm 1.9$ kg. The data obtained showed that the greatest increase in body weight was observed in girls 17-19 years old compared to 16 years old, which can be explained with certain hormonal shifts in the girls' bodies. Similar results were revealed in terms of height:  $159.7 \pm 1.6$  cm,  $164.0 \pm 1.9$  cm,  $160.7 \pm 1.6$  cm,  $164.9 \pm 2.3$  cm, respectively, a comparison of the average growth rates of female athletes and girls who do not go in for sports did not reveal significant differences ( $p > 0.5$ ).

Due to the fact that an increase in muscle strength leads to an increase in the strength of muscle contractions, the contraction of the flexor muscles of the fingers of the hands was studied. The maximum force of contraction of the fingers of the right hand in girls 16 years old averaged  $26.3 \pm 1.3$  kGm, 17 years old -  $31.9 \pm 1.2$  kGm, 18 years old -  $32.0 \pm 1.8$  kGm, 19 years old -  $34, 0 \pm 1.3$  kGm. The same indicators of the left hand were  $25.7 \pm 1.5$  kGm,  $29.6 \pm 0.3$  kGm,  $31.0 \pm 1.4$  kGm,  $33.5 \pm 1.2$  kGm, respectively. These data showed a significant increase in the maximum force of muscle contraction depending on the age of the athletes ( $p < 0.001$ ).

It is known that the respiration of women is characterized by lower volumes and capacities of the lungs, higher frequency indices. In this regard, it was of interest to study the shape of the chest, topography and morpho-functional properties of the organs of the chest cavity. Therefore, measurements of the chest at the level of the armpit, nipples of the mammary glands and the xiphoid process of the sternum were taken at rest, deep inhalation and exhalation. Resting chest circumference at the level of the armpit in female athletes increased with age. A significant increase was found in girls 19 years old ( $p < 0.01$ ). Similar data were obtained when measuring at the level of the nipples of the mammary glands. An increase in these indicators was observed in girls of age groups. However, this increase was not significant. Measurements at the level of the xiphoid process of the sternum also showed an increase. With a deep breath, all groups of subjects showed an increase in indicators in all types of measurements. The greatest significant increase in the chest circumference with a deep breath was found in girls 17 and 19 years old. This was especially true for measurements at the level of the nipples of the mammary glands and the xiphoid process of the sternum, which indicates an increase in the volume of the chest.

The indices of the chest circumference during deep exhalation practically did not differ from those at rest.

As can be seen from the data obtained, physical exercises have a significant effect on the physical development of the body, which indicates the development of complex compensatory-adaptive reactions that arise as a result of physical exertion. In this regard, it is of great interest to study the state of the cardio-respiratory system of the body of girls involved in athletics. The heart rate in girls 16-17 years old was  $88.0 \pm 1.3$  beats / min and  $82.8 \pm 0.7$  beats / min, respectively, which is associated with the physiological state of the body. Since the formation of the cardiovascular system continues in this period, which affects the state of this indicator, the heart rate level in girls 18-19 years old was lower:  $74.0 \pm 1.5$  beats / min and  $73.8 \pm 1.8$  beats / min, respectively. This is an indicator that the activity of the cardiovascular system is approaching that of an adult body. Comparison of these indicators for girls 16 and 19 years old revealed a decrease in heart rate in girls 19 years old by 14.2 beats / min. This difference is statistically significant ( $p < 0.001$ ). A decrease in heart rate at rest to a certain extent reflects the productivity and efficiency of the functioning of the cardiovascular system.

The data obtained show that a decrease in heart rate occurs due to an increase in the systolic volume of the heart. This increase indicates that an increase in the physical performance and qualifications of athletes leads to corresponding changes in the functional state of the heart.

Therefore, changes in heart rate as a result of exercise depend on the age and duration of the exercise. The dynamics of this state reflects the level of metabolism in the body and its efficiency.

Blood pressure indicators were studied along with the heart rate. The blood pressure level depends on the following factors: the amount and viscosity of blood entering the vascular system per unit of time, the capacity of the vascular system, physical activity, the external environment, etc.

It is known that systolic and diastolic pressure in healthy men grows evenly with age, while in women the dependence of pressure on age is more complicated: from 20 to 40 years, their pressure increases slightly, and its value is less than that of men; after 40 years, with the onset of menopause, blood pressure indicators rapidly increase and become higher than in men [2,7]. During exercise, systolic and diastolic blood pressure, cardiac output and heart rate increase.

BP indicators in athletes are within age groups. With the development of fitness, there is a tendency to an increase in blood pressure. [5,10]

According to our data, systolic blood pressure in 16-year-old girls was  $96.6 \pm 1.0$  mm Hg. Art. ,  $102.0 \pm 2.2$  mm Hg, and  $107.2 \pm 1.6$  mm Hg ( $p < 0.001$ ), respectively. Diastolic pressure also tended to increase (Fig.). This is due to a decrease in tissue demand for blood supply. In this regard, small arteries narrow, their lumen decreases. The resistance to the outflow of blood to the periphery during diastole increases, which leads to an increase in diastolic pressure [10].

Systematic exercise also affects the morphological and functional capabilities of the respiratory system. This is one of the most important conditions that ensure increased oxygen consumption during work. These changes are expressed in the development of the respiratory muscles, which can be judged by the measurements of the chest circumference in various states (Fig. 1).

An important indicator of an athlete's physical performance is the vital capacity of the lungs (VC). VC depends on gender, age, body size, physical development. This indicator for girls 16 years old was  $2942, 0 \pm 131.1$  ml. With age, a significant increase in VC was observed ( $p < 0.001$ ). To assess the respiratory function of the lungs, a vital indicator was calculated, i.e. the ratio of VC (in ml) to body weight (in kg). The vital index was within the normal range (tab. 1). An increase in this indicator depending on age indicates the development of the respiratory function of the chest of athletes.

Table 1. Respiratory system indicators in female athletes depending on age

Age, year	LVC, ml	Life index ml / kg
16	$2942,0 \pm 131,1$	55,3
17	$3264,0 \pm 69,3$	53,8
18	$3468,0 \pm 90,8$	57,9
19	$3532,0 \pm 71,16$	57,8

Along with this, calculations of the Quetelet index were made, which was calculated as the ratio of weight in g to height in cm. According to our data, the average indicator of this index for girls aged 16-19 was 354.6 g / cm; 369.5g / cm; 372.1 g / cm; 370.5g / cm respectively.

Thus, regular exercise causes certain changes in all body functions. For the harmonious development of physical, moral, moral-volitional qualities, the correct construction of the training process is important. [4] When organizing and conducting athletics classes with women, it is necessary to take into account their anatomical and physiological characteristics at different age periods.

It is known that the development of a woman's body in these age periods is uneven. For example, the growth of the body in length in girls under 11 years of age is more intense than weight gain. The proportions of the body change: the legs lengthen, the chest rate decreases.

In adolescence, the physical development of girls differs significantly from the development in the previous period, since the active period of puberty begins. At this age, signs of uneven growth of parts of the body are clearly manifested.

During puberty, the rate of growth and development of the respiratory system is the highest, the aerobic capacity of the body increases. The mechanisms of adaptation of the cardiovascular system as a whole to physical activity during this period are not yet perfect [1]. At the age of 16-18, gender differences in body size and proportions, functional capabilities and general working capacity of boys and girls become clearer. loads leads to an increase in the functional capabilities of the body of girls and girls, who, in many important indicators of the functional state, differ significantly from girls who do not go in for sports.

Each type of athletics has a different effect on the body of women and contributes to the development of the necessary qualities. When carrying out training sessions in all types of athletics, it is necessary to take into account the peculiarities of the specific biological cycle of the female body - the ovarian-menstrual cycle (OMC) and the physical capabilities of women, depending on their specialization.

Menstrual irregularities occur with excessive physical exertion or overtraining and cause an increase in the release of adrenocorticotrophic hormone by the pituitary gland, which increases the release of androgens by the adrenal glands, this inhibits the function of the pituitary gland, as a result of which the function of the ovaries is disrupted.

When developing and improving physical qualities and motor skills in training athletes, it is necessary to be guided by the general principles adopted in training. At the same time, it is necessary to take into account the specifics of the female body. Knowledge of the basics of physical training, ways of developing and improving physical potential, medico-biological foundations of training and hardening contributes to the achievement of a high level of health and harmonious perfection of a person.

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# *School Biological Education With A Focus On World Experience*

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**Abstract** – The international student achievement assessment program (PISA) is an international assessment of skills and knowledge from 15-year-old students, in addition, it provides information on a range of factors that contribute to successful studies, schools, and the education system. PISA is the result of joint efforts of the Organization for economic cooperation and development (OECD) member countries. As PISA is an international assessment, it measures skills that are universally recognized as key outcomes of the educational process. Instead of testing on facts, the assessment focuses on young people at the end of compulsory school education and their ability to use their knowledge and skills to meet real-world challenges.

**Keywords** – Education, PISA, Literacy, Thinking, Natural Science Knowledge, Creativity, Natural Science Literacy, Competence.

On August 12, 2020, the President of the Republic of Uzbekistan signed a decree "On measures to improve the quality of continuous education and the effectiveness of science in the areas of" chemistry "and" biology ".

The document notes that the quality of teaching in the subjects "chemistry" and "biology" does not meet modern requirements, the teaching methodology and laboratories are morally outdated, mechanisms of decent incentives for teachers' work in general education schools are not introduced, there is no close relationship, effective dialogue and cooperation between institutions secondary specialized, vocational, higher education, research institutions and industrial enterprises of the industry for the training and use of scientific results. [1]

The decree approved the gradual creation in each region of the republic of 14 basic schools specialized in chemistry and biology, equating the specialized boarding school for young biologists and chemists named after Abu Ali ibn Sina with the status of these schools. In addition, 150 specialized schools with in-depth study of chemistry and biology will be gradually created in the regions (cities) of the republic. 55 departments of higher educational institutions will be assigned to basic specialized schools and specialized schools to coordinate effective teaching of the subjects "chemistry" and "biology" in these schools. production enterprises will be assigned to 47 professional educational institutions that train middle-level personnel in specialties corresponding to the areas of "chemistry" and "biology" in order to effectively establish a system of training middle-level personnel for industries.

11 research institutes of the Academy of Sciences and industries will be assigned to 74 departments of higher educational institutions for the effective organization of the educational process in the areas of "chemistry" and "biology" and the development of subjects in higher educational institutions.

The head of state instructed to create special funds without the status of a legal entity under the Council of Ministers of the Republic of Karakalpakstan, khokimiyats of regions and the city of Tashkent for additional financing of activities, equipment, payment of allowances to teachers, as well as financing other activities for teaching the subjects "chemistry" and "biology" in schools, specialized in chemistry and biology. A plan will be developed to assess the knowledge and pedagogical skills of teachers in the subjects "chemistry" and "biology" of specialized schools and to improve the qualifications of selected candidates.

Starting from January 1, 2021, the amount of the established allowance to the base rate of teachers in the subjects "chemistry" and "biology", as well as management personnel (director and deputy director for specialized subjects), admitted to specialized schools and basic specialized schools will be increased by 50 percent ...

The State Testing Center, together with the Ministry of Higher and Secondary Specialized Education, the Ministry of Public Education, the Academy of Sciences and the Uzstandart agency, were instructed to implement a national certification system to assess the level of knowledge in the subjects "chemistry" and "biology" by February 1, 2021. Students of general education schools, academic lyceums and vocational colleges who have received a national certificate of the level that provide an exemption, upon admission to higher educational institutions, are exempted from passing tests in the subjects "chemistry" or "biology" with the award of a maximum score, respectively, in the subjects "chemistry" or "biology". A national competition will be organized for the creation of educational and scientific literature on the subjects "chemistry" and "biology" for educational institutions based on the best foreign experience. Authors, recognized as winners by the results of the national competition, are encouraged by a one-time monetary reward in the amount of 100 million soums at the expense of the fund for supporting innovative development and innovative ideas. Starting from 2021, once every two years, international subject Olympiads in chemistry and biology named after Abu Raikhan Beruni will be organized among students of higher educational institutions.

On November 6 of this year, the Decree of the President of the Republic of Uzbekistan "On measures for the development of education and science in a new period of development of Uzbekistan" was adopted. The decree entrusted the task of studying the experience of advanced countries in the field of school education, in particular, the characteristics of the Finnish educational system. The head of our state cited Finland as an example; this country is characterized by its successes in international studies to assess the quality of education. Finnish schoolchildren scored the best in literacy and educational equity across the board in PISA. [2] Thus, the international student assessment program (PISA - The program for international student assessment) is the most common of the research programs. In 2015, more than 500,000 young people from 72 countries and over 600,000 from 79 countries took part in the PISA survey. A distinctive feature of PISA is that it measures literacy in various fields. Literacy is defined as "the ability of learners to apply knowledge and skills to key topics, the ability to effectively analyze, reason and communicate in identifying, interpreting and solving problems in different situations." The PISA program assesses students' literacy in math, science and reading in repetitive cycles every 3 years.

Modern schools today require the use of a variety of methods in the lesson process and the application of an innovative approach to teaching subjects. Much has been said and said about the newest methods of teaching the lesson at its different stages. but the current school has already risen to the level where innovative methods can be applied to the control of the assimilation of knowledge by students over a certain period. [five]. In addition to standard types of control, in which students' knowledge of the topics covered are assessed, it is also recommended to use PISA tests, which help the teacher to develop the logic, memory and thinking of students.

The authors of PISA proceed from the fact that the new quality of education is associated with the reorientation of the school to work in the logic of the competence-based approach (competence is understood as the ability of a person to act effectively in non-standard situations), and the PISA studies are the measure of the level of development of competence.

Typically, a PISA task consists of text or texts that are united by a common theme, provided with pictures, graphs, tables (both containing and not containing information useful for successfully answering questions), a set of questions related to the topic set by the information block.

Science literacy is the ability of a person to take an active civic position on issues related to the natural sciences, and his willingness to take an interest in natural science ideas.

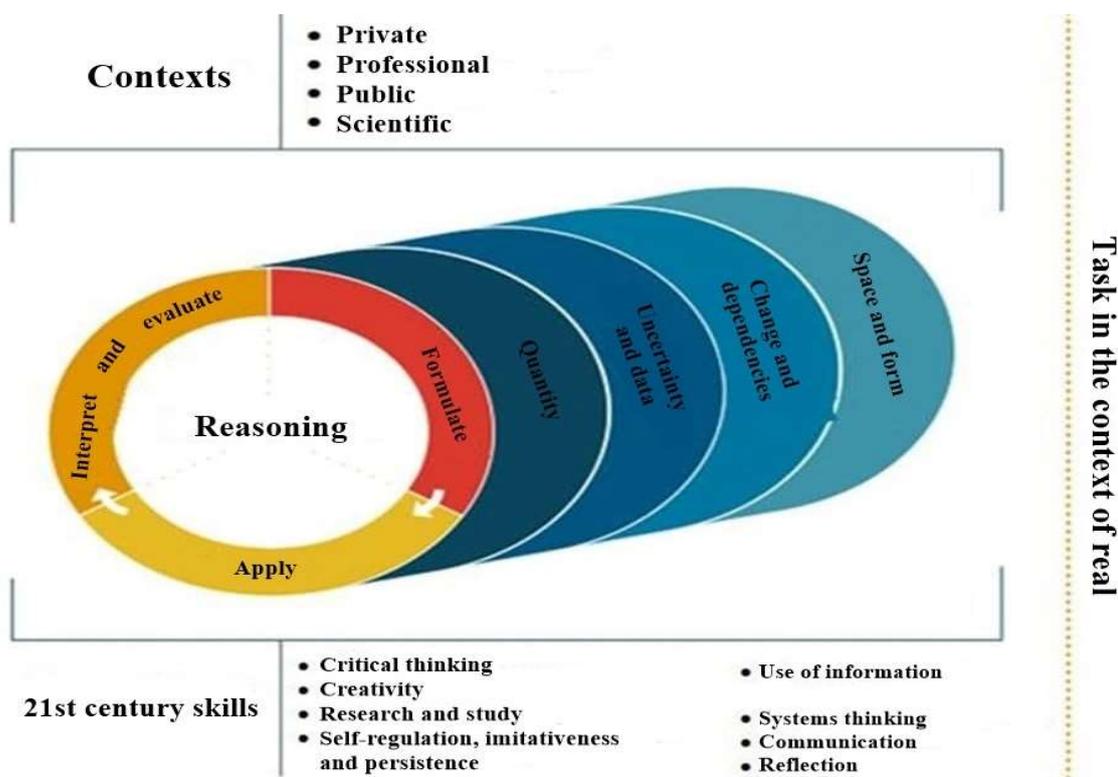
Natural Science Literacy Natural sciences and technologies have an impact on the material and intellectual spheres of society. The content framework of the PISA Science Literacy Test has four components.

First block. "Context" provides for three groups of tasks presented in real life situations. it is "personal", "social" and "global" (health, natural resources, environment, sources of danger and risks, links between natural science and technology).

Second block. "Competence" assesses three skill groups "recognizing and posing scientific questions" (identifying problems, identifying keywords and finding key features), "scientific explanation of phenomena" (applying knowledge, justifying or interpreting phenomena and recognizing) and "using scientific evidence" (formulating conclusions and assessing the consequences).

Third component. "Knowledge" includes such sections and topics as "physical systems" (structure of matter, chemical changes in substances, movement and forces, energy), "system of living organisms" (cell, man, populations, ecosystems and biosphere), "earth and space systems "(Shells, energy in systems and the history of the earth) and" technological systems "(connection between science and technology, inventions).

Fourth block. "Attitude" reveals the level of formed skills of curiosity and interest of students in science and research problems. Thus, the content blocks and tools of this direction allow us to determine the ability of a 15-year-old adolescent to understand and understand, explain and reasonably prove natural science phenomena and formulate scientifically grounded conclusions.



A natural science literate person seeks to participate in a reasoned discussion of problems related to natural sciences and technology, which requires him to have the following competencies: explain phenomena scientifically, evaluate and plan scientific research, scientifically interpret data and evidence.

PISA is fundamentally different from other existing assessment systems. They consist in:

1. The breadth of coverage. many world states participate in the program.
2. A focus on lifelong learning. Study participants report about their self-image after some time, about their motivation to continue their studies after basic education, about strategies for acquiring new knowledge and skills.
3. Orientation towards a policy that involves linking data on educational outcomes and attitudes towards learning with information about the background of students, their social status and the factors that influence the assimilation of knowledge and skills in schools.

4. Consistency and orderliness, allowing the participating countries to track the success of achieving educational goals over time.

Natural science literacy. it is regarded as a human capacity for an active citizenship in the natural sciences, as well as a complete willingness to take an interest in ideas in the natural sciences. a modern person should be competent in explaining phenomena, interpreting evidence and data, planning and evaluating research, arguing discussion of topical world problems [6]. Also, within each cycle, additional directions are introduced. for example, in 2012 financial literacy was tested, in 2015 attention was paid to problem solving, in 2018 the emphasis was on global competencies.

In 2021, representatives of our country are participating in the PISA study for the first time and are now preparing. Seminars are currently being held in fourteen regions. Seminars, which are held in the regions of Uzbekistan, are important for preparing the country for participation in international studies, which are a mechanism for increasing the global competitiveness of Uzbekistan [4].

Our representatives decided that the study will be carried out in a computer version. Uzbekistan will participate in this study in electronic format. Representatives of our country will be able to successfully conduct a PISA study. Since Uzbekistan is participating in these studies for the first time, there are no concrete results so far, and it is difficult to say anything. Representatives of our country in mathematics and natural sciences will be able to give better results. [3]. Our country has set itself the goal of participating in international research. This is not just some control of the state of education, but a direction that will provide information about the state of the education system, help improve the education system and make it more competitive. Countries need to participate in international research as they provide external assessments against international standards.

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# *Isolation Of Hydrolytic Enzymes By The Salivary Glands And Their Content In The Blood After Unilateral Nephrectomy*

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**Abstract – We studied the mechanisms of transformation of some salivary enzymes and established the real contribution of the salivary glands to the enzymatic homeostasis of the body in unilateral nephrectomy.**

**The results were obtained that with unilateral nephrectomy, the content of amylase and pepsinogen in the blood increases, but its lipolytic activity remains unchanged, the volume of basal secretion of the salivary glands, the content and release of amylase by the parotid salivary gland increases. Unilateral nephrectomy stimulates the increment of pepsinogen by the gastric glands, and, accordingly, enhances its recreation from the blood, by the salivary glands. After unilateral nephrectomy, lipolytic activity and its secretion in saliva remain unchanged.**

**Keywords – Homeostasis, Nephrectomy, Pepsinogen, Lipolytic, Hypertrophied.**

## I. INTRODUCTION

It is well known that after unilateral nephrectomy, the remaining kidney is compensatory hypertrophied. A huge amount of literature is devoted to this issue, which emphasizes the theoretical and practical significance of this issue. The method of unilateral nephrectomy was used to study the basic laws of compensation for the function of paired organs. Unilateral nephrectomy is one of the most common operations in the surgical treatment of kidney disease.

There are very few works devoted to the complex accounting of renal release of hydrolytic enzymes after nephrectomy, and the task of this part of the study was to study the effect of unilateral nephrectomy on the content of amylase, lipase, and pepsinogen in the blood and their secretion by the salivary glands, kidneys under basal (fasting) and stimulated conditions. giving food stimuli to the increment of these enzymes by the digestive glands.

The aim of the study was to study the mechanisms of transformation of the enzymatic spectrum of saliva and to establish the real contribution of the salivary glands to the enzymatic homeostasis of the body in unilateral nephrectomy.

Research methods. In chronic experiments on animals, the secretion of individual enzymes by the salivary glands, their content in the blood after unilateral nephrectomy, under conditions of the basal secretion of the salivary glands, was studied. The experiments were performed on dogs with previously removed ducts of the salivary glands.

After unilateral nephrectomy, the secretion of enzymes in saliva and their content in the blood under conditions of basal secretion were recorded. During the experiment, blood was taken from a vein and saliva was collected by stimulating salivation with meat-rusk powder. The content of amylase, lipase and pepsinogen was determined in plasma and saliva.

**II. RESEARCH RESULTS**

Table 1 presents data on the effect of unilateral nephrectomy on the content of enzymes in the blood under conditions of the basal secretion of the digestive glands, which are sources of hydrolases incremented into the blood. As can be seen from this table, unilateral nephrectomy affects the content of amylase, pepsinogen and lipase in the blood ambiguously.

Table 1. The effect of unilateral nephrectomy on the content of enzymes in the blood (on an empty stomach)

Dog names	Amylase (units / ml)		Lipase (units / ml)		Pepsinogen (units / ml)	
	1	2	1	2	1	2
<b>Weasel</b>	4,9±0,4	6,6±0,6*	0,6±0,05	0,5±0,04	11,1±1,0	14,9±1,3*
<b>Bobby</b>	5,7±0,5	6,6±0,6	0,7±0,06	0,6±0,05	16,2±1,5	17,9±1,6
<b>Tarzan</b>	4,8±0,4	6,6±0,5*	1,1±0,1	0,9±0,1	12,5±1,4	17,8±1,6*

**Note: \* - reliability of difference (> 0.05);  
 -1 - before nephrectomy;  
 -2-after nephrectomy;**

After unilateral nephrectomy under conditions of basal secretion in two dogs (Laska, Tarzan), amylolytic activity and pepsinogen content significantly increased. In the third dog (Bobik), they remain at the level of the original values.

The blood lipolytic activity in experimental dogs after unilateral nephrectomy remains unchanged. This means that the performed unilateral nephrectomy not only affects the excretion of enzymes by the kidneys, but also affects the increment of enzymes by the digestive glands.

From the data presented in Table 2, it can be seen that after unilateral nephrectomy in experimental animals, the volume of the basal secretion of the salivary glands, in the dog Tarzan - of the parotid gland, Laska - of the submandibular and sublingual salivary glands, increases.

Table 2. Effect of unilateral nephrectomy on basal secretion enzymes by the salivary glands

Nicknames dogs	Salivary glands	Saliva volume ml / min		Amylase (x100)		Lipase		Pepsinogen	
		1	2	1	2	1	2	1	2
Weasel	OK	0,11±0,0 04	0,12±0,0 03	$\frac{5.9 \pm 0.6}{0.6 \pm 0.1}$	$\frac{7.7 \pm 0.5^*}{0.9 \pm 0.1^*}$	$\frac{12,6 \pm 0,6}{1,3 \pm 0,05}$	$\frac{11,8 \pm 0,6}{1,4 \pm 0,06}$	$\frac{16,3 \pm 1,7}{1,7 \pm 0,4}$	$\frac{18,4 \pm 1,8}{2,2 \pm 0,5}$
	Under	0,30±0,0 1	0,33±0,0 1*	$\frac{2,7 \pm 0,4}{0,9 \pm 0,2}$	$\frac{3,6 \pm 0,5}{1,2 \pm 0,3}$	$\frac{15,1 \pm 0,8}{4,7 \pm 0,3}$	$\frac{15,7 \pm 0,9}{5,2 \pm 0,4}$	$\frac{23,1 \pm 2,4}{7,2 \pm 0,7}$	$\frac{24.9 \pm 2.1}{9.5 \pm 0.8^*}$
Bobby	OK	0,12±0,0 03	0,13±0,0 04	$\frac{6.1 \pm 0.4}{0.7 \pm 0.1}$	$\frac{7.9 \pm 0.6^*}{0.95 \pm 0.1^*}$	$\frac{13,2 \pm 0,7}{1,4 \pm 0,06}$	$\frac{14,4 \pm 0,8}{1,5 \pm 0,07}$	$\frac{17,1 \pm 1,8}{1,9 \pm 0,5}$	$\frac{19,6 \pm 1,6}{2,5 \pm 0,6}$
	Under	0,31±0,0 1	0,33±0,0 1	$\frac{2,9 \pm 0,5}{1,0 \pm 0,2}$	$\frac{3,3 \pm 0,5}{1,1 \pm 0,2}$	$\frac{15,7 \pm 1,0}{5,1 \pm 0,5}$	$\frac{15,9 \pm 1,0}{6,1 \pm 0,7}$	$\frac{25,6 \pm 1,9}{7,4 \pm 0,8}$	$\frac{29,6 \pm 1,4}{9,8 \pm 0,9}$

Tarzan	OK	0,10±0,0 03	0,12±0,0 04*	$\frac{6,3 \pm 0,6}{0,7 \pm 0,1}$	$\frac{8,2 \pm 0,6^*}{0,98 \pm 0,1^*}$	$\frac{13,4 \pm 0,6}{1,4 \pm 0,07}$	$\frac{14,1 \pm 0,7}{1,7 \pm 0,1^*}$	$\frac{17,4 \pm 1,6}{2,0 \pm 0,4}$	$\frac{19,6 \pm 1,4}{2,3 \pm 0,5}$
	Under	0,33±0,0 1	0,32±0,0 1	$\frac{3,1 \pm 0,6}{1,1 \pm 0,3}$	$\frac{3,9 \pm 0,6}{1,2 \pm 0,3}$	$\frac{16,3 \pm 0,9}{5,2 \pm 0,4}$	$\frac{15,8 \pm 0,7}{5,0 \pm 0,5}$	$\frac{24,4 \pm 1,9}{7,7 \pm 0,6}$	$\frac{31,4 \pm 2,1^*}{10,0 \pm 0,8^*}$

**Note:** - numerator enzyme content unit / ml; - the denominator of the release of the enzyme units / min;

\* - reliability of the difference; ok - parotid salivary gland; sub - submandibular and sublingual salivary gland; -1- before nephrectomy; -2- after nephrectomy.

In the Bobik dog, the volume of basal secretion of the salivary glands after unilateral nephrectomy remains at the initial level.

Unilateral nephrectomy on the enzyme spectrum of saliva is ambiguous. In all experimental dogs, after nephrectomy, amylolytic activity and its debit increase in the saliva of the parotid salivary gland. In the submandibular saliva with the sublingual salivary glands, the amylolytic activity and its flow rate, after unilateral nephrectomy, remain at the level of the initial values.

There is a unidirectional change in the amylolytic activity of blood and its secretion by the salivary glands, this proves the participation of the salivary glands in maintaining enzymatic homeostasis by incretion and recreation, especially amylase.

Our results of a correlation analysis between the content of amylase in the blood and its release in saliva showed that the correlation coefficients for the saliva of the parotid gland were always higher than for the saliva of the submandibular and sublingual glands. These results confirmed the literature data [1, 2] that in the composition of the saliva of the parotid, submandibular and sublingual glands, the ratio of S-, P- amylolytic activity is observed in parotid saliva S - 55-67%, P - 33-44%, and in the submandibular and sublingual saliva S - 79%, P - 21%.

Hence, we can conclude that the parotid salivary gland can recruit more  $\beta$ -amylase from the blood than the submandibular and sublingual salivary glands.

In all experimental animals after unilateral nephrectomy, the content of pepsinogen in the saliva of all salivary glands tends to increase, but these changes are not significant. In two dogs (Laska and Tarzan) out of three, the release of pepsinogen in the saliva of the submandibular and sublingual salivary glands significantly increased (Table 2). The correlation coefficients between the content of pepsinogen in the blood and its excretion by the salivary glands were high and positive. This means that there is a direct dependence of the release of pepsinogen by the salivary glands on the level of its content in the blood. These results confirmed the literature data [3] that pepsinogen in saliva has a recreational nature; it is secreted from the blood by the salivary glands. Pepsinogen is secreted into the blood by the main cells of the gastric glands.

From the foregoing, we can conclude that unilateral nephrectomy stimulates the increment of pepsinogen by the gastric glands, and, accordingly, enhances its recreation from the blood by the salivary glands.

After unilateral nephrectomy, the basal lipase secretion by the salivary glands remains unchanged. Only one dog (Tarzan) showed an increase in the release of lipase in the saliva of the submandibular and sublingual glands. This is most likely the result of increased salivation by these glands.

Correlation analysis showed that there is a direct relationship between the lipase content in the blood and its secretion by the salivary glands. We consider this as an argument confirming the recreational nature of lipase in saliva.

After unilateral nephrectomy, under conditions of basal secretion of dogs, amylolytic activity and the content of pepsinogen in the blood increase or remain at the level of the initial values, while its lipolytic activity remains unchanged. This means that unilateral nephrectomy stimulates the increment of pepsinogen and amylase by the gastric and pancreas, and, accordingly, enhances their recreation from the blood by the salivary glands.

After unilateral nephrectomy, there is a direct dependence of the content and, especially, the release of amylase in saliva, on the level of its excretion in the urine. The correlation coefficients of parotid saliva are much larger and more reliable than those of the submandibular and sublingual glands. The reason for this may be the following phenomenon, firstly, homeostasis of amylase in the

blood is provided by the kidneys and salivary glands, an increase in the content of amylase in the blood after unilateral nephrectomy led to an increase in its excretion in the urine and saliva.

After unilateral nephrectomy, lipolytic activity in the blood and its secretion by the salivary glands remains unchanged. But the content and, especially, the excretion of lipase in the urine after unilateral nephrectomy significantly decreases. These multidirectional changes in lipase secretion by the salivary glands and with urine led to the fact that the Tarzan dog had negative correlation coefficients between lipase secretion by the salivary glands and urine. This means that the salivary glands to a certain extent compensate for the insufficient work of the kidney in the homeostasis of the lipase enzyme.

After unilateral nephrectomy in experimental dogs, the content of pepsinogen in the blood increases and, accordingly, this led to an increase in its release in the saliva of the submandibular and sublingual salivary glands. The correlation coefficients between the content and excretion of pepsinogen by the salivary glands and in the urine are generally positive and low.

Food stimulation, after unilateral nephrectomy, regardless of the type of stimulus, stimulates the secretion of amylase by the salivary glands; it did not affect lipolytic activity and lipase debit, the release of pepsinogen in the saliva of the submandibular and sublingual salivary glands.

One direction of the change in the release of amylase in the saliva of the parotid gland and urine, after unilateral nephrectomy, under conditions of stimulation of incretion of enzymes, shows that both the parotid salivary gland and the remaining one kidney play a role in blood amylase homeostasis.

There is an interdependence between the submandibular, sublingual salivary glands and, after nephrectomy, one kidney in maintaining pepsinogen homeostasis. Hence, we can conclude that the salivary glands, as it were, "specialized" in maintaining enzyme homeostasis, if the parotid salivary gland is more involved in maintaining the constancy of amylase and lipase, and the submandibular and sublingual salivary glands maintain the constancy of pepsinogen in the blood more.

Hence, it can be concluded that homeostasis of various enzymes reacts ambiguously to a decrease in renal excretory function, i.e. the role of the kidneys in maintaining homeostasis of various enzymes is not the same. In terms of the importance of the kidneys in maintaining enzymes, the position is unequal, pepsinogen is in the first place, amylase is in second place, and lipase is in last place. Therefore, when the excretory function of the kidneys is impaired, the content of pepsinogen in the blood increases most of all, and then amylase, and the lipase content remains unchanged.

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## *Lingua-Cognitive Aspect Of Metaphoric Euphemization*

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**Abstract – The article is about lingua-cognitive research of metaphoric euphemisms, and it gives scientific substantiation for creation of complex lingua-cognitive and logical mixture of objective metaphoric legality in subjective relation and speech condition.**

**Keywords – Metaphor, Cognitive Metaphor, Euphemism, Cognitive Linguistics, Concept, Semantic Phenomenon, Semantic Concept.**

None of the languages is the precise reflection of national peculiarity. Otherwise there would not be even a word about inter-language impact, language nutrition from each other, or at least word borrowing from other languages. But in a certain language national peculiarity can be fully described. Verbal description of the reality, drawing verbally the social picture of the world depends on the degree of the unity of the «artist» with the world he belongs to, how well he absorbed ethnical values and the degree of its stability, presence or none presence of ideological gap in his outlook and thought. The verbal picture of the reality is very complex and many phased process; it has got an algorithm which is solid and continuous. This algorithm is a peculiar universal, and it is characterized by being one and the same postulate for any languages.

Metaphoric euphemistic device consists of main information content and connotative meaning is set upon it in layers. In fact information gets complicated with euphemistic connotative meaning, and one of the positive or negative meanings which served as a basis of a metaphoric image in the pile of connotative meanings plays the leading role, and maintains the direction of connotative task. Metaphoric object in the role of connotative image is its denotative or connotative basis having euphemic meaning. For example let's have a look at the following sentence; «Аргамчига эҳтиёт бўл, унинг ишни бажариб , қочиб кетаётганлигини билиб қоласан холос» – (Be careful with the rope, you can only notice how it has done its job and is running away). In this sentence a metaphoric image is the *rope*. This image is a conditional sign. It is chosen as a metaphorical image because it looks like a snake. But is this sufficient to be chosen as an image? The form is primary and basic element for our sight. But as assistants always obey the primary source and cannot exist without it, the primary source cannot show in full its essence without its assistants. This is why there are a number of signs realizing and assisting the main quality form expressed by a euphemistic expression. They are such qualities of the rope as inanimateness as an object, safeness, usefulness for people and that people desire its destiny. If we pay attention the euphemistic expression in fact based on formative image cannot be explained and interpreted in isolation without qualities we have mentioned just now. Metaphorical image seemed to be only based on form in fact cannot describe the undermined meaning and task in isolation of additional signs in our subconsciousness. Besides, a euphemistic expression formed on the basis of a metaphoric image also has a functional value of «hiding the fear» moving these main and additional meanings in integrity. If these meanings do not work for this task, their existence will be spoiled. A word cannot convey a euphemic task unless it has one of such euphemistic bases as fear, shame, irritation and respect. Speech situation and condition also show euphemic power of an expression. If the word *аргамчу- rope* stays in language as a shifted expression of the *snake* on the new metaphoric basis and if it

forms up some social peculiarities, become equal to the word of snake from the point of view of hiding fear, then the euphemistic task get weaker. Or if the expression shifts to speech in the areas where there are a lot of snakes, the taboo of the word *snake* and euphemization of the word *rope* gets stronger. So we can say that a certain circumstance and situation is one of the factors showing the degree of euphemization, in general a factor depicting pure euphemistic essence. For example those people who have taboo thought inclinations use rope or other such expressions when they are in a garden, cave, lake and other places. In such situation metaphoric euphemistic image works with its full strength. Anyway, taboozation of euphemistic metaphoric images in the minds of language speakers, replacing the words which are not proper to say, keeping their denotative meanings, giving new connotative colors are shown as new illustrational basis replacing the old expression. In using metaphorical euphemic expression the degree of activeness and workability of taboo maintains the degree of predicative content of euphemism. Metaphoric euphemic image can have the essence of multi meaningfulness it turned out that every occasional metaphoric euphemistic expression two layer task is fulfilled and they are in mutual external and internal relations. Externally euphemistic meaning is expressed and internally predicative meaning is understood.

The reality is many sided and the world is three-dimensional. The world around us consists of the complex of quantity and quality signs and peculiarities. These signs and peculiarities cannot be expressed and imagined in separation with the objects they describe. Many sidedness of an object in the process of metaphorization, infinity of quality and quantity signs and peculiarities, conceptualization in the «??? field» show that they have free directions. Here working of only cognitive mechanisms correctly on the basis of certain conformity determine idealness of metaphoric scenario. Contemporary science ties all thought activity, creativeness and imaginary thought to metaphoric thought and metaphoric knowledge. During cognition a subject of thought uses his memories, in majority of cases find two items logically remote from one another, connects them with conditional, invisible ties – forms a metaphor. Ultimately, the result of thought transfers to real communication process: the speaker creates a metaphoric image on the basis of metaphrization, and this image of course is formed on existing and stable knowledge.

The language is one of the main means created by the process of cognition. It makes conditional and uses more human quality and peculiarities than other species, more perception, more memory, more problem solving, consciousness and skills.

From the cognitive point of view information contents of a unit with metaphoric meaning (for example: гул қизи (daughter of the flower)) consists of an interplay of a conclusion sign of a pile of connotative meanings of inner predicate which serves as its basis (У гулнинг қизидир (she is a daughter of the flower)) and subject (in order to strengthen beauty). And the most important of connotative meaning is a seme which shows whether positive (гул қизи - a daughter of the flower) or negative (ғилоф бандаси – a man of form) relation. Learning language facts together with people, ethnos, society values of the people speaking this language is getting more strength in the modern linguistics. Learning stable cultural-national images taking special place among interpretations of national-cultural values and stereotypes plays important role in the revealing and interpreting factors of formation of verbal depiction of the reality. Ethnic stereotypes are formed on the basis of knowledge and values connected with this nation. Ethnic values are characterized with their priority and stability to national values. When we say ethnic stereotype we mean «standard imagination and dimensions peculiar to the majority of people belonging to this or that ethnic group.» [1. 458] For example the word *уй* – house which is the euphemic expression of *қабр* – grave can be an example for such an ethnic stereotype. In fact, we can say comparing the grave to the house is peculiar to all Turkic nations:

*У нимадир, дарвозасиз қалъадир,  
У нимадир, деразасиз бинодир,  
У нимадир, бир-биридан аълодир,  
Шоир бўлсанг, шундан бизга хабар бер!  
(Махтумқули, «Савол-жавоб»)  
What is it which is a fortress with no gates?  
What is it which is a building windowless?  
What is it that from each other is the best?  
If you're poet tell us quickly what is that.  
(Makhtumkuli, «Question-answer»)*

Southern and central parts of Uzbekistan are characterized with more popularity of this stereotype.

House – a euphemic expression. It unites the stereotype of imaginations about afterlife. The notion of «grave» is seen in the unity with imaginations of the house. Secondary nomination of *house* enriches its original denotative content of subject matter with the notion of «grave», thus can convey twice as meaningful content, and this is its characteristic feature. Ideas about characteristic features of Nations and ethnic groups, metaphoric euphemic expressions formed on the basis of stereotypes can often be met in our language.

People of the world will not forget World War II when millions of innocent people got killed and the Fascist Germany invaders' massacres. As a result nations' consciousness formed a new form of mercilessness, ruthlessness, bloodthirstiness. Today we can meet a lot of examples of people's using the word *fascist* to qualify merciless people.

A number of euphemistic devices are formed on the basis of stereotypes unified ethnical and national peculiarities.

Human consciousness uses effectively the methods of analyzing generalness perceptively, relating analytically, networking synthetic generalness, breaking into pieces the essence of objects and events through going along the way of deductive analysis and thus forming full idea about process and structure. Here ideas of the theory of cognitive Gestalt fulfill the task of methodological support.

The central category of lingua-cognitology is concept. The thought unit of concept, idea is a philosophical phenomenon, meaning is the kernel of concept and idea, and this fact is recognized by all the specialists, and we think that it is not necessary to look through sources to prove this condition which has risen to the level of axiom. Lingua-cognitology which is being regarded to be one of the directions of semantic-cognitive analysis by the linguists also deals with such other cognitive categories as Script, Scenario, Gestalt and Frame. But they have a peculiar feature of working on the basis of the principle of «language - concept».

Personification is one of the peculiar forms of metaphoric shift. Alongside with this, in the essence of expressing a person or group of persons, social layer or social amalgamation there is euphemization. We can observe two forms of personification:

- 1) forming sensitive expression about a thing through uniting animate object to inanimate one;
- 2) forming less sensitive expression about a thing through uniting animate object to inanimate one;

In the latter condition there appear metaphoric euphemization. Personification of names of states, countries, organizations and institutions serve for euphemization. Personification of names of states, countries, organizations and institutions can clearly be seen in frame analysis. Human society has been compared to people from ancient times, and now this stereotype is preserved in the consciousness of people [2. 138]. For example a seme of person is loaded to such expressions as USA, Russia, Foggy Albion, Uzbekistan, Ukraine. Here are some examples 1. *Евросоюз объявил ещё пакет санкций против РФ (АиФ, - № 29, 2014)*. 2. *Только на охрану семей каждого из них [экс-президентов] США тратят ежегодно 500 тыс. долларов (АиФ, -№1. 1999)*. 3. *Впервые со времён Второй Мировой войны США, образно выражаясь, «закрыли границы – ввели усиленный досмотр транспорта и грузов. (Изв., -№215, 2001)*. Here the compared object and the human being form anthropometrical frame:

STATES, COUNTRIES, ORGANIZATIONS AND INSTITUTIONS = human

As states, countries, organizations and institutions are personified, all human biological and social characteristics are given to them. For example, Ўзбекистон бунни чуқур ҳис қилади, Малайзияга ҳамдардлик билдирилди, Россия қўл қовуштириб тура олмайди (Uzbekistan deeply understands the situation, Malaysia received sympathy, Russia cannot stay folding her arms).

State names in the above said examples imply the government members, state administration or people of this country. But in many cases a moral behavior and sometimes publicistic style demand of not naming directly a person or people's institutions makes it necessary to use other expressions euphemistically.

Every frame gets synthesized from descriptions of big texts. Opening the essence of concept expressed in this text meets the following problems:

- a) metaphoric degree of expression;
- b) euphemic degree of expression;
- c) continuity of constituent parts;
- d) discreteness of the text.

Regarding these four factors as devises of analysis in integrity gives the expected results from the frame analysis.

We can come to a conclusion from the above said that euphemism can be evaluated differently in connection with its product. A process seen as a euphemism in one instance can be regarded as normal utterance in another. Euphemic expression in one psychological circumstance acts as a language means with a mark of abstention. So if an environment of communication, communication situation serve as external factors of forming euphemisms, the process of communication culture and cultural degree of the speaker is internal factor. The process of euphemism takes place when two of all three factors – communication environment, communication situation and culture of communication participate in conversation.

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# *Dilemma of Business Climate and The "Real Climate"*

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**Abstract – The role of business in advancing the economy and welfare is highly expected in the community. In the development of a business that occurs, it often sacrifices non-profit aspects, such as the environment. The indirect impact that can arise from business development is climate change. This study uses climate data and the number of industrial enterprises by type at the village level, to determine the effect of business on the climate that occurs. This study uses ordinary least square, to determine the role of each independent variable. The results of this study indicate that an increase in 1,000 of these types of businesses will result in an increase in temperature of 1 °C. Furthermore, an increase in 1,000 types of business will reduce rainfall by 11 to 64 mm. Government and community efforts are needed to maintain climatic conditions for the sustainability of the ecosystem.**

**Keywords – Climate; Effort; Rain; Temperature**

## I. INTRODUCTION

The distribution of business in Indonesia is dominated by the real business sector. This domination causes the absorption of labor and at the same time advances the country's economy. Based on data from the 2016 Economic Census, it is known that Indonesia has more than 26 million businesses. This business sector has absorbed more than 78 million people, so that on average each business can absorb 3 people. Existing businesses in Indonesia contribute positively to the level of people's welfare. More than 1,300 trillion rupiah was spent by all businesses for remuneration to workers (BPS, 2017).

Business development is urgently needed, as a catalyst in the government's development program (Carree & Thurik, 2010; Haidar, 2012; Taiwo et al., 2012). The private sector is at the forefront of forming the business sector in society (Aliero et al., 2013; Mawdsley, 2015), because the government sector cannot absorb the productive population who are ready to work. Recently, the business development has been very significant. The efforts made by the community can be done flexibly according to the passion of the business actor (Cardon, 2008). In fact, not a few people have taken the initiative to leave the government sector, only to try their luck on the business that will be carried out. The rise of the business sector has no doubt about its benefits. However, every economic development will have an impact on other factors, one of which is climate.

Climate change that occurs in various parts of the world is the impact of the behavior / habits carried out by the community (Gifford et al., 2011; Van Aalst et al., 2008). Currently, various countries continue to strive to change the negative behavior of society to protect the environment (Guagnano et al., 1995; Kollmuss & Agyeman, 2002; Straughan & Roberts, 1999), so that indirectly this action will also have a positive impact on climate development in a region (Pruitt et al., 2011).

The exploration of resources carried out by business actors will indirectly have an impact on the environment, and at a later stage will have an impact on the climate (Duinker & Beanlands, 1986; Pagiola et al., 2005). The increase in the number of businesses

coupled with population density, limited natural resources, and carried out en masse will certainly lead to a number of dynamics in the environmental ecosystem. (Costanza, 1996; Danielopol et al., 2003; Omer, 2008).

There are two climates in Indonesia, namely dry and rainy. In the dry season it can sometimes feel very hot, compared to several decades ago (Jennings & Magrath, 2009). Coupled with the pollution caused by the business sector, this adds to the perception of the public who are uncomfortable with the latest environmental conditions. On the one hand, the community feels very significant regional development, in addition, the community feels uncomfortable with the latest climatic conditions. This is quite significant in rural areas which tend to be more beautiful.

There have been many studies discussing economic development have an impact on the climate of a country (Chang et al., 2018; Xiao & Weng, 2007), but still limited to analyzing business development by type. Through this background, this study aims to determine the role of business in influencing climate conditions that occur in Indonesia. This study uses data at the village level. From the research, it is known that business development has a negative impact on changes in temperature and rainfall intensity in Indonesia.

## II. METHODOLOGY AND DATA

The data used in this study are raw data from the 2018 PODES data collection, which describes business conditions according to the village level. The PODES data collection is carried out by BPS and is specifically designed to collect data that can describe conditions in rural areas and sub-districts, as well as prepare future censuses through the collected data and information. In addition, this study uses data on temperature and rainfall intensity, which comes from the BMKG. This study also uses control variables, namely the village bordering the sea. This control variable is intended to test the model (robust) (King, 1980). This research uses ordinary least square (OLS) research method, to determine the role of each type of business in the formation of temperature and rainfall. The models to be formed in this study are as follows:

$$Temperature = \alpha + \beta_1 Ind_{wood} + \beta_2 Ind_{metal} + \beta_3 Ind_{cloth} + \beta_4 Ind_{stone} + \beta_5 Ind_{webbing} + \beta_6 Ind_{food} + \beta_7 Ind_{others} + \varepsilon \quad (1)$$

$$Rainfall = \alpha + \beta_1 Ind_{wood} + \beta_2 Ind_{metal} + \beta_3 Ind_{cloth} + \beta_4 Ind_{stone} + \beta_5 Ind_{webbing} + \beta_6 Ind_{food} + \beta_7 Ind_{others} + \varepsilon \quad (2)$$

## III. RESULTS AND DISCUSSION

From the research results, it is known that business development has an impact on increasing temperature and decreasing rainfall intensity. From the results of the regression analysis in Table 1, it is stated that the wood goods industry, the pottery / ceramic / stone industry, and other industries have a significant positive effect on temperature, either using control variables or not using control variables. The results of this study indicate that an increase in 1,000 of these types of businesses will result in an increase in temperature of 1 oC. This result is in line with previous research which states that increasing the effort will increase the temperature of the area around (Jones et al., 1986; Kumar & Hingane, 1988). Exposure to waste products from production will produce substances that have a negative impact on the climate, which will disrupt existing temperature conditions. In addition, in the production process, entrepreneurs often take the main production materials from nature. The disruption of natural ecosystems will also contribute positively to the increase in temperature in an area.

Table 1. Effect of Industry on Temperature

Industry Business	Temperature	
Goods originating from wood	0.001*** (0.000)	0.001*** (0.000)
Goods originating from precious metal or metal material	0.000	0.000

	(0.001)	(0.001)
Goods originating from fabric/woven	0.000	0.000
	(0.000)	(0.000)
Goods originating from earthenware / ceramic / stone	0.001***	0.001***
	(0.000)	(0.000)
Goods originating from wicker made of rattan / bamboo, grass, etc.	0.000***	0.000***
	(0.000)	(0.000)
Food and beverage industry	0.000	-0.000
	(0.000)	(0.000)
Other industry	0.001***	0.001***
	(0.000)	(0.000)
The village borders the sea		0.024***
		(0.006)
Constant	27.412***	27.408***
	(0.003)	(0.004)
Observations	83,931	83,931
R-squared	0.001	0.001
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

If traced in depth, the wood products industry is obtained from plants. Plants are believed to help circulate water from the sky to the land through rain, until it returns to the sky through evaporation. The decreasing number of plants that are not matched by replanting will have an impact on increasing temperatures. Apart from that, the stone equipment industry and the like, which dig into catchment areas will disturb water absorption and have an impact on arid conditions.

From the results of the regression analysis in Table 2, it is stated that the wood goods industry, cloth goods industry, stone goods industry, wicker industry, food and beverage industry, and other industries have a significant negative effect on rainfall intensity, either using control variables or not. using control variables. The regression results indicate that an increase in 1,000 of these types of businesses will result in a decrease in rainfall of 11 to 64 mm. This result is in line with previous research which states that increasing the effort will increase the temperature of the area around (Brezonik & Stadelmann, 2002; González & Aristizábal, 2012).

Table 2. The Effect of Industry on Rainfall

Industry Business	Rainfall	
Goods originating from wood	-0.064***	-0.063***
	(0.009)	(0.009)
Goods originating from precious metal or metal material	-0.009	-0.008
	(0.015)	(0.015)
Goods originating from fabric/woven	-0.063***	-0.063***
	(0.005)	(0.005)
Goods originating from earthenware / ceramic / stone	-0.024***	-0.024***
	(0.006)	(0.006)
Goods originating from wicker made of rattan / bamboo, grass, etc.	-0.036***	-0.036***
	(0.003)	(0.003)
Food and beverage industry	-0.011**	-0.012**
	(0.005)	(0.005)
Other industry	-0.029***	-0.030***

	(0.006)	(0.006)
The village borders the sea		0.683
		(0.524)
Constant	181.703***	181.599***
	(0.162)	(0.166)
Observations	83,931	83,931
R-squared	0.003	0.003

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Similar to the increase in temperature, the wood goods industry and stone equipment industry and the like have an indirect effect on decreasing rainfall. The use of chemicals in the manufacturing process of cloth goods will indirectly affect the decrease in rainfall. Each fabric industry factory will produce waste production residue, which will unconsciously cause pollution and have an impact on the rainfall that occurs. The woven industry also has a negative influence, because the basic materials of this production are mostly obtained from nature.

Government efforts are needed in regulating regulations to maintain the sustainability of a good climate. In practice, environmental factors are often neglected, because the economic impacts arising from business activities are real. However, in the long term this condition needs to be anticipated, because it is possible that in the next few decades, unfavorable climatic conditions will actually hamper business.

In data processing, this study still uses temperature and rainfall intensity data at the station level, which are only a few in each province. For this reason, climate data at the village level are needed so that the research results can be more representative. In addition, further research can add control variables to determine the strength of the model. The addition of types of business in the industrial sector is possible for the variation in the roles of each type of industry on temperature and rainfall intensity.

#### IV. CONCLUSION

Community unrest caused by global warming, without realizing it, can be caused by negative behavior / activities carried out by the community itself. In carrying out activities, people often ignore environmental factors that will indirectly have an impact on the climate. From the results of this study, information is obtained that business development has an impact on increasing temperature and decreasing rainfall intensity. This needs to be the attention of the government and society, to maintain the sustainability of a good climate.

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# *Developing Literacy And Numeracy In Early Childhood Education In Ghana: The Role Of Traditional Ewe Play Games*

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**Abstract** – There is the need for the training of Early Childhood Education Teachers to appreciate and exhibit the integration of indigenous knowledge in the teaching and learning process. This paper aims to create the awareness in the society that the time to encourage and support Early Childhood Educators to use indigenous knowledge in facilitating themes and concepts in the classroom is ripe. This knowledge is common in our Traditional Ewe Play Games hereafter called TEPG. The integration of traditional play games in teaching and learning at the Early Grade Level is one sure means of arousing learning interest in children. Traditional play games, sustain their interest towards learning and opens up multi- sensory learning behavior in them. Educational benefits of traditional play games cannot be overemphasized. Indigenous plays allow a multisensory spectrum of scaffolding, assessment and responsive feedback for coaching. The paper suggests that when Pre-service Teachers are properly trained to acquire the knowledge and skills in the use of indigenous play games at their training levels, they would be well equipped to facilitate the Pre-tertiary Education Curriculum hence producing functional citizens for the nation. This qualitative research adopted exploratory design to collect data through observation, interview and available literary materials. Descriptive approach was used to analyze the data.

**Keywords** – Traditional Ewe Play Games (TEPG), modification, pre-service teacher, literacy, numeracy.

## I. INTRODUCTION

The adoption, modification and integration of play games in educational practices as teaching and learning approach is the focus of this paper. World Bank report on education (2019) in Sub-Saharan African countries is dubbed *Ending Learning Poverty: What will it take?* This report bemoans the low level of literacy proficiency among primary school learners. The report suggests that the progress made so far in reducing learning poverty is far too slow to meet the aspirations of SDG 4. It estimates that by 2030 about 43% of children at age ten will still be learning-poor. The report laments that teachers in many countries are not providing the types, sequences, and amounts of instruction students need to acquire literacy skills. Betéille and Evans (2018) suggests that a good pre-service education program is one effective approach towards equipping pre-service teachers with content, pedagogical and managerial knowledge and skills to become effective teachers. One key area that needs attention during pre-service training would be teaching methodologies that foster life-long learning. Teachers are expected to be trained with both traditional and non-traditional skills of imparting knowledge before they join the teaching profession. Traditional skills include content and pedagogical knowledge while non-traditional skills include being able to foster socio-emotional skills among children. Promotion of collaboration and social activities among students increase their involvement and participation in team learning. Trajkovik, Malinovski, Vasileva-

Stojanovska, and Vasileva (2018) suggests that when students share their own ideas and respond to others' reactions their level of thinking and understanding deepens. Due to a strong connection between culture and learning, educators are expected in the 21<sup>st</sup> century to use culturally responsive pedagogy to facilitate learning. It also aims at encouraging community and family engagement in educating the child (Ford, Stuart & Vakil, 2014). Educational properties embedded in TEPG when effectively modified and facilitated, can turn the classroom into creative environment for academic interaction hence promoting creativity and life-long learning. By this effort, the classroom becomes an extension of the home; a play-based learning environment. Better collaboration between teacher and learner, home and school would be achieved and learning outcomes improved. However, play seems to have taken a backseat in early grade classrooms to teacher-directed instruction. This unproductive practice is based on the belief that play does not effectively prepare children to perform well on standard-based assessments (Kekesi, Donkor, Aburampah & Torkonyo, 2019:505). Several challenges account for the non or less use of play as teaching approach by teachers. Notable among them is the lack of motivation by teachers to use play to facilitate concepts and themes. Teachers need to demonstrate to children that they care for them by participating in their play activities. By using play, children's learning abilities and emotional well-being will be transformed and promoted. Informed by the gap, the paper intends to answer the following research questions;

1. What educational properties are available in Ewe Traditional Play Games?
2. How can Ewe Traditional Play Games be used to facilitate literacy and numeracy in an Early Grade Classroom?

## **II. THEORETICAL BACKGROUND**

Huizinga (1949:1-2) a classic play theorist opines that play is a cultural phenomenon that both humans and animals share. Play is more than a mere physiological occurrence or a psychological reflex. In play there is something "at play" which transcends the immediate needs of life and imparts meaning to the action. Play constitutes a training of the young creature (learner) for the serious work that life will demand later on. Play is voluntary and takes place within its own proper boundaries of time and space according to fixed rules and in an orderly manner (p.13). Vygotsky (1978:102-103) highlighting how children learn project the social constructivist theory. The assumption of the theory encourages social interaction among peers as an appropriate strategy of learning. Games, simulations and problem-solving activities are identified as examples of classroom practices in this theory. In play children perform actions of imagination in an imaginary situation. They create voluntary intentions. They form real-life plans and pursue voluntary motives in play. This is what makes play the highest tool of pre-school development strategy. The theory states that children do not only practise what they already know but also learn new things. In Vygotsky's cultural-historical theory, play is an important part of early childhood. Vygotsky believed that play promotes cognitive, social, and emotional development in children (Scharer, 2017:63). The oral transmission strategies in plays drive children to practice what they already know and learn new things as they perform various activities in play. The theory of learning by doing propounded by Dewey (1938) stipulates that the child interacts with the environment to adapt and learn. Accordingly, classrooms are expected to be representatives of real life situations. The classroom should have the opportunity to allow and support children to participate in learning activities interchangeably and flexibly in a variety of social settings. Play games is one social interactive activity that encourages learning by doing sometimes using simulation and real situations.

## **III. METHODOLOGY**

The paper is a qualitative research with uses exploratory design to collect the data. Observation and interview were used to collect primary data. The secondary data was solicited from research papers. According to Stebbins (2011) the focus of exploratory design is to gain insight and familiarity with basic details, settings and concerns of research problems that has little or no research details at their stage of investigation. It helps to generate new ideas and assumptions about the research problem. Due to its scope less number of respondents are used but has the potential to generate a large volume of data. The data for this paper was collected mainly between February 25<sup>th</sup> and July 10<sup>th</sup>, 2020. During the period basic school learners were at home due to the COVID 19 pandemic. The children engaged in various forms of traditional play games with their peers and elders. The researchers observed children play some of these games in villages in Ziope Traditional Area. The people of this area speak Avenor dialect of the Ewe language in the Volta Region of Ghana. Materials and concepts described in the games are glossed into English. The researchers interacted with parents and gathered further information in addition to what was observed during children's active play time. Researchers observed all the WHO COVID 19 prevention protocols by wearing face mask and keeping at least one meter distance between the game participants during play and same was observed between the respondents during interview sessions. Some of the data was also solicited from secondary sources to confirm the names of the play games and their descriptions.

#### IV. LITERATURE REVIEW

**Right to Play** (2020) maintains that different types of play give children the opportunity to learn different things. In the classroom, games help children to actively engage in their lessons, enhancing their learning. Play ignites passion for learning by providing resources that make learning and life-skills development active, engaging and fun. Outside the classroom, they play through performance, music or dance to gain critical life skills. Play instils positive values in children and develops healthy behaviour. It allows for self-expression and creates space for dialogue through art, role play, drama and performance. Play is a child-led and self-directed activity (<https://www.righttoplayusa.org/en/our-work/#:30/10/2020>). For a wholesome psychocognitive functioning of a child, Manyara and Murungi (2018) observed that motor development of young children is a powerful pivot that drives cognitive abilities in their formative years. Early gross motor abilities have been associated with several cognitive processes that are fundamental for academic learning: processing, speed and memory. Traditional play games and songs are generally effective no-cost strategies that parents, caregivers and older siblings use to teach not only appropriate norms and values but also various concepts taught by teachers in Kenyan schools. Children acquire fundamental social and emotional skills for life-long living through play games (Mweru & Murungi, 2013:496-497). Movement is one dominant component of all Ewe traditional play games. Movement has been observed to be an integral part of the play games. It is either a light movement of fingers in drawing, picking, use of the arms in throwing and catching, legs in pushing or rigorously by using whole body in running, pulling, jumping, dancing etc. When children perform the art of movement in play games, they act out the social context of meaning of words and sentences. The traditional play games are culturally specific and rich in the development of the linguistic competences of young children. A good mother tongue acquisition is a better foundational tool, for literacy, numeracy and science. Traditional play games support free manipulation of the indigenous language forms available in the environment. In effect, development of literacy skills such as phonemic awareness, vocabulary, comprehension, prosody and writing are ensured via play. The resultant application of these language skills enhances bridging from the first language to the second language smoothly with less difficulty (NaCCA, 2019:v). Manyara and Murungi (2018:254) compare language development benefits in play to other instructional strategies by saying children use more words and complex sentences during play than they do in other types of classroom activities. Their practice of age-appropriate language in play is likely to promote communicative competence. Children who engage in traditional play games at home and also access the same form of games as learning strategies in school will acquire a wide stock of vocabulary. They would also understand grammatical structures as well as linguistic conventions for easy listening, speaking, reading and writing. This will result in producing good communicators, effective collaborators, critical thinkers, lifelong learners and problem solvers for the nation (NaCCA, 2019:vi-x). Singer, Singer, D'Agostino and DeLon (2009:286) found make-believe games to be effective to help a child expand vocabulary and link objects with actions, develop object constancy, learn strategies for problem solving and develop divergent thinking ability. In effect, these role play games develop the child for future adult life to propel the society towards peaceful coexistence, economic emancipation and self-reliance. Play supports children's ability to role-play, reflect before acting, the ability to show empathy, and development of their emotional understanding and self-regulation. Cooperation, negotiation, problem-solving, group work, and getting along are also simulated in children's play even without adult intervention. Both learner-initiated and teacher-guided play are important to children's social and academic development (Kekesi, et al., 2019). Eberle (2011:19) maintains that play educates us broadly and deeply early and throughout our life. At the very beginning of our lives, we learn language in game-like interchanges with fluent speakers. Later we sharpen our vocabularies with wordplay. We explore the concepts of number and sequence in games. We tune our ears to songs, chants, and rhymes. We play with our sense of space and train our appreciation of color with finger paints. A good number of Ewe play games are accompanied by relevant play music which makes them drama-oriented. To sum up the educational merits of traditional play games, Vasileva-Stojanovska, Vasileva, Malinovski and Trajkovik (2015:2) argues that the introduction of traditional games into the learning activities enhances motivation in all the components of instructional pedagogy promoting:

- sustainable attention by ensuring active participation of all the learners in the game-based learning activities,
- relevance by utilizing familiar playing activities to achieve the newly set-up learning goals,
- confidence by providing a relaxed environment in which students have control over the actions needed to achieve the objective,
- satisfaction, which is an intrinsic attribute of the games offering positive feelings of equity, unity, vividness, fairness, that can be effectively used during the learning activities.

### **The Pre-service teacher factor**

World Bank report estimates that by 2030 about 43% of children at age ten will still exhibit a high level of learning deficiency. The report laments that teachers in many countries are not providing the types, sequences, and amounts of instruction students need to acquire literacy skills. The report further suggest that children improve their literacy proficiency when taught first in the language they speak. Betéille and Evans (2018) suggests that a good pre-service education program is one crucial step towards equipping teachers with content, pedagogical and managerial knowledge and skills to become effective in their delivery. This presupposes that during the training stage, the pre-service teacher is equipped with indigenous knowledge in play games in the language of instruction. Mweru and Murungi (2013:497) observed that many schools in developing countries are faced with various support challenges including the lack of resources needed during classroom instruction. This lack of resources has usually affected learning outcomes of learners resulting in pupils' failure to understand various concepts taught in schools. As a result undesirable performances are recorded in national and international examinations. However, resources needed for play games are readily available in local communities. Schareer (2017:62) laments:

many prospective ECE teachers I have worked with (especially ones teaching kindergarten and elementary grades but also some prospective preschool teachers) hold the preconception that play is something they can allow children to do between blocks of instruction, something that children will do unprompted and that does not need their input, something that gives teachers or educators time to do other things. These prospective teachers' idea of play was either centre time (playing house, blocks, reading corner) or outdoor play (playground time). I found that even when these prospective teachers learn about the benefits of learning through play, they still worry about parental opposition to playtime in the classroom and that playtime will take away from their ability to complete their curriculum.

Eberle (2011:19) bemoans the contemporary society that we deliberately do not set out to learn by playing. The aim of an Early Grade Education in the 21<sup>st</sup> century should be focusing heavily on the renewed agenda of the development of the 4Rs; **R**eading, **wR**iting, **aR**ithmetic and **cR**eativity (T-TEL, 2019:1-12). This agenda aims at producing functional citizens for the future of the world. The use of creative pedagogy is necessary in providing classroom practices that require innovative teachers equipped with relevant teaching approaches. One sure way of targeting this objective is harnessing both human and cultural resources in training the pre-service Early Childhood Education Teacher (ECET) in the pedagogical knowledge and values in the traditional games of the language of instruction (LOI). The linguistic community of the school is rich in vocabulary, low cost and no cost resources to ensure teacher learner interactions focusing on achieving positive learning outcomes. The desire to break away from the usual mode of teaching to encouraging healthy interactive classrooms has become necessary due to increasing complexity of learning needs of children. These approaches support scaffolding learners' progress in their learning process. Creating instructions to facilitate creative learning is achieved by producing creative teachers to function appropriately in the school environment.

Several make-belief plays can be modified from adult real live activities and adopted to teach various themes and concepts in the Early Grade classrooms. Scharer (2017:67-68) suggests that imitation of museum in the classroom helps to teach arithmetic concepts like, counting, sorting, record keeping, statistics, calculating change and balance during sale of tickets and wrist bands. Such literacy skills as writing, reading, drawing, vocabulary are also developed. Social skills like collaboration, problem solving, presentation of alternative solution to problems etc are developed when children develop museum artefacts and exhibit them. In this regard, role playing of museum practices including, production and exhibition of artefacts, receiving and processing visitors at the reception. Restaurant duties help the child to learn literacy and numeracy skills. Role playing these adult duties fosters flexible opportunities for healthy communication, peer collaboration, peer problem solving and turn taking among children and prepares them for life.

### **Challenges of using play as a teaching approach**

Teacher motivation is one key factor affecting the use of play to facilitate concepts and themes. This important aspect of child growth and development requires well motivated teachers for their full participation in children's activities. The motivation factor is a global issue that need to be looked at by all Early Childhood Development Education stakeholders (Manyara & Murungi, 2018:254). Some early grade teachers in the classrooms may not have adequate knowledge of the traditional plays hence not interested in their use to facilitate learning in the classroom. Hygiene needs of teachers are not fully catered for in many schools. Play involves use of dirt prone materials and activities. Teachers need to change into play costumes before and during play instructions. The inability of schools to provide essential play materials demotivate teachers from using play instructions to teach in the classroom. Another challenge is the packed nature of the instructional time table for schools. The curricular time table is handed down to the teacher by MoE/NaCCA/GES. The teacher has no responsibility of modification to integrate play instructions.

The teacher is constrained by time and fidelity of implementation. Play instruction is a time consuming enterprise by nature. Learners must play and enjoy play to their satisfaction to motivate their readiness to participate in the next episode.

Play requires time and space to function. Most of our classroom set ups cannot support play activities. Societal perception about play is one disadvantage of its use in the classroom. Society expects children to display pure academics fostered through rote learning. Many parents and guardians frown upon traditional play and may not support children to learn by doing in the domain of traditional play games. Teachers face parental opposition to playtime in the classroom arguing that playtime will affect their ability to complete their curriculum (Schareer, 2017:62). One other challenge has to do with the language of instruction. In some of the classrooms, the teachers are not speakers of the LoI which accommodates the play hence cannot encourage its integration as a teaching approach.

**The role of teachers in the use of play as a creative pedagogy.**

In schools, teachers are expected to provide adequate play materials for children’s play using their fine and gross motor skills. The teacher is also expected to participate in children’s play appropriately and timely. Teachers are expected to create Play Learning Environment (PLE) that supports effective engagement of the learner devoid of unnecessary interruption by non-playing mates. During active play time, the total being of the learner becomes fully and usefully activated for academic work through play. The teacher, in the facilitation of Play Based Learning enterprise acts as a co-learner. Teachers need to research into the indigenous play games available in the culture of the school society. This equips the teacher in the domain of material, language, rules, costume, time and support where applicable. This directs the teacher in effecting relevant and appropriate modifications necessary in executing the play game to facilitate educational concepts in the classroom.

**V. FINDINGS**

Materials, rules and modification of three TEPG namely; **aqifɔɔ**, **papa kple dada** and **tolovi** are analyzed to demonstrate their educational properties that would be applicable in the classroom.

**Play 1: Aqifɔɔ (Pebble picking)**

**Materials/playing space:** The object used to play this game is mainly **nefi** (palm kernel). Pebbles can be improvised or any other seed of the size of palm kernel is applicable. Five palm kernels are needed; one of which is identified as the head pebble. It is usually bigger than the others. An open space where two or more participants can sit is required to play the game. Pebbles picking can be a helpful method for introducing mathematics to youngsters. Some of its practices are intended to encourage counting and help to explore the physical characteristics of the stones, such as shape, size and weight. A pebble has something special-the way its smooth form fits into the palm. Pebbles are also interesting to explore with their range of textures. They would probably have used natural objects such as small pebbles when learners first began to count, and it seems appropriate to introduce them as a resource for early grade learners as they develop this valuable ability. For many other mathematical operations, including sorting, weighing and exploring shape, pebbles, can also be used effectively (MA Education, 2015).

**The game:**

The game is played by two or more competitors. The first person to play the game is determined by the competitors. It has four stages of play.

Fig 1: Stages of playing Aqifɔɔ (Pebble picking)

Stage	Name of stage	Number of pebbles			
		1	2	3	4
1	Oɔenke	●	●	●	●
2	Ovee		●●	●●	
3	Otɔe			●●	●
4	Onee				●●

At stage one, the playing competitor loudly says “*Odenke*” (one) and throws the palm kernels or pebbles onto the ground. The head pebble is picked by the player. The player throws the head palm kernel into the air and quickly picks one of the palm kernels on the ground and catches the head onto it with the same hand. He then drops the he the pebble he picks from the ground aside and repeats same step till the other three on the ground are picked in turns. He collects the five palm kernels in his hand again. He says “*Ovee*” (Two) at stage two and throws them on the ground skilfully and creatively such that they are grouped into a pair and a three or into two pairs and one. The player then picks the head palm kernel to keep two pairs on the ground. He throws up the head palm kernel and briskly picks a pair of the two pairs on the ground and catches the head onto it. He repeats the step for the remaining pair. At stage three, the player says “*Otve*” (Three) and throws the five on the ground to have a pair and a three. This time he picks the head to have one and a three on the ground. He throws the head kernel up and briskly collects the three and catches the head onto it. He drops the three, throws the head again and quickly pick the one and on the ground then catches the head onto it. At stage four, says ‘onee’ “*Onee*” (Four) and throws them onto the ground and pick the head pebble, leaving four palm kernels on the ground. He throws the head up and briskly collects the four at a go and quickly catches the head onto it to make five in his palm. The head pebble is the most needed and active material during the play.

### Rules:

Only the head pebble must be used as the playing object by all players.

At the specific stage, one must collect the number of pebbles he is playing from the ground.

The player must always catch the head pebble onto the number he is playing.

If one misses the playing number he is declared “*ku*” (dead/lost the playing right) and transfers the playing right to the next competitor to play in turn.

The other is ‘**the rule of touch**’. A player’s fingers must not touch any of the palm kernels he is not picking. If it does, the player dies (lost the playing right). It is optional

**Modification:** The game can be modified to teach word reading. The number of letters and or syllables in a word requires the kind of modification to suit the word the teacher wants to teach.

**Development of literacy:** phonological awareness (a component of reading), syllabification, chunking, blending which are all reading strategies can be developed using this play. From a basket of words, learners can compete for words having the number of pebbles. It also helps to develop automaticity of word recognition and attack (*reading*).

**Development of numeracy:** counting, grouping, ordering, subtraction and addition (*arithmetic*).

From the play the learners perform various activities numerically and it becomes part of their arithmetic building competency:

1. Recites numbers in order of magnitude.
2. Sometimes matches numerals and quantity correctly.
3. Counts objects and beginning to count beyond 10.
4. Counts an irregular arrangement of at least ten objects.
5. Categorise objects according to properties such as shape and size.
6. Orders two items by weight
7. Uses familiar objects and common shapes to create and recreate patterns.

**Development of Science:** Teacher can briefly create the awareness of gravitational force, distance, size and speed in this activity.

### The teacher’s role:

Teacher must consult the local school community to acquire requisite knowledge about the game; name, materials, rules, how to determine a winner etc. Teacher collaborates with learners to provide the appropriate no cost and low cost materials available in the school environment in required quantity guided by the enrolment of the class. Teacher groups learners according to learning needs to ensure effective collaboration. The teacher must identify an aspect of the game that teaches a particular skill/concept. Use his/her pedagogical knowledge to integrate the playing of the game into the teaching and learning process.

**Crosscutting issues:** Although the play does not discriminate against gender such that boys and girls can play, it has a slight issues with inclusivity where amputated learners cannot be active players. However they can however be observer participants or referees.

**Core competencies developed:** Collaboration and communication, personal development and leadership are developed through this play.

**Development of Values and attitudes:** The play has the propensity of developing in the learners the values of turn taking, endurance, honesty, conceding defeat, group work, fairness etc.

**Development of skills:** Fine motor skills, good hand-eye-mind coordination.

## **Play 2: Papa kple Dada (Father and Mother)**

This is one type of make-belief or imitation game. It is by structure a role play game (Amlor, 2016:67). In this game, children imitate and mimic daily human activities performed by adults including social, political, religious, economic and household activities in various forms. In groups children perform traditional gender roles on play grounds. A miniature home set up is improvised such that all participants have a role to play. Girls imitate traditional female roles by engaging in household chores such as cooking food in pieces of broken pots, bowls and tins. Other activities are bathing, feeding and cuddling dolls or pieces of wood assumed to be newly-born babies. The boys role play male roles as husbands, elders, chiefs and imitate how the men folk undertake traditional vocations like farming and hunting. They also perform child upbringing roles by punishing wayward acts by other members of the simulated society.

**Materials for the game:** Mainly waste materials; empty cans, broken pots and plates, head gears, torn footwear, sticks, used artificial hairs, etc. To be sincere, the materials are dictated by the roles to be played hence this study cannot exhaust the list.

**Rules:** The game is not rigidly governed by any structured principles to be observed as social life revolves mainly around social norms. These norms are encouraged during this type of play. A participant should not reject or refuse to play a role assigned to him or her. Exhibition of group tolerance, respect and commitment is encouraged by all (Amlor, 2016).

**Modification:** Depending on what theme/sub-strand the teacher is facilitating, this play can be modified to support the teaching of the specific concept. Personal hygiene for instance can be facilitated by creating a simulated home in the classroom where learners are bathing, cutting overgrown nails, trimming hairs at the salon, sweeping, washing of dishes etc. A project work to desilt choked gutters and clearing bushy areas in the school environment can be taught in pretend games. This kind of games are common in African societies. They help to promote social development of the children instilling high sense of self-control, tolerance, critical thinking, collaboration and the ability to exhibit good performance skills similar to what their parents do. It is common to see children performing leadership roles in these plays as chiefs, elders, church leaders, teachers, hunters, linguists etc. Lessons drawn from this indigenous play games also enhance the use of different societal skills that prepare children towards future adult life (Lancy, 2007; Amlor, 2016).

**Development of literacy:** children develop oral language skills including listening and speaking. They develop mother tongue vocabulary which fosters second language acquisition. Vocabulary is one of the major components of reading which can be developed through various play games. As children interact as a whole family or community to imitate adults – children roles, language becomes the vehicle that drives their acts to completion. Children through these role plays develop various lexical vocabulary of the various themes they explore in the play. Songs which accompany some of the roles are good sources of language development. Language of commerce is developed when children act as buyers and sellers in a market scene or shop scene during the make believe play.

**Development of numeracy:** counting of money in buying and selling, ordering of family members by age, identifying the quantity of materials needed for an activity etc. (*aRithmetic*).

### **The teacher's role:**

Teacher selects the various themes in relation to the sub-strand to be facilitated through the role play. Creating a learning theatre in the classroom or in the school environment is a duty of the teacher prior to the facilitation of the play. Teacher groups learners according to learning needs. Teacher has to develop the role sheets in advance.

**Crosscutting issues:** Pretend play does not discriminate against gender such that boys and girls can play since there are socially challenged parents and children in the society as teachers, nurses, doctors, lawyers, drivers etc.

**Core competencies developed:** Collaboration and communication, personal development and leadership.

**Development of Values and attitudes:** parenthood, turn taking, endurance, honesty, group work, fairness etc.

**Development of skills:** Fine motor skills, good hand-eye-mind coordination.

**Play 3: Tolovi (push and measure)**

Tolovi is played by both sexes. It can be played by two to five competitors. It is played using one toviku (tovi seed). Any round object can be improvised for the purpose. To play the game, a sandy field is needed. A circle is drawn and the players sit around it. The toviku/playing object is placed at the centre of the circle. The first player is determined through a kind of toss. The player curves the first finger and pushes the toviku forward. The toviku rolls on the ground and finally settles. The distance covered is measured by span. Two or three fingers are used to rule lines from the circumference of the circle to the point the playing object stops. A second player takes the turn to play, measure and draws the lines. This process continues in turn. When it comes to the turn of the first player, he/she extends the line from where it ended earlier. The process continues till a winner is determined. After a number of pushes, the total distance covered is measured for all by a referee/observer. A person who has the longest distance is declared the winner.

**Rule:** Only one playing object is used by all players; individual players must not use their own playing objects. A player must not intentionally cheat to win the game. A player who feels he/she is being cheated must not exit the game but report to the referee/observers.

**Modification:** The main arithmetic concept embedded in this play game is counting and measurement. Other social concepts include accuracy, vigilance, turn taking and tolerance. The main literacy skill fostered by the play game is writing and drawing. However, the game can be modified to facilitate, reading. The number of hand counts can be equated to a number of sounds/letters/syllables in a word. A learner after measuring the number of hand counts looks for a word that has same number of sounds/letters/syllables according to the teacher’s instruction. The learner identifies the word and decode the word. Such words can be arranged along his line during the play. After the game, the words can be rearranged to form a sentence, phrase or a short story.

**VI. DISCUSSION OF FINDINGS**

The study found that the pre-service teacher need to be trained to acquire the knowledge and skills of traditional play games. The training would fascinate the teacher to appreciate the integration of play into classroom activities. This mandate lies at the onus of the college tutor to integrate play based learning activities into teaching the pre-service teacher at the college level. During teaching practice the pre-service teacher is expected to demonstrate the integration of play into teaching activities. The college tutor should make conscious efforts to provide responsive feedback to the pre-service teacher and also provide coaching services about the integration of play into the teaching activities. The reflection aspect of the coaching process would ensure mastery of the knowledge and skills of learning through play. The pre-service teacher who is well trained in this direction would use the knowledge in teaching and learning activities in the basic education classroom.

It is also observed that TEPG can be used to facilitate literacy and numeracy at the early grade levels and beyond. Observing play 1, a teacher can use it to teach word reading. Learners can be supported to identify five letter words, say; “akutu”. At stage one of the play, learners can identify the various phonemes as / a k u t u /. The learners at stage two can easily blend these phonemes to form syllable [a ku tu]. They can then blend the syllables [a + ku + tu] to form the word [akutu]. This process of separating the five letter word into its composite letters and syllables are demonstrated as the number of pebbles at the various stages of the play. In the activity, the head pebble is identified as the initial sound performing active role in the process. The teacher can modify the play to accommodate the number of letters and syllables in the particular word to be taught. In teaching numeracy one can use the play to teach counting and sum of numbers.

Target word:	a k u t u	
Stage 1:	1 2 3 4 5	[ 1 + 1 + 1 + 1 + 1 ]
Stage 2:	a ku tu	[ 1 + 2 + 2 ] = 5
Stage 3:	aku tu	[ 3 + 2 ] = 5
Stage 4:	a kutu	[ 1 + 4 ] = 5

} grouping and regrouping.

Later, the play can be used to teach factors of numbers.

The knowledge gain from the play activities empowered the learners to perform the activity in the figure below:



The figure above would help the child develop various competencies now (numeracy) and later (arithmetic thinking).

Understanding size, shape, and patterns, ability to count verbally (first forward, then backward), recognizing numerals, identifying more and less of a quantity, understanding one-to-one correspondence (i.e., matching sets, or knowing which group has what number of elements)

**Number Sense:** This is the ability to count first forwards correctly. The ability to see relationships between numbers, including adding and subtracting, is a more nuanced skill linked to number sense. They were counting with their teacher: "One, two, three, four, five, six...". Number sense is a set of skills that help children to work with numbers. Understanding definitions such as more and less, and bigger and smaller. Understanding symbols representing numbers and making comparisons of numbers.

**Representation:** By using terms, images, symbols, and objects to make mathematical ideas “real” (like pebbles). The teacher asked students to carefully set out four plastic plates and four plastic cups: “You can come to a party with your whole family!” Assuming that their family consisted of four members, learners would be able to apply this knowledge to the number of plates and cups they wanted. Naturally, children are visual and can construct associations between numbers and a depicted entity. To explain a relationship, using representation or pictures allows the use of mathematics real to the mind of a child.

**Spatial Sense:** Kids will call this “geometry” later in school, but it incorporates the concepts of form, scale, space, location, direction and movement for toddlers. For children, in relation to the people and things around them, spatial sense is mainly about their awareness of themselves. In their art and craft activities, encourage children to use shapes. Try to teach them how to diagonally fold a square piece of paper and to cut to create two triangles along the fold. You may also allow them to use their cut-out shapes to create an image.

**Measurement:** This scientifically uses units like inches, feet or pounds to find the length, height, and weight of an object. Time calculation (for example, in minutes) also falls under this skill aspect. Playing in the classroom or playground with bits and pieces, such as old crab shells, leaves and pencils, offers opportunities to incorporate vocabulary for measuring. As children play with everyday objects, terms such as measure, taller than, shorter than, wider than, narrower than, length, volume, weight, area, centimeter, meter, inches, feet, yards (choose according to location), heavier, lighter can be used. (Refer to play 1)

**Estimation:** This is the ability to make a reasonable guess about something’s volume or size. For small children, this is really hard to do. By teaching them the definition of terms like more, less, larger, smaller, more than, less than, but can be supported through plays.

**Pattern:** Patterns are objects that repeat in a logical way: numbers, shapes, pictures. Patterns help kids learn to make assumptions, understand what’s next, communicate logically, and use thinking skills. It was found that the capacity of children to detect mathematical patterns, more than other abilities such as counting, may predict later mathematical achievement. Again, it was found that pattern recognition can differ greatly between people: we have all seen kids who organize objects in radial patterns or make reflective symmetry constructions, while others pay little attention at all to patterns (Gifford, October, 2017).

**Problem solving:** There is more than one path to the answer to the ability to think about a dilemma, to understand. It means finding an answer using previous experience and critical thinking abilities. Teachers can encourage the problem solving of children by offering expanded learning time blocks, rearranging classroom spaces to foster teamwork, and presenting a range of resources for use by children (Britz, 1993).

The study also found that play games can be used as an assessment strategy in the classroom. For the purpose of developing a functional citizens for the nation, assessment in education is expected to be procedural, continuous, regular and timely. Assessment

is expected to be multisensory and not limited only to the pen and paper (memory and recall). The focus of assessment must be geared towards application of knowledge, demonstration of skills acquired and learned. Play is one teaching strategy that has inbuilt assessment mechanisms. Arithmetic concepts can be assessed through make believe play games that involve, counting, measurement, buying and selling etc. Literacy (reading and writing) assessment can be assessed in plays focusing on prosody, oral language and songs. Assessment in the form of project works can be organized in plays where all learners are actively involved. Plays ensure higher learner involvement and participation in assessment. Assessment as learning (AaL) can start from collection and assembling of play items and costume. Assessment for learning (AfL) can occur when learners take up and switch various roles in a particular play. Assessment of learning (AoL) is fostered when learners use play games to resolve real life challenges in society, ie, settling of disputes amicably as parents, group leaders and chiefs. Others include performing such traditional plays during communal labour, festivals and community celebrations to entertain the society and sensitize the society on a specific phenomenon etc.

Plays can also support assessment at the early grade levels. Plays are used to engage the attention of the class while the teacher concentrates on individual learners to assess them in turns. In a classroom where a teacher is conducting Annual Status of Educational Report (ASER) – a reading test, play can be used to engage the other learners in class to prevent interruption of the assessment process.

We found out that play is one of the indigenous cultural knowledge forms that is universal to the globe. Objects used in play are found commonly in the environment and are mainly accessible without cost. For instance the materials (palm kernel or pebble) used in adifofɔ is available in every household making it possible for easy organization of the game. To integrate play into the classroom practices requires the purposeful readiness of the instructor. Parents and learners would be ready to support the teacher to collect these free learning resources and use. Parents and other education stakeholders would be available to support the teacher to prepare some of the teaching resources for the classroom use. In most Ewe communities, parents feel appreciated when teachers approach them for support in preparing materials for TEPGs in teaching and learning activities. They feel involved and would be ready to help. Members of the local community would be readily available as resource persons to train the teacher on knowledge of play; materials, terms, rules, costume etc.

## **VII. CONCLUSION AND RECOMMENDATIONS**

It is observed that there is a conscious paradigm shift towards the use of creative pedagogy in the classroom. One strategy of creative pedagogy is the use of traditional play games. The play based instructions support multisensory approach to learning.

Play, when carefully modified and used in a play learning environment is a sure vehicle to ensuring acquisition, understanding and application of knowledge to real life situations.

The best educational stage where play can best be used to introduce learners to practicum of multisensory learning is the early grade level. Children at this grade have tender brain and motor abilities that must be developed and shaped so they become functional citizens for nation building.

One sure consideration in achieving mother language instruction is to train the pre-service teacher in the use of indigenous knowledge to facilitate literacy delivery in the classroom. It is apparently incumbent on Colleges of Education specializing in ECE programs and the Universities who have ECE departments to invest their time and other resources into research in the educational values of traditional plays games. The research findings would in turn inform review of their curricular in training the pre-service ECE teacher who is well equipped with play based learning strategies before graduation. This teacher can apply the skills and pedagogical knowledge to teaching through play to enhance multisensory learning.

Informed by the conclusion above, we suggest the following recommendations;

1. Stakeholders in Early Childhood Education and parents should avail themselves to educate teachers in the knowledge of traditional play games during Professional Learning Community (NaCCA, 2019:43-47). Community members can volunteer to support teachers as resource personnel in the use of play in the instructional activities in the classrooms.
2. Through in-service training, head teachers and School supervisors are expected to encourage ECE teachers to develop positive perception towards play as an instructional strategy (Kekesi, Donkor, Aburampah & Torkonyo, 2019:515). NGOs in education are encouraged to invest in workshops that aim at building the capacity of ECE teachers in traditional play games and their integration into the creative pedagogical spectrum for teaching.

3. The mentoring universities of Colleges of Education can also review their curricular to accommodate traditional plays, games and songs as an examinable semester course. This approach would encourage equipping the pre-service teacher for the literacy classroom.

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# *Examining The Ravaging COVID-19 And Its Implications For Educational Institutions On A Global Perspective*

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**Abstract –** The study examined the ravaging COVID-19 pandemic and its implications for educational institutions on a global perspective. COVID-19 outbreak occurred in Wuhan City, China at the twilight of the year 2019 and spread like wild fire to other countries. Globally, over eight million people have been infected with the coronavirus, over four million people recovered and more than half a million deaths recorded due to the COVID-19 pandemic. The disease was so dreadful that various nations adopted the lockdown measure to forestall further spread. Consequently, educational institutions at all levels were shut-down along-side other sectors. Corollary to the above, it was found that the academic calendar would be affected; international students' enrolment might reduce; schools that depend more on foreign students for funding may experience a down-turn during the period of COVID-19 outbreak; schools may not be able to be liberal with their financial aid offerings; private school owners may find it difficult to pay the salaries of their employees during the period of the ravaging COVID-19 pandemic. It was however, recommended that schools should source revenue through entrepreneurial practices; the government of each country should allocate 26% of her annual budget to education sector; tuition fee for international students should be cut down by at least 20%; World Health Organization (WHO) should sponsor more researches toward getting a vaccine for COVID-19.

**Keywords –** Ravaging COVID-19, Educational Institutions , Global Perspective.

## I. INTRODUCTION

The novel coronavirus which is also known as COVID-19 is a microscopic organism that ordinarily could have been despised but the devastating effects of the virus have earned it an unprecedented popularity. Once the virus is contracted by a person, the transmission is usually spontaneous. The virus is so infectious that at its very beginning, it was difficult to contain even by developed countries hence the number of positive cases (infected persons) consistently increased and people died in hundreds and thousands especially in such continents as Asia, Europe, North America and South America. The spread know no bounds. Both the small and great were infected leading to deaths of people irrespective of age, colour, height, weight, sex, social status etc.

In order to forestall further spread of the deadly disease, various countries adopted the policy of lockdown. Resultant from the above, schools, markets, banks, religious centres (churches and mosques), motor parks, airports, etc were closed down except essential sectors such as health and security. Consistent with the above, World News (2020) reported that

*Italy is considering a country-wide closure of all schools and universities in an effort to stop a further spread of coronavirus. Some international schools have already issued letters informing parents and guardians they will be closed as a preventative measure as of Thursday, with remote online teaching beginning Friday (p.35).*

In some countries, schools were closed abruptly in response to the suggestion or rather recommendation of lockdown as most effective measure to contain the spread of the dreaded disease.

It is known that the school is an important institution of the society established to engender development in the society. Unfortunately, coronavirus outbreak has halted the operations/activities. The school as an institution of the society plays both social and economic roles. Inadvertently, the COVID-19 pandemic and the attendant lockdown has some implications for the educational institutions.

Corollary to the above, this paper discusses the origin/cause of COVID-19, its extent of spread, some prominent persons infected, impact of school and business closure (lockdown) on COVID-19 transmission rate, COVID-19 threats on human race and strategies of nations to contain it, World Health Organization's (WHO's) conditions to ease COVID-19 restrictions (lockdown), and the COVID-19 implications for education institutions on a global perspective.

## **II. ORIGIN OF COVID-19**

The cause of coronavirus which is ravaging the whole world is still in obscurity. While it is known that the new virus outbreak occurred in Wuhan, China, it actually manifested at the twilight of 2019. Wuhan City is the capital of Hubei province in the People's Republic of China. According to International (2020:46) "the Wuhan outbreak came at the worst possible time which was on the eve of Lunar New Year when tens of millions of Chinese travel to celebrate with their families".

Concerning the cause or origin of the COVID-19, the whole world especially the United States of America had been so curious to know. The United States President, Donald Trump stated that his government is trying to determine whether the coronavirus emanated from a laboratory in Wuhan City of China. Chairman of the US Joint Chiefs of Staff, Gen. Mark Milley said US intelligence indicates that the coronavirus likely occurred naturally which is in sharp contrast to being created in a laboratory in China. While the world populace are eager to hear or know the cause of the virus, the United States version is taking a dimension of politics. Consistent with the above, International (2020) reveals thus

*Fox News reported on Wednesday that the virus originated in a Wuhan laboratory not as a bioweapon but as part of China's effort to demonstrate that its efforts to identify and combat viruses are equal to or greater than the capabilities of the U.S (p. 46).*

The above excerpt is suggestive of the Wuhan laboratory as being where virology experiments take place and lax safety standards there led to someone getting infected and appearing at a nearby "wet" market, where the virus began to spread. While this accusation by U.S against China continues, it is worthy of note that U.S has relied on China for personal protection equipment desperately needed by American medical workers hence the two countries emphasize strong economic ties. The accusations notwithstanding, since February 2020, the Chinese state-backed Wuhan Institute of Virology dismissed rumours that the virus may have been artificially synthesized at one of its laboratories or perhaps escaped from such a facility. Moreso, China's foreign ministry has quoted World Health Organization (WHO) as positing that there is no evidence that the coronavirus that has infected millions of people globally was made in a laboratory. Nevertheless, the broad scientific consensus holds that SARS-CoV-2, the virus official name, originated in bats (International, 2020).

## **III. EXTENT OF SPREAD/TRANSMISSION OF COVID-19**

It is strongly argued especially by the United States that the Coronavirus was created in the laboratory in the Wuhan Institute of Virology. Besides, the laboratory lacked safety facilities hence it led to someone getting infected and appearing at a nearby "wet market" where the virus began to spread. The spread had reached almost all the countries in the world with several active cases and deaths in each of the countries.

The rate of transmission of COVID-19 could be considered on a global perspective. For instance, African continent as at the period of this study had lower cases of coronavirus than other continents apart from Australia. The secretary to the Government of the Federation of Nigeria and Chairman of the Presidential Task Force on COVID-19, Mr. Boss Mustapha hinted as was reported by Obisue (2020) that

*recent studies had revealed that the transmission rate of coronavirus in Africa is lower than what is obtainable in other climes ... the study also implies that Africa has so far experienced fewer severe cases and fewer death rate as earlier predicted (p.8).*

In a recent publication by the World Health Organization on risk modeling for 47 countries in the African region, it was predicted that there would be 82,000 to 190,000 deaths during the first year of the pandemic. The above prediction may not be doubted considering the experience in northern Nigeria, particularly in Kano where dozens of human beings died as a result of coronavirus. This of course may not be unconnected with Mr. Boss Mustapha's remarks that African continent's healthcare systems were already overburdened hence the call on African leaders to take necessary measures to forestall a worst-case situation. He also emphasized that it is expedient to expand capacity to mitigate the implications of widespread community transmission of COVID-19 (Obisue, 2020).

In another development, WHO made a stern warning recently that COVID-19 pandemic is far from over, at the instance of 106,000 new active cases recorded globally. The WHO's Director General, Tedros Ghebreyesus as reported by Adewole (2020) stated in Geneva at a world press conference that

*the virus was spreading in poorer countries, just as wealthier nations were emerging from lockdown. We still have a long way to go in this pandemic. We are very concerned about rising cases in low and middle-income countries. The infection rate has been growing rapidly in Latin America, with Brazil becoming the country with the third most confirmed cases after it surpassed the UK recently (p.36).*

Still on the global spread of COVID-19, seventy-two Nigerians living in China have tested positive for the coronavirus disease. It was explained by Chinese authorities that 65 persons who had contact with the positive cases were being traced. The information was disclosed by the Foreign Affairs Office of Guangzhou Municipal People's Government in a note verbale (diplomatic correspondence) to the Nigerian Consulate in Guangzhou dated 22<sup>nd</sup> April, 2020. Part of the correspondence reads thus: "According to the data by Guangzhou Municipal Health Commission on April 21 there are currently 16 confirmed cases and 56 positive test cases among Nigerian citizens in Guangzhou as well as 65 cases of contact. It was also reported that III (one hundred and eleven) other African nationals also tested positive for COVID-19 during the tests of 4,553 Africans in Guangzhou City (Adepegba, 2020).

The aftermath of measures taken by various countries have yielded good result which is reduction or low spread rate of coronavirus especially in developed countries. The above notwithstanding, scientists are warning that though COVID-19 transmission dip as we head into the spring and summer, such a reduction should not be mistaken for an end to the outbreak. It should rather be noted that a reduction of cases during the summer should be exploited or used as an opportunity to prepare for next winter, when a new model suggests the virus could infect 100 times more people. Research scientists from universities in Basel and Stockholm have modelled the effects of seasonal variation on COVID-19 as which is the prevalent strain of coronavirus-transmission rates. Their model suggests we are currently experiencing a "small peak in early 2020 in temperate regions of the Northern Hemisphere" which will be followed by "a larger peak in winter 2020-21". Considering other coronaviruses, the researchers believe the rate of transmission will indeed drop as we head into spring and summer but then rise again, infecting as many as a hundred million people in total (International News, 2020).

#### **IV. SOME PROMINENT PERSONS INFECTED WITH COVID-19**

Prince Charles of Wales has tested positive for coronavirus. Prince Charles is aged 71 and is the eldest son and heir to Queen Elizabeth II. The septuagenarian has been displaying mild symptoms of COVID-19 but otherwise remains in good health hence he has been working from home during the ailment. The Duchess of Cornwall (Camilla) has also been tested but does not have the virus. However, the couple (the Prince and the duchess) underwent self-isolation at their home in Scotland (prince Charles, 2020).

Menegian Saro-Wiwa who also had underlying health conditions had died after testing positive for coronavirus. Menegian died in London on the 13<sup>th</sup> April, 2020. Menegian is the son of the Late Playwright and Ogoni activist, Ken Saro-Wiwa. His sister Noo Saro-Wiwa announced via an Instagram post as was reported by News (2020) thus

*We said goodbye to my brother, Gian, on Monday. He had COVID-19 combined with underlying health conditions. Gian was the smartest and most talented out of all of us: a champion sprinter at school, a poet, an artist, budding engineer, a self-taught guitarist and pianists (p. 10).*

In Nigeria the Governor of Bauchi State, Mr. Bala Mohammed has tested positive of the deadly coronavirus. This information was disclosed by the governor's Senior Special Assistant (SSA) on Media, Mr. Muktar Gidado. His revelation as was reported by Garba, (2020) states thus

*This is to inform the general public that the result of the six initial tests carried out by the Nigeria Centre for Disease Control (NCDC) on Governor Bala Mohammed, his family and aids that accompanied him to Lagos is out; Of the six initial tests carried out, one of the samples was confirmed positive of COVID-19. The positive result happened to be that of Governor Mohammed, the Governor of Bauchi State (p.5)*

Also Mohammed Abubakar, the son of Nigeria's former Vice-President, Atiku Abubakar has tested positive to coronavirus. Atiku's son was treated and managed at Gwagwalada Specialist Teaching Hospital in Abuja. It was revealed that Governor Bala Mohammed of Bauchi and Atiku's son shook hands and exchanged pleasantries when they met in Lagos in Aero Contractors aircraft (Garba, 2020).

Apart from the above, the Chief of Staff to President Muhammadu Buhari of Nigeria, Abba Kyari also tested positive to COVID-19 and the complications arising from the COVID-19 led to his death. It is said that Abba Kyari was in the delegation that travelled to Germany to attend a meeting with the officials of Siemens to hold talks on improving electricity supply in Nigeria. The Chief of Staff may have contracted the disease from Germany since Germany was regarded as high risk country then. Worse still on Kyari's coronavirus infection and eventual death, Olaoye (2020:5) reveals that "New Telegraph gathered that while the delegation returned to the country on March 14, Kyari failed to abide by the directives of the NCDC which recommended 14-days self-isolation for anyone returning from any of the coronavirus ravaged countries". Also infected by the deadly virus was speaker of Edo State House of Assembly, Hon. Frank Okiye.

Furthermore, nine medical doctors have died in Philippines from COVID-19. The Philippine Medical Association as reported by International (2020:47) said "a ninth doctor had died of the virus, and that health workers were not getting enough protection" Expressing worries over the doctors' death, Benito Atienza, vice president of the Philippine Medical Association stated as was reported in International (2020:47) that "if it were up to me, test the frontliners first and test them again after seven days. Doctors could be carriers themselves".

Apart from the above, Guinea-Bissau's Prime Minister, Nuno Gomes Nabiam had been infected with COVID-19 alongside three top government functionaries. They include Interior Minister, Botche Cande; Secretary of State for Public Order, Mario Fambe; and Secretary of State for Regional Integration, Monica Boiro (International 2020 May 1). Moreso, the British Prime Minister Boris Johnson was infected with coronavirus. According to Musa (2020)

*The world stood attention as the British Prime Minister Boris Johnson was wheeled out of the intensive care unit (ICU) amidst cheers by those who have sacrificed their own lives so that others may live. In complete recognition of the sacrifices these healthcare givers are offering to take care of those infected with the virus, many countries take a particular time of the day to open their windows and salute their courage and resilience through a standing ovations in their various lockdown abodes. The public acceptance of their relentlessness and selfless service to carry on the battle to the end is a great inspiration worthy of global recognition and honour (p.40)*

Also, Kogi State Chief Judge, Justice Nasir Ajana as well as former Governor of Oyo State Senator Abiola Ajimobi have all died of COVID-19. Ondo State Governor, Rotimi Akeredolu tests positive for COVID-19 as well as the Nigerian Foreign Affairs Minister, Mr. Onyeama Geoffrey.

#### **V. IMPACT OF LOCKDOWN (SCHOOL AND BUSINESS CLOSURE) ON COVID-19 TRANSMISSION RATE**

Most countries indeed took measure of lockdown ie to restrict movement between cities or states. The Chinese government adopted this measure and implemented to the letter. Wuhan, the city where the COVID-19 outbreak occurred first was placed on permanent lockdown. In order to achieve the safety of all students including foreign students, the students were isolated from the rest of the people. They were quarantined in their campuses all through the period when the coronavirus was ravaging. In order to make an appraisal of the impact that school and business closures has on coronavirus transmission rates, using data on how often people interact and where, researchers developed a model. Three separate scenarios were compared in the study viz no intervention and no holiday travel; no physical distancing and normal holiday travel; and school closures with only key workers at work. The researchers found that intervention by way of closing businesses and schools had significant impact in reducing new cases. In other words, the unprecedented measures the city of Wuhan adopted to minimize social contacts in school and the workplace have enhanced the control of the outbreak (International, 2020).

#### **VI. COVID-19 THREATS ON HUMAN RACE AND HOW NATIONS STRATEGIZED TO CONTAIN IT.**

COVID-19 has caused the world to experience a serious and inexplicable turn around in the milieu. People are dying in their numbers without respect for social status. Describing the scenario more appropriately, Lukman (2020) stated thus

*One thing that is however certain is that COVID-19 is a world leveler whether with reference to so-called developed or undeveloped nations, rich or poor citizens, powerful or powerless citizens, or ideological standpoints. It is attacking and taking lives almost in the same magnitude across all countries indiscriminate of political, economic or social status. Somehow, the threat of COVID-19 is affecting all nations and humanity equitably (p.18)*

Indeed the virus has spread and has killed so many persons which made the WHO to declare it a pandemic. Giving credence to the above assertion, Musa (2020) stated that

*... the epidemic that has caused the deaths of thousands of people and put other hundreds of thousands in the valley of death ... in Indonesia alone, no fewer than 18 doctors have paid the supreme price in the fight against the infection. From global statistics, no fewer than 100 doctors and nurses have been felled by COVID-19, with most of them suffering exhaustion (p.40).*

The excerpt above is not limited to medical practitioners alone who have fought tooth and nail in staving off COVID-19 threat of extinction threatening human race. It rather encompasses over two million people infected globally.

It is against this backdrop that nations adopted certain measures especially total lockdown which affected almost all sectors including the education sector. The total lockdown measure is harsh as the poor finds it extremely difficult to cope. In line with the foregoing, Musa (2020) posits that

*In recognition of the fact that the shutdown option is not appropriate in countries with high incidence of poverty, the World health Organization (WHO) had earlier warned against the imposition of lockdown on a populace that depends on daily incomes (p.48).*

Considering the extent to which the lockdown (stay at home order) is biting hard on the populace, the various nations came up with new policies such as opening only supermarkets, allowing people to go to work for few hours, allowing banks to operate between 8:00am and 12:00 noon etc. These measures still left the populace dissatisfied especially the poor. Besides, WHO has warned that about 73 million persons across Africa risk acute hunger and starvation following the restriction of movement brought about by the COVID-19 pandemic. WHO is of the view that coronavirus was exacerbating food shortages, as food imports transportation and agricultural production have all been hampered by a combination of lockdowns, travel restrictions and physical distancing measures (Otokpa, 2020).

## VII. WHO'S CONDITIONS TO EASE COVID-19 LOCKDOWN (RESTRICTIONS)

In a bid to show responsiveness to the yearnings of the world populace on COVID-19 lockdown, the WHO boss Tedros Adhanom Ghebreyesus said countries that want to lift COVID-19 restrictions must meet a row of conditions to prevent another surge of infections. Such conditions include:

1. Government must ensure that the spread of the novel coronavirus is under control. This means that health authorities must know the origin of every single case and cluster of infections.
2. National health systems must also be able to find, test, isolate and treat every new case, and all recent social contacts of every infected person must be tracked down.
3. Countries that want to ease their curbs must minimize infection risks in hot spot settings such as hospitals and nursing homes.
4. Preventive measures must be in place in workplace, schools and other essential locations. This includes physical distancing, hygiene etiquette and possibly, temperature measurements, according to the new WHO guidelines.
5. Countries must also manage the risk of importing new cases from abroad, by detecting infected travelers, and by quarantining those who arrive from hot spot countries.
6. It is important that “communities are fully educated, engaged and empowered to adjust to the new norm” of behaving in ways that prevent new infection. News Agency of Nigeria (NAN) as reported in (News, 2020).

## VIII. EXAMINING THE RAVAGING COVID-19 PANDEMIC AND ITS IMPLICATIONS FOR EDUCATIONAL INSTITUTIONS ON A GLOBAL PERSPECTIVE

It is not disputable that coronavirus has spread to all the continents except the Antarctica causing not only health crisis but also social and economic crisis (Camara, 2020). On the economic sphere, educational institutions that depend more on foreign students to make money may be affected during the period of the COVID-19 outbreak.

Buttressing the above, Australia Council for International Education has it that there were over 212,000 about 28 percent of international students in the country. The students contribute over A\$12 billion to the country's economy annually. Unfortunately, due to the coronavirus pandemic, about 100,000 of the students are stuck in China. Consequently, the Global Reputation Taskforce has been set up by the Australia Council for International Education to research and unravel the implications and impact of the crisis caused by the pandemic. The United States of America has its own experience of the pandemic with its attendant implications. There were about 370,000 Chinese students in America prior to the coronavirus outbreak. India is second to China with regards to highest number of foreign students in the United States. Most of the foreign students are affected by the pandemic hence they are unable to go back to school whereas freshers are finding it uneasy to resume. Foreign students contributed over \$41 billion to the American economy in 2018/2019 academic session. The New York University which had over 20,000 foreign students is so cherished by foreign students. It is therefore not surprising that the university received over 85,000 applications for admission in the year 2020. Undoubtedly, most of those that applied may not go and take up their admission due to the COVID-19 effects. Writing on the implications of the pandemic on educational institutions, Hafeez Lukhani as cited in (Wuhab, 2020) posited that

*It could be a setback to many universities and colleges because in the last decade, there have been deep cuts in state funding of higher education which made universities and colleges to focus on admitting more international students. And if there are fewer foreign students in American Universities and colleges, those schools would have to admit more domestic students that would pay full tuition and that means the schools may not be able to be generous with their financial aid offerings (p.29).*

Apart from the above, the United Kingdom also has so many foreign students. About 17,640 Nigerians studied in UK universities in 2011/2012 academic session. Unfortunately, the seeming global economic meltdown arising from COVID-19 outbreak could hinder many foreign students from going back to school (Wahab, 2020). The above could be true as the price of crude oil has abysmally fallen in the international market. Besides, the Nigerian currency (Naira) has been so devalued that US \$1 is exchanged

for over N360 whereas one British Pound (€1) is exchanged for over N400. This means that it would cost about N4,000,000 (four million naira) to sustain a student's study for a year.

In Africa, especially in Nigeria, a lot of activities in educational institutions were put on hold or postponed. This is quite indisputable because proposed fairs, workshops, seminars and symposia have been postponed by the organizers due to the COVID-19 pandemic. Giving credence to the above, Wahab (2020:28) reported that "the Lagos State University, LASU, Ojo, had to shift its 24<sup>th</sup> convocation ceremony billed for this week. This is despite the huge resources already spent on preparations among others". Furthermore, the financial consequences of COVID-19 on institutions of learning is enormous. Buttressing on this, the Chairman, Triple Square Private Schools, Lagos, Mr. Doyin Adebusuyi as reported by Wahab (2020:28) said "private school owners now have to grapple with how to pay their teachers for the period the schools would be closed".

### **IX. CONCLUSION**

COVID-19 pandemic has indeed pushed the world to a standstill affecting the education sector tremendously. Education institutions at all levels were shut down during the ravaging period of COVID-19 pandemic. The economies of both individuals and nations were adversely affected and this permeated down to local and foreign students. Consequently, education institutions that depend on international students for funding would be negatively affected. More so, the generosity exhibited by such schools in terms of financial aid offerings may either be withdrawn or reduced to bare minimum.

### **RECOMMENDATIONS**

Based on the findings and conclusion above, the following recommendations were made thus:

1. Government of each country should allocate 26% of its annual budget to education sector as recommended by the United Nations;
2. Tuition fees for international students should be cut down by at least 20%;
3. Education institutions should source revenue through entrepreneurial practices;
4. WHO should sponsor more researches to provide vaccine for COVID-19 cure;
5. Upon resumption, each school should establish a centre where each student would be tested and quarantined for fourteen days before full integration.

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# *Influence Of Induction Of The Latent Nuclear Polyhedrosis Virus On Reproductive Characteristics Of The Silkworm *Bombyx Mori L**

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**Abstract – This article presents the results of the effect of cold induction of latent nuclear polyhedrosis virus on the reproductive performance of silkworm. It has been established that as a result of the induction of latent nuclear polyhedrosis virus and strict selection for all reproductive indicators, fertility increases. An analysis of the physiological defects in clutches showed that the breed Ipakchi 2 has a significant decrease in comparison with the years in 2018 (4,6 %), in 2019 (0,9 %) and in 2020 (1,9 %). All other experimental breeds and lines have a fairly low physiological defect rate – 1,7-2,0 %. According to the results of the analysis of the initial clutches (F3), the grains of the rocks and lines were selected for the tribe all the analyzed clutches. In subsequent generations, a more rigorous selection by reproductive indicators will be carried out.**

**Keywords – Sericulture, Silkworm, Nuclear Polyhedrosis, Cocoon, Viability, Resistance.**

## I. INTRODUCTION

Today, more than 20 countries around the world breed silkworm caterpillars. Every year, 22-24 million boxes of industrial silkworm are harvested. From cooked silkworm grains, 840 - 860,000 tons of live cocoons are produced worldwide. Among them: the People's Republic of China - 650 thousand tons, the yield from one box of greens (85 kg), India - 150 thousand tons (80 kg), Uzbekistan – 20,0 thousand tons (59,6 kg) and 40,0 thousand tons falls on the share of other countries.

The production of living cocoons is increasing throughout the world, while infectious diseases, especially nuclear polyhedrosis, cause damage in the amount of 15-20% of the cocoon harvest. To solve this problem, research is being carried out in leading scientific centers of the world.

In this regard, the recognition of genes resistant to nuclear polyhedrosis of the silkworm, the identification of productive forms from populations of various origins, the creation of biological and chemical agents against diseases, the development of preventive measures are one of the most important tasks.

The republic has achieved high results in the production of living cocoons. However, during the feeding season, various types of silkworm diseases appear.

The spread of diseases in industrial feedings leads, first of all, to a sharp decrease in yield, grade, textile properties of cocoons and produced cocoon raw materials.

The strategy of actions for the further development of the Republic of Uzbekistan for 2017-2021 provides for the intensive development and modernization of agriculture, in particular animal husbandry, including the development of silkworm breeding and a gradual increase in the harvest of cocoon raw materials by developing effective measures to prevent and combat especially dangerous diseases of the silkworm, with the purpose of preserving the yield and quality of the cocoon is of great scientific and practical importance.

In our republic, the study of the epizootic of infectious diseases, the development of measures for the control and prevention of their occurrence on industrial feedings, scientists were engaged in E.N.Mikhaylov [8], L.F.Kashkarova [6], E.N.Troitskaya [17], N.A.Akhmedov [1], D.A.Ismatullaeva [4], S.Sabirov [14].

On a global scale, scientific research was carried out by a number of leading scientists of the world on the study of host-parasitic relations in protozoa diseases, the use of drugs, the search for disinfectants, the study of hereditary factors of silkworm resistance at the genetic level: E.I.Baburashvili [2], N.Baramidze [3] I.A.Kirichenko [7]; and S.Salimzhanov [15] and positive results have been achieved.

To date, scientific research has been epizootic and unsystematic. Therefore, there is still no coherent program of consistent and reasonable application of preventive and therapeutic measures to combat diseases of the silkworm in silkworm production in Uzbekistan.

Based on this, the creation of new and improvement of existing methods for the prevention and control of diseases of the silkworm, the search for genetically resistant to nuclear polyhedrosis and nosematosis of the silkworm breeds and the construction of a scientifically based system of preventive and therapeutic measures when keeping the silkworm is considered one of the urgent tasks.

At present, the identification of breeds and hybrids genetically resistant to nuclear polyhedrosis, the creation of new disease-resistant lines or breeds are the main directions in the development of measures to combat especially dangerous infectious diseases of the silkworm [2].

The possibility of creating silkworm breeds with high disease resistance was noted by the International Sericulture Commission [16].

One of the approaches to solving this problem was recommended to use signs of very high disease resistance in polyvoltine breeds with a high silk yield in monovoltine breeds. It was also noted that, in the future, the compilation of a molecular gene map, the isolation of genes and their transfer from polyvoltine breeds to monovoltine ones using genetic engineering methods will be carried out.

In recent years, Georgian breeders have created new breeds with high biological and technological indicators, as well as resistant to high-temperature summer conditions - Nina, Tbilisuri-2 and Kvatsikhe.

These breeds tolerate a high-temperature environment well, they also have a stable immunity to diseases, both in the open season, the stimulation of its cyclic development is due to both, and daily changes [5].

## **II. MATERIALS AND METHODS**

2 lines and 2 breeds (Line 27, Line 28, Japanese 120, Ipakchi 2) obtained from the laboratory of breeding and selection of the silkworm NIISH were used as material for the study.

The incubation and feeding of caterpillars of all lines and breeds was carried out in accordance with the experimental feeding methodology approved for white-beaked breeds.

In accordance with the same methodology, all data obtained as a result of incubation, feeding, papillonnage and storage of green, as well as a result of microscopic analysis of the experimental material, were collected and statistically processed. The following techniques were used in the work:

- selection of 4 breeds and breeding lines, the best in biological and technological characteristics;

- traditional selection and breeding selection at all stages of development of the silkworm (green, caterpillar, cocoon, butterfly) to study the stability of experimental breeds and lines [9];
- the assessment of the resistance of the above breeds and lines to nuclear polyhedrosis was carried out using the stress method
- the method of cold induction [11];
- the method of individual analysis and selection of breeding individuals for obtaining offspring from them in order to create breeding material resistant to nuclear polyhedrosis.

**III. RESULTS AND DISCUSSION**

To carry out research work on the creation of an initial breeding material for breeding resistant silkworm lines to nuclear polyhedrosis, the institute's breeders in 2018 recommended 2 alternative breeds that differ from each other: Jap-120, Ipakchi 2 and 2 breeding lines: Line 27, Line 28. The choice of these rocks and lines as a source material is justified by the following considerations, i.e. at present, the production mainly feeds highly silky-bearing foreign industrial hybrids.

In the long term, it is envisaged to completely stop the import of industrial grains into the republic from abroad by 2022, and by this time competitive industrial silkworm hybrids should be introduced by domestic breeders.

Therefore, we considered it necessary to create an initial breeding material resistant to nuclear polyhedrosis on the basis of promising breeds Jap-120, Ipakchi 2 and lines Line 27, Line 28.

Clutches F<sub>2</sub>, cooked last year and in each clutch was determined by the number of eggs, weight of eggs, weight of one egg and physiological marriage. The average indicators of the number of eggs in a clutch, weight of eggs in a clutch, weight of one egg and physiological marriage were determined (Table 1).

Table 1. Reproductive indicators of breeds and lines  
( in 2018-2020)

Breeds and lines	Number of eggs in clutch, pcs		Mass of eggs in clutch, mg		Weight of one egg, mg		Physiological marriage, %	
	$\bar{X} \pm S \bar{x}$	C <sub>v</sub>	$\bar{X} \pm S \bar{x}$	C <sub>v</sub>	$\bar{X} \pm S \bar{x}$	C <sub>v</sub>	$\bar{X} \pm S \bar{x}$	C <sub>v</sub>
<b>2018 year (F<sub>1</sub>)</b>								
Japanese 120	643±1,35	0,01	314±5,2	7,07	0,489±0,001	1,2	0,7±0,49	123,5
Ipakchi 2	619±2,12	0,01	330±4,8	6,55	0,534±0,001	1,3	4,2±0,90	97,6
Line 27	562±10,3	7,95	308±8,0	11,63	0,550±0,001	1,2	1,7±0,08	27,2
Line 28	551±14,3	11,6	266±9,7	16,30	0,505±0,001	1,4	2,6±0,16	27,7
<b>2019 year (F<sub>2</sub>)</b>								
Japanese 120	657±2,2	1,8	340±1,6	2,6	0,520±0,001	1,2	1,9±0,04	10,5
Ipakchi 2	699±1,9	1,6	386±1,1	1,7	0,542±0,001	1,3	0,9±0,6	12,2
Line 27	555±2,2	2,3	280±0,6	1,4	0,508±0,001	1,2	1,8±0,03	10,0
Line 28	586±1,0	8,5	274±1,9	3,2	0,500±0,001	1,4	2,0±0,04	10,0
<b>2020 year (F<sub>3</sub>)</b>								
Japanese 120	741±1,5	0,08	372±4,4	3,1	0,523±0,001	1,4	1,5±0,04	11,0
Ipakchi 2	763±1,8	0,05	418±6,5	2,3	0,555±0,001	1,6	1,8±0,03	12,4
Line 27	563±2,3	5,91	258±3,6	1,7	0,458±0,001	1,2	1,9±0,06	10,9
Line 28	541±4,1	8,3	273±7,4	2,6	0,495±0,001	1,3	6,4±0,70	22,0

The data in Table 1 shows that the breeds are more fertile than the breeding lines. The number of eggs in a clutch in the Japanese 120 and Ipakchi 2 breeds in 2018 varied from 643 to 619, and in the Line 27, Line 28 breeding lines - from 562 to 551.

The same indicators in 2019 are significantly higher than the previous year that is, for the Jap-120 and Ipakchi 2 breeds ranging from 657 pcs to 699 pcs, and for the Line 27, Line 28 breeding lines - from 555 pcs to 586 pcs.

In 2020, the number of eggs in clutch for the Japanese 120 and Ipakchi 2 breeds ranged from 741 pieces to 763 pieces, and for the Line 27, Line 28 breeding lines - from 563 pieces to 541 pieces.

For clarity, the fertility of ovipositions of breeds and lines are shown in the form of a histogram (Fig. 1).

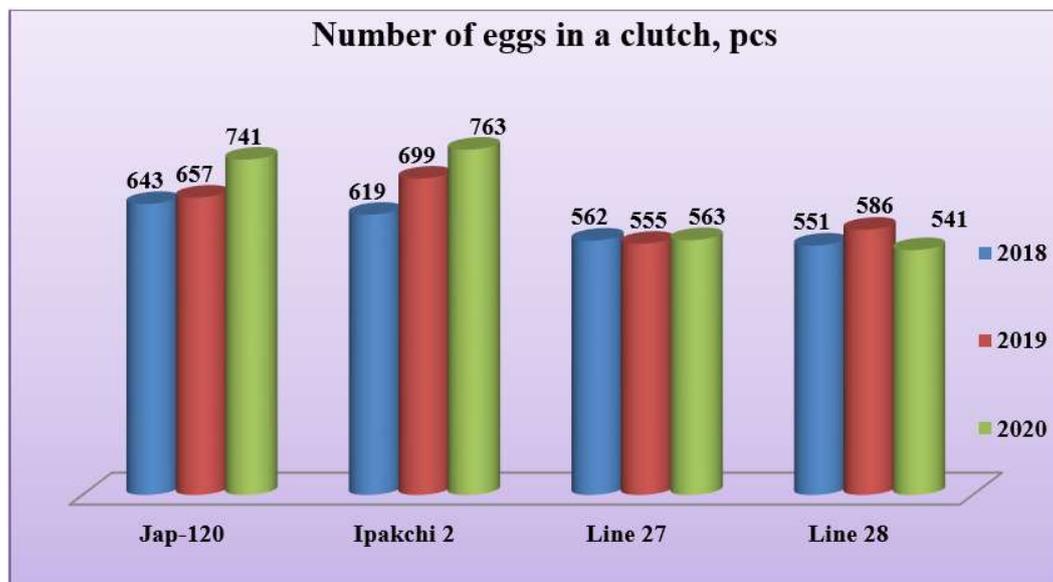


Figure 1. The number of eggs in the clutch of the studied species and lines  
(2018-2020 yy.)

As can be seen from Figure 1, the number of eggs in a clutch in 2020 is higher in breeds than in 2018 and 2019. For example, the breed Jap-120 has 84 pieces, Ipakchi 2 has 64 pieces. And for breeding lines, this indicator is almost the same than the indicators obtained in the previous year.

Based on the analysis of the original clutches (F<sub>3</sub>), all the analyzed clutches were selected for the tribe. In subsequent generations, a more rigorous selection will be carried out for reproductive indicators.

#### IV. CONCLUSIONS

The clutches (F<sub>3</sub>) of breeds (Jap-120, Ipakchi 2) and lines (Line 27, Line 28) prepared in 2018-2020 reproductive indices were calculated. As a result of the analysis of the number of eggs, physiological defects in clutches, it was found that they are more fertile in comparison with the indicators of the previous year.

1. The number of eggs in a clutch in the Japanese 120 and Ipakchi 2 breeds in 2018 varied from 643 to 619, and in the line 27, Line 28 breeding lines - from 562 to 551.

2. The same indicators in 2019 are significantly higher than the previous year, that is, for the Jap-120 and Ipakchi 2 breeds ranging from 657 pcs to 699 pcs, and Line 27, Line 28 - from 555 pcs to 586 pcs. In 2020, the number of eggs in a clutch for the Japanese 120 and Ipakchi 2 breeds ranged from 741 pieces to 763 pieces, and for the Line 27, Line 28 breeding lines - from 563 pieces to 541 pieces.

3. Analysis of physiological marriage in clutches showed that the Ipakchi 2 breed has a significant decrease in comparison with the years in 2018 (4,6%), in 2019 (0,9%) and in 2020 (1,9%) those, selection for reproductive characteristics favorably affects the fertility of the population. All other experimental breeds and lines have a fairly low rate of physiological marriage – 1,7-2,0%.

4. Indicators of variability of reproductive traits in breeds and lines in 2019 show that the lowest coefficient of variability was shown by breeds Jap-12 (Cv = 1,6%) and Ipakchi 2 (Cv = 1,8%), while Lines 27 and 28 variability in fertility is at the level of Cv = 2,3-8,5%.

These coefficients of variability give reason to conclude that the experimental breeds and lines have low variability in the leading reproductive traits, which is the result of individual selection for the fertility of female butterflies.

5. It has been established that as a result of selection for all reproductive parameters against the background of induction of the latent nuclear polyhedrosis virus, the fertility of breeding populations increases.

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## *A Bus Reservation System On Smartphone*

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**Abstract** – The use of bus in traveling is a large growing business in the world. Hence, bus reservation system deals with maintenance records of each passenger who had reserved a seat for a journey. Moreover, the ticketing system includes maintenance of schedule, fare and details of each bus traveling. This paper is a web-based application that will manage the scheduling of buses in all bus terminals of a transport company and also analyses the basic needs of passengers and design requirements of the transfer algorithm, and influence factors for effective running. This software developed can be used by any transport company as it wasn't designed for a particular bus station/company. The scheduling of buses which was the major addition to the bus booking application was implemented using round robin for proper bus assignment in a way that improves operational efficiency. The system thus designed will provide a scenario for the customer/passengers and the bus company to attain a win-win situation. It is an adaption of the speed-up technique. This aim is achieved through the use of object-oriented methodology.

**Keywords** – *Bus Reservation System, Passengers, Online System, Round Robin.*

### I. INTRODUCTION

Transportation assumes an urgent part in urban areas as it altogether impacts the nature of individuals' lives and is frequently the vital methods for getting to schooling, work and fundamental administrations. All the more along these lines, throughout the long term, a great many people like to go by transports since it's more advantageous and generally reasonable than different methods for street transport. The essential commitment of a vehicle association is to give customers satisfaction to the extent organization transport by decreasing the proportion of holding on schedule for each customer. On this note, the use of reservation has used a subject of phenomenal interest. The usage of booking targets organizing a way to deal with improve the utilization of a fleet of vehicles [1]. This is characterizing the highway a vehicle should be allotted by contemplating the exercises of those vehicles. Transport working organizations depend on some huge factors, for example, populace, culture, atmosphere, and economy. As

referenced already, transports are by a wide margin the most utilized procedure of street transport inferable from their adaptability, high accessibility, and availability, which normally prompted this paper. [2]. Transport reservation done physically is a method of making a schedule for each transport in the diverse warehouse by drafting the plan to contain their everyday course and arrangement of outings. At the point when a given course has less sum or no travelers, transports doled out to this course, will be reassigned to more bustling courses regardless of whether it's in another takeoff station of the vehicle organization.

Transport booking otherwise called transport booking is one of the trademark exercises of the arranging cycle in a Transport Company in that it deals with the most ideal undertaking of transport task to serve the normal voyager demand [3]. A Bus reservation System will assist the traveler with knowing when he is booked to travel which thus will assist with staying away from considerable delays and objections at the transport terminal. For example, if a traveler shows up at the bus stop and there is no transport or there are no travelers for his objective, this traveler may need to stand by the entire day and still will be unable to travel. All the more in this way, Bus reservation System will fill in as an organization chief to control and screen the development of transports and the everyday reservation of transports to various courses. Transport reservation System will fill in as a warning framework to help organizations use sound judgment and augment benefit.

Throughout the long term, people/travelers have thought that it was hard to grasp a Bus reservation System for their movements, reasons may be that they either don't design appropriately for their excursion or they are not mechanically slanted. These entanglements have been considered in this work, hence it is made to be easy to use and organizations/firms utilizing Bus reservation System might have staff(s) prepared for this reason to encourage the utilization of Bus reservation System.

## II. THEORETICAL BACKGROUND

The theoretical background gives a synopsis of the technologies used in developing the system “Bus Reservation System” and the general concept of the research topic as seen by the other researchers. The technology is chosen in other to present a more user-friendly system.

The site developed comprises various web contents written in HTML, PHP, JAVASCRIPT and MYSQL server used in the development of the database of the system.

### 2.1. Scheduling Algorithm

Scheduling is the act of following a schedule, while a schedule is an outline of things to be done and the time when they will be done. However, the concept of scheduling is mostly used in operating systems where processes are scheduled to run within a particular time after which the CPU may be preempted from it, and this brings us to types of scheduling

Scheduling may be

1. **Preemptive Scheduling:** the CPU can be preempted from a process even while it has not exhausted its CPU burst.
2. **Non-preemptive Scheduling:** Once a process is assigned the CPU, it cannot be taken away until the process completes its CPU burst.

And this brings us to the types of scheduling algorithms.

- i. First Come First Serve (FCFS)
- ii. Shortest Job First (SJF)
- iii. Round Robin (RR)
- iv. Shortest Remaining Job First (SRJF)

2.2. Comparison Of Scheduling Algorithms Using Waiting Time And Starvation

Name	Definition	Waiting Time incurred	Starvation
<b>First Come First Serve</b>	Simplest possible scheduling algorithm, depending only on the order in which processes arrive	<b>High</b>	Leads to starvation especially when long jobs arrive first on the queue
<b>Shortest Job First</b>	Associate with each process the length of its next CPU burst and Uses these lengths to schedule the process with the shortest time and uses e.g., FCFS to break ties	Low	Leads to the starvation of long jobs
<b>Round Robin</b>	A preemptive scheduling scheme for time-sharing systems	Low	Solves the problem of starvation as each job is allocated a time slice.

2.3. Bus Reservation Techniques

Round robin scheduling (RRS) is quite possibly the most prepared, leased buildings, most attractive and most extensively used booking calculations ever utilized [4]. It is a preemptive type of planning and furthermore a work booking calculation that is accepted to be reasonable, as it utilizes time cuts that are allotted to each cycle in the line or line. Each cycle is then permitted to utilize the CPU for a given time measure, and on the off chance that it isn't finished inside the assigned time, it is appropriated and afterward moved at the rear of the line with the objective that the accompanying system in line can use the CPU for a comparative proportion of time.

Cooperative planning is a calculation predominantly utilized by working frameworks, working structures, and frameworks that serve different customers or clients that expect assets to be utilized. It handles all solicitations in a round first-in-first-out (FIFO) request and evades need so that all cycles/applications can utilize similar assets in a similar measure of time and have a similar measure of holding up time each cycle; henceforth it is additionally considered as a cyclic chief.

2.4. How Round Robin Is Applied

However, this project makes use of round robin in assigning buses for a particular route. Here, buses for the same route are assigned different departure time but if a bus departure time has elapsed and the bus is yet to leave the bus station within the time slice allocated to it as a result of insufficient passengers, then the passengers will be reassigned to the next bus plying that route

whose departure time has not elapsed. Then the bus returned to the back of the queue where it waits for its turn again to be loaded. This process will continue as long as the bus has not yet reached its maximum sitting capacity. More so, the last bus will depart once the time slice assigned to it has elapsed (i.e. run to completion), this will ensue regardless of the number of passengers on the bus.

### 2.5. Advantages Of Round Robin Over Other Scheduling Algorithms

1. It is very simple to achieve because there are no complex timings or priorities to consider, Simply put it is a FIFO with time allocated to each job or process to ensure equal distribution of the CPU across all jobs.
2. It helps to solve the problem of starvation (a situation in which a job is not able to use the CPU because it is always preempted by other jobs that are usually considered being more important). In this case of the bus station, it helps to avoid the overstressing of some buses while others are left less busy.
3. It helps in a win-win situation. In which resources will be properly harnessed by the bus station while ensuring customer satisfaction.

## III. REVIEW OF RELATED LITERATURE

A bus reservation system is not a new concept in use as it has been implemented for different bus stations around the globe. However, in Nigeria and most developing countries, bus reservation is basically done manually i.e. the manager picks which bus to include on the traveling queue and the bus is then assigned to passengers. In turn, a passenger goes to a bus station and books for a ticket and is manually issued a ticket which is a slip containing his name, seat number, destination and amount paid. This may be done online or offline.

Different publications have also been published on this subject as a consequence of comprehensive studies over the past decades. Several model approaches, as well as specific solving strategies have been provided for the issue and its extensions. These are discussed below based on the benefits of public bus transport, the need for customer satisfaction, bus reservation and other online bus systems.

[5] Recognized issues with the present type of the Russian urban transport scheme, since the existing modes and strategies of transport growth may not always be relevant in certain conditions. Afterward, a solution or feasible way to improve their transport system was found. The analysis was done by using the successful nominated six cities as demonstrator cities to develop a roadmap for sustainable mobility together with the city government and related stakeholders.

[6] Proposed an intelligent transport system composed of three parts: a sensor system, a surveillance system, and a display system. A sensor system gets information from a global positioning system (GPS) and near-field communication (NFC), temperature and moisture sensors. The surveillance scheme extracts significant information from the raw data collected from the sensor scheme and gives it to the bus driver. The presentation framework shows transportation and travel-related information at the bus stop to commuters.

A paper by [7] acknowledged that the increase in the public transport traveler stacks in the USA is decreasing fuel utilization by around 11 million gallons yearly - the proportionate advantage of expelling 23,813 vehicles from the street. The benefits of public bus transport include but are not limited to: It is more economical for commuters, It helps to de congest the roads as it reduces the number of vehicles that would have filled the road if commuters had travelled with private vehicles, It helps to reduce noise pollution.

[8] Conducted a survey to determine the reasons for traffic congestion in Lebanon and discovered that the reasons are simply as a result of a high number of private cars and the absent of a good transportation code. While the later can be solved only by the government the former can be reduced by providing a good public transport system. The study tried to investigate the problems associated with the transport system in Lebanon. The problems were highlighted as:

Accidents, Traffic congestion, Noise and Air pollution

[4] Noted that there was only one functional public bus service enterprise that provides transport services in and around the city. The enterprise uses a fixed bus schedule system to serve passengers in 110 routes. However, this type of bus assignment system

created a problem in the company's operational and financial performances. Hence the researchers studied the operation pattern of the enterprise and developed a model to best schedule buses for the day to day activities of the bus company. The number of passengers at each period of the day was noted and these time periods were referred to as shifts. Since the enterprise uses a fixed number of buses scheduled per route in its day to day operations, optimal bus/resource utilization was not ensured.

[9] Addresses schedule design for a bus route with one intermediate bus stop also known as time point. The authors tried to minimize passenger waiting time, the delay time for through passengers, delay/early penalty and total operation cost. Unlike. Used a schedule based holding control strategy to achieve this. Schedule-based holding control strategy involves withholding a bus ready to depart from a bus station at a time earlier than the scheduled departure time until the scheduled departure time but if it is delayed beyond the scheduled departure time, it will depart once it has completed all necessary requirements for departure.

[10] Designed a schedule to minimize waiting time at bus stops. Used the time control point strategy, which is bus arrival time at each of its time control point (i.e. bus stop) on the bus route. The strategy was chosen by because it is the type used by most bus companies in China and Singapore. This type of control involves using the expected bus arrival time at bus stops to determine when a bus will arrive at its final destination.

[11] Stressed the need for a bus information system that offers a range of helpful data for customers in towns and particularly distant regions where bus transport is the only type of transportation accessible. Again, because these remote areas contain fewer amounts of commuters, the time spent in waiting for buses at bus stops is high.

[12] Proposed implementation of a crowd-participation bus arrival time forecast scheme using cellular signals. The scheme bridges the gap between customers questioning about the arrival time of the bus and customers ready to share data, providing them real-time bus data, regardless of any bus company. A querying user sends the server the bus stop and path of concern. A sharing customer sends the server a series of a cell tower. The server then matches the sequence of cell towers to the bus route and predicts the arrival time of the bus.

[13] Suggested a wireless sensor network with which the bus information system can provide customers with the current bus position and estimated bus arrival times. Bus nodes, router nodes, bus stop nodes, and concentrators are part of the network.

[14] Studied GPS, Remote Sensing (RS) and Geographic Information System (GIS) methods and suggested using them all to depict the real-time status of each bus and bus arrival time on maps. [15] Introduced an intelligent public transport system composed of bus modules fitted with a GPS receiver, digital speedometer, telecommunications modem, and other server modules, bus stop modules and client applications. The system supplied customers with data about the present place of buses approaching the bus stop.

While [16] suggested using the genetic algorithm to discover the shortest driving time with various situations of actual traffic environments and variable car speeds.

[17] Proposed a web-based system. It allows a customer to check the ticket availability and search for the most possible prices. The system is always available online, but the basic benefits of the system is in its ability to allow the customers to search and choose his/her seat position and ticket payment procedure. They collected data to define the new application's demands.

#### IV. ANALYSIS OF PROPOSED SYSTEM

The main aim of this software is to help bus transport companies to schedule their buses to ensure maximum resource utilization in their day to day operation. This software developed can be used by any transport company as it wasn't designed for a particular bus station/company. The scheduling of buses which was the major addition to the bus booking application was implemented using round robin for proper bus assignment in a way that improves operational efficiency. The system thus designed will provide a scenario for the customer/passengers and the bus company to attain a win-win situation. Hence timers were assigned to each bus and before the designated time is exhausted the bus is checked if not at least half-filled, then the passengers in the bus are moved to the next bus in line of the same route. This is continued till the last bus to ply the route cannot accommodate the spillover passengers. Nevertheless, if there is only one bus assigned for to a particular route, it will leave the bus station once its allotted time has elapsed.

### 4.1. Structured Of The Proposed System

The framework to be planned is an upgraded bus reservation application. Booking in accordance with travelers and reservation in accordance with the administration of the everyday exercises and assets of the bus stop to guarantee consumer loyalty and decrease operational expense.

Examination has indicated that a great many people like to go by transport because of its vicinity and moderateness, yet the helpless administrations given by these transport organizations will in general disperse travelers who wish to go by transport. Consequently, the framework has been planned utilizing Round robin Algorithm.

The cooperative calculation includes allotting time cuts to each transport that has been doled out a course. The framework naturally checks the transports at stretches and tunes in to know whether the transport is half plowed to its ability before an hour to the takeoff time. In the event that it is up to a large portion of its ability, the transport is dispatched from the line once its time cut (takeoff time) pass, Otherwise, the travelers are moved to the following transport in the prepared line and a message is sent across to all travelers in the transport revealing to them that their transport has been deferred. The framework consequently sends the message across educating them regarding what to do in the event of any crisis.

The product configuration measure model utilized in this work is the cascade model. This is on the grounds that it takes into consideration appropriate arranging and assists with including all the plan elicitations of the clients. The plan stage began with correspondence for example visiting the transport organization to get an outline of how the current framework runs and to determine what different functionalities they wished the framework had. The undertaking will utilize a social data set and a web engineering since it will run on the web. The social information base was picked because of its adaptability and ability to meet all kinds of information requires. The plan apparatus utilized in this work is Unified Modeling Language (UML). The UML is a standard graphical documentation for portraying programming examination and plans. It has images to help with portraying and reporting all aspects of the application improvement measure.

**The class diagram contains 8 classes in which the user is a superclass to admin, customer, and agents. The aforementioned are subclasses which inherit the attributes and functions of the superclass, user. The relationships between them are specified through the multiplicity.**

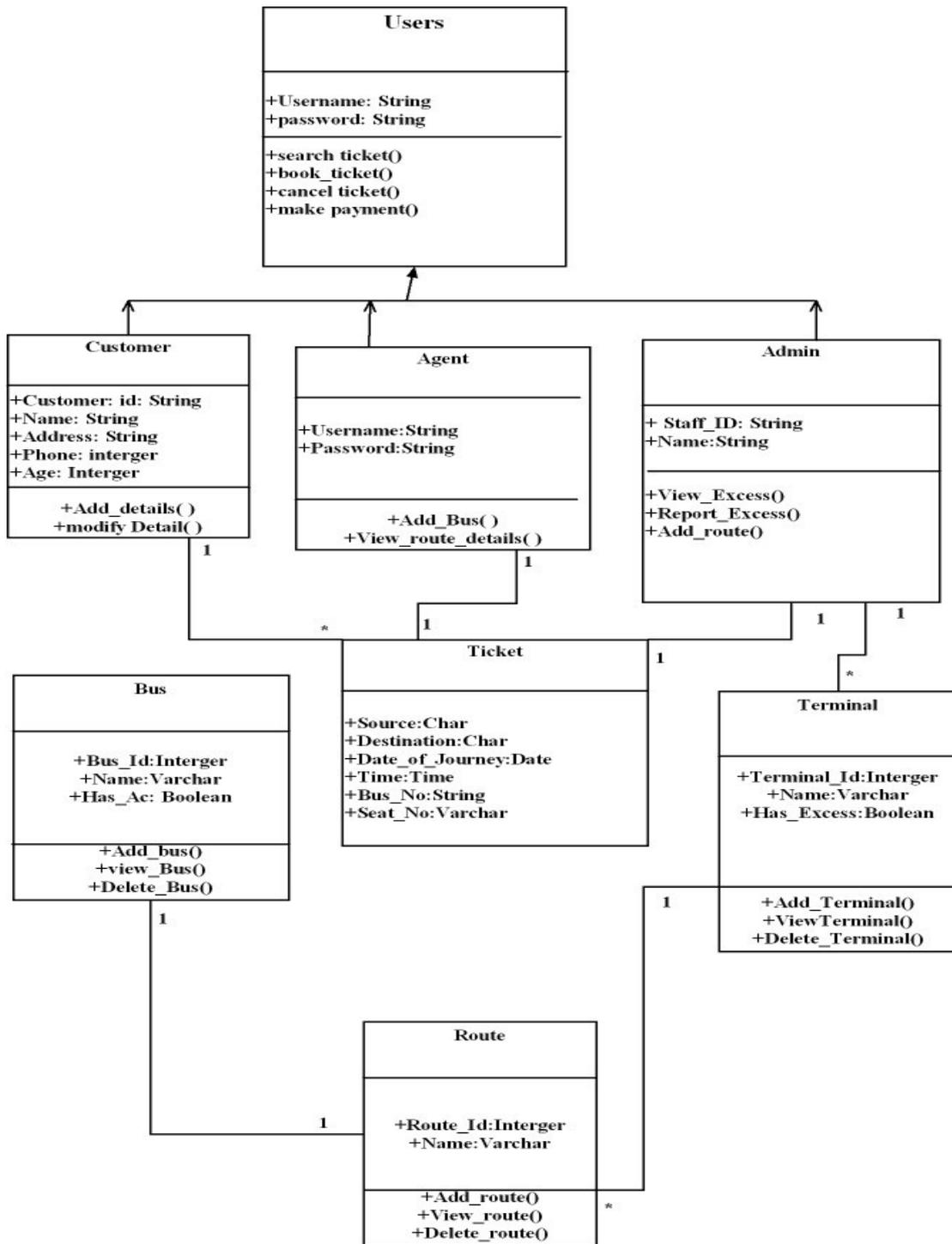


Figure 3.0: Class diagram of the proposed system

### V. SYSTEM IMPLEMENTATION

System implementation has to do with the transformation of the framework's calculated and intelligent plans into an actual execution. Usage exercises incorporate choice and establishment of the picked language, coding, investigating, testing, documentation, preparing and client manual. In this venture work, a XAMP worker was introduced on a framework and the product was coded on its IDE and conveyed on localhost. The coding includes a methodical portrayal of the framework's model in a robotized structure under a decision advancement climate. Investigating and testing the product incorporate eliminating the mistakes

of the framework at the various phases of its turn of events and running the framework severally as every blunder is repaired. The product runs well on a nearby worker following the building structure specified in the plan.

### 5.1. Development Environment

The development environment (IDE) utilized in this undertaking is Netbeans 8.1 IDE and Notepad++. In spite of the fact that, Netbeans is generally utilized as a Java IDE however it can likewise be utilized for so numerous other programming dialects including PHP. The significant favorable circumstances of NetBeans over other IDEs like scratch pad which was utilized in this work, include:

1. Ability to make test classes, run and see the code inclusion straightforwardly from IDE interface.
2. There's an implicit neighborhood history that allows you to contrast code changes and return with a particular amendment. Supportive when source code record is unintentionally overwritten.
3. The capacity to effectively leap to work usage from work call by squeezing (Ctrl + click), this element makes it simpler to investigate and adjust capacities;
4. The way it oversees source code as bundles stacking all documents identified with the venture in its record director segment instead of going forward and backward the windows record voyager.

### 5.2. Choice Of The Programming Language Used

The choice of the programming language used depends on the suitability of the language attributes to the scope and usage of the system developed. They are PHP, HTML, CSS. PHP is a scripting language. It facilitates the development of a web-based program and creation of web-pages. The WAMP server has some sets of scripts, logs, SQL manager and PHP code that enable communication between the MYSQL database and HTML. The system developed is an online system that allows multi usage. The wamp server enables data to be shared among users online and secures the data from the various users. The cascading style sheet formats the presentation of a web page to the end-user. It creates a suitable and user-friendly outlook for the user interface. Hence, these attributes informed the choice of the language used.

### 5.3. Implementation Architecture

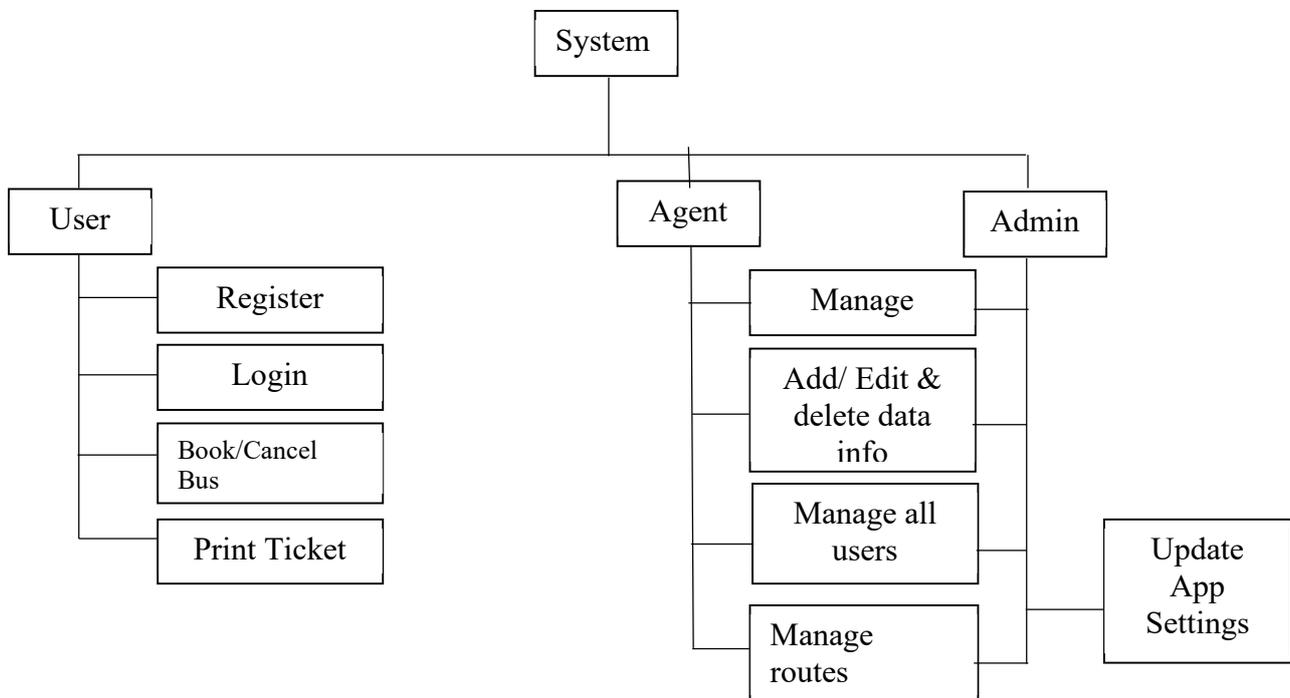


Figure 4.1: Implementation architecture.

## VI. RESULT AND DISCUSSION

Bus reservation system is another stage for travelers to book tickets by utilizing the application through their cell phones anywhere and whenever. The framework was intended to help alleviation course arranging and oversee abundance transports and transport lack at terminals. The BRS has been created to encourage travelers and give them an essential choice to book ticket as well as check their tickets anywhere and whenever utilizing their cell phone through Internet. What's more BRS will help the Admin and driver too in them day by day work to make their work more coordinated and effectively to Handle, and furthermore makes it quicker and simpler for the traveler to easily no the accessible transport and season of takeoff in the solace of their homes. The method for the framework's utilization is given in the client's manual. In an offer to diminish holding up time in transport stations while simplifying authoritative utilities, this examination was done. It is an improvement to the current reservation framework and electronic data stockpiling framework for transport stations. BRS was grown explicitly to fill in as a device for compelling transport stations the board. Below are screenshots of BRS.

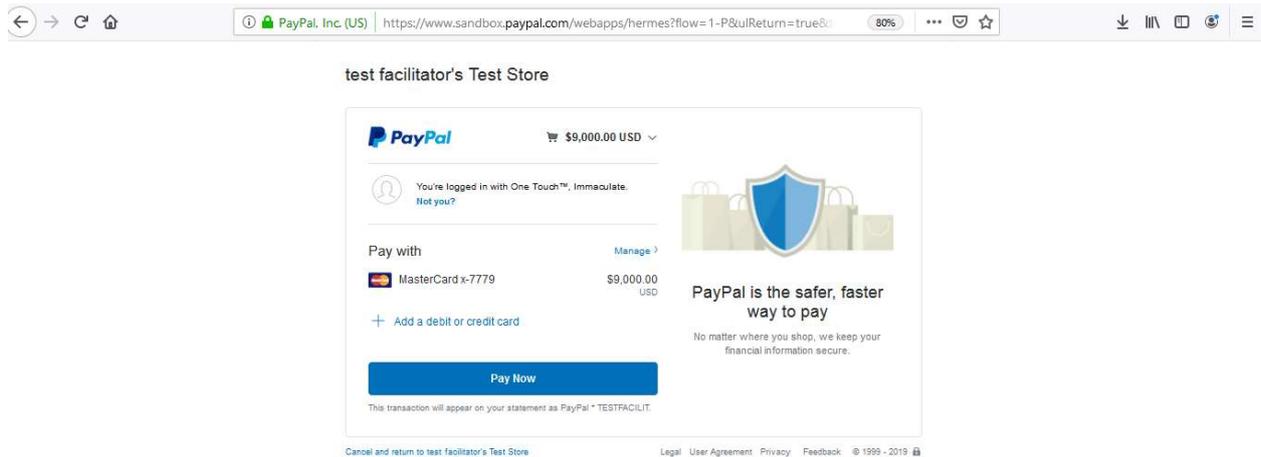


Figure 5.0: Payment page

This is a test page created with paypal sandbox to test run the booking app. Once he clicks on “pay now” and a successful payment has been made.

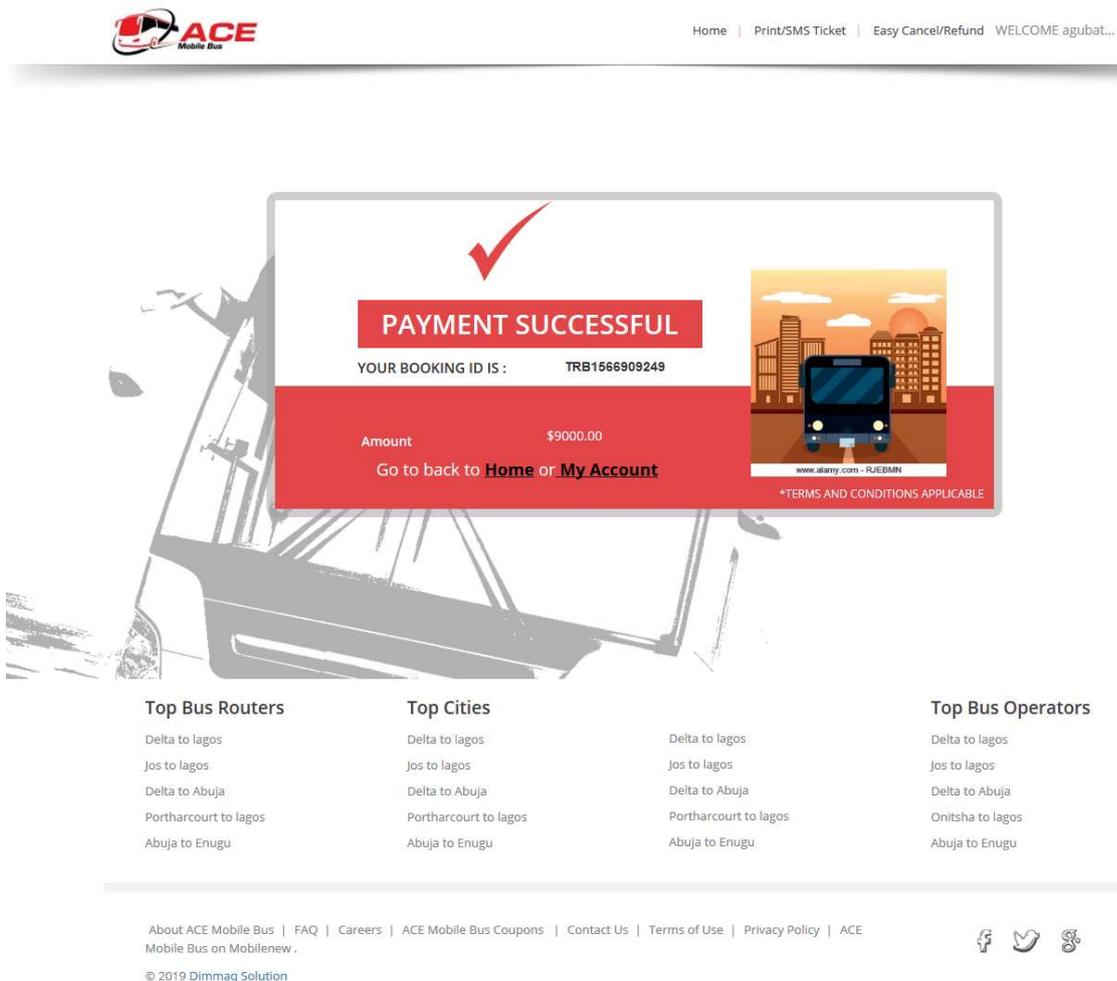


Figure 5.1: Ticket page

## VII. CONCLUSION

Bus Reservation System was developed to help passenger to book their ticket various like mobile devices or laptop and so on, also to help Admin and drivers for their daily work. In a bid to reduce waiting time in bus stations while maximizing organizational utilities, this project was carried out. It is an improvement to the existing booking system and electronic information storage system for bus stations. This project work was named BRS and was developed specifically to serve as a tool for effective reservation of bus management. The software was tested using Mozilla Firefox alongside google chrome. Notepad++ was the IDE (integrated development environment) that was used due to its ability to specify line numbers.

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# *Estimation Of Water Requirement Of Lycopersicon Esculentum Mill*

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**Abstract** – Crop water requirements of Roma tomato that planted on different spacing for four treatment and its replications in Nyagatare district Kihira village have been computed with CROPWAT 8.0 using the meteorological parameters. The water requirement was computed using evapotranspiration (ET<sub>0</sub>), effective rainfall, Net Irrigation demand, the Gross Irrigation demand and irrigation interval for crops grown in different treatment of different spacing have been computed. Based on the rainfall data, effective rainfall and soil characteristics of the experiment site, it was shown that the total net irrigation requirement of tomato in experiment site as presented in CROPWAT 8.0 is 286.2mm and the total gross irrigation requirement is 408.8mm. The total water loss during irrigation is obtained by taking the total gross irrigation requirement minus the total net irrigation requirement and found to be 122.6mm. As per CROPWAT 8.0, Tomato water requirement in whole growing stages is 620.3mm. This total water required by tomato at experimental site was supplied to crop by rainfall as effective rainfall (211.5mm) and the remaining portion (408.8mm) was supplied to crop through irrigation. A wide spectrum of scenarios has been discussed in the paper along with the guidelines for future management of water resources.

**Keywords** – Crop Evapotranspiration, Crop Water Requirement, Net Irrigation, Gross Irrigation.

## I. INTRODUCTION

The uneven rainfall distribution pattern and low water holding capacity of soils, soil moisture stress occurs during summer season and it is considered as one of the major limiting factors for higher productivity of tomato. Many studies conducted by various research institutions like Kerala Agricultural University, Central Plantation Crops Research Institute, Centre for Water Resources Development and Management etc. have shown that irrigation can enhance the productivity of the crops in the State (Surendran et al., 2015). Hence this need to be improved to attain an improved productivity, one of the main reasons for the low irrigation efficiency in the State is the lack of location-specific scientific information on irrigation scheduling for different crops. The studies have identified the influence of one or more parameters on irrigation water requirements. To achieve effective planning on water resources, accurate information is needed for crop water requirements, irrigation withdrawal as a function of crop, soil type and weather conditions. Studies of such climatic parameters are thus helpful in defining risk levels in arable agriculture (Surendran et al., 2015). Keeping all this in background the study was carried out with the following objective to compute the agricultural water

demand (crop water requirements) of tomato cultivar at Kinihira, Nyagatare district with the long term climatic data by using CROPWAT 8.0 model (Raes *et al.*, 2009).

Penman-Monteith method is used in the present study for determining reference crop evapotranspiration (ET<sub>0</sub>) since it is reported to provide values that are very consistent with actual crop water use data worldwide (Allen, 2005, Cai *et al.*, 2007, Farahani *et al.*, 2007). The irrigation schedule recommendations for tomato crop should be determined by considering the soil types and agro ecological conditions. The scientific crop water requirements are required for efficient irrigation scheduling, the reference evapotranspiration (ET<sub>0</sub>), effective rainfall (Pe), gross irrigation requirement (GIR), net irrigation requirement (NIR) and to assess the potential for crop production (Bonachela *et al.*, 2006, Savva & Frenken, 2002, Katerji *et al.*, 2013) . Hence, in this paper an attempt has been made to compute the crop water requirements of tomato crops at Kinihira village Nyagatare district using CROPWAT 8.0 (FAO 2009) and comparing the same with the available water resources in that district to assess the current status and future demand, which is essential for planning.

II. MATERIALS AND METHODS

2.1. Study location

The area is located in the granite low valley whose altitude is 1513. 5m and experiences small quantity of rains and hot temperatures. The annual average temperature varying between 25.3 °C to 27.7 °C. The monthly distribution of the rains varies from one year to another. Annual rain falls are both very weak (827 mm/year) and very unpredictable to satisfy the needs in agriculture and livestock. The soil of this area is characterized by the tightness of the humifere layer of the soil brought about by the grassy savanna and by the vertisoils that are rich in nutrients mineral elements but lacking organic substances. Kinihira village is characterized, in general, by lowly inclined hills separated by dry valleys. The area experiences the following seasons as follow:

Table1. Seasons of the study area

Climate	Duration	Local name
Short dry season	January to mid-March	Urugaryi
Long rainy season	Mid-March to Mid-June	Itumba
Long dry season	Mid June to Mid-October	Impeshyi
Short rainy season	Mid October to December	Umuhindo

Source:<https://Nyagatare.gov.rw/index.php?id=83>

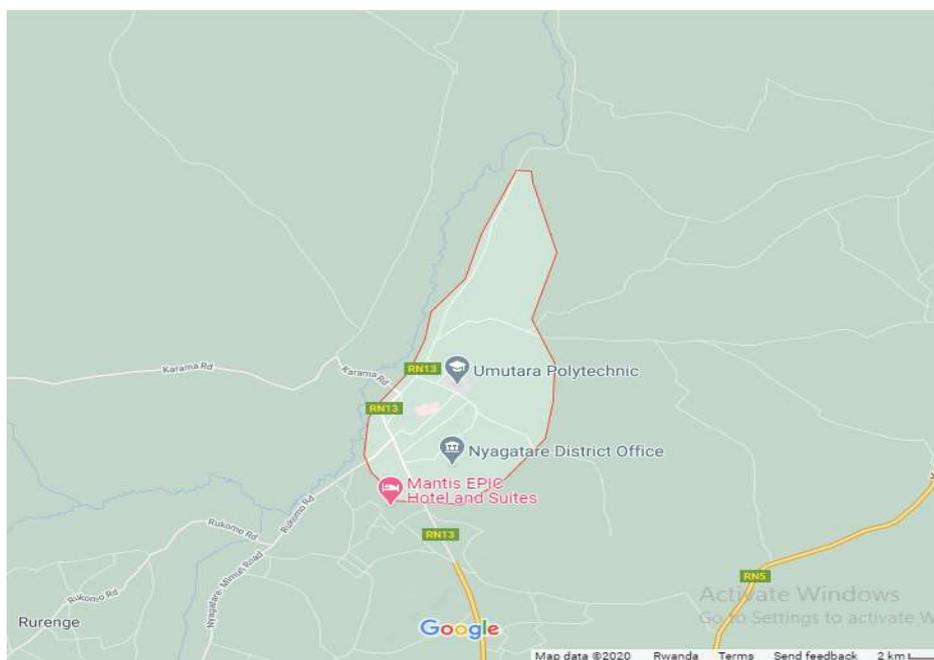


Figure 1: Map of experimental site

## 2.2. Crop water requirement

The data from Rwanda meteorological station (RMS) for 30 years (1989-2019) were used. The parameters used are latitude, longitude and altitude of Nyagatare station, maximum and minimum temperature (°C), Relative humidity (%), wind speed (km/day) and sunshine hours. To calculate crop water requirements and irrigation requirement of Roma tomato cultivar, soil and climate data of experimental site were considered. The reference evapotranspiration (ET<sub>0</sub>), Effective rainfall (P<sub>e</sub>), Gross irrigation requirement (GIR), Net irrigation requirement (NIR) and Irrigation schedule of Roma tomato are calculated by FAO Penman-Monteith method, using decision support software –CROPWAT 8.0 developed by FAO.

## 2.3. Crop Data

The cultivated crop in study is Roma tomato that are planted in different spacing of 30cm,40cm,50cm and 60 cm under drip irrigation, Crop coefficient values (K<sub>c</sub>) are taken from available published data. K<sub>c</sub> values for initial, mid and late growth stages of tomato were used.

## III. RESULTS AND DISCUSSION

### 3.1. Determination of Reference Evapotranspiration (ET<sub>0</sub>)

The reference evapotranspiration (ET<sub>0</sub>) is an important agro meteorological parameter which has been used in a number of applications. In present study daily ET<sub>0</sub> was determined for Nyagatare meteorological station using 30 years weather data following P-M approach. The reference crop evapotranspiration was determined using CROPWAT8.0 with referring to Penman-Monteith approach. Thirty years climate data from 1989 to 2019 was considered. Minimum temperature, Maximum temperature, relative humidity, wind speed, sunshine hours and solar radiation average data of thirty years was used to determine the average, optimum and maximum ET<sub>0</sub> of the experimental site.

Table2: Determination of Reference Evapotranspiration (ET<sub>0</sub>)

Month	Min Temp °C	Max Temp °C	Wind km/day	Sun hours	Rad MJ/m <sup>2</sup> /day	ET <sub>0</sub> mm/day
January	15.9	26.9	349	5.6	17.7	5.29
February	16.1	27.7	351	6.2	19.1	5.87
March	15.7	26.9	395	5.7	18.5	5.97
April	16.8	26.2	324	5.4	17.4	5.18
May	16.9	25.9	340	5.8	16.9	5.07
June	15.9	26.4	426	7.5	18.6	5.45
July	15.4	27.9	372	7.8	19.3	4.99
August	16.6	28	271	6.5	18.5	4.56
September	16.6	28.7	197	6.7	19.7	4.56
October	15.9	27.2	303	5.6	18.1	5.26
November	15.7	27.1	352	5.5	17.6	5.48
December	15.9	27.4	361	5.6	17.4	5.31
Average	16.1	27.2	337	6.2	18.2	5.25

The optimum ET<sub>0</sub> was found in August and September and found to be 4.56mm/day. The maximum ET<sub>0</sub> was found in March and found to be 5.97mm/day. The average ET<sub>0</sub> was calculated automatically by CROPWAT 8.0 software and found to be 5.25mm/day. The growing of tomato by considering meteorological parameters within the study area show that the optimum ET<sub>0</sub> of tomato crops is 4.5mm/day mean a while, in general the ET<sub>0</sub> was lowest during the peak of the rainy season to highest during the peak of the dry season for the respective. As discussed in the research conducted by Surendran et al. (2015) AEU, the effect of higher reference evapotranspiration of the crop is to act adversely against the effect water stored in zone of the tomato.

### 3.2. Determination of effective rainfall

Aside from soil, air and daylight, crops need water to develop. How much water the different yields need has been clarified. This water can be provided to the harvests by precipitation (likewise called precipitation), by water system or by a blend of precipitation and water system. In the event that the precipitation is adequate to cover the water needs of the harvests, water system isn't needed. In the event that there is no precipitation, all the water that the yields require must be provided by water system.

Table3: Determination of effective rainfall

	Rain (mm)	Eff rain (mm)
January	77.9	68.2
February	92.6	78.9
March	115.4	94.1
April	157.3	117.7
May	88.8	76.2
June	18.9	18.3
July	11.9	11.7
August	31.9	30.3
September	69.9	62.1
October	106.2	88.2
November	112.8	92.4
December	78.3	68.5
<b>Total</b>	<b>961.9</b>	<b>806.5</b>

Previously, the Reference evapotranspiration was worked out and it was found to be 5.25mm/day for Roma tomato cultivar. The total of rain fall (Total Water requirement) and effective rain fall (Crop Water Requirement) was found to be 961.9 mm and 806.5 mm for the period of twelve months. It was also found that the maximum total rainfall and effective rainfall of 157.3 mm and 117.7 mm was found in the month of April while and the minimum values were recorded in July and June with the corresponding values of 11.9 mm and 11.7 mm (in July); 18.9 mm and 18.3 mm (in June) respectively. It shows that July is the dries month, which needs more irrigation and the high rainfall to optimize the Roma tomato yield. In addition, the distinction view of the average monthly rainfall totals over the 30 year period reveals that rainfall is generally highest in the month of March, April, October and November (Refer **Table 3**). Most of the seasonal rainfall change occurs between June and September. This situation has the potential of causing water scarcity on the fields and it requires more irrigation intensities to compensate the plant water deficit. The rainfall distribution in the month of June is very erratic and could pose dangers of dry spells. To meet the crop water demand, the farmers should rely on weather forecast. These research finding are coherent with the study conducted by Ndamani and Watanabe (2015), (Ravindran, 2001) who found similar results that when physically based seasonal forecasts are not available, crop management strategies and planning should be based on statistical assessment of historical rainfall records.

### 3.3. Determination of Crop water requirement of Roma tomato in experimental site

The total water requirements for different crops in various agro-ecological should be different. Based on FAO Irrigation and Drainage Paper 56(FAO 1998). The FAO CROPWAT program (FAO, 2009) incorporates procedures for reference crop evapotranspiration and crop water requirements and allow the simulation of crop water use under various climate, crop and soil conditions. So, here the following data show the crop water requirement of Roma tomato cultivar in experimental site within whole growing period of 4 months and 4 days from 19 February 2020 to 23 June 2020 was calculated using CROPWAT 8.0 and found to be 620.3 mm.

Table 4: Crop water requirement of Roma tomato

Month	Decade	Stage	Kc	ETc	ETc	Eff rain	Irr. Req.
			coeff	mm/day	mm/dec	mm/dec	mm/dec
Feb	2	Init	0.45	2.64	5.3	5.2	5.3
Feb	3	Init	0.45	2.66	21.3	27.9	0

## Estimation Of Water Requirement Of Lycopersicon Esculentum Mill

Mar	1	Init	0.45	2.67	26.7	29.4	0
Mar	2	Deve	0.56	3.36	33.6	31	2.6
Mar	3	Deve	0.78	4.44	48.8	33.8	15.1
Apr	1	Deve	0.99	5.41	54.1	38.6	15.4
Apr	2	Mid	1.15	5.99	59.9	42.3	17.6
Apr	3	Mid	1.17	6.01	60.1	36.7	23.4
May	1	Mid	1.17	5.96	59.6	30.5	29.1
May	2	Mid	1.17	5.91	59.1	26.1	33
May	3	Late	1.16	6.05	66.5	19.5	47
Jun	1	Late	1.09	5.77	57.7	10.9	46.8
Jun	2	Late	0.98	5.32	53.2	3.7	49.5
Jun	3	Late	0.91	4.79	14.4	1.1	12.5
					<b>620.3</b>	<b>336.8</b>	<b>297.3</b>

The amount of water was required in February, April, May and June as per planting and harvesting date. February has two decades with the crop water requirement of 26.6mm, March has three decades with the crop water requirement of 109.1mm, April was having three decades with the crop water requirement of 174.1mm, the month of May was having three decades with the crop water requirement of 185.2mm and the latest month which is June was having two decades and 3 days and was having the crop water requirement of 125.3mm. As shown by the obtained output data above, it indicated that the huge amount of water required was obtained mid-season stage starting from the second decade of April to the second decade of May and the latest stage which was starting from last decade of May up to 23 day of June with 238.7mm and 191.8 mm of water required in mid-season and latest stage of tomato growth stage respectively. While the least amount of water required by tomato in experimental site is obtained in initial stage from the first day of February to the first decade of March and in crop development stage from the second decade of March to the first decade of April with 53.3 mm and 136.5mm of water required by tomato in its initial stage and development stage respectively. This is similar to the FAO (2009) report, in that crops grown in the dry season needs more water than those grown during the rainy season hence it is essential to plan a scientific water requirement, so that the high productivity can be achieved with optimum quantity of water.

### 3.4. Net irrigation requirement (NIR), Gross irrigation requirement (GIR) and Irrigation schedule for tomato

Net Irrigation Requirement (NIR) of crops mainly depends on reference crop evapotranspiration (ET<sub>o</sub>) and hence, accurate estimate of ET<sub>o</sub> is a key component in hydrological studies. ET<sub>o</sub> depends on several climatological factors, such as temperature, humidity, wind speed, radiation, type and stage of growth of the crop and so on (Khandelwal & Dhiman, 2017). Gross irrigation requirement (GIR) is the total amount of water applied through irrigation is termed as 'gross irrigation requirement'. In other words, it is the net irrigation requirement plus losses in water application and other losses. The gross irrigation requirement can be determined for a field, for a farm, for an outlet command area or for an irrigation project, depending on the need, by considering the appropriate losses at various stages of growth of the crop. Irrigation scheduling is the decision of when and how much water to apply to a field, Its purpose is to maximize irrigation efficiencies by applying the exact amount of water needed to replenish the soil moisture to the desired level, Irrigation scheduling saves water and energy, All irrigation scheduling procedures consist of monitoring indicators that determine the need for irrigation

Table 5: Net irrigation requirement (NIR), Gross irrigation requirement (GIR) and Irrigation schedule for tomato

Date	Day	Stage	Rain	Ks	Eta	Depl	Net Irr	Deficit	Loss	Gr. Irr	Flow
			mm	fract.	%	%	Mm	mm	Mm	mm	l/s/ha
20-Apr	61	Mid	0	1	100	52	56.3	0	0	80.4	0.15
11-May	82	Mid	0	1	100	52	56.3	0	0	80.4	0.44
26-May	97	Mid	0	1	100	54	57.8	0	0	82.6	0.64
06-Jun	108	End	0	1	100	54	58.8	0	0	84	0.88

## Estimation Of Water Requirement Of Lycopersicon Esculentum Mill

17-Jun	119	End	1.7	1	100	53	57	0	0	81.4	0.86
23-Jun	End	End	0	1	0	22					

Based on the rainfall data, effective rainfall and soil characteristics of the experiment site, it was shown that the net irrigation requirement by Roma tomato in June was found to be 115.8mm, 114.1mm in May and 56.3mm in April. while the Gross irrigation requirement of tomato was found to be 80.4mm, 163mm and 165.4mm in April, May and June respectively. The water losses during irrigation was calculated and found to be 24.1mm, 48.9mm and 49.6mm in April, and June respectively. The total net irrigation requirement of tomato in experiment site as presented in CROPWAT 8.0 is 286.2mm and the total gross irrigation requirement is 408.8mm. The total water loss during irrigation is obtained by taking the total gross irrigation requirement minus the total net irrigation requirement and found to be 408.8mm-286.2mm=122.6mm. As per CROPWAT 8.0, Tomato water requirement in whole growing stages is 620.3mm. This total water required by tomato at experimental site was supplied to crop by rainfall as effective rainfall (211.5mm) and the remaining portion (408.8mm) was supplied to crop through irrigation. These shows that crop water requirement of tomato for experimental site should be the same and hence it shows the significance of requirement of scientific planning for irrigation in Nyagatare district, Barija cell.

### IV. CONCLUSION AND RECOMMENDATION

The crop water requirement of Roma tomato cultivar for experimental site were determined by difference factors including meteorological data of 30 years from (1989 up to 2019) were used for getting the optimum data that lead to obtain the parameters related with all input, gathering Crop evapotranspiration (ET<sub>o</sub>) by considering meteorological parameters within the study area 4.5mm/day as the optimum (ET<sub>o</sub>) of tomato crops, The total effective rainfall for experimental site were 806.5mm calculated using CROPWAT 8.0 and by following USDA S.C approach as per USDA S.C 806.5mm is the downpour water permeates beneath the root zone of the plants to be utilized by Roma tomato crop in experimental site the detailed effective rainfall per months are shown above in Tab2. The water requirement indicated that the huge amount of water required was obtained mid-season stage starting from the second decade of April to the second decade of May and the latest stage which was starting from last decade of May up to 23 day of June with 238.7mm and 191.8 mm of water required in mid-season and latest stage of tomato growth stage respectively. While the least amount of water required by Roma tomato in experimental site is obtained in initial stage from the first day of February to the first decade of March and in crop development stage from the second decade of March to the first decade of April with 53.3 mm and 136.5mm of water required by Roma tomato in its initial stage and development stage respectively. The details output data are above in Tab3, Net irrigation requirement (NIR), Gross irrigation requirement (GIR) and Irrigation schedule for Roma tomato are other parameters that were discussed in Tab4 using calculations from rainfall data, effective rainfall and soil characteristics of the experiment site. where effective rainfall (211.5mm) supplied by rain fall and the remaining portion of (408.8mm) was supplied to crop through irrigation hence total water required of Roma tomato for experimental site were 620.3 mm. Nevertheless, our analysis showed a clear relationship between rainfall variability and crop production in our study area and also because production practices have not changed much over the period of study. To resolve rainfall challenge and sustain crop production in the area, piloting irrigation for selected crops vis a vis new cultivars, as some farmers are already doing, is highly recommended.

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### CONFLICTS OF INTEREST

The author of this article declare that there is no conflicts of interest regarding the publication of this paper.

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# *Mesenchymal Stem Cell Therapy For COVID-19; Is A New Challenge*

## *Review*

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**Abstract** – "Coronavirus" is the word that absolutely isn't forgotten by everybody who lives in the first half of the twenty-first century. COVID19, as a pandemic, has driven numerous researchers from various biomedical fields to discover arrangements or therapies to deal with the pandemic. Nonetheless, no standard treatment for this infection has been found to date. Presumably, preventing the acute severe respiratory infection type of COVID-19 as the most risky period of this disease can be useful for the therapy and decrease of the death rate.

In such manner, mesenchymal stem cells (MSCs)-based immunomodulation treatment has been proposed as a reasonable restorative methodology and a several clinical studies have started. Recently, MSCs as indicated by their immunomodulatory and regenerative properties stand out in clinical trials. After the intravenous transplantation of MSCs, a large population of cells gathers in the lung, which they close by immunomodulatory impact could protect alveolar epithelial cells, recover the respiratory microenvironment, prevent pneumonic fibrosis, and cure lung dysfunction. Given the vulnerabilities here, we checked on detailed clinical preliminaries and theories to give helpful data to scientists and those keen on stem cell therapy.

In this study, we considered this new way to deal with improve patient's immunological reactions to COVID-19 utilizing MSCs and talked about the parts of this proposed treatment. Nonetheless, right now, there are no affirmed MSC-based methodologies for the anticipation or potentially treatment of COVID-19 patients however clinical preliminaries progressing.

**Keywords** – (COVID-19, Mesenchymal stem cells, stem cell treatment, Immunomodulatory, Clinical trials).

### I. INTRODUCTION

At the long term's end, various instances of extreme respiratory infections were reported for in Wuhan, China, and were at first idea to be an occasional influenza sickness, given that some patients had a history of attending or working in the wholesale market for fish and seafood, then the market was promptly closed down on January 1, and environmental sanitation and disinfection were completely executed. A couple of days after the fact, subsequent to dismissing the analysis of occasional flu, avian flu, adenovirus, Covid, SARS, Covid, and other organisms, on Jan. 1, the infection was proclaimed a causative agent of the disease in four of the nine hospitalized patients: another Covid that has a 5% genetic relationship with SARS and is a subset of Sarbecovirus [1]. As of

now, the infection has been momentarily named SARS-CoV-2 infection for additional data and COVID-19, the name was given by the World Health Organization (WHO) to the SARS-CoV-2 infection related disease.

This disease has brought about that clinicians and researchers from various parts of biomedicine were assembled to discover a solution or treatment for the management of this pandemic.

As per a new declaration of the International Society for Stem Cell Research (ISSCR), at present, there are no approved stem cell-based methodologies for the anticipation and treatment of COVID-19 disease. Nonetheless, as of late, mesenchymal undifferentiated cells (MSCs) have presented one of the helpful methodologies for utilizing in the treatment of COVID19 [2]. As we probably are aware, MSCs opposes viral infection because of the presence of specific cytokines improved qualities. These highlights are available in MSCs in the characteristic specialty before their partition cycle occurs. Hence, MSCs can be expected to endure regardless of whether they are relocated into a patient with an affirmed COVID-19. Due to there is difference in MSCs treatment to treat COVID-19, we looked into announced clinical preliminaries and news to introduce supportive data to specialists of the stem-based treatment field. In this study, we considered this proposed way to deal with improve patient's immunological reactions to COVID-19 utilizing MSCs and examined the parts of this helpful methodology.

## **II. SARS-CoV-2 AND COVID-19**

"Coronavirus" the word that positively it isn't forgotten by every individual who lived in the principal half of the twenty-first century. Covid disease 2019 which known as COVID-19 is the aftereffect of one Covid contamination for the sake of SARS-CoV2. Covids (CoV) are a huge group of infections that some of them are more referred to, for example, Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV), yet some of them are not more known like Severe intense respiratory disorder Covid 2 (SARS-CoV-2). SARS-CoV-2 that recently known by the 2019 novel Covid (2019-nCoV), is another strain of Covid that hasn't been distinguished in people up to late December of 2019. Nonetheless, there are reports that exhibit the SARS-CoV-2 infection started from bats and afterward moving into camels, however its careful elements are as of now obscure. In addition, a large part of the pathogenesis data respects to SARS-CoV-2 isn't completely known.

SARS-CoV-2 is from the Nidovirales request, an individual from the class  $\beta$ -Covid ( $\beta$ -CoV) [3].  $\beta$ -CoV incorporates five subgenera remembering for embecovirus (counting HCoV-OC43 and HCoV-HKU1) [4], nobecovirus (counting BtCoV HKU9) [4], hibecovirus (counting Bat Hp-betacoronavirus Zhejiang2013) [4], sarbecovirus (counting SARSr-CoV and its strains, for example, SARS-CoV, SARS-CoV-2, and Bat SLCoV-WIV1), merbecovirus (counting Middle East respiratory disorder (MERS)-CoV, BtCoV-HKU4, and BtCoV-HKU5) [4, 5].

SARS-CoV-2 is encompassed, positive-sense, single-stranded RNA infection (with nucleocapsid) by 79.6% arrangement character the equivalent to SARS-CoV [6], that known as the biggest found RNA infections by around 30 kb long genome structure.

It was first detached utilizing human aviation route epithelial cells [7] yet can be separated from the bronchoalveolar lavage liquid from a COVID-19 patient [6, 7]. For the most part, both of the SARS-CoV and the SARS-CoV-2 are confined and filled promptly in Vero cells [7, 8] (a genealogy of cells that was detached from kidney epithelial cells of an African monkey [9]). Additionally, this infection as SARS-CoV-2 enters its host cell by binding to the angiotensin converting enzyme 2 (ACE2) receptor [10, 11].

On March 11, 2020, the World Health Organization (WHO) described the spread of COVID-19 as a pandemic that it has caused unreasonable fear and led to unnecessary suffering and death [12]. Until now, as indicated by the Worldometer site report in excess of 199 nations and domains around the globe have been influenced, with significant episodes individually in the USA, Italy, China, Spain, Germany, and Iran. The mortality rate of COVID-19 has been accounted for from 0.7% [13] to 15.2% [14] as per various investigations in assorted regions and nations. Too, its most extreme incubation period has been accepted fourteen days [15] to about two months [14, 16]. Coronavirus has brought about that numerous specialists from various parts of biomedicine were pulled in to discover an answer or treatment for the administration of this pandemic. Notwithstanding, to date haven't been found the standard solution for this disease.

Several investigations have indicated that the principal phase of the pathogenesis of this kind of infection is the ID of angiotensin-converting enzyme 2 (ACE2) receptor by its spike protein [17]. Hence, ACE2-positive cells are infected by this infection [17]. Another study has demonstrated that the cell protease TMPRSS2 is likewise needed to permit the passage of Covid into host cells [18]. It is possible that the ACE2 receptor is generally circulated on the outside of human cells, particularly alveolar type 2 (AT2)

and capillary epithelium, and AT2 cells to a great extent express TMPRSS2 [18]. Then again, curiously, bone marrow, lymph nodes, thymus, spleen, and immune cells, for example, T and B lymphocytes and macrophages are consistently negative for ACE2 [19]. These discoveries recommend that immunoglobulin treatment can help treat patients with the virus infection. Along these lines, it ought to be noticed that the limit of the infection is enormously reduced by the cytokine-induced storm of the virus. The current sign of SARS-CoV-2 pathogenesis is the cytokine storm in the lung. Virally-set off intense cytokine arrival of GSCF, IP10, MCP1, MIP1A, IL-2, IL-6, IL-7, and TNF brings about pneumonic edema, dysfunction of air-exchange, acute respiratory distress syndrome (ARDS), and acute cardiac injury, and leading to death [2].

Until now, there is no particular remedy for Covid-19, albeit clinical management of these patients includes prevention or control of the infection and supportive care, including supplemental oxygen and mechanical ventilation when required. Recently, in the viral surface glycoprotein, a few epitopes, remembering for 5 CTL epitopes, 3 successive B cell epitopes, 5 spasmodic B cell epitopes of immune cells [20], and 13 MHC-I and 3 MHC-II antigenic epitopes [21], have been accounted for through immunoinformatics approach that a portion of these epitopes perhaps had potential candidates for the development of 2019-nCoV vaccines.

A progression of endorsed drugs for different indications is in progress in clinical preliminaries for these patients, including Chloroquine, Hydroxychloroquine, and Remdesivir around the world. This since, protected, ideal and powerful strong medicines are the unavoidable guideline in patients who create serious signs of COVID19.

### **III. MESENCHYMAL STEM CELL THERAPY**

Right now, cell-based treatment and particularly stem cell therapy has become a promising remedial field, in which many see opportunities to cure incurable diseases [22]. Notwithstanding the significant development of the stem cell-based treatment field, immunogenicity, restricted cell source and moral issue as the primary limits of this helpful methodology have not been addressed at this point. Among these, MSCs has stood out because of source potential, a high proliferation rate, low invasive procedure, and free ethical issues. There is a lot of predominance in utilizing MSC treatment in correlation with different medicines [23], including in;

- I. They are easily accessible and can be isolated from different tissues, for example, bone marrow and fat tissues, remembering for umbilical cord, dental pulp, menstrual blood, buccal fat pad, fetal liver, etc.
- II. They are multipotent stem cells.
- III. MSCs can without much of a stretch grow to clinical volume in an appropriate time frame.
- IV. MSCs can be stored for repetitive therapeutic usage.
- V. Clinical preliminaries of MSCs so far haven't indicated unfavorable responses to allogeneic MSC.
- VI. Safety and viability of MSCs have been clearly reported in a several clinical preliminaries [23].

As referenced, Following the COVID-19, may trigger a destroying immune overreaction in the body. In COVID-19 patients, the safe framework creates a lot of inflammatory factors, causing a cytokine storm including, in an overproduction of immune cells and cytokines [24].

it is the beginning of the MSC therapy idea in the treatment of COVID-19 patients, MSC therapy can prevent the storm release of cytokines by the immune system and stimulate endogenous repair by reparative properties of the stem cells.

After intravenous infusion, part of the MSC population entraps in the lung, which frequently in systemic infusion it is recognized as a limit. In any case, here these MSCs could recover the pulmonary microenvironment, intercept pulmonary fibrosis, and cure lung dysfunction and COVID-19 pneumonia [25].

In any case, one of the principal limitations in this methodology is the suppling wellspring of clinical-grade MSCs and therefore the speed of preparation for clinical utilization that here stem cell banks can play a significant part. Additionally, MSCs can be isolated from various adult tissues, including ideally bone marrow (BM), peripheral blood (PB) and fat tissues (AT), (for example, stomach fat, infrapatellar fat pad, and buccal fat pad) and neonatal birth-related tissues, including placenta (PL), umbilical cord (UC), Warton jelly (WJ), amniotic liquid (AF), and cord blood (CB), and afterward put away for future potential applications. In this manner, it appears MSCs-based therapy may possibly be an ideal candidate for clinical trials or at least the combination of treatment to treat COVID-19 patients.

#### IV. MSC CLINICAL TRIALS FOR COVID-19

Recently, China, USA, Jordan, Iran, and a few different nations have started cell-based treatment clinical studies and a few reports have been distributed. Curiously, one of the accessible strategies to evaluate its efficacy in the maintenance or repair of damaged vital organs is the utilization of mesenchymal immature cells (MSCs) treatment that broadly utilized in the treatment of type 2 diabetes, immune system disease, spinal cord injury, GVHD and several other diseases specially with high immunity rates have been used [23, 26–28].

MSCs, utilizing their immunomodulatory properties and their differentiation ability, can prevent lung tissue death by counteracting the cytokine storm and regeneration and reconstruction of damaged tissues. As of late, the utilization of these cells in the clinical treatment of H5N1 viral diseases that affect the lung has additionally been recommended [29].

Moreover, as of late a case study was accounted for in China on a female patient with an intense COVID19 condition that the aftereffects of lab tests and CT pictures gave incredibly powerful outcomes following 21 days of therapy with umbilical cord MSCs. A new contextual analysis of a case report of a 65-year-old female patient determined in basic condition to have COVID-19, at that point distinguished the specific 2019nCoV variation presently called SARS-CoV-2 [30]. The patient had a neutrophil increment of 87% and a lymphocyte reduction of 9.8% and was treated with antiviral medications, for example, lopinavir/ritonavir, IFN- $\alpha$  and oseltamivir just as intravenous infusion of moxifloxacin, Xuebijing, methylprednisolone and immunoglobulin. The patient was likewise exposed to noninvasive mechanical ventilation to encourage breathing and soothe muscle weakness because of poor oxygenation. As the imperative signs deteriorated, the patient was treated with line MSCs alone and with  $\alpha 1$  thymosin  $5 \times 10^7$  cells every multiple time. The aftereffects of the study demonstrated that after the subsequent infusion, serum albumin, CRP, and ALT/AST slowly diminished, just as other fundamental signs improved. From that point, the patient was taken out from the ventilator and ready to walk, and the quantity of white blood cells and neutrophils in the patient diminished to an ordinary level, while the quantity of lymphocytes increased to their typical level. Above all, CD3+ T cell, CD4+ T cell and CD8+ T cell numbers were altogether increased. Additionally, the subjective outcomes acquired from CT pictures after the second and third infusions of cord stem cells demonstrated that the pneumonia was exceptionally very relieved, 2 days after the third infusion the patient was released from the ICU ward and most of the vital signs and clinical laboratory parameters were typical. The outcomes recommended that umbilical cord mesenchymal stem cells could be an ideal treatment alternative alone or in combination with other immune modulators for severe COVID-19 patients [30]. In another study delivered as of late in China and as a team with the United States, 7 patients with COVID19 pneumonia in Beijing YouAn Hospital from January 23 to February 16 experienced mesenchymal stem cell transplantation and clinical manifestations, changes in immune function levels [25]. Likewise, inflammation was evaluated inside 14 days after transplantation. The outcomes demonstrated that the clinical symptoms of all patients improved altogether 2 days after stem cell transplantation. Among the patients considered, one was exceptionally severe and two patients with milder conditions were released from the medical clinic 10 days after transplantation. Their outcomes additionally demonstrated that peripheral lymphocyte levels increased, activated cytokine-secreting immune cells, for example, CXCR3+ CD4+ T cells, CXCR3+ CD8+ T cells and NK CXCR3+ cells disappeared on day 6–6.

A gathering of CD14+ CD11c+ CD11bmid regulatory DC cell population likewise increased significantly. Simultaneously, TNF- $\alpha$  levels were essentially diminished, though IL-10 was expanded in patients treated with MSCs compared with patients treated with conventional treatment. What's more, gene expression profiling of mesenchymal stem cells showed that these cells are ACE2- and TMPRSS2-, which demonstrated that mesenchymal stem cells are free of COVID19 infection [25]. In this way, they presumed that MSCs would be safe and effective for treating patients with COVID19 pneumonia, especially for patients with very acute conditions.

#### V. CONCLUSION

Immunomodulatory and anti-inflammatory properties of MSCs in the treatment of respiratory infections were affirmed by 17 completed clinical investigations, and furthermore in excess of 70 preliminaries are enrolled in such manner.

Umbilical cord, umbilical cord blood, Wharton's jelly, menstrual blood, and dental pulp, are the significant MSC sources that will be utilized in these preliminaries. Notwithstanding, the process of developing new therapeutic and bringing it to clinical application has important practical implications and not over for MSC therapy of COVID-19.

Nonetheless, the cost-effective and speed of therapeutic preparation are the capable discussed topic for MSC based therapy for COVID-19, however unquestionably, the life of a human is more commendable and COVID-19 is so risks. Along these lines, the clinical utilization of MSCs treatment to treat COVID-19 is still some time away, yet there are some encouraging reports to apply stem cell treatment and particularly MSCs may potentially be is quite possibly the best therapeutics, or a combination of treatment to treat COVID-19 patients. Nonetheless, scientists are trying incessantly to develop therapeutics to treat this disease.

### CONFLICT OF INTEREST

All authors declare no conflicts of interest.

### AUTHORS CONTRIBUTION

Authors have equally participated and shared every item of the work.

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# *Hair Loss in Foreign Medical Students and Alter its Intensity during the Covid-19 Pandemic in Georgia*

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**Abstract** – The current millennial and generation Z are known to experience more stress than any generation before them. A fraction of individuals belonging to these generations is current foreign medical students, where medicine is known to be one of the stressful courses one can study. When this extreme stress is met with genetic predisposition, nutritional deficiencies, internal diseases, and inappropriate hair care practices hair loss can be quite aggressive. An online survey consisting of 15 questions was conducted to find if these factors contribute to foreign medical students experiencing hair loss at a very young age and if the current chaotic environment of the covid-19 pandemic has accelerated hair loss. 81.7 % (n=156) foreign medical students belonging to ages 17 to 25 years started to experience hair loss (p= 0.0127), where stress (54.5 % (n=85)), nutritional deficiencies and internal conditions (37.5 % (n=58)) have been responded to be contributing factors for their condition. Interestingly, 54.5 % (n=85) students are experiencing hair loss after moving to Georgia (p=0.04). Despite all the acknowledgment of cause for their conditions, 92.3 % (n=144) of foreign medical students have responded to not undergo any treatments to manage and control hair loss. Additionally, 33.3 % (n=52) of students stated that they have noticed more progression in hair loss during this pandemic. If these students continue to ignore undergoing treatments then they might experience more progression in hair loss.

**Keywords** – Hair loss; Foreign medical students; Stress; Micronutrients deficiency; Pandemic; Hair loss intensity; Coronavirus

## I. INTRODUCTION

In Homo sapiens, hair plays a very important role, in current times hair is a symbol of class, intellect virility and is often associated with youthfulness and vitality [1]. As we age we experience changes in our hair and scalp health, these changes are multifactorial with contributions from genetic predisposition, pathological states, stress, pharmacotherapy, and nutritional inadequacies [2]. Over the generations there has been a rapid increase in stress due to various factors and generations such as millennials and Generation Z are more increasingly living under stress [3]. This stress has the potential to alter the immune response and transiently hamper hair growth [4].

Over the last few decades, malnutrition around the world has increased and younger populations are increasingly becoming malnourished. Currently, micronutrient deficiency is becoming more prevalent. Micronutrients are known to impact both hair structure and hair growth [5], thereby linking micronutrient deficiency to hair loss. Several internal diseases are also a key contributor to hair loss [6].

Certain hair care practices that have become popularized over the last few decades can also cause hair fragility leading to breakage [7]. All these factors can contribute to premature hair loss in younger ages more specifically in millennials and generation Z.

Medicine is known to be one of the most stressful courses one can study. A huge fraction of millennials and generation Z are current medical students amongst them International students tend to experience the most stress. Additionally, the recent SARS-CoV-2 emergences had made situations way worse by impacting the lives of individuals around the globe in several ways.

This survey aims to study if factors such as transition from home country to foreign country, extreme stress, nutrient deficiencies, internal diseases, and hair care practices can contribute to premature or progressive hair loss in foreign medical students and if the recent SARS-CoV-2 emergences have altered the intensity of hair loss in them.

### II. METHODS

The cross-sectional survey was administered online through google docs to gather information from students. A team of two medical students of Tbilisi State Medical University under the supervision of Dr. Luiza Gabunia, Director of Scientific Research-Skills Centre, and Associate Professor of Medical Pharmacology Department, designed the survey questionnaire. The 15-item questionnaire was constructed that can be finished filling within 5 minutes. The link to the survey was shared with representatives of each year of the international faculty of TBILISI STATE MEDICAL UNIVERSITY. This survey required an email log-in for participation. The questionnaire was self-administered using google docs online. Electronic consent for participation was required at the initial page of the survey with the reassurance of maintaining the anonymity of the responses.

The statistical analysis was performed using the Microsoft excel 2016, and [quantpsy.org](http://quantpsy.org). Regression analysis was done to see relation of hair loss in foreign medical students in Georgia. A chi-square test was performed to examine the relation of hair loss after moving to Georgia. P values less than 0.05 were considered as a statistical significance.

The following questions were asked in the survey:

- 1) We would like to know if you would be interested in filling this form.
- 2) Please select the year you are studying
- 3) Gender
- 4) Please select your age
- 5) Have you been experiencing any hair loss lately or have you been dealing with hair loss for quite some time now?
- 6) How long have you been suffering from hair loss?
- 7) Did your hair loss intensity alter during the COVID-19 pandemic?
- 8) Did you start experiencing Hair loss after moving to Georgia?
- 9) Some studies have shown that stress leads to hair loss. If you often feel stressed then do you think your stress may be the cause for your hair loss?
- 10) Do you suffer from any below-listed conditions?
- 11) Are you concerned that you would be losing more hair in the future?
- 12) Do you use hair care products available in Georgia?
- 13) Are you taking any precautionary measures to prevent or manage hair loss?
- 14) Do you think, with proper treatment and manageable steps you will be able to control your hair loss?
- 15) Do you think, with proper treatment and manageable steps you will be able to control your hair loss?

### III. RESULTS

100% participation was seen by the students. A total of 191 responses were collected from foreign medical students studying in Tbilisi State Medical University after informed consent.

8.4 % (n=16) of 1st year, 17.8 % (n=34) of 2nd year, 16.9 % (n=32) of 3rd year, 24.6 % (n=47) of 4th year, 25.7 % (n=49) of 5th year and 6.8 % (n=13) of 6th year have filled the questionnaire (Figure 1). Among them, a total of 68.6 % (n=131) are female students and 30.4 % (n=58) are male students. These students belonged to 17-25 years of age (Figure 2).

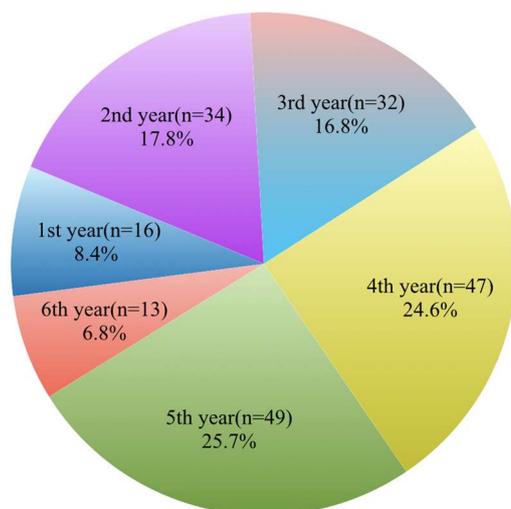


Fig. 1. Participants from each medical year.

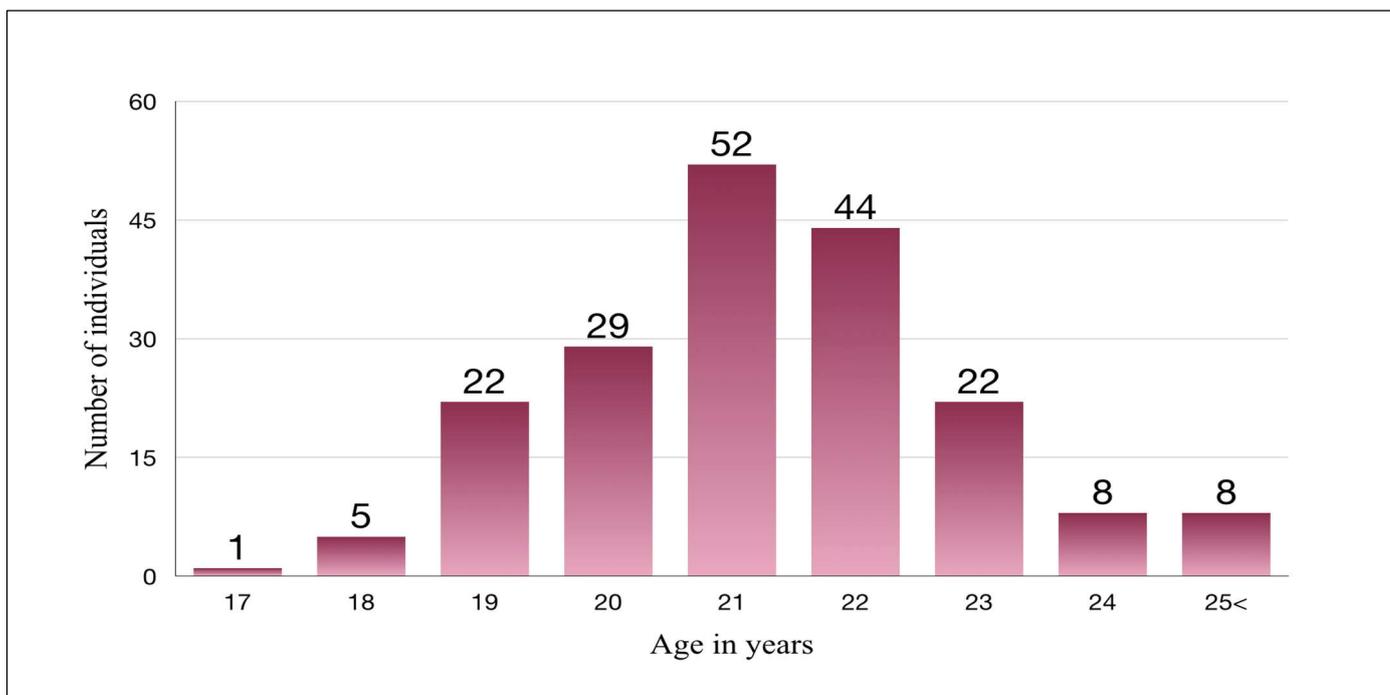


Fig. 2. Number of participants according to age.

81.7 % ( n=156) respondents stated that they are dealing with hair loss (p=0.0127) (Figure 3) and 59.6 % ( n=93) stated to have been dealing with hair loss for more than a year, most of these students were studying 4th and 5th year of medicine at the time of conducting the survey (Figure 4).

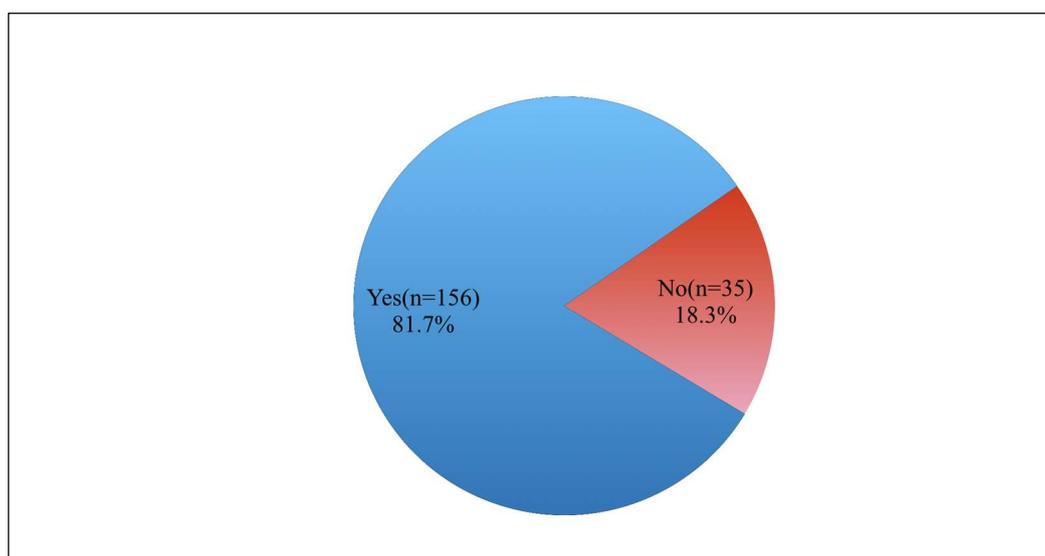


Fig. 3. Participants experiencing hair loss.

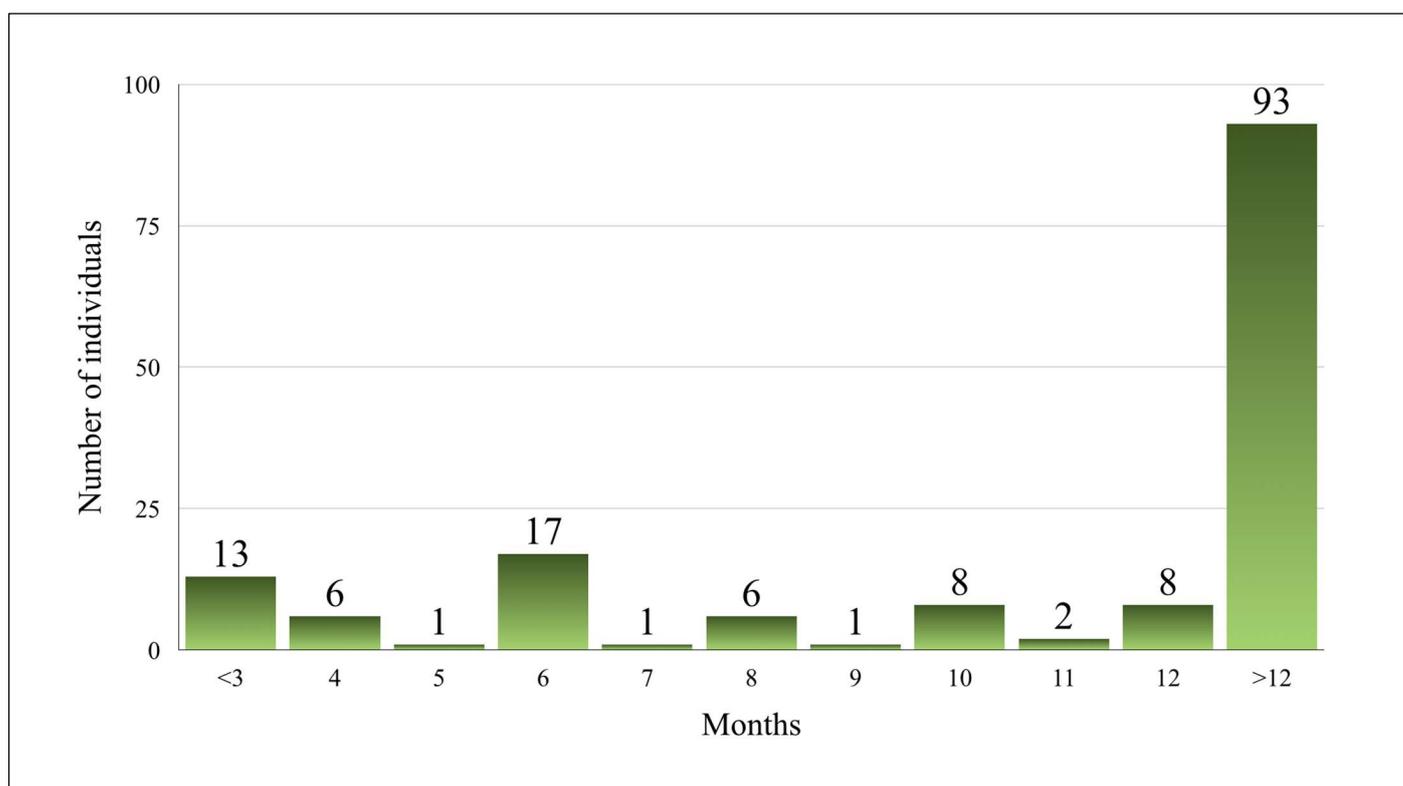


Fig. 4. Duration of hair loss.

33.3 % (n=52) of respondents responded that their hair loss intensity altered after the pandemic started, 30.8 % (n=48) responded to have observed no changes and 35.9 % (n=56) were not sure if they noticed any changes (Figure 5).

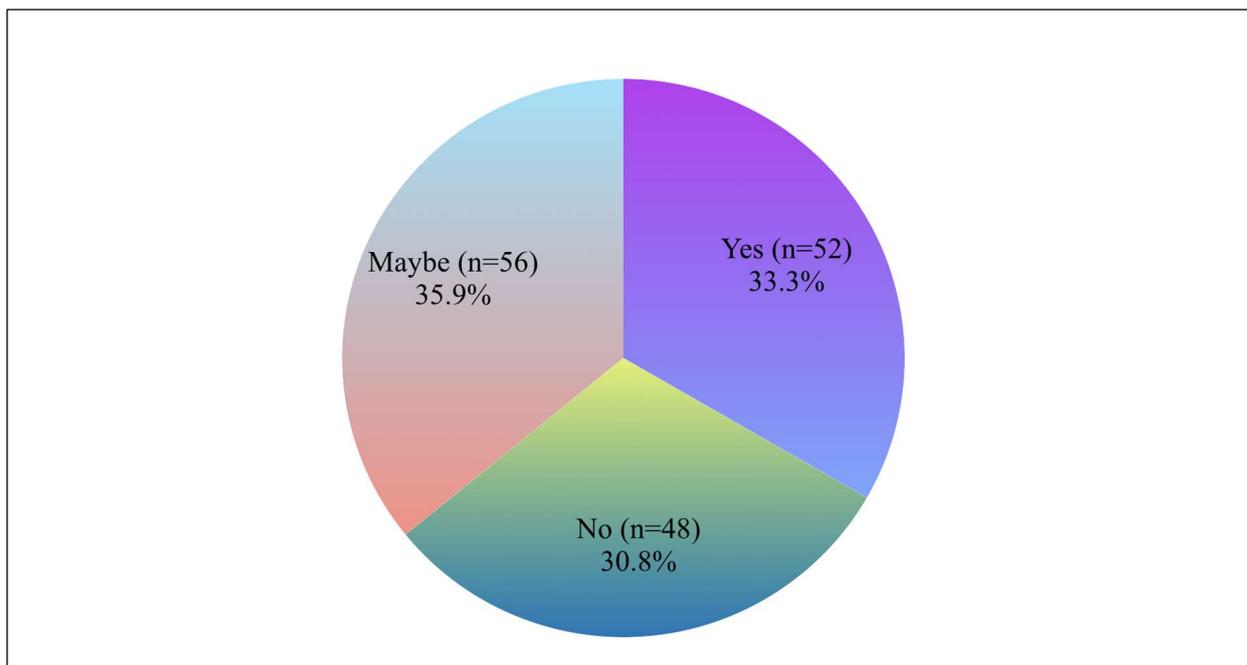


Fig. 5. Altered hair loss intensity after pandemic.

This altered intensity might be due to the chaos caused by sudden changes in lifestyle and its impact on mental and physical health.

A total of 54.5 % (n=85) responded to have experienced hair loss after moving to Georgia (p=0.04) that is after starting medical school (Figure 6). This can be primarily due to sudden weather changes and lifestyle changes.

Academic year	Experiencing Hair loss	No Hair loss	Maybe	
1	4	7	2	
2	11	7	10	
3	14	9	2	p=0.04
4	23	12	4	
5	26	8	6	
6	7	1	3	

Fig. 6. Experiencing hair loss after moving to Georgia.

Stress and internal causes -

54.5 % (n=85) responded that they think stress is the cause of their hair loss (Figure 7). 10.9 % (n=17) responded to be dealing with vitamin d deficiency, 10.3 % (n=16) responded to be dealing with iron deficiency, 7.1 % (n=11) of female participants responded to be dealing with Polycystic ovary syndrome (PCOS). Several respondents also stated to be dealing with biotin deficiency, zinc deficiency folate deficiency, and diabetes (Figure 8).

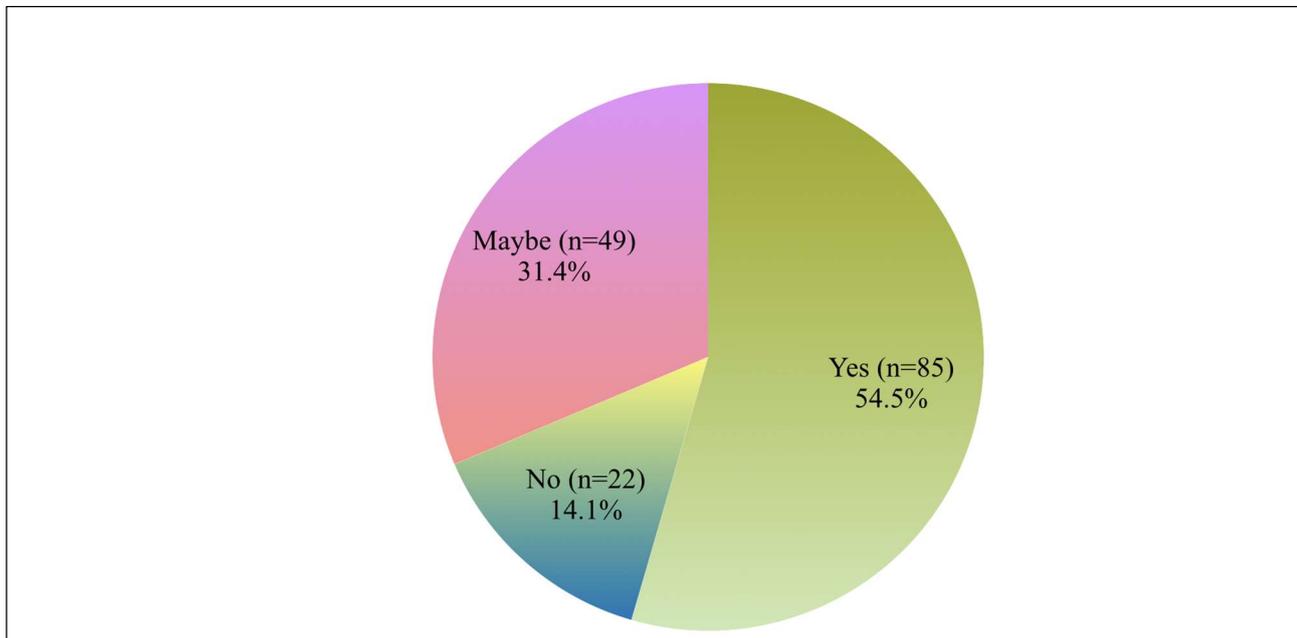


Fig. 7. Hair loss due to stress.

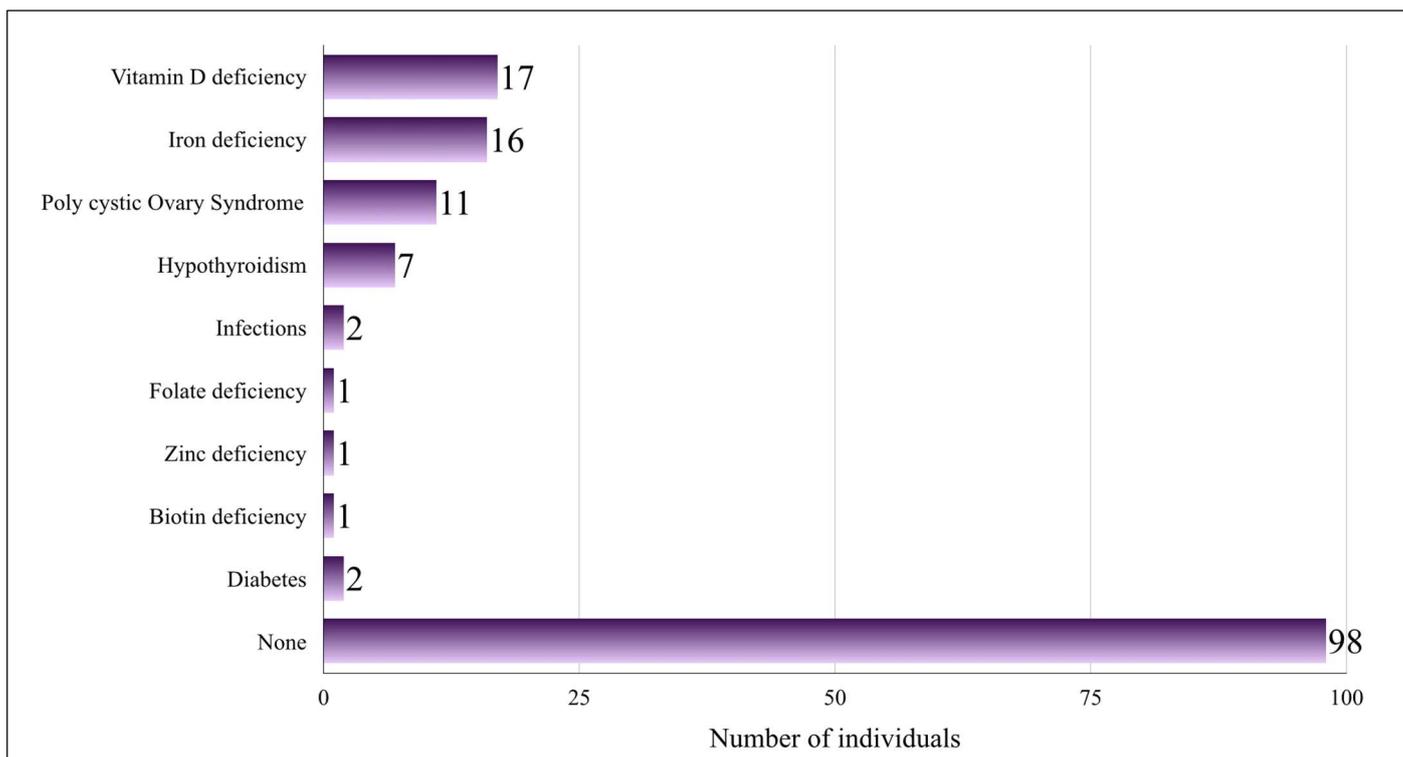


Fig. 8. Deficiencies and diseases in participants.

76.3 % (n=119) stated that they are concerned that they might be losing more hair in the future (Figure 9) only 34 % (n=53) of all the respondents stated that they use hair care products available in Georgia (Figure 10).

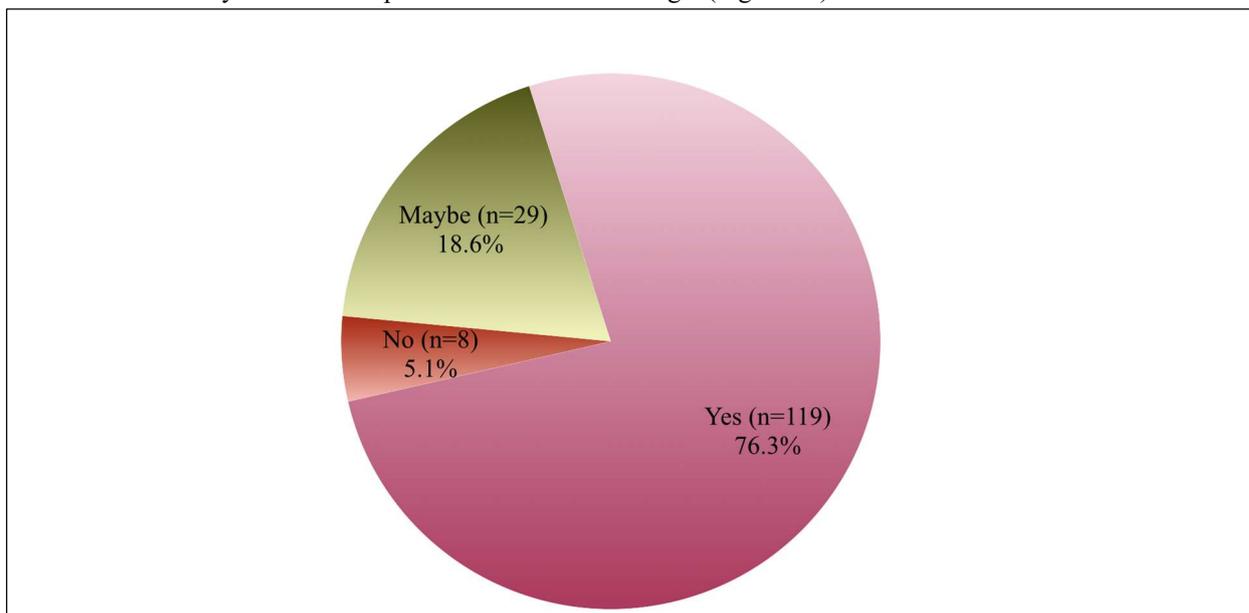


Fig. 9. Participants concerned losing more hair in future.

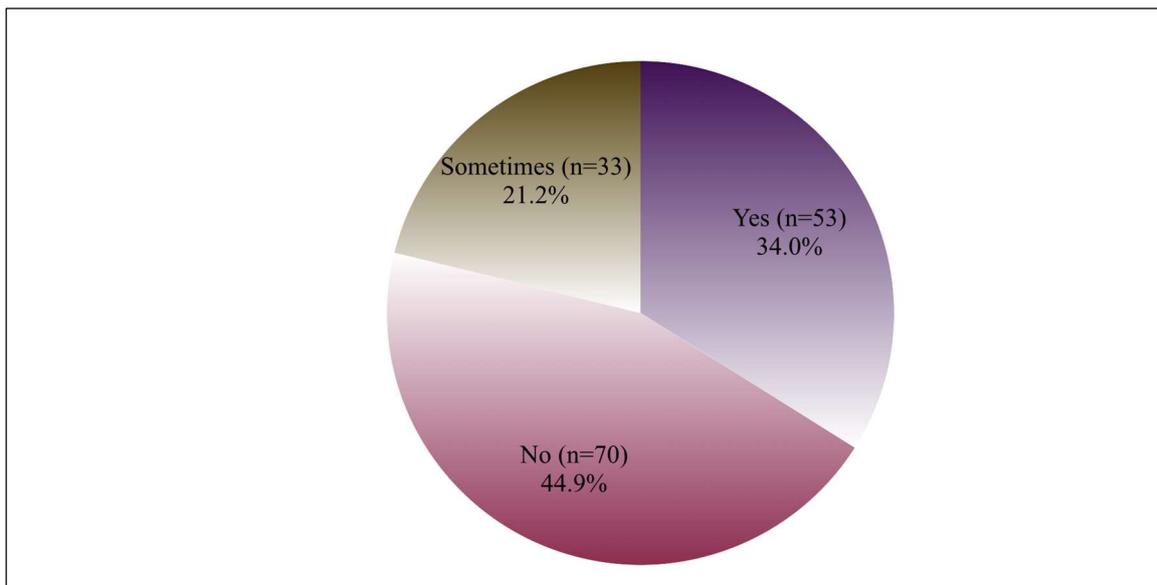


Fig. 10. Participants using hair care products available in Georgia.

57.1 % (n=89) stated that they are taking several manageable measures to control hair loss and 71.2 % (n=111) believe that with proper treatment and manageable steps they can control their hair loss, but surprisingly 92.3 % (n=144) of respondents dealing with hair loss are not undergoing any treatments to manage and control hair loss (Figure 11).

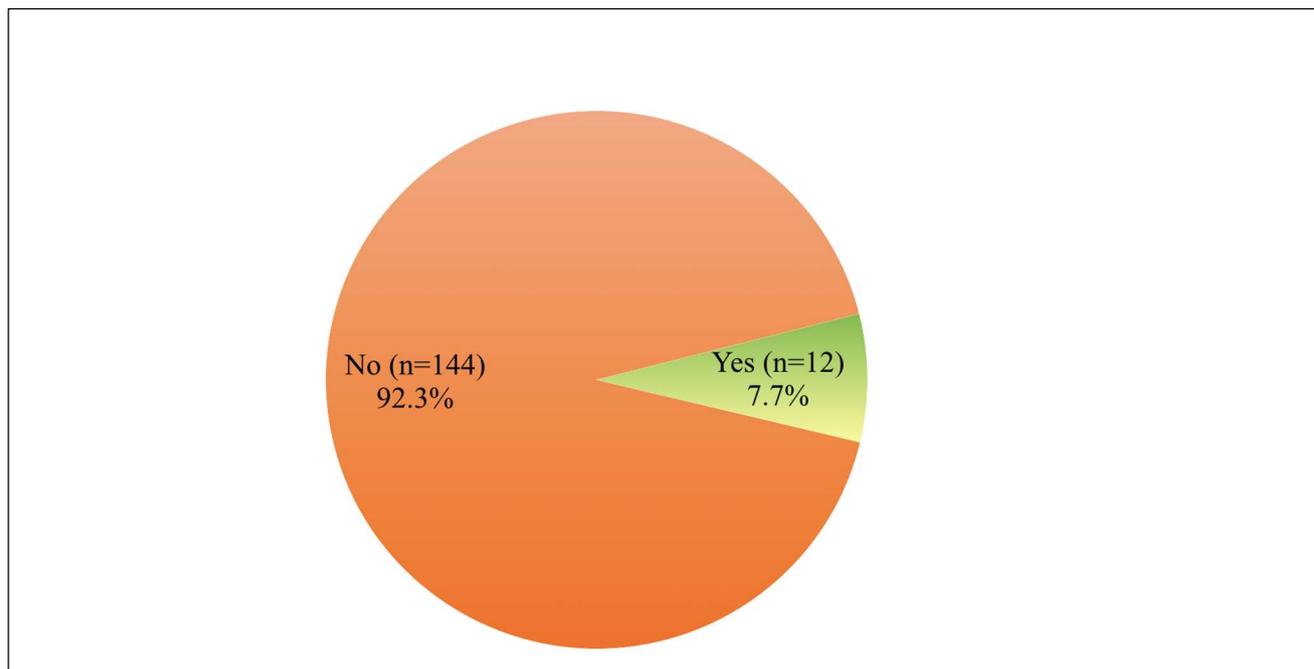


Fig. 11. Participants undergoing any treatments to manage and control hair loss.

IV. DISCUSSION

Hair is a protein filament that is one of the charismatic features for humans and is also an indicator of good health. Hair plays a prominent role especially in individuals in their early twenties. As our lives have become more fast-paced and overstretched health has taken a backseat, especially in those who just started adulthood. And life is extremely disquiet in medical students, more so in the foreign in medical students [8].

This survey aims to study if foreign medical students deals with progressive hair loss after moving out of their home country and if extreme stress, nutrient deficiencies, internal diseases, hair care products are contributing factors and also if the current pandemic has altered their condition. This self-designed survey was distributed to all foreign students studying at Tbilisi State Medical University. A total of 191 students filled the questionnaire.

It is quite surprising to see 54.5 % (n=85) students experiencing progression in hair loss after moving to Georgia (p=0.04), from the first year of their course, that is students as young as 17 years of age. Hair loss is noticed to be a major problem among students of all academic years of medicine and most common among the 6<sup>th</sup> year students (Figure 12).

Academic Year	Total participants(n)	Participants experiencing hair loss	% of hair loss	
1	16	13	81.25	
2	34	28	82.35	
3	32	25	78.13	p=0.0127
4	47	39	82.98	
5	49	40	81.63	
6	13	11	84.62	

Fig. 12. Hair loss intensity according to academic year.

As many students experienced hair loss after moving abroad to attend their courses, it can be the impetus to other factors such as stress and internal conditions. Micronutrients are important for healthy hair structure and hair growth. Studies have shown that nutritional deficiencies can lead to hair loss [5], [6], [9], [10].

Stress is known to contribute to inflammation that can result in hair loss more so at periods of excessive stress [4], [8]. This stress when combined with nutritional deficiencies such as vitamin D, folate, zinc, biotin, iron, and internal diseases like diabetes, PCOS and hypothyroidism can accelerate hair loss which can be studied through this survey as well. The current circumstances with the covid-19 pandemic has made the situation worse in certain individuals already dealing with hair loss. 33.3 % (n=52) stated to notice alteration in hair loss intensity amid pandemic, which is due to added crisis like constant tension of lack of practical exposures mostly among clinical year students due to restrictions and online mode of conducting classes.

Despite the optimism that their hair loss can be controlled and managed, it is interesting to notice that majority of the students are not undergoing any treatment.

This survey brings forth that foreign medical students are more prone to experience hair loss due to their complex lifestyle which is often hectic.

The limitations of this study include undisclosed ethnicity of the students, type of hair loss, genetic predisposing factors to hair loss, hair care products used, fewer male participants, and kind of management measures are taken by the students.

### V. CONCLUSION

Hair loss can be multifactorial with contributors such as genetic predisposition, pathological states, stress, pharmacotherapy, weather, and inappropriate hair care practices. Data from this survey shows that these factors like stress and nutritional deficiencies are indeed a few contributors to hair loss experienced by foreign medical students. 81.7% (n=156) belonging to age groups 17 to 25 years are experiencing hair loss ( $p=0.0127$ ). These existing factors in addition to new confusing and uncertain atmosphere in student's life amid the COVID-19 pandemic has also played a role in altering the intensity of hair loss as seen in 33.3% (n=52) of students. It is also important to note that 62.8% (n=98) students stated not to suffer from any diseases and deficiencies yet, experiencing progressive hair loss after moving to Georgia ( $p=0.04$ ). Therefore, factors like adapting to new geographical area and lifestyle changes play an important role in hair loss condition.

Though optimistic 71.2% (n=111) that hair loss can be prevented, students have also shown concern that they might experience more hair loss in the future 76.3% (n=199). Despite this concern, 92.3% (n=144) of students responded that they are not undergoing any treatment to control hair loss. With the right precautions and the treatment took under the supervision of a professional such as an esthetician and dermatologist hair loss progressive hair loss can be prevented and controlled at a young age.

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# *Variations Intra-Saisonnères des Pluies et Production Agricole dans la Commune de Tori Bossito au Bénin*

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BP 677 Abomey-Calavi ;



**Résumé** – Les irrégularités pluviométriques constatées depuis les années 1970 ont tôt fait de perturber les cycles culturels et de bouleverser le calendrier agricole traditionnel. L'objectif global de cette recherche vise à évaluer les manifestations, perceptions et adaptations paysannes des variations intra-saisonnères des pluies et la production agricole dans la Commune de Tori-Bossito.

La démarche méthodologique adoptée est axée sur la recherche documentaire et les enquêtes de terrain. L'analyse des statistiques climatologiques (pluviométrie, température, humidité), les observations directes, les interviews directes et la méthode des itinéraires a permis d'avoir les informations indispensables et de connaître les facteurs responsables des variations intra-saisonnères des pluies et la production agricole dans la commune de Tori-Bossito.

Les résultats obtenus montrent que les variations intra-saisonnères des pluies se manifestent par un démarrage tardif de la pluie et s'arrête précocement avec une forte pluie selon 85 % des enquêtés et ceci suite aux déboisements anarchique, aux perturbations du climat par les forces obscurantisme, l'exploitation de grande emblavure pour la production agricole et les feux de végétations chez les populations paysannes. Cependant cela bouleverse le cycle du calendrier agricole et provoque à 85 % une baisse au niveau du rendement agricole. Mais, chaque saison et séquences climatiques sont génératrices de contraintes telles que 45 % de la réduction de la durée des saisons pluvieuses, 25 % du prolongement du nombre de jours d'harmattan, les fortes chaleurs (35 %), les vents orageux (10 %), etc. En réaction à ces contraintes, les populations développent des stratégies d'adaptations telles que l'organisation des cérémonies et offrandes aux dieux et ancêtres pour favoriser la pluie en cas de démarrage tardif.

**Mots clés** – Bénin, Tori-Bossito, variations intra-saisonnères, production agricole.

**Abstract** – Rainfall irregularities observed since the 1970s have disrupted crop cycles early and upset the traditional agricultural calendar. The overall objective of this research is to evaluate the peasant manifestations, perceptions and adaptations of the intra-seasonal variations of the rains and the agricultural production in the Municipality of Tori-Bossito.

The methodological approach adopted focuses on desk research and field surveys. The analysis of climatological statistics (rainfall, temperature, and humidity), direct observations, direct interviews and the route method provided essential information and knowledge of the factors responsible for intra-seasonal variations in rainfall and production. In the municipality of Tori-Bossito.

The results obtained show that the intra-seasonal variations of the rains are manifested by a late start of the rain and stops early with a heavy rain according to 85 % of the respondents and this following the uncontrolled deforestation, the disturbances of the climate by the forces obscurantism, the exploitation of large area for the agricultural production and the fires of vegetation at the peasant populations. However, this disrupts the cycle of the agricultural calendar and causes a 85% decrease in the agricultural yield. But, each season and climatic sequences generate constraints such as 45% of the reduction of the duration of the rainy seasons, 25 % of the extension of the number of harmattan days, the hot weather (35 %), the stormy winds (10 %), etc. In response to these constraints, the populations develop adaptation strategies such as the organization of ceremonies and offerings to the gods and ancestors to promote the rain in the event of a late start, the adoption of a new fashion in time of harmattan, etc.

**Key words** – Bénin, Tori-Bossito, intra-seasonal variations, agricultural production.

## I. INTRODUCTION

Partout dans le monde, le climat a une influence très forte sur la production agricole qui peut être considéré comme l'activité humaine la plus dépendante des conditions météorologiques [8] L'agriculture en Afrique de l'Ouest, vitale pour la production locale, est extrêmement dépendante de la saison des pluies estivales et nécessite une bonne compréhension du cycle saisonnier de la pluviométrie [6]. Au Bénin, les travaux [3] ont montré que l'agriculture reste presque exclusivement pluviale (les calendriers agricoles sont calés sur les rythmes des événements pluvieux) donc très tributaire des incertitudes climatiques. A cet effet, les irrégularités pluviométriques constatées depuis les années 1970 ont tôt fait de perturber les cycles culturels, de bouleverser le calendrier agricole traditionnel et de rendre non opérationnel les normes culturelles en vigueur chez les populations paysannes [5]. Les questions du changement de variabilités climatiques sont placées depuis quelque temps au centre des préoccupations des scientifiques et des décideurs politiques en raison de leurs répercussions immédiates et durables sur le milieu naturel et sur l'homme [1]. Les changements climatiques et leurs impacts constituent aujourd'hui l'un des sujets les plus préoccupants de la communauté scientifique internationale. Même s'il subsiste encore de nombreuses incertitudes et bien des désaccords entre les chercheurs sur les changements climatiques [4] La Commune de Tori-Bossito occupe une position stratégique dans l'organisation de l'espace régional. En effet, elle a fait l'objet de peu d'étude sur les variations intra-saisonnères des pluies car les populations paysannes de cette Commune rencontrent d'énormes difficultés pour la production agricole. Cependant, la non-maîtrise des impacts des variations intra-saisonnères des pluies ne favorise pas une stabilité de la production agricole dans la Commune de Tori-Bossito.

## II. MÉTHODES ET DONNÉES UTILISÉES

### ➤ Données utilisées

-Relevés pluviométriques concernant les hauteurs d'eau journalières enregistrées sur les différentes stations retenues de 1981 à 2015;

- Informations qualitatives d'investigation et la perception des populations vis-à-vis de la variabilité des pluies du début de la saison agricole et de cerner les mesures adaptatives qu'elles mettent en place pour faire face aux perturbations engendrées sur le calendrier agricole traditionnel par la variabilité des pluies du début de la saison pluvieuse ;

-Des statistiques climatologiques notamment pluviométriques et thermométriques extraites des fichiers de l'ASECNA sur la période 1980-2010. La station de Pobè a été prise pour sa proximité géographique par rapport à la commune

### ➤ Echantillonnage

#### Techniques de collecte des données

Pour une recherche efficiente, les techniques ci-après sont utilisées :

- la méthode probabiliste de SCHWARTZ (1995) qui est calculé avec un degré de confiance de 95 % et une marge d'erreur de plus ou moins 5 %.

$X = Z\alpha^2 - p(1-p) / e^2$  avec

X= taille de l'échantillon ;

Z $\alpha$ = 1,96 Ecart fixé correspondant à un degré de confiance de 95 %

P= nombre de ménage de la commune ou de l'arrondissement ;

e = taux d'erreur aléatoire égale à 5 %

-l'observation directe pour identifier le mode de culture, les pratiques culturelles et les stratégies endogènes d'adaptation des producteurs agricoles face à la variation intra-saisonnière des pluies.

La taille de l'échantillon est déterminée en tenant compte des groupements ou associations de producteur agricole. En effet, l'enquête a pris en compte 6 arrondissements au sein duquel on peut dénombrier 47 villages et quartier de ville. Ainsi, au hasard 10 groupements de paysans sont identifiés par arrondissement en tenant compte de l'importance de leurs activités et de l'ancienneté ; soit au total 60 groupements de paysans dans toute la commune. Par groupe, il est procédé au choix de 3 personnes à enquêter. Ce choix tiens compte de l'ancienneté de la personne dans l'association ou dans le groupement et aussi de son rôle. Ainsi, à ce niveau,

**Variations Intra-Saisonnères des Pluies et Production Agricole dans la Commune de Tori Bossito au Bénin**

180 personnes seront prises en compte. A cet effet, s’ajoute une liste de 24 autorités en raison de 4 autorités par arrondissements. Au total 204 personnes ont été enquêtées.

La Commune de Tori-Bossito est comprise entre 6°25’ et 6°37’ de latitude Nord, 2°1’ et 2°17’ de longitude Est et se trouve au centre du département de l’Atlantique. Elle est limitée au nord par la Commune d’Allada, au sud par la Commune de Ouidah, à l’est par les Communes d’Abomey-Calavi et de Zè, à l’ouest par la Commune de Kpomassè. Sa superficie est de 328 km<sup>2</sup> soit 10 % de la superficie totale du département de l’Atlantique.

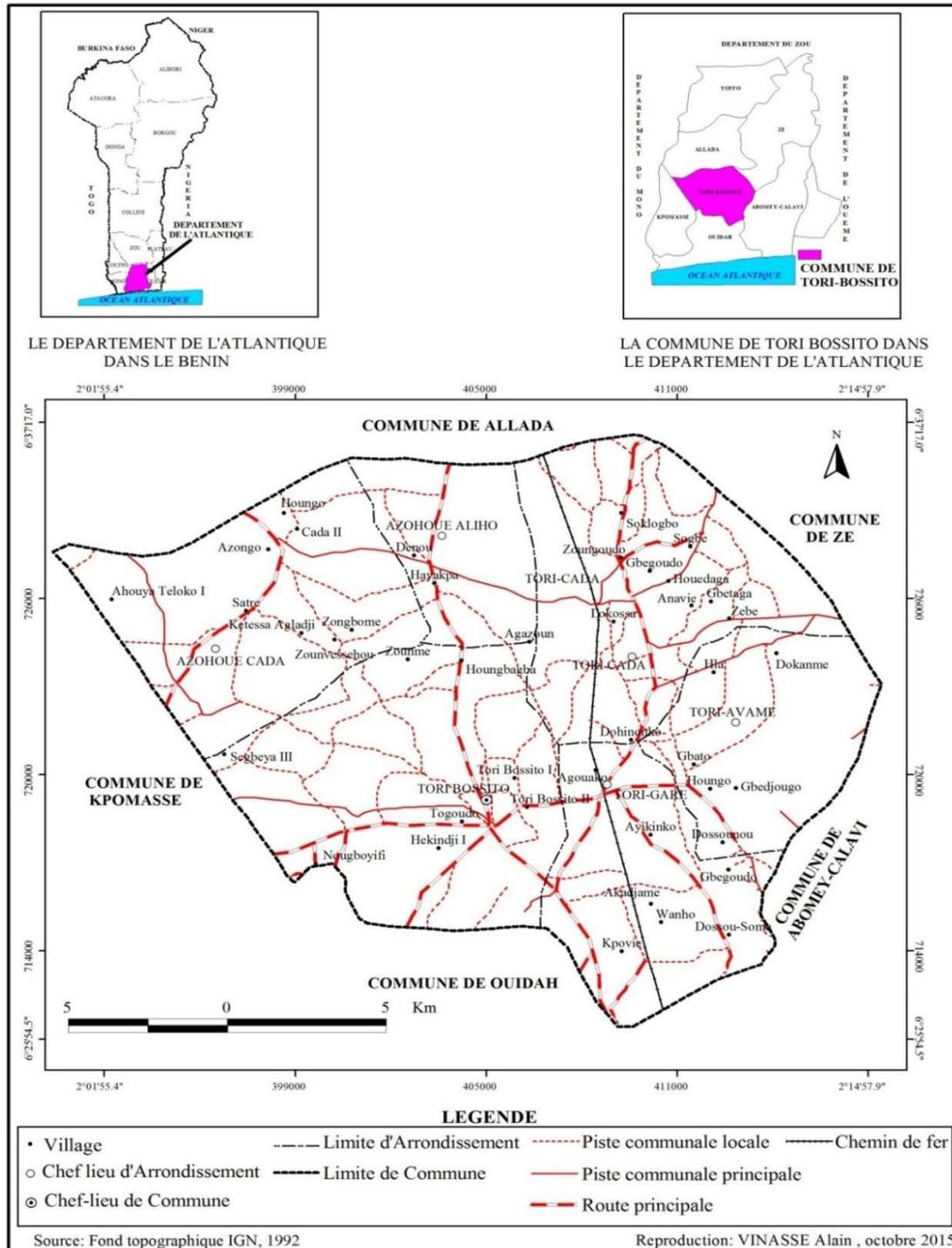


Figure 1: Situation géographique du secteur d’étude

### III. RÉSULTATS

#### 3.1. Facteurs physiques favorables à la production agricole

Les facteurs physiques du secteur ont été étudiés à travers le climat, les formations pédologiques et le réseau hydrographique de la commune.

Le climat joue un rôle important dans la variation intra-saisonnière des pluies et la production agricole. La Commune de Tori-Bossito ne disposant pas de station synoptique, les facteurs peu fluctuants utilisés proviennent des relevés de l'ASECNA pour la ville de Cotonou. Par contre, la pluviométrie utilisée provient de la station pluviométrique de Ouidah, ville qui sert de frontière au milieu d'étude et la température provienne de la station synoptique de Bohicon.

##### ▪ Précipitations

Le secteur d'étude jouit d'un climat de type subéquatorial caractérisé par la succession annuelle de quatre saisons.

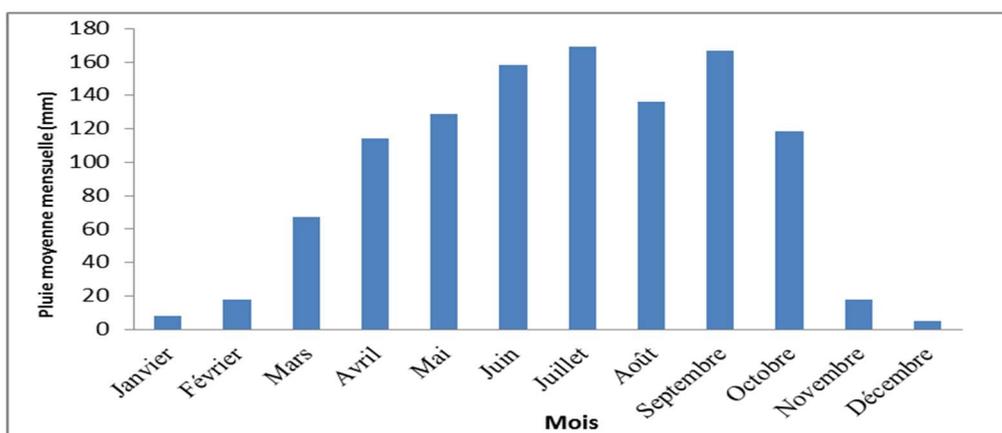


Figure 2: Variation moyenne mensuelle des précipitations de (1981- 2015)

Source : Météo-Bénin, 2018

L'examen de la figure 2 révèle l'alternance de quatre (04) saisons :

- une grande saison de pluie qui s'étend de mi-mars à mi-juillet ;
- une petite saison sèche durant le mois d'août ;
- une petite saison de pluie allant de mi-septembre à mi-novembre ;
- une grande saison sèche couvrant quatre (04) mois, mi-novembre à mi- mars.

De cette répartition, il se dénote que les mois de juin et juillet sont les mois les plus arrosés (300–350 mm), ce qui joue un grand rôle dans la production agricole (figure 3).

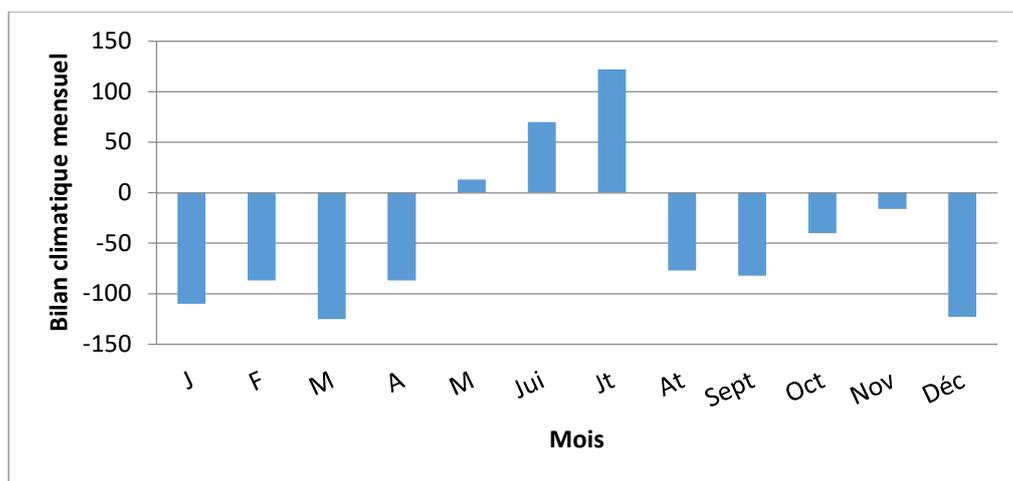


Figure 3: Bilan climatique mensuel (1981-2015)

Source : Météo-Bénin, 2018

De l'analyse de la figure 3, il ressort que le mois de juin demeure le plus pluvieux de l'année. A partir du mois d'avril, les premières pluies qui tombent servent à combler le déficit de saturation du sol, provoqué par l'évapotranspiration de la grande saison sèche.

▪ Variabilité interannuelle de la pluviométrie dans la Commune

La variabilité interannuelle des pluies constitue un aspect de la dynamique climatique qui se manifeste par l'occurrence des années très sèches ou très pluvieuses.

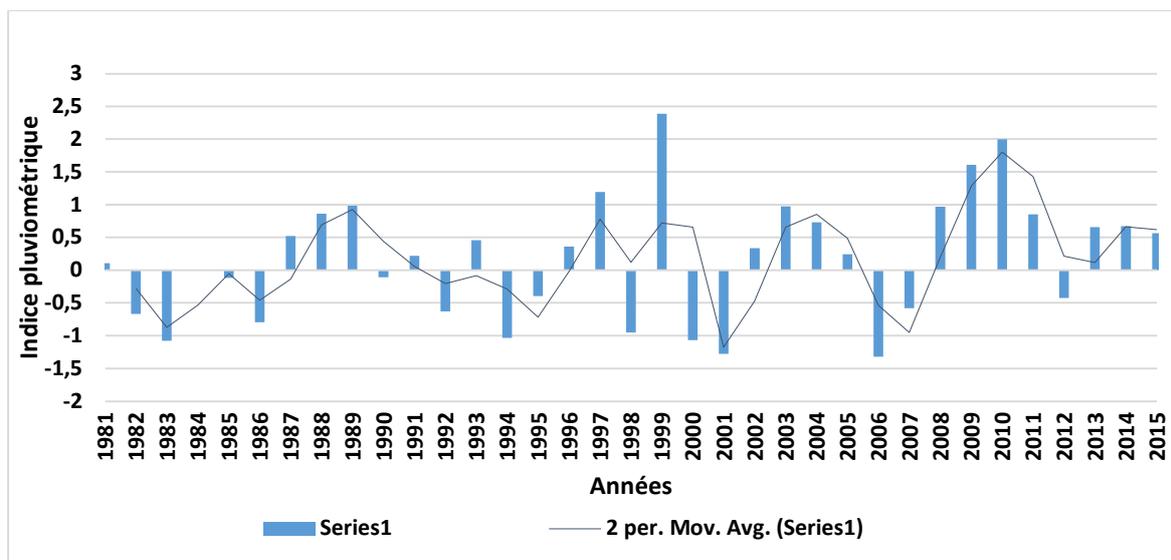


Figure 4: Variabilité interannuelle de la pluviométrie (1981-2015)

Source : Données ASECNA, (2018)

La figure 4 montre une alternance des années très pluvieuses avec des années très sèches. L'analyse de la figure 4 a permis de déterminer trois phases ou périodes à savoir : les années déficitaires, les années excédentaires et les années normales. Le tableau II présente les années déficitaires, excédentaires et normales sur la période de 1981 à 2015 de la Commune.

○ Variations inter mensuelle des températures

La température est l'un des facteurs les plus importants du climat qui contrôle le développement des plantes. En effet, elle agit sur la respiration, la transpiration et la photosynthèse des plantes. A l'échelle mensuelle, les températures maximales et minimales varient d'un mois à l'autre.

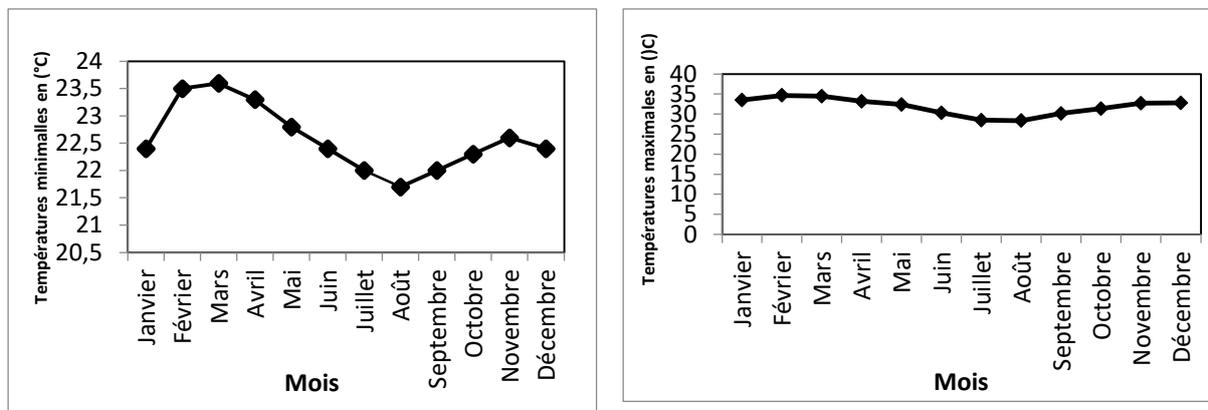


Figure 5: Variations inter mensuelles des températures mini et maxi (1981 - 2015)

Source : Données ASECNA, Station de Bohicon, 2019

De l'examen de la figure 6.1. Il ressort que, avec une moyenne des températures minimales de 23,5 °C, le mois d'août est le mois le plus frais avec une température de 21,7 °C. Les mois de février (23,5 °C) et de mars (23,6 °C) enregistrent les plus fortes valeurs thermiques minimales.

Avec une moyenne de 32 °C, les températures maximales sont situées autour de 28,4 °C pour le mois le plus frais (août) et de 34,7 °C en février (le mois le plus chaud).

En saison sèche, l'accroissement des températures constatées ces dernières années peut entraîner un tarissement précoce des mares d'eau. La hausse des températures conduit à une forte évapotranspiration. Cela entraîne une perte d'eau de la biomasse et des plans d'eau, mettant ainsi les végétaux dans une situation de stress hydrique.

3.1.1 Formations végétales

La Commune de Tori-Bossito est largement défrichée, la forêt originelle n'existe presque plus. Actuellement, la végétation est caractérisée par une savane herbeuse associée à des plantations de palmiers à huile. Du fait de la pluviométrie intéressante et de la qualité du sol, les plantations d'arbres sont assez répandues dans le milieu avec comme essence principale le teck.



Planche 1: Plantation privée de teck à Oukan, Tori gare (1.1) et palmier observé à Avamè (1.2)

Prise de vue : R.Bamisso, juin 2019

L'objectif principal du reboisement comme le montre la photo 1.1 de la planche 1 est de constituer une ceinture protectrice vivante au noyau central pour favoriser sa reconstitution. A cet objectif s'ajoute celui de la production de bois d'œuvre et de service de bonne qualité. L'essence principale de reboisement utilisée à cet effet est le teck (*Tectona grandis*) qui occupe 60 % des terres reboisées.

○ **Mosaïques de cultures et de jachères**

Les mosaïques de cultures et de jachères comme le montre la planche 2 dominent la commune. Les champs de cultures sont constitués de cultures annuelles (maïs, manioc, patate douce, arachide, coton etc.) et quelquefois semées en associa.



**Planche 2:** Culture de maïs observées à Tokoli (2.1) et à Honvié (2.2)

Prise de vue : R. Bamissoh juin 2019

La photo (2.1) de la planche 2 montre une mosaïque de culture observée à Tokoli. Cette photo présente l'aspect dégradé d'une formation végétale en mosaïque de culture et la photo (2.2) montre une ancienne jachère à Honvié avec la présence importante de graminées pâturable par les bêtes. Les formations naturelles connaissent une dégradation continue, du fait des activités humaines, notamment agricoles. Ces jachères constituent par ailleurs, les zones de pâtures des troupeaux. La figure 6 montre la proportion de la couche agricole, comparativement aux autres professions.

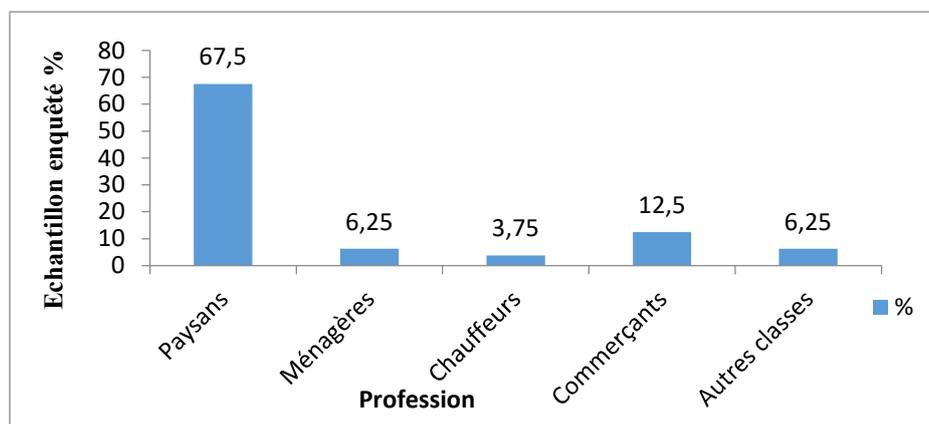


Figure 6 : Proportion de la couche paysanne

Source : Résultats d'enquête, 2019

L'analyse de la figure 8 montre que la commune dispose une importante couche paysanne dans les activités socio professionnelle notamment agricole (67,5 % du taux d'activité).

### 3.1.2 Activités socioéconomiques

Les activités économiques dans la commune concernent l'agriculture, le commerce, les activités de transformation, le transport, l'élevage, la chasse, l'artisanat. L'agriculture occupe une partie importante de l'économie des populations du secteur d'étude et reste dominée par les principales cultures comme le maïs (*Zea mays*), le riz (*Oryza sativa*), le manioc (*Manihot esculenta*), le niébé (*Vigna unguiculata*) [L.] Walp, le soja (*Glycine max*) et l'arachide (*Arachis hypogea*) dont les rendements évoluent en fonction des paramètres climatiques et de la qualité des sols notamment les précipitations qui varient d'une culture à une autre. La culture d'ananas (*Ananas comosus*) est celle bien pratiquée ; elle constitue même pour ces régions, la principale source de revenu.

La commune de Tori-Bossito est essentiellement agricole avec produits phares, le manioc, le maïs, l'ananas (surtout la variété pain de sucre). Elle est en effet un grenier de producteurs d'ananas en quantité et en qualité et dont la période de production s'étend du mois de mars à septembre.



**Planche 3:** Champ de manioc et d'ananas à Azowè Cada

*Prise de vue : FAKEYE, juin 2019*

En dehors de ces cultures, ils produisent également les produits maraîchers comme les légumes de toutes sortes, de la carotte, du haricot vert, du poivre, du poivron, du persil, du chou etc. concernant les productions animales, il faut noter la pisciculture, l'élevage des volailles, de porcins, de caprins, de bovins et d'ovins les différentes activités pratiquées dans la commune sont : l'agriculture, la pêche, la chasse, l'exploitation du bois, du feu, la transformation des produits.

### 3.2. Caractérisation de la variation intra-saisonnière des pluies

#### 3.2.1 Régime moyen des pluies de la période de 1981-2015

La considération de la variation intra-saisonnière des régimes pluviométriques est importante car, à quantité annuelle de pluie égale à la variabilité interannuelle équivalente, une plus grande instabilité des régimes pluviométriques d'une année à l'autre est préjudiciable à l'agriculture.

L'étude des régimes pluviométriques moyens sur la période 1981-2015 est incontournable et nécessaire, car le calendrier cultural dépend du rythme pluviométrique. Toute modification du rythme pluviométrique nécessite une réadaptation des systèmes de culture et des modes de production agricole. La figure 9 ci-après montre le régime pluviométrique moyen des pluies de la période de 1981-2015.

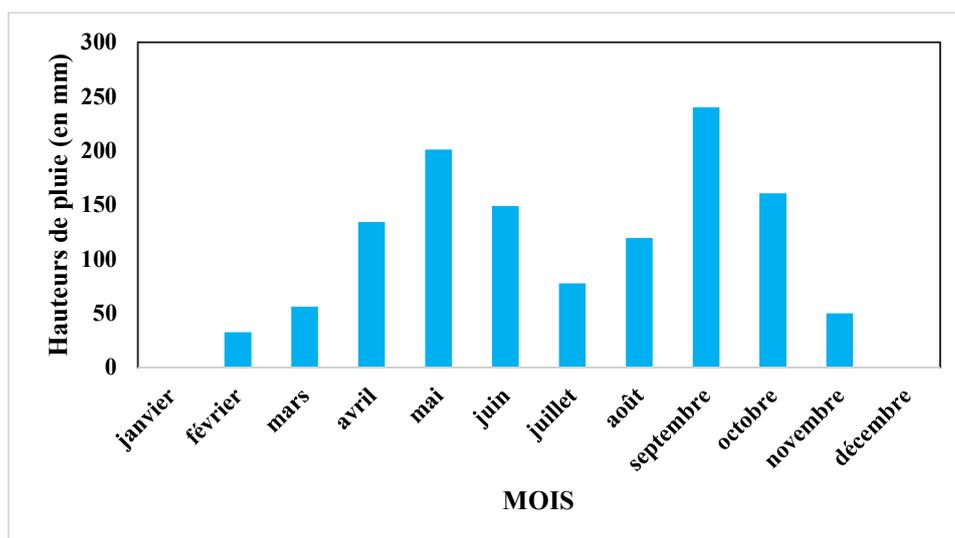


Figure 7: Régime moyen de hauteur de pluie de la période 1981-2015

Source : Traitement des données ASECNA

L'analyse du régime moyen de hauteur de pluie de la période 1981-2015 montre que le secteur d'étude a un régime pluviométrique bimodal du nombre de jours de pluie dont le plus élevé s'observe en Septembre. Elle montre aussi une modification du profil de répartition spatio-temporelle des hauteurs de pluie mensuelle dans la Commune. Cette analyse est en harmonie avec la plupart des régimes pluviométriques des climats de type subéquatorial [ 2] qui est marqué par l'apparition de deux saisons pluvieuses de mars à juillet et de septembre à novembre ; et de deux saisons sèches dont la première de décembre à mars et la seconde qui correspond aux fléchissements des précipitations en août.

### 3.2.2 Variabilité interannuelle

La figure 8 présente la variabilité interannuelle des hauteurs de pluie dans la Commune de Tori-Bossito.

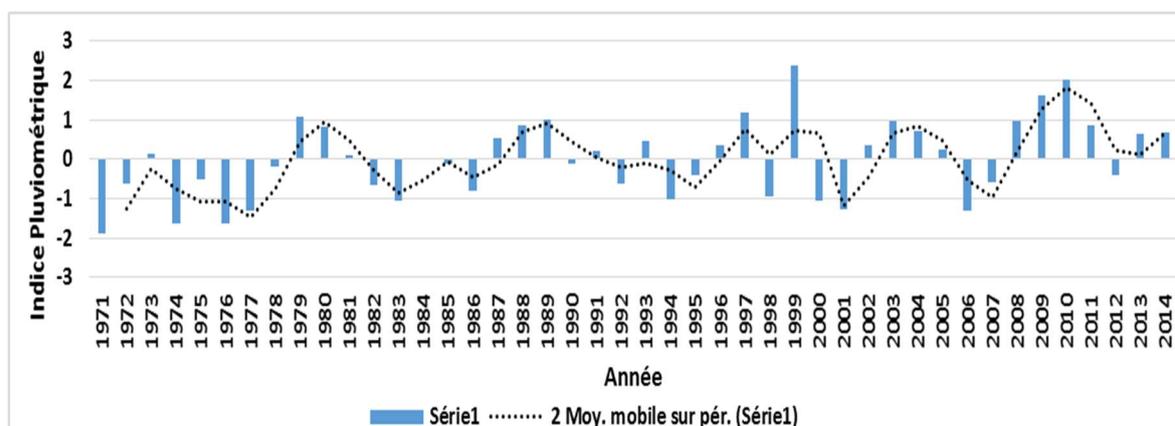


Figure 1: Variabilité interannuelle des hauteurs de pluie dans la Commune de Tori-Bossito

Source : Traitement des données ASECNA

L'analyse de la figure 8 révèle que sur la période 1971 à 2014, la plupart des anomalies sont positives, ce qui correspond à la période humide. Notons qu'il y a aussi une forte représentation des anomalies négatives traduisant ainsi les années déficitaires. Deux sous périodes se dégagent donc de cette analyse à savoir la période de la hausse pluviométrique et celle de la récession pluviométrique.

De façon globale, la période 1971-2014 a été marquée par une forte variabilité des hauteurs des précipitations. Cette variabilité pluviométrique est dominée par des années sèches et humides avec un indice. Pour mieux apprécier ces différentes sous périodes, la rupture de stationnarité dans les épisodes pluvieux ont été déterminés.

### 3.2.3 Etude comparée des sous périodes de ruptures à Bohicon de 1971-1986 et de 1987-2014

L'évolution interannuelle du nombre de jour de pluie à Bohicon a été étudiée à travers les sous périodes 1971-1986 et 1987-2014.

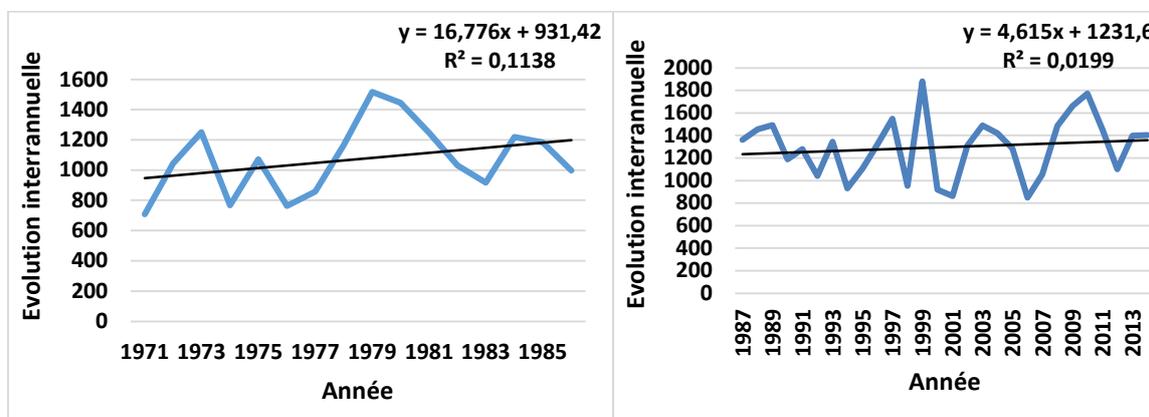


Figure 9: Evolution interannuelle du nombre de jours de pluie à Bohicon

L'analyse de la figure 9 révèle que la sous période 1987-2014 est déficitaire par rapport à la sous période 1971-1986.

### 3.2.4 Variabilité temporelle intra-saisonnière des séquences sèches dans la commune de Tori-Bossito et besoins en eau des cultures.

Il est indispensable de faire un diagnostic de la sécheresse afin de déceler les périodes d'absence ou de rareté de pluies nécessaire pour la croissance des plantes au cours des saisons pluvieuses. Cette démarche s'inscrit dans la stratégie d'évaluation des risques de sécheresse.

Il est important de signaler que nous avons choisi par saison une culture pour la prise en compte du besoin minimum en eau. Ainsi, pour la grande saison des pluies, la culture du maïs a été retenue car elle est pratiquée par tous les producteurs dans cette période. Pour la petite saison des pluies, le niébé a été retenu car il est prioritairement cultivé dans cette période. Le tableau III indique les exigences pluviométrique et thermique des principales cultures de la zone d'étude.

Tableau 1: Préférences thermique et pluviométrique des cultures.

Cultures		Préférences	
Nom courant	Nom scientifique	Température en °C	Besoin en eau (mm)
Maïs	Zea mays	+18 à +30	500 à 1000
Niébé	Vigna unguiculata	+18 à +25	400 à 800
Arachide	Arachis hypogea	+24 à +33	400 à 1200
Manioc	Manihot esculenta	+25 à +30	1000 à 1200
Tomate	Lycopersicon esculentum	+10 à +30	-
Patate douce	Ipomea batatas	+10 à +28	750 à 1000

Source : Mémento de l'agronome (2015)

### 3.2.5 Synthèse du diagnostic climatique

Le diagnostic pluviométrique de la commune de Toti-Bossito à partir de la période 1981-2015 met en évidence l'existence d'une péjoration pluviométrique. A l'échelle annuelle, on note une baisse des précipitations entre cette période. A l'échelle mensuelle, les précipitations (les pluies) sont à la baisse sur l'ensemble des mois de l'année. La petite saison sèche est devenue plus pluvieuse qu'avant.

La baisse des précipitations est importante en début de la grande saison de culture (mars, avril et mai) ; ce qui pourrait globalement signifier un début de saison caractérisé par un démarrage tardif des pluies (mois de mars plus sec) et une baisse pluviométrique (baisse en avril et mai plus important). Une recherche à partir des données climatiques journalières ou décennales pourrait donner plus de précision.

La petite saison des pluies démarre sur la période 1981-2015 en septembre ; ce qui fait que la deuxième saison de culture démarre aussi un peu plus tôt avec une forte réduction des pluies à la fin (mois de novembre). Durant les trente dernières années, les besoins minima en eau des principales cultures vivrières ont été plus satisfaits en grande saison qu'en petite saison, même si la tendance est à une augmentation des cumuls pluviométriques au cours de la petite saison des pluies depuis 2015. Cette situation n'a pas suffi pour inverser la tendance pluviométrique en petite saison sur les trente ans.

## IV. DISCUSSION

Le savoir, l'inventivité et le caractère expérimentateur des agriculteurs ont été longtemps sous-estimés [7] et les agriculteurs et les scientifiques peuvent et doivent être des partenaires, au sens plein et véritable du terme, au sein du processus de recherche et de vulgarisation. Mais à la suite d'une évaluation honnête dans leur activité, de nombreux scientifiques se montrent sceptiques quant au savoir et à la contribution potentielle des agriculteurs ; ces chercheurs n'ont tout simplement pas décelé les preuves de l'existence et de la valeur de ce savoir [6] de telle sorte qu'il existe un grand fossé entre les agriculteurs et les scientifiques.

De même que [6] affirme que « Le scientifique est aussi distant de l'agriculteur, qu'il prétend faire bénéficier de sa recherche que la lune l'est de la terre ». Par conséquent, de nombreuses technologies proposées par les chercheurs aux producteurs n'ont pas été adoptées par ceux-ci qui les ont tout simplement rejetés ou adaptés à leurs conditions de vie [3] a montré que l'innovation est mieux promue lorsqu'elle prend en compte et intègre les contraintes des producteurs dans le cadre des moyens qu'engendrerait son adoption. Au nombre de ces moyens, on a les services de motivation du changement, l'emplacement spécifique de la ferme et sa conduite par le paysan.

## V. CONCLUSION

Les études effectuées sur les manifestations, les perceptions et les stratégies d'adaptation des paysans faces aux variations intra-saisonnères des pluies et la production agricole, a permis d'étudier l'environnement agricole et les contraintes climatiques qui influencent le rendement de la production. Il ressort que les variations intra-saisonnères des pluies à de répercussion sur la vie du ménage des paysans et sur la production agricole en particulier. De plus, la baisse des précipitations pour la période 1981-2015 entre l'échelle annuelle saisonnière et mensuelle. La petite saison sèche est devenue plus pluvieuse qu'avant. La baisse des précipitations est importante en début de la grande saison de culture (mars, avril et mai) ; ce qui pourrait globalement signifier un début de saison caractérisé par un démarrage tardif précoce des pluies (mois de mars plus sec) et une baisse pluviométrique (baisse en avril et mai plus important). Les températures, les valeurs sont significativement en hausse autant pour les températures minimales que pour les températures maximales.

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# *Croissance Urbaine Et Terres Agricoles Dans La Ville De Pobè*

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**Résumé** – La ville de Pobè connaît une évolution démographique et spatiale qui entraîne la réduction des espaces agricoles. Ce travail de recherche dont les résultats sont inscrits dans le présent mémoire met en exergue les effets de la croissance sur les terres agricoles dans la ville de Pobè.

L'approche méthodologique utilisée est basée sur la collecte des données, leur traitement et l'analyse des résultats. La recherche documentaire et les enquêtes de terrain sont les méthodes de collecte de données. L'analyse des résultats a été faite par le modèle PEIR. Au total, 226 personnes ont été enquêtées.

Il ressort de l'analyse des résultats que la population de la ville de Pobè a augmenté au cours de ces dernières années. En effet, les données démographiques du recensement de 1979, 1992, de 2002 et de 2013 ont révélé que la ville compte respectivement 16633 habitants (INSAE 1) 23427 habitants (INSAE 2), 33249 habitants (INSAE 3) et 49232 habitants (INSAE 4). En outre, les superficies des agglomérations ont passé de 591,51 ha en 2008 à 694,76 ha en 2018 alors la Mosaïque de Culture et Jachère sous Palmiers ont passé de 176,82 ha à 71,15 ha. Cette évolution accompagnée de l'urbanisation engendre la réduction des espaces agricoles. Cette situation entraîne la diminution de la production, des superficies et des rendements agricoles.

**Mots clés** – Pobè, croissance urbaine, réduction, terres agricoles.

**Abstract** – The city of Pobè is experiencing demographic and spatial changes which lead to the reduction of agricultural areas. This research work, the results of which are included in this thesis, highlights the effects of growth on agricultural land in the city of Pobè.

The methodological approach used is based on data collection, processing and analysis of the results. Documentary research and field surveys are the methods of data collection.

The analysis of the results was done by the PEIR model. A total of 226 people were surveyed.

The analysis of the results shows that the population of the town of Pobè increased during the latter year. Indeed, the demographic data of the 1979, 1992, 2002 and 2013 censuses revealed that the city has 16,633 inhabitants (INSAE 1) 23,427 inhabitants (INSAE 2), 33,249 inhabitants (INSAE 3) and 49,232 inhabitants (INSAE 4), respectively. In addition, the areas of the agglomerations increased from 591.51 ha in 2008 to 694.76 ha in 2018 while the Mosaic of Culture and Fallow under Palm Trees increased from 176.82 ha to 71.15 ha. This evolution accompanied by urbanization leads to the reduction of agricultural areas. This situation leads to a reduction in production, areas and agricultural yields.

**Keywords** – Pobè, urban growth, reduction, agricultural land.

## INTRODUCTION ET JUSTIFICATION DU SUJET

Dans le monde, les pays connaissent une croissance démographique et spatiale remarquable.

Selon T. Vigninou (2010, p.17), l'installation des industries a favorisé la croissance spatiale et démographique rapide des villes résultant des apports migratoires intenses.

Les villes africaines se caractérisent par l'augmentation extrêmement rapide de leurs populations au fil des années et un mouvement de périurbanisation intense. La croissance démographique urbaine aux multiples causes et le développement des activités économiques de divers ordres jouent un rôle fondamental dans la dynamique des milieux urbains. La période postcoloniale est fortement marquée dans les pays d'Afrique en général et ceux de la côte ouest africaine en particulier, par une croissance urbaine particulièrement rapide (K. A. Biakouye, 2014, p.2). Selon D. M. Baloubi (2013, p.34), l'originalité du fait urbain à l'époque contemporaine réside dans son universalité et son rythme de plus en plus accéléré. Selon J. S. A. Tanmakpi (2014, p.17), le monde vit une civilisation urbaine dont l'une des évolutions est le passage progressif de l'urbanisation à la métropolisation. Pour S. A. Vissoh (2012, p.20), les formes de la croissance spatiale varient d'une région à une autre. Si dans les pays développés, la croissance des villes s'effectue en hauteur (la plupart des constructions comportent des étages), dans les pays sous-développés, les villes s'étalent beaucoup plus en surface. Une telle situation pose des problèmes d'urbanisation car souvent ces villes ne sont pas dotées de plans directeurs d'aménagement ou de plans d'occupation du sol. Cette croissance démographique entraîne l'augmentation des besoins alimentaires et conduit à une compétition pour l'espace entre les activités agricoles et forestières.

L'un des problèmes cruciaux auxquels sont confrontés les pouvoirs publics au Bénin comme dans la plupart des pays sous-développés est la maîtrise de l'urbanisation dans un contexte de croissance exponentielle de l'effectif de la population des villes (G. A. Glèlè, 2015, p.67). La population béninoise est passée de 3.331.210 habitants en 1979 (RGHP1) à 4.915.600 habitants en 1992 (RGHP2), à 7.633.000 habitants en 2002 (RGPH3) et à 9.983.884 habitants en 2013 (RGPH4) avec une superficie de 114.762 km<sup>2</sup> (INSAE, 2013). Alors qu'en 1961, date de la première enquête démographique au Bénin, le taux d'urbanisation n'était que de 16 %, il passe à 26,5 % en 1979 (année du premier recensement général de la population) et à 35,7 % en 1992 (année du deuxième recensement). Avec un taux d'urbanisation de 38,9 % au recensement de 2002, l'effectif de la population urbaine est passé de 1.756.197 habitants en 1992 à 2.630.133 habitants en 2002 (INSAE, 2003). Selon les projections de l'INSAE (2003), en 2012, la population urbaine devrait atteindre 4.125.146 habitants pour une population totale de 9.012.163 habitants, soit un taux d'urbanisation de 45,77 %. Selon D. M. Baloubi (2013, p.36), le Bénin connaît une urbanisation rapide. Cette forte urbanisation rapide au Bénin est responsable des problèmes de réduction des espaces agricoles. Le défi majeur à relever dans ce contexte pour les autorités est la bonne gestion des conséquences de cette forte urbanisation sur la consommation de l'espace.

La ville de Pobè, n'est pas épargnée de ces réalités. Le processus d'urbanisation qu'induit la croissance spatiale de cette ville, a pris la forme d'une occupation extensive périphérique et le plus souvent inorganisée de terres jadis agricoles. L'arrivée de la population sans cesse croissante exige une disponibilité importante de terres et les ressources foncières deviennent de plus en plus convoitées, d'où un renchérissement de la valeur des biens fonciers. L'explosion démographique et spatiale de cette ville a des conséquences de réduction de l'espace cultivable. En effet, la croissance urbaine accélérée et non maîtrisée de Pobè engendre des problèmes de réduction d'espaces agricoles. Aujourd'hui, le nombre de demandes de parcelles d'habitation évolue. Cette situation a largement favorisé l'extension urbaine et contribué à la diminution des espaces cultivables. L'espace devient de moins en moins disponible pour l'agriculture du fait de l'urbanisation. Or la pratique de l'agriculture urbaine répond à une logique de lutte contre le chômage et d'approvisionnement de la ville en légumes frais et à moindres coûts. La nécessité de maîtriser cette urbanisation oblige à mener davantage de recherches sur le foncier car celui-ci constitue le socle des investissements urbains.

### I. APPROCHE METHODOLOGIQUE

L'approche suivie pour la rédaction de la présente recherche a accordé une large place à la concertation et au dialogue avec toutes les couches socio-professionnelles de la ville, afin de susciter la participation des uns et des autres à une meilleure compréhension de la situation actuelle de la dynamique urbaine de la ville et ses effets sur l'agriculture urbaine.

#### 1-1- Données utilisées

Les données utilisées dans le cadre de cette recherche sont :

- les données démographiques constituées des statistiques issues des résultats des premier, deuxième, troisième et quatrième recensements de la population et de l'habitation (RGPH1, RGPH2, RGPH3 et RGPH4) tirées du compendium de l'INSAE. Ces données sont utilisées dans le but d'étudier l'évolution de la population afin d'analyser la part de la croissance démographique dans la dynamique urbaine;
- les données physiques (relief, sols, climat, hydrographie) à météo Bénin Bohicon de 1985 à 2014 ;
- les données sur les infrastructures sociocommunitaires (écoles, voies de communication, équipement marchands, etc.) collectées auprès des services techniques de la mairie ;

- les données relatives aux statistiques agricoles à la Direction Départementale de l'Agriculture, de l'Elevage et de la Pêche du Plateau.

Ces différentes données sont collectées grâce à l'utilisation de méthodes appropriées.

### 1-2-Techniques de collecte des données

Pour mener à bien cette recherche, plusieurs techniques ont été utilisées pour collecter les données.

#### ➤ Entretiens

Les entretiens ont été faits surtout avec les chefs d'Arrondissements, le responsable du service planification de la mairie. Les personnes rencontrées ont été interrogées sur leur origine, fonction, les causes de leur installation et les problèmes de la dynamique de la ville.

- un focus group a été organisé dans la ville où les autorités (maire, chefs d'arrondissements, conseillers en production agricole) et les habitants ont répondu aux différentes questions posées.

#### ➤ Observations directes

Les observations directes de terrain ont duré tout le long des recherches de terrain. Au cours de cette phase, le contact a été pris avec le cadre de recherche pour son observation directe.

### 1-3-Outils de collecte des données

#### • Questionnaires

Les enquêtes par questionnaire ont été faites au niveau des ménages. A l'aide des questionnaires, les opinions et les perceptions des habitants par rapport aux problèmes de la dynamique de la ville ont été recueillies.

#### • Guide d'entretien

Le guide d'entretien a permis de réaliser les entretiens.

#### ▪ Grille d'observation

La grille d'observation a permis de bien faire les observations sur le terrain.

### 1-4-Matériel de collecte des données

Il a été utilisé un appareil photographique numérique pour les prises de vues instantanées et un appareil GPS (Global Positioning System) pour la prise des coordonnées géographiques.

### 1-5-Echantillonnage

Dans le cadre de ce travail, des groupes cibles ont été identifiés et un échantillon défini. Tous les quartiers de la ville pris en compte par le RGPH4, le dernier recensement en date, ont été choisis pour les enquêtes de terrain. Le groupe cible est constitué des ménages, les responsables de la mairie, les chefs d'Arrondissement. La technique du choix aléatoire a été appliquée. Dans les ménages, seuls les chefs de ménages (femme ou homme) ont fait objet d'enquête.

La taille de l'échantillon a été déterminée sur la base de la formule de Schwartz (1995), et calculé avec un degré de confiance de 95 % et une marge d'erreur de plus ou moins 5 %. La formule s'écrit :

$$N = Z\alpha^2 \times PQ / d^2 \text{ avec}$$

N = taille de l'échantillon par quartier

$Z\alpha$  = écart fixé à 1,96 correspondant à un degré de confiance de 95 %

P = nombre de ménages par quartier/nombre de ménages de la ville selon les résultats du RGPH4

Q = 1 - P

d = marge d'erreur qui est égale à 5 %

Au total, 219 ménages ont été enquêtés. A ces 219 ménages, s'ajoutent le maire, 4 chefs d'arrondissements, 3 conseillers en production agricole).

### 1-6- Traitement des données

Chaque type de données et informations collectées ont été traité suivant des méthodes spécifiques.

Les questionnaires ont été d'abord dépouillés manuellement ; codifiés ; dénombrés et les réponses obtenues sont intégrées dans l'ordinateur pour être traitées.

La quantification des résultats d'enquête est réalisée sur la base du score réel (réponses positives et négatives) de chaque rubrique du questionnaire et non à partir du nombre total des personnes interrogées.

Le traitement des données collectées a été fait à l'aide des logiciels Word et Excel 2010.

Les différentes cartes d'analyses ont été réalisées grâce au logiciel ARCGIS 10.5.

### 1-7-Analyse des résultats

L'analyse des résultats a permis d'établir des liens entre les informations recueillies, de faire des comparaisons, de les synthétiser afin de les présenter sous forme de figures, tableaux, etc. Par conséquent, l'analyse des résultats s'est faite par le modèle PEIR. De façon spécifique, il a permis d'identifier dans le cadre de cette étude, les Pressions (les forces et acteurs qui déterminent ou induisent des changements dans ce milieu), l'Etat (la situation actuelle du milieu), les Impacts (les impacts néfastes qui découlent de la dynamique urbaine sur les terres agricoles) et puis les Réponses (des approches de solutions aux éventuels problèmes).

## II. SITUATIONS GEOGRAPHIQUE

La ville est située entre 6°67'45'' et 6°69'15'' de la latitude nord et entre 2°39' et 2°40'30'' de la longitude est. Pobè est une ville du sud-est du Bénin, chef-lieu de la commune du même nom et préfecture du département de Plateau. La ville de Pobè à la limite frontalière avec le Nigéria. Elle est délimitée au nord par la bourgade de Kétou. Puis, au sud et à l'Ouest par la Commune d'Adja-ouèrè (figure 1).

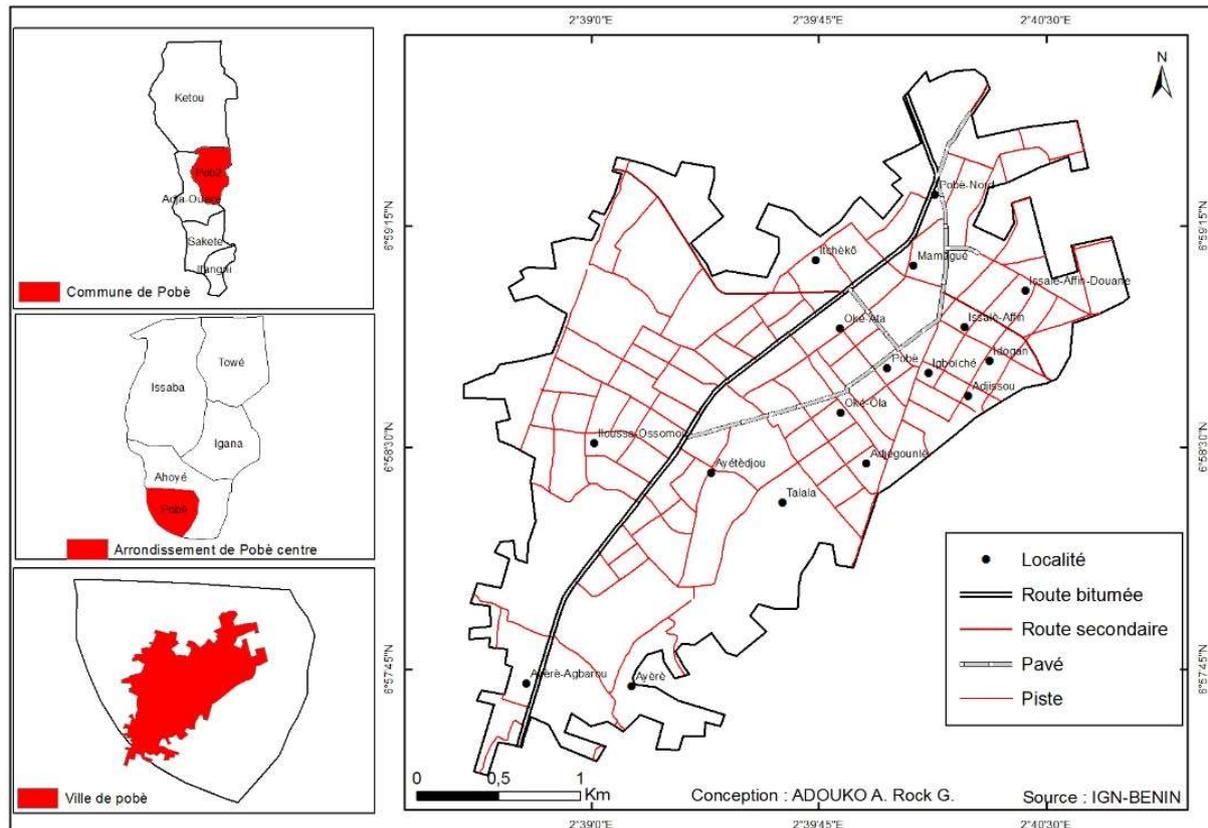


Figure 1: Situation géographique de la ville de Pobè

La situation géographique de la ville est favorable à l'installation humaine et le développement des activités.

## III. FACTEURS PHYSIQUES DE LA CROISSANCE URBAINE DE POBÈ

Plusieurs fondements physiques sont à la base de la croissance urbaine de Pobè.

### 3-1-Relief

La ville de Pobè fait partie de la zone de dépression suivant le classement par zone agro écologique. L'altitude est assez basse (50 m par rapport au niveau de la mer (PDC 2019). Comparativement aux Communes de Kétou et de Sakété, qui sont pourtant limitrophes. De plus, son relief est très peu accidenté et favorable aux cultures vivrières, maraîchères, de rentes et à la réalisation des infrastructures.

### 3-2- Diversité de sols

Dans la ville de Pobè, on distingue deux types d'unité pédologique : un sol hydromorphe et un sol ferralitique. Le sol hydromorphe très fertile où se pratiquent les principales cultures agricoles est situé dans la dépression d'Issaba. Il occupe environ les trois quarts (3/4) de la superficie de la commune.

Le sol ferralitique est situé sur le plateau Pobè-Sakété. Il est composé de sable, de grès et d'argile. C'est un sol rouge qui occupe le quart environ (1/4) de la superficie de la commune. Cette diversité de sols permet l'installation humaine et la production urbaine.

## IV. EVOLUTION DE LA POPULATION DE LA VILLE DE POBE

La population de la ville de Pobè connaît une forte croissance démographique. En effet, les données démographiques du recensement de 1979, 1992, de 2002 et de 2013 ont révélé que la ville compte respectivement 16633 habitants (INSAE 1), 23427 habitants (INSAE 2), 33249 habitants (INSAE 3) et 49232 habitants (INSAE 4). La figure 2 présente l'évolution de la population de la ville.

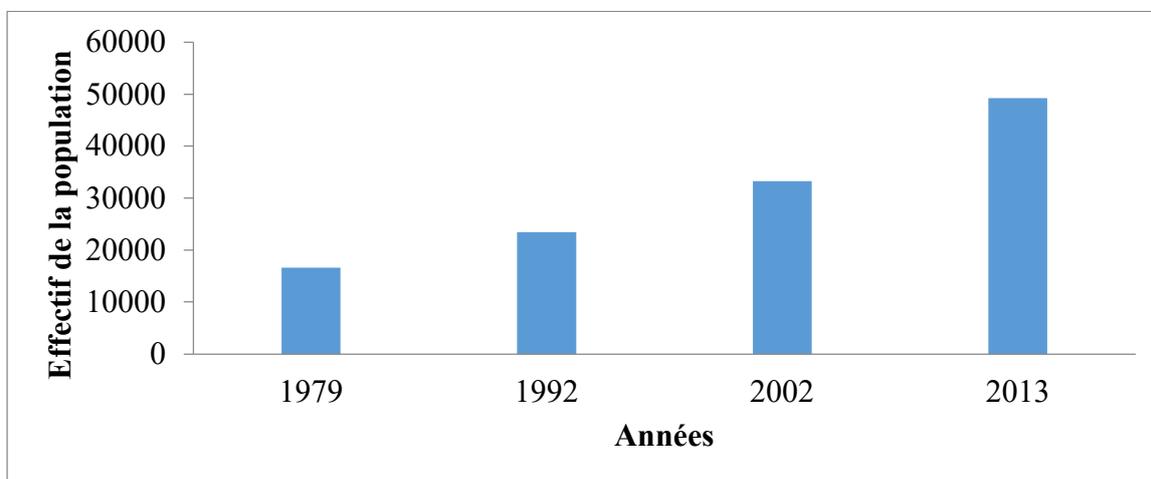


Figure 2: Evolution de la population de la ville

Source : INSAE 1, 2, 3 et 4

Il ressort de l'analyse de la figure 2 que la population de la ville de Pobè a augmenté à une évolution démographique. En effet, elle est passée de 16633 habitants en 1979 à 49232 habitants en 2013. Cette évolution de la population entraîne l'augmentation des besoins en logement. La satisfaction de ces besoins en logement oblige les ménages à utiliser les espaces agricoles à des fins de construction.

## V. ACTIVITES ECONOMIQUES

Cette partie traite des principales activités qui permettent la croissance de la ville.

### 5-1-Agriculture et élevage

Dans la ville de Pobè, le secteur primaire est essentiellement basé sur l'agriculture. A côté de cette dernière, l'on retrouve aussi l'élevage et la pêche. En effet, l'agriculture occupe plus de 50 % de la population active et est pratiquée autant par les hommes que par les femmes. Ces dernières interviennent surtout au semis et à la récolte. Les principales cultures sont : le maïs, le manioc, le niébé, l'igname, la patate douce, l'arachide, le Palmier à huile, la tomate, le gombo, le piment et les légumes.

L'élevage constitue une activité secondaire dans la ville de Pobè. Les exploitants qui pratiquent l'élevage du bovin confient leurs troupeaux aux peuhls spécialistes en la matière. Les hommes s'occupent du pâturage et les femmes sont plus impliquées dans

l'élevage des petits ruminants, des volailles et dans leur commercialisation. Ces activités attirent la population qui vient s'installer dans la ville. La photo 1 présente un champ de manioc dans la ville de Pobe



Photo 1: Champ de manioc

Prise de vue : R. Adouko, août 2020

La photo 1 présente un champ de manioc dans la ville. La production du manioc permet de satisfaire plus de 40 % des besoins alimentaires de la ville selon les enquêtes du terrain.

Cette activité attire les migrants agricoles dans la ville de Pobe.

## VI. MANIFESTATION DE L'EXTENSION DE LA VILLE DE POBE

L'extension de la ville engendre plusieurs effets sur les terres agricoles à Pobe.

### 6-1-Principaux modes d'accès à la terre agricole

Le foncier joue un grand rôle dans la dynamique spatiale de la ville de Pobe. L'importance du foncier s'accroît chaque jour dans la ville. Il a une fonction économique, sociale. La valeur du foncier varie selon sa situation par rapport à une voie principale, à une infrastructure socio-économique importante et au centre de la ville. Le foncier joue un rôle important dans la dynamique de la ville. Dans la ville de Pobe, la location, l'héritage, l'emprunt et l'achat sont les principaux modes d'accès à la terre agricole. La figure 3 montre les différents modes d'accès à la terre.

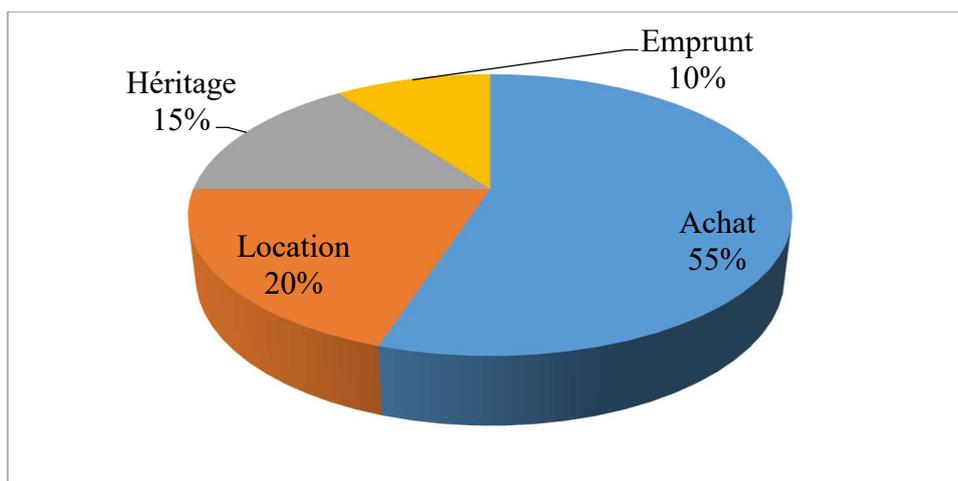


Figure 3: Principaux modes d'accès à la terre agricole

Source : Enquêtes de terrain, août 2020

De l'analyse de la figure 3, il ressort que l'achat des terres agricoles (55 %) est le mode d'accès dominant à la terre agricole. La location des terres agricoles occupe 20 %. L'héritage des terres agricoles occupe 15 % des modes d'accès à la terre. L'emprunt est le mode d'accès qui le moins pratiqué. Il occupe 10 %. La croissance démographique accompagnée de l'urbanisation est la base de ces différents modes d'accès à la terre. La terre a une valeur marchande aujourd'hui dans la ville. Celle-ci entraîne la problématique d'accès à la terre agricole.

### 6-2-Spéculation foncière dans la ville de Pobe

La croissance démographique dans la ville influence le foncier. En effet, la pression foncière induit une augmentation du coût des parcelles dans la ville. Selon plus de 60 % des personnes enquêtées, le prix des parcelles varie suivant la situation de la parcelle par rapport au centre-ville, à une infrastructure socio-économique, etc. Le tableau I présente la variation du coût des parcelles dans la ville.

Tableau I: Variation du prix des parcelles dans la ville

		Prix (F CFA) d'une parcelle de 500 m <sup>2</sup>		
Années		1990	2013	2020
Ville de Pobe	Au centre-ville	200 000	600 000	6 000 000
	En périphérie	60 000	300 000	700 000

Source : Enquêtes de terrain, août 2020

De l'analyse du tableau I, il ressort que le prix des parcelles a évolué de 1990 à 2020. Le tableau montre qu'entre 1990 et 2020, le prix d'un terrain de superficie 500 m<sup>2</sup>, est passé de 200 000 F CFA à 6 000 000 de F CFA au centre de la ville de Pobe. Tandis qu'en périphérie, ce prix est passé de 60 000 F CFA à 700 000 F CFA. Le prix des parcelles à la périphérie fait que les populations s'y installent. La spéculation foncière est l'une des causes de l'extension urbaine de Pobe.

### 6-3-Occupation du sol dans la ville de Pobe

Les agglomérations évoluent dans la ville. En effet, la volonté manifeste de chaque citoyen d'avoir sa propre habitation favorise cette évolution. Selon plus de 60 % des enquêtés, la disponibilité des terres dans la ville a joué un rôle déterminant dans la construction des habitations. Les figures 4 et 5 présentent l'extension des agglomérations dans la ville.

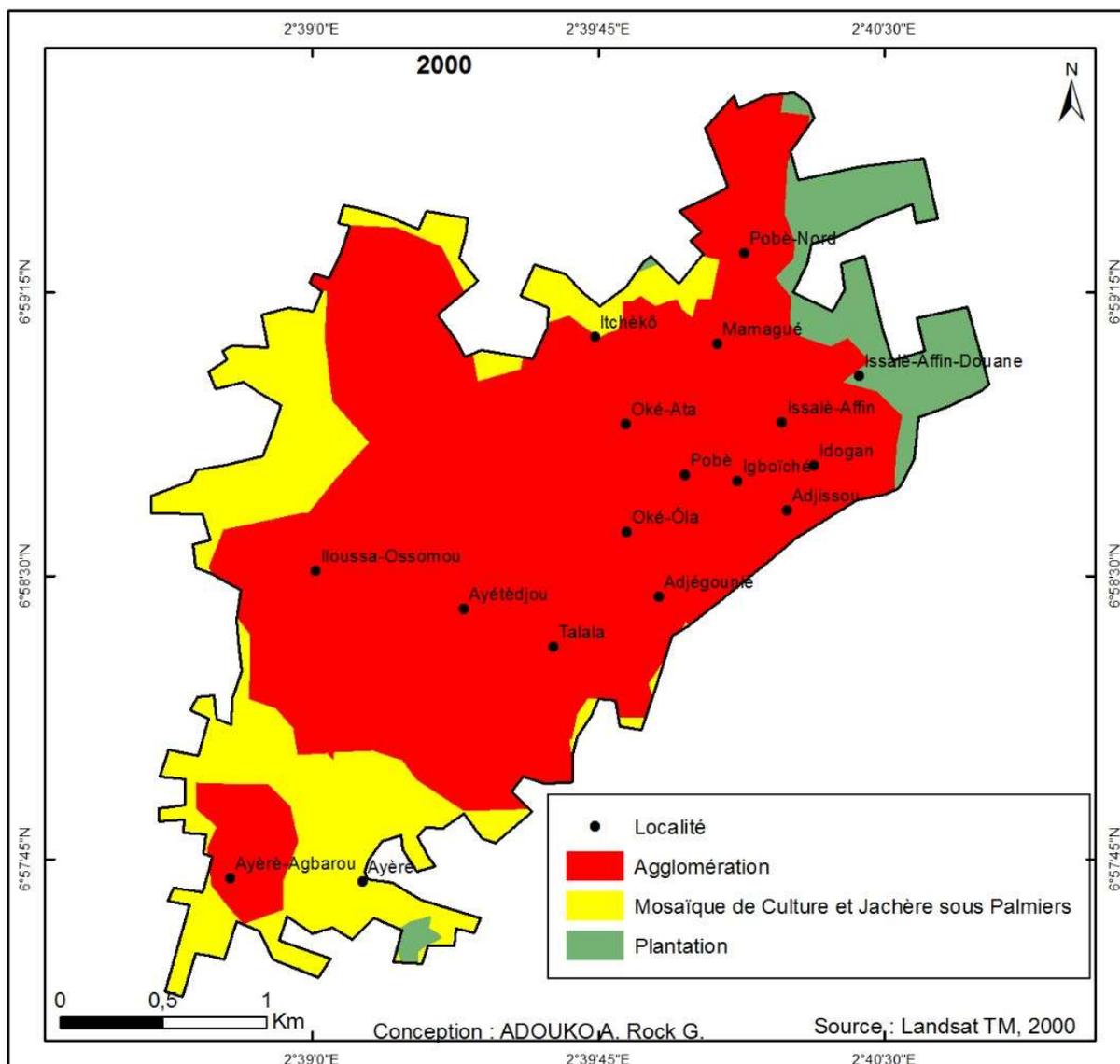


Figure 4: Occupation du sol dans la ville en 2000

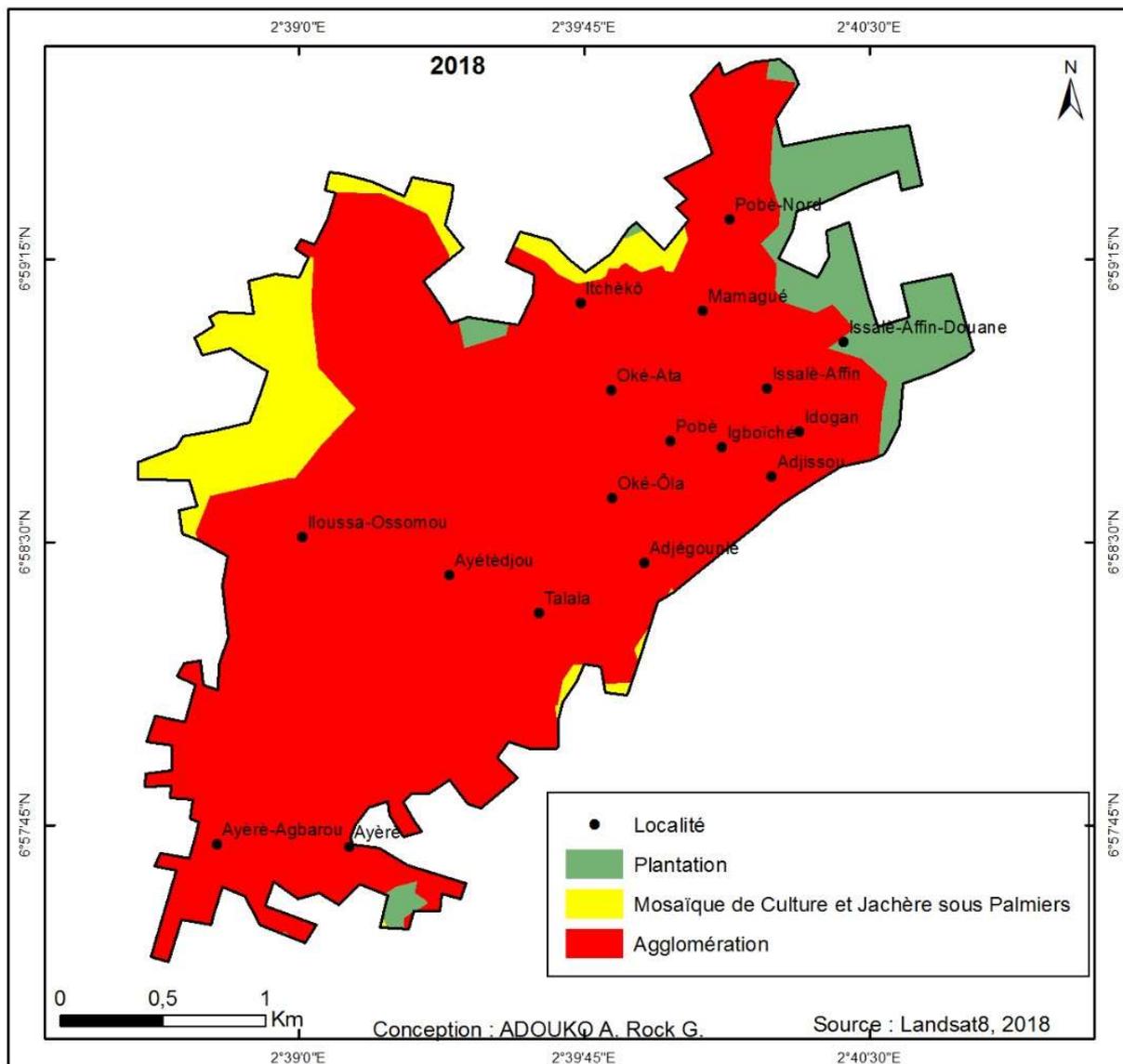


Figure 5: Occupation du sol dans la ville en 2018

Le tableau II présente la matrice d’occupation du sol dans la ville.

Tableau II: Matrice d’occupation du sol dans la ville

Unités d’occupation du sol	Superficie en 2000 (Ha)	Superficie en 2018 (Ha)	TAA (%)	Bilan
Plantation	61,42	63,84	0,22	Progression
Mosaïques de Cultures et Jachères sous Palmeraies	176,82	71,15	-3,32	Régression
Agglomération	591,51	694,76	0,97	Progression

Source : Landsat TM et 8

Il ressort du tableau II que la superficie des agglomérations ont connu une progression. Elles sont passées de 591,51 hectares en 2000 à 694,76 hectares en 2018 soit un taux annuel d’accroissement de 0,97%. Les mosaïques de cultures et jachères sous palmeraies ont connu une régression. Elles sont passées de 176,82 hectares en 2000 à 71,15 hectares en 2018. Ces données montrent que les

agglomérations ont évolué au détriment des autres unités d'occupation. Cette situation entraîne la réduction des terres agricoles dans la ville. La photo 2 présente un champ de maïs dans le quartier "résidentiel" à Pobe.



Photo 2: Champ de maïs dans le quartier "résidentiel" à Pobe.

Prise de vue : R. Adouko, août 2020

Ce champ de maïs est à proximité des maisons. Il est vulnérable à la pression immobilière. Selon le propriétaire de ce champ enquêté, « *c'est le manque de terre agricole qui m'a obligé à cultiver sur cette parcelle réservée à la construction d'habitation. Je ne suis pas sûr de continuer mes activités d'ici l'année prochaine* ». Ces propos recueillis témoignent de la pression immobilière sur les espaces agricoles dans la ville.

### 6-4-Evolution des habitations dans la ville de Pobe

L'habitation a aujourd'hui évolué dans la ville de Pobe. Cela se traduit par la disparition progressive des habitations sommaires ou traditionnelles au profit des habitations semi-modernes, modernes ou à haut standing.

#### ➤ Habitations semi-modernes

Les habitations semi-modernes sont constituées de "parpaings de terre" ou briques de terre. En effet, le ciment offre une bonne protection contre les pluies et la tôle est une meilleure garantie contre les incendies selon plus de 50 % des personnes enquêtées. L'habitation semi-moderne représente 60 % des constructions dans la ville de Pobe.

Les progrès réalisés dans la modernisation de l'habitation fait apparaître un troisième type d'habitat : l'habitat en dur ou maisons dites modernes.

#### ➤ Habitations en dur ou maisons modernes

Les habitations sont crépies et parfois peintes à la chaux. On peut distinguer, s'agissant des maisons modernes :

- les maisons en dur. Leur forme et leur plan sont assez variables ;
- les villas et les maisons à étages ; ce sont des bâtiments dont le nombre demeure réduit dans la ville de Pobe.

La photo 3 présente une habitation en dur dans la ville.



Photo 3: Habitation moderne dans le quartier A « résidentiel » à Pobè

Prise de vue : Adouko, août 2020

Cette habitation en dur occupe une proportion de 30 % des types d'habitation dans la ville. Cette habitation est de niveau qualitatif et économique élevé. L'évolution des habitations entraîne la réduction et le recul des terres agricoles.

#### **6-5-Infrastructures sociocommunautaires dans la ville de Pobè**

La ville dispose de plusieurs infrastructures sociocommunautaires. Il s'agit des infrastructures éducatives, sanitaires, hôtelières, sportives, communicationnelles. La figure 6 présente les infrastructures sociocommunautaires dans la ville.

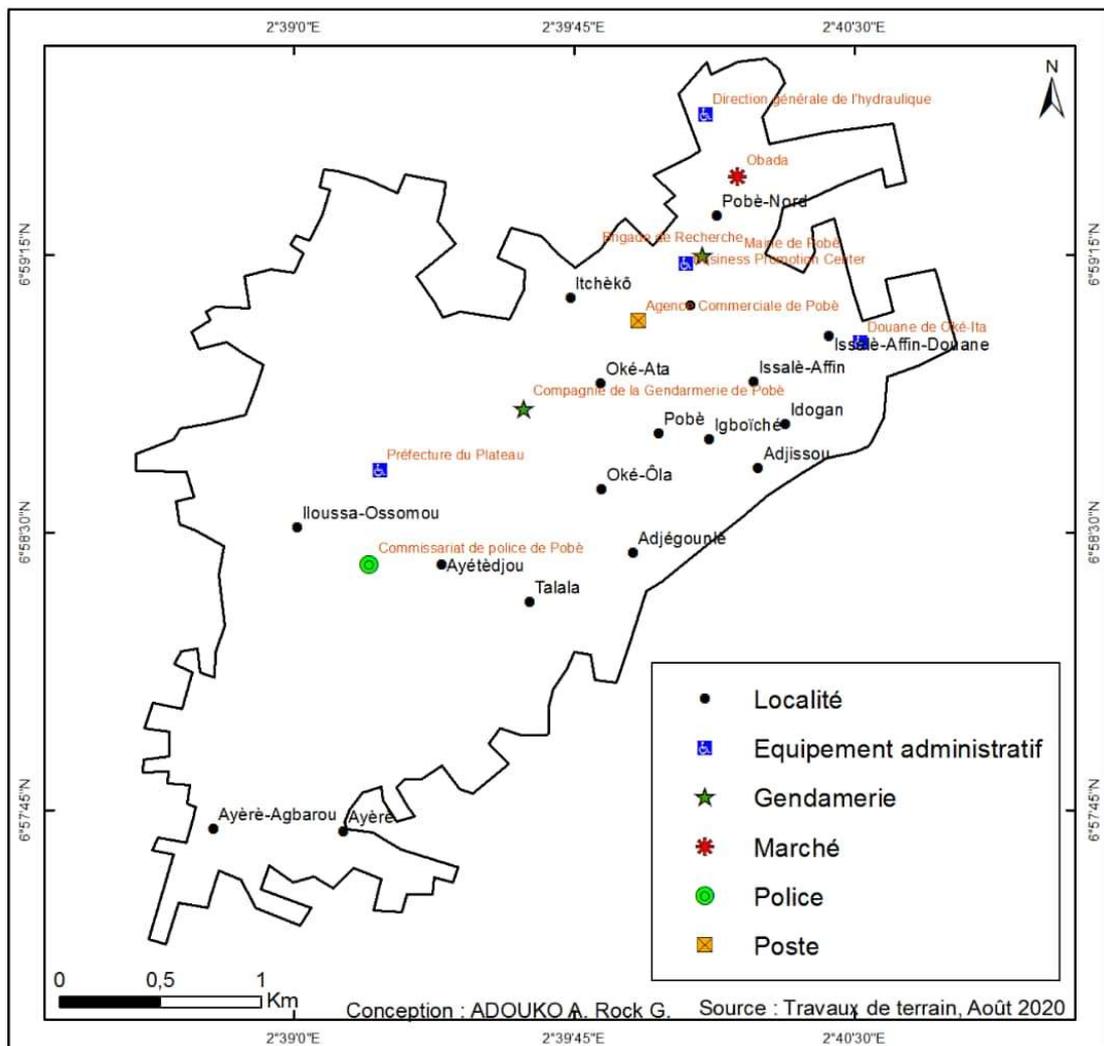


Figure 6: Infrastructures sociocommunautaires dans la ville

Il ressort de l'analyse de la figure 6 que la ville compte plusieurs infrastructures. La construction de ces infrastructures favorise l'extension urbaine de Pobe. Cela est un facteur de réduction et de recul des terres agricoles dans la ville.

La photo 4 montre le Collège d'Enseignement Général 2 de Pobe.



Photo 4: CEG 2 de Pobè

Prise de vue : Adouko, août 2020

Ce collège est construit sur une vaste parcelle entre temps agricole selon plus de 60 % des personnes enquêtées. La construction de ce collège a obligé les exploitants agricoles qui cultivaient sur cette parcelle à abandonner leurs activités. La construction des infrastructures sociocommunitaires est un facteur de réduction et du recul des terres agricoles dans la ville.

#### **6-6- Effets de l'installation des citadins sur les espaces agricoles dans la ville de Pobè**

L'installation des citadins dans les quartiers périphériques entraîne une réduction des aires de culture et un recul des terres agricoles. En effet, il a été observé que dans les zones périurbaines, la croissance des villes a créé des situations d'insécurité foncière pour beaucoup de petits producteurs, du fait d'une part de l'empiètement progressif des périmètres urbains sur les terroirs villageois, mais également de la forte compétition pour l'accès aux terres agricoles qui se raréfient de plus en plus. Les terres agricoles diminuent par l'extension spatiale des agglomérations avec l'installation de nouvelles habitations dans les quartiers de la ville de Pobè. Les mosaïques de cultures et jachères sous palmeraies ont connu une régression. Elles sont passées de 176,82 hectares en 2000 à 71,15 hectares en 2018.

L'extension urbaine crée une nouvelle fonction de l'espace agricole, celle résidentielle. C'est surtout cette nouvelle fonction qui fait du foncier autrefois agricole un bien marchand objet de beaucoup de convoitise et de spéculation. Seuls les espaces non encore bâtis sont mis en valeur pour la production agricole. Ainsi, les parcelles non encore occupées dans les quartiers périphériques sont souvent mis en cultures.

### **VII. DISCUSSION**

Le monde connaît une croissance démographique et spatiale remarquable. L'accroissement de la population accélère l'urbanisation. La croissance démographique urbaine aux multiples causes et le développement des activités économiques de divers ordres jouent un rôle fondamental dans la dynamique des milieux urbains. En effet, les espaces périurbains accueillent avant tout les fonctions habitats alors que les fonctions activités restent concentrées dans les agglomérations. Les résultats de cette recherche sont similaires à ceux de T. Vigninou (2010, p.24).

La ville de Pobè à l'instar de celles du Bénin, continuent d'attirer les populations malgré l'absence d'une gestion rationnelle du foncier. Il se pose la question foncière à cause de la forte pression humaine. L'urbanisation n'a pas été une préoccupation des autorités administratives. L'installation des populations se fait de façon spontanée sans aucun ordre. L'absence d'une planification foncière rigoureuse accentue le phénomène des problèmes fonciers. Les résultats de cette recherche sont similaires à ceux de S. A. Vissoh (2012, p.13).

L'extension de la ville exerce une forte pression sur l'espace agricole. Or la pratique de l'agriculture urbaine répond à une logique de lutte contre le chômage et d'approvisionnement de la ville en légumes frais et à moindres coûts. L'extension urbaine grandissante soulève d'énormes défis à relever concernant la production agricole urbaine à Pobè. En effet, l'extension de la ville exerce une forte pression sur les ressources naturelles et les espaces agricoles à la périphérie de la ville ; ce qui entraîne une réduction des espaces agricoles et / ou naturels. Les résultats de cette recherche corroborent ceux de D. M. Baloubi (2013, p.9).

La réduction des espaces agricoles engendre la réduction de la production agricole de même que des rendements agricoles dans la ville. P. Houndji (2020, p.12) a trouvé les mêmes résultats dans ses recherches. Pour lui, l'urbanisation entraîne la réduction des espaces agricoles donc la réduction de la production agricole de même que des rendements agricoles.

### VIII. CONCLUSION

L'étalement urbain est un phénomène qui a affecté la plupart des villes du monde en général et celles du Bénin en particulier. C'est le cas de la ville de Pobè dont la population a connu une forte croissance démographique accompagnée d'une urbanisation intense. En effet, les caractéristiques physique et humaine de la ville permettent son extension. En outre, l'étalement de la ville de Pobè est aussi dû à sa fonction de Chef-lieu de département qui permet l'installation des infrastructures sociocommunitaires.

Par ailleurs, l'étalement urbain entraîne la réduction et le recul des terres agricoles. La réduction et le recul des terres agricoles entraînent la diminution des productions, des superficies et des rendements agricoles. La maîtrise de ce phénomène d'étalement urbain ne peut être efficace que si les multiples facteurs qui l'ont donné naissance sont bien appréhendés. Ainsi, plusieurs dispositions urgentes doivent être prises par l'Etat central et les autorités locales pour faire face à cet étalement. Ces actions vont permettre de maîtriser l'étalement urbain afin de préserver les terres agricoles.

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# *Les Déterminants De La Performance Des Projets Et Programmes De Développement Au Burkina Faso*

## *[The Determinants Of The Performance Of Development Projects And Programs In Burkina Faso]*

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**Résumé** – Cet article vise à contribuer à l'amélioration de la performance des projets et programmes de développement au Burkina Faso à travers une évaluation des facteurs bloquants assortie de proposition de solutions. L'estimation des données a montré que « la qualité des travaux livrés » ; le « délai de livraison des travaux par les entreprises » ; le « délai de décaissement » ; le « délai de traitement des dossiers de passation des marchés publics » ; le « niveau de la représentativité dans les comités de revue des projets et programmes » ; le « nombre d'activités sous financées » et « l'insécurité » ont une influence sur la performance des projets et programmes. Cette démarche analytique est une contribution à la problématique de la performance des projets et programmes de développement au travers de la détermination des facteurs bloquants.

**Mots clés** – projet, programme, management, performance, succès, développement.

**Abstract** – This study aims to contribute to improving the performance of development projects and programs in Burkina Faso through an assessment of blocking factors accompanied by the proposal of solutions. The estimation of the data showed that the « quality of the work delivered » ; the « delivery time of the works by the companies » ; the « disbursement deadline » ; the « processing time for public procurement files » ; the « level of representativeness in review committees » ; the « number of underfunded activities » and « insecurity » influence the performance of project and programs. This research is a contribution to the problem of the performance of development projects and programs through the determination of blocking factors.

**Keywords** – Project, Program, Management, Performance, Success, Development.

## **I. INTRODUCTION**

La mise en œuvre des projets et programmes de développement contribue avec le concours d'autres acteurs à la lutte contre la pauvreté. Ils constituent des instruments opérationnels de mise en œuvre des politiques publiques. Au Burkina Faso, la vie des projets/programmes est discutée à travers les assemblées régionales, sectorielles, générales et des revues de portefeuilles qu'organisent le Ministère de l'Economie, des Finances et du Développement à travers la Direction Générale de l'Economie et de la Planification (DGEP)

Pour l'élaboration et la mise en œuvre des projets/programmes, le Burkina Faso bénéficie de l'accompagnement de nombreux Partenaires Techniques et Financiers (PTF), qui interviennent prioritairement sous forme d'appui projets.

Plusieurs partenaires multilatéraux et bilatéraux comme l'Union Européenne, la Banque Ouest Africaine de Développement, la Banque Mondiale, la Banque Africaine de Développement, l'Agence Française de Développement... interviennent dans le financement du développement au Burkina Faso.

Pourtant le constat majeur qui se dégage est qu'après plus d'une dizaine d'années dans cette direction qui s'occupe des projets et programmes sur l'ensemble du territoire Burkinabè, les mêmes préoccupations demeurent et sont persistantes. Les responsables de projets et programmes sont confrontés à un ensemble de difficultés qui émaillent la réalisation de leurs activités, entraînant ainsi des contreperformances au niveau de certains projets et programmes de développement. Ces difficultés ou contraintes sont d'ordre général touchant de ce fait tous les projets et programmes dans certains cas ; dans d'autres, elles sont spécifiques aux projets pris individuellement.

Après plusieurs décennies d'allocation de l'aide au développement, les échecs des projets et programmes de développement sont devenus plus patents et ils évoluent de prorogation en prorogation de leurs délais de clôture prévus tandis que rares sont leurs succès. Plusieurs facteurs expliqueraient cet état de fait.

Alors, quels sont les facteurs qui entravent la bonne performance des projets et programmes de développement au Burkina Faso?

Pour mener à bien notre analyse, nous posons les deux hypothèses suivantes :

H1 : les longues procédures de passation des marchés publics entravent la bonne exécution des projets et programmes de développement ;

H2 : l'environnement interne et externe influent sur le succès des projets et programmes de développement.

Avant tout propos, une exploration de la littérature sur la problématique est nécessaire.

## **II. REVUE DE LITTERATURE**

### **2.1. Les Projets Et Programmes Comme Des Formes D'organisation**

Sur le plan international, les études sur la performance des projets et programmes de développement puisent l'ensemble de leurs fondements dans la théorie des organisations. Plusieurs approches ont été développées par des auteurs dont nous retiendrons particulièrement celles de Birley et Westhead (1995), de Weinzimmer (1993), de Lohmann (1998), et de Brilman (1998).

Ainsi Birley et Westhead (1995) ont effectué une classification des déterminants de la croissance. Pour eux, la croissance d'une organisation est fonction de sa faculté d'adaptation et d'apprentissage par rapport à son environnement interne et externe. C'est ainsi qu'ils déterminent les variables de croissance d'une firme. Selon leurs travaux, ils dégagèrent de nombreuses variables considérées comme des freins ou des stimulants de la croissance.

Les travaux en sciences de gestion ont permis à Weinzimmer (1993) de distinguer deux théories concurrentes dans sa thèse « Organizational growth of US corporations: environmental organisational and managerial determinants » (1993), en ce qui concerne les déterminants de la performance des organisations. Il s'agit du modèle interne et celui externe.

Trois bases théoriques ont servi à Lohmann (1998), dans son article intitulé « Strategies of high growth firms in adverse public policy and economic environments » (1998), publié par « Babson College ». Dans son analyse, il tente de déterminer si la réussite d'une organisation est influencée par ses ressources; celles accumulées, l'entreprise elle-même, son environnement interne ou externe.

A l'instar des organisations, des théories ont été développées sur les projets et programmes à proprement parler.

## 2.2. La spécificité Des Projets Et Programmes De Développement

Le Project Management Body of Knowledge Guide (PMBOK Guide) définit un projet comme « un effort temporaire décidé dans le but de créer un produit, un service ou un résultat unique » (Project Management Institute, 2017).

Il peut également être défini (IPMA, 1999) comme un ensemble d'activités coordonnées, comportant des dates de début et de fin, entreprises par des individus ou des organisations dans le but de réaliser des objectifs spécifiques, dans la limite des paramètres de temps, de coût et de performance définis. Les facteurs de succès concernant la bonne gestion ont fait l'objet de recherches et sont bien connus et sont selon Jean Brilman « le niveau de priorité; l'urgence; l'expérience du manager de projet; le soutien reçu par le chef de projet; la qualité de la coordination, la communication; le degré d'autonomie du projet; le rapport avec les structures permanentes ; la concourance ; le bon usage des outils : WBS, GANTT, PERT, etc. » (Brilman et Hérard, 2011, p. 418).

Les travaux de recherche de Proulx et Brière (2014) ont concerné la réalisation d'une enquête inédite auprès de gestionnaires de projets basés au sein d'ONG ayant en moyenne plus de 10 années d'expérience et ayant œuvré dans plusieurs secteurs et régions du monde. Aux termes de leurs travaux, ils ont identifié cinq facteurs de succès des projets et programmes de développement. Il s'agit de : « la durabilité des changements; de bonnes pratiques de gestion; de la croissance économique et sociale; des parties prenantes impliquées » (Proulx et Brière, 2014, pp. 18-21)

Le département de l'évaluation de la Banque Mondiale (1992 -1997) pense que les échecs des projets et programmes de développement sont consécutifs au manque de rigueur dans la conception, la faiblesse des capacités techniques et institutionnelles locales.

Olav torp, kjell Austeng et Wubishet Jekale Mengesha (2005) dans leurs travaux de recherche pensent que les stratégies de gestion des parties prenantes et des contrats ont été identifiées comme des facteurs distincts qui sont considérés comme faisant partie intégrante des problèmes organisationnels. Les autres facteurs de succès les plus significatifs sont : « (i) la stratégie en matière de contrats; (ii) la planification et le contrôle de projet; (iii) le contrôle du calendrier et les estimations préliminaires comme importants ; (iv) les conditions-cadres stables ». Cette étude a révélé que les facteurs techniques et les conditions externes (marché, politique, etc.) étaient moins importants.

Sophie Brière et Denis Proulx ont fait sortir de leur étude non seulement les facteurs de réussite mais aussi les différents obstacles. Ces obstacles sont : « i la difficulté d'impliquer les parties prenantes dans tout le cycle de vie du projet, (ii) le mauvais fonctionnement des structures de gouvernance des projets et (iii) l'appropriation difficile des projets conçus dans une logique de gestion axée sur les résultats et selon des modèles propres au bailleur de fonds » ((2013).

Toujours dans la littérature, les facteurs de succès des projets et programmes de développement international peuvent être regroupés suivant quatre axes : (i) l'implication des parties prenantes tout au long du cycle de vie des projets, (ii) l'atteinte de résultats, (iii) l'impact des projets et (iv) les compétences de l'équipe des projets et le mode d'implantation et de gestion des projets dans la communauté.

Amaka Ogwueleka (2011), lui, a dégagé cinq facteurs de succès qui sont nécessaires pour obtenir une réelle satisfaction du succès de la mise en œuvre du projet dans l'industrie de la construction au Nigéria. Ces facteurs de succès sont : la gestion objective, la conception, les facteurs techniques, le soutien de la direction générale et la gestion des risques. Son étude a également montré que l'environnement d'exploitation joue un grand rôle dans la détermination des facteurs de succès critiques qui influencent la performance d'un projet.

Francique Pochette (2015), dans sa thèse intitulée « facteurs critiques des projets d'aide au développement en Haïti » expose les facteurs critiques des projets d'aide au développement. Ainsi de son analyse qui se basait sur des outils statistiques, il est ressorti que les résultats des projets en Haïti s'appuient sur le triangle de fer à laquelle il faut associer la participation des bénéficiaires. Il a également trouvé quatre facteurs explicatifs de ces projets et qu'il a d'ailleurs pu hiérarchiser : **(i)** l'impact, **(ii)** l'environnement externe, **(iii)** la conformité du projet et **(iv)** les compétences des gestionnaires à intégrer la connaissance locale.

Mamadou Oury Diallo (2017), pense également que « une viabilité plus accrue des projets et programmes due à leur appropriation par les bénéficiaires. Une fois impliquée, la population bénéficiaire se préoccupera beaucoup plus de la permanence des

infrastructures construites et de leur maintenance. Par conséquent, la qualité des infrastructures et de la performance en termes de services offerts serait supérieure à celle des biens fournis par l'État... »

Selon Bourdeau, Rivard et Barki (2003), on distingue « (i) le risque technologique; (ii) la taille du projet; (iii) l'expérience et l'expertise; (iv) la complexité du livrable; (v) l'environnement organisationnel; (vi) la complexité du projet; (vii) les risques endogènes; (viii) les agents externes ».

Les auteurs Cimil et Hodgson (2006) partent du constat des auteurs tels Koskela et Howel (2002); Maylor (2001); Morris (2004); Morris, Patel et Wearne (2000); Winch (1996) pour affirmer la nécessité d'introduire de nouvelles approches dans l'étude des projets et des implications y afférentes. Ils définissent le projet comme une « vision normative du domaine, qui peut être résumée comme l'application des connaissances, des compétences, des outils et des techniques aux activités du projet pour répondre aux exigences du projet » (p.111).

Les travaux de recherche de Lavagnon A. Ika a et Jennifer Donnelly (2017) intitulés « Success conditions for international development capacity building projects » publiés dans le « International Journal of Project Management » (2017) révèlent toute la difficulté de dégager les facteurs de réussite communes pour tous les projets de développement. Ces projets sont beaucoup influencés par le contexte dans lequel, ils évoluent. Ils ont déterminé trois facteurs de succès des projets et programmes « structural conditions (C1), institutional conditions (C2) and finally project management conditions (C3) » (p.49)

### III. METHODOLOGIE DE L'ETUDE

L'échantillon de l'étude a été déterminé par un échantillonnage aléatoire systématique et est de 20 projets et programmes de développement. L'avantage de cette méthode d'échantillonnage est qu'elle tend à répartir l'échantillon sur l'ensemble de la liste de la population, ce qui permet d'obtenir une assez bonne précision.

Concernant les variables, le niveau de performance des projets et programmes de développement (variable dépendante) peut être affecté par de nombreux facteurs. Huit facteurs sont identifiés en tant que variables indépendantes et tous sont référés sur la base d'une revue de littérature et de constat. Ce sont: la qualité des travaux livrés, le délai de livraison des travaux par les entreprises, le délai de décaissement; le niveau du personnel, le délai de traitement des dossiers de passation des marchés, la qualité de la représentativité dans les comités de revue/pilotage, le nombre d'activités sous financées, la situation sécuritaire.

Un questionnaire a été élaboré ad hoc à cet effet et administré aux Coordonnateurs et aux suivi-évaluateurs de ces dits projets et programmes. Il est composé de plus d'une trentaine de questions et comprend quatre grandes parties : (1) une introduction qui présente le but du présent questionnaire ; (2) les informations d'ordre général sur le projet ou le programme à savoir le nom et prénom du répondant ; le nom du projet ou du programme ; la disponibilité ou non d'une étude de faisabilité ou d'un document de projet ; (3) les règles d'anonymat qui sont appliquées ; (4) le questionnaire proprement dit.

Le questionnaire proprement dit est structuré en deux grandes parties à savoir : (i) les difficultés/contraintes liées à l'environnement externe du projet ou programme et (ii) les difficultés/contraintes liées à l'environnement interne du projet ou programme.

Pour que le questionnaire soit opérationnel, nous avons procédé dans un premier temps à une recherche bibliographique qui nous a permis de le construire.

Nous avons ensuite eu recours à la méthode dite des "juges experts" pour apprécier le degré d'appartenance de chaque item pour sa pertinence et l'ensemble des items retenus représente bien tous les aspects du construit (représentativité) ainsi que leur adaptation au contexte des projets et programmes de développement en exécution au Burkina Faso.

Dans le but de mesurer les caractéristiques du questionnaire, celui-ci a été soumis à un échantillon de la population cible (05 projets et programmes de développement). Ce qui a permis d'ajuster certaines questions.

En ce qui concerne l'estimation du modèle, nous avons utilisé le logiciel SPSS. De façon spécifique, pour atteindre l'objectif général de l'étude, nous avons déterminé les facteurs de succès ou d'échec des projets et programmes. Douze projets et programmes ont renseigné le questionnaire ; ce qui est représentatif de la population.

En effet, la taille minimale de l'échantillon peut être déterminée par la formule ci-dessous de Cochran G (1977) :

$$n = t^2 \times p \times (1-p) / m^2$$

Dans la formule, n représente la taille minimale pour obtenir des résultats significatifs ;

t est égal à 1,96 et représente le niveau de confiance (niveau de confiance 95%);

p=1/196 c'est la probabilité qu'un projet ou programme soit tirée au hasard ; la population étant composée de 196 projets et programmes de développement ;

m représente la marge d'erreur soit 5%.

Nous trouvons alors  $n=7,7968959936$  soit à peu près 8 projets et programmes de développement. Ce qui signifie que déjà à partir de 8 projets et programmes, nous avons des résultats significatif au seuil de 95%.

Dans notre étude, la variable dépendante est : le niveau de performance des projets et programmes de développement qui pourra être matérialisée par le taux de décaissement cumulé par rapport au temps consommé. En effet, les différents projets et programmes de développement ont des délais d'exécution différente. Les taux d'exécution cumulés sont donc calculés sur des périodes différentes. Ce qui rend la comparaison entre projets et programmes très difficiles. Pour lever cette contrainte, nous avons divisé le taux de décaissement cumulés par le temps consommé en année. Nous avons obtenu un taux de décaissement annuel représentant la performance annuelle notée « **Np** ». En effet, Np ou niveau de performance annuelle des projets et programmes ou taux de décaissement annuel détermine la mise en œuvre des activités sur le terrain. Il peut être défini comme étant le rapport du montant annuel effectivement décaissé par un projet ou programme de développement par le coût global du projet. Plus ce taux de décaissement est élevé c'est-à-dire lorsqu'il tend vers 100%, plus le projet est performant.

Les variables indépendantes sont :

- la qualité des travaux livrés notée « **qt** ». Une note de 1 à 4 est attribuée selon que les travaux livrés sont bons (note de 4), moyen (note de 3) ou mauvaise (note de 1).
- le délai de livraison des travaux par les entreprises. Ici selon la perception des responsables de projet/programme, une note de 1 et 4 est attribuée aux entreprises prestataires de service selon que la livraison se fait dans les délais (note 4) ou hors délai (note de 1). « **dl** » signifie donc délai de livraison des travaux par les entreprises.
- le délai de décaissement noté « **dc** ». Les conditionnalités de décaissement retardent beaucoup le démarrage des projets et programmes au Burkina Faso. Ce qui fait que les premiers décaissements se font tardivement. De 1 à 3 mois c'est la note 4, de 3 à 6 mois c'est la note 3, de 6 à 9 mois c'est la note 2.
- le délai de traitement des dossiers de passation des marchés « **dpm** ». Ici selon la perception des responsables sur une échelle de 1 à 4, les structures en charges des marchés publics sont notées selon qu'ils ont une mauvaise réputation ou une bonne réputation
- la qualité de la représentativité dans les comités de revue/pilotage « **rp** ». Une note de 1 à 4 est attribuée selon que la représentativité est mauvaise à bonne.
- le nombre d'activités sous financées « **asf** ». Dans le questionnaire selon qu'il y'ait des activités sous évaluées, la note de 0 ou 1 sera attribuée lorsqu'il n'existe pas d'activités sous évaluées.
- la situation sécuritaire notée « **secu** ». si les activités du projet ou programmes sont impactées par la situation sécuritaire, il lui est attribué 4 ; 0 si non.

En résumé nous sommes amenés à poser que :

« **Np** » = « **βqt** » + « **αdl** » + « **Ωdc** » + « **Ɔdpm** » + « **γrp** » + « **μasf** » + « **Nsecu** » + ε où β ; α ; Ω ; Ɔ ; γ ; μ ; N sont des coefficients à déterminés et ε, une constante

IV. RESULTATS ET DISCUSSION

4.1. Resultats De L'estimation

Tableau 01 : Récapitulatif du modèle

Modèle	R	R-deux	R-deux ajusté	Erreur standard de l'estimation	Changement dans les statistiques					Durbin-Watson
					Variation de R-deux	Variation de F	ddl1	ddl2	Sig. Variation de F	
1	,899 <sup>a</sup>	,807	,471	5,10958%	,807	2,397	7	4	,208	1,554

a. Valeurs prédites : (constantes), La situation sécuritaire notée « secu ». , Le nombre d'activités sous financées « asf ». , La qualité de la représentativité dans les comités de revue/pilotage « rp ». , La qualité des travaux livrés notée « qt ». , Le délai de livraison des travaux par les entreprises noté « dl ». , Le délai de traitement des dossiers de passation des marchés « dpm ». , Le délai de décaissement noté « dc ».

b. Variable dépendante : le niveau de performance des projets et programmes notée « Np »

Tableau 02 : ANOVA

Modèle	Somme des carrés	ddl	Moyenne des carrés	D	Sig.
1 Régression	437,989	7	62,570	2,397	,208 <sup>b</sup>
Résidu	104,431	4	26,108		
Total	542,420	11			

a. Variable dépendante : le niveau de performance des projets et programmes notée « Np »

b. Valeurs prédites : (constantes), La situation sécuritaire notée « secu ». , Le nombre d'activités sous financées « asf ». , La qualité de la représentativité dans les comités de revue/pilotage « rp ». , La qualité des travaux livrés notée « qt ». , Le délai de livraison des travaux par les entreprises noté « dl ». , Le délai de traitement des dossiers de passation des marchés « dpm ». , Le délai de décaissement noté « dc ».

Tableau 03 : statistiques des coefficients

Modèle	Coefficients non standardisés		Coefficients standardisés	t	Sig.	95,0% % intervalles de confiance pour B		Corrélations			Statistiques de colinéarité		
	A	Erreur standard	Bêta			Borne inférieure	Limite supérieure	Corrélation simple	Partielle	Partie	Tolérance	VIF	
(Constante)	16,908	17,325		,976	,384	-31,195	65,011						
La qualité des travaux livrés notée « qt »	,726	2,402	,093	,302	,778	-5,944	7,395	,116	,149	,066	,507	1,971	
Le délai de livraison des travaux par les entreprises noté « dl »	,136	1,802	,030	,075	,944	-4,868	5,140	-,246	,038	,017	,306	3,266	
Le délai de décaissement noté « dc ».	3,149	3,913	,433	,805	,466	-7,715	14,013	-,093	,373	,177	,166	6,011	
Le délai de traitement des dossiers de passation des marchés « dpm ».	4,346	4,533	,414	,959	,392	-8,239	16,930	,163	,432	,210	,258	3,869	
La qualité de la représentativité dans les comités de revue/pilotage « rp ».	-11,896	4,988	-1,053	-2,385	,076	-25,747	1,954	-,431	-,766	-,523	,247	4,051	
Le nombre d'activités sous financées « asf ».	-2,749	4,133	-,202	-,665	,542	-14,223	8,726	-,274	-,316	-,146	,524	1,908	
La situation sécuritaire notée « secu ».	-1,648	1,369	-,483	-1,204	,295	-5,450	2,153	-,553	-,516	-,264	,298	3,351	

a. Variable dépendante : le niveau de performance des projets et programmes notée « Np »

L'étude a été menée auprès de 12 projets et programmes de développement qui ont une performance moyenne de 12,59% (tableau 01). La moyenne des variables oscille entre 0,58 et 2,75. Les écarts types par contre varient entre 0,515 et 2,060. Les variations entre les variables sont importantes car l'écart type (7,02218%) est supérieur à  $\frac{1}{2}$  (12,5978%).

Le tableau 02 nous permet de déterminer si nous rejetons l'hypothèse nulle ( $H_0$ ) ou non. Dans notre cas, nous voulons savoir dans un premier temps si les différentes variables prédisent mieux le niveau de performance des projets et programmes. L'hypothèse nulle est donc que les variables sont corrélées au niveau de performance des projets et programmes

Lorsque nous observons le tableau 02, nous remarquons la valeur D obtenue pour le modèle, on peut rejeter l'hypothèse nulle. En effet, la valeur de 1,589 est significative à  $p < 0,95$ , ce qui indique que nous avons moins de 95 % de chance de se tromper en affirmant que les modèle contribue à mieux prédire la performance des projets et programmes

Dans notre étude, tous les coefficients de corrélation tendent vers 1. Ce qui atteste que le modèle est fortement significatif.

Notre modèle est très significatif car la valeur de la corrélation est proche de 1. En effet, elle est de 0,899 (confère tableau 01). Le tableau 01 récapitulatif du modèle permet de déterminer la contribution de la variable.

La valeur de la corrélation, de même que le  $R^2$  laissent présager que les données sont de manière satisfaisante ajustées au modèle. La valeur de la statistique de Durbin Watson est acceptable et est de 1,600 donc entre 1 et 3 et proche de 2. Nous pouvons donc affirmer que les données sont bien ajustées.

La valeur de  $R^2$  est très élevée. En effet, le modèle de régression explique avec l'ensemble des variables près de 80 % de la variabilité de la performance des projets et programmes de développement au Burkina Faso.

Comme nous savons maintenant que notre modèle est significatif, il est alors possible de construire l'équation de régression multiple pour prédire une valeur de Y.

Notre équation est (tableau 03) :

$$Np = 0,726 qt - 0,136 dl - 3,149 dc - 4,346 dpm + 11,896 rp - 2,749 asf - 1,648 sécu + 16,908.$$

Dans notre étude, le signe des coefficients nous indique le sens de la relation.

1. Ainsi la qualité des travaux livrés a une influence positive sur la performance des projets et programmes.
2. Le délai de livraison des travaux par les entreprises a une influence négative sur la performance des projets et programmes. Plus le délai de livraison baisse, plus la performance augmente. Ce qui est conforme à la réalité.
3. le délai de décaissement a une influence négative sur la performance des projets et programmes de développement. Ce qui est conforme à la réalité.
4. Le délai de traitement des dossiers de passation des marchés publics a une influence négative sur la performance des projets et programmes. Plus le délai de traitement des dossiers de passation s'améliorent, plus la performance augmente. Ce qui est conforme à la réalité.
5. La qualité de la représentativité dans les comités de revue a une influence positive sur la performance des projets et programmes. Plus elle augmente, plus la performance augmente. Ce qui est conforme à la réalité.
6. Le nombre d'activités sous financées a une influence négative sur la performance des projets et programmes. Plus le nombre d'activités sous financées baisse, plus la performance augmente. Ce qui est conforme à la réalité..
7. L'insécurité a une influence négative sur la performance des projets et programmes. Plus l'insécurité baisse, plus la performance des projets et programmes augmente. Ce qui est conforme à la réalité.

## 4.2. Discussion Theorique

### 4.2.1. Impact de l'environnement interne sur la performance des projets et programmes de développement

L'environnement interne des projets et programmes de développement est constitué des facteurs internes tels le nombre d'activités sous financées et la qualité de la représentativité dans les comités de revue.

Dans notre étude, nous avons trouvé que la qualité de la représentativité dans les comités de revue/pilotage a une influence positive sur la performance des projets et programmes. Le comité de revue est, selon le décret N°2018-0098/PRESS/PM/MINEFID

du 15 février 2018 portant réglementation générale des projets et programmes en exécution au Burkina Faso, un organe d'orientation et de pilotage des projets et programmes de développement (article 14, page 3). Il est constitué de membres statutaires au nombre de vingt (20) et de membres observateurs. La composition de ce comité de revue est faite de telle sorte que toutes les parties prenantes ne peuvent pas participer. La mise en œuvre des projets et programmes est impactée par le manque de discussion entre toutes les parties prenantes au projet ou programme. Il faudrait que toutes les sensibilités soient représentées; que ce soit les syndicats, les professionnels et ouvriers ou les groupements de producteurs afin que les décisions qui sortiront de cette instance soient consensuelles. Un projet ou programme de développement ne peut pas avoir des résultats probants sans l'implication de la communauté d'accueil. Nous avons abouti aux mêmes observations que Proulx et Brière qui trouvent que pour le succès des projets et programmes il faut une implication des parties prenantes d'une part et d'autre part, ils trouvaient que les obstacles au succès des projets tenaient : « à la difficulté d'impliquer les parties prenantes dans tout le cycle de vie du projet, le mauvais fonctionnement des structures de gouvernance des projets et l'appropriation difficile des projets conçus dans une logique de gestion axée sur les résultats et selon des modèles propres au bailleur de fonds » (2013).

Mamadou Oury Diallo pense qu'« une viabilité plus accrue des projets et programmes due à leur appropriation par les bénéficiaires. Une fois impliquée, la population bénéficiaire se préoccupera beaucoup plus de la permanence des infrastructures construites et de leur maintenance. Par conséquent, la qualité des infrastructures et de la performance en termes de services offerts serait supérieure à celle des biens fournis par l'État. Les parties prenantes en particulier les bénéficiaires ont une « grande maîtrise du terrain qui permettrait aux projets et programmes de s'exécuter sans grande difficulté. Par exemple, les populations locales disposent d'une plus grande capacité à cibler les foyers les plus pauvres et les catégories les plus défavorisées. C'est donc un atout en termes d'informations qui permettrait d'améliorer l'impact des projets de développement en termes de d'amélioration du bien-être » (2017).

Ika Lavagon, Amadou Diallo et Denis Thuillier dans leur article intitulée « Critical success factors for World Bank Project : An empirical investigation » (2012) mettent l'accent sur la qualité de la représentativité qui peut être une des causes de l'échec des projets. Ils rapportent que la Société Financière Internationale a constaté que plus de la moitié de ses projets et programmes de développement avaient une mauvaise performance. Le constat établi par le Groupe d'évaluation indépendante (IEG) est que 39% des projets et programmes échouaient dans la réalisation de leurs objectifs. Les causes de ces échecs sont qualifiées de « gestionnaires » et « d'organisation » (Kwak, 2002): conception de projet imparfaite, gestion médiocre des parties prenantes, retards entre l'identification du projet et son démarrage, retards dans la mise en œuvre du projet, dépassements de coûts, défaillance de la coordination, etc. (p. 105).

Le nombre d'activités sous financées a une influence négative sur la performance des projets et programmes. Phénomène qui n'a pas encore été soulevé par les chercheurs mais qui dénote d'un problème de planification ou de conception. Parmi les facteurs de succès identifiés par Amaka Ogwueleka figure « la conception » (The critical success factors influencing project performance in Nigeria ; 2011). L'agence canadienne de développement internationale (ACDI) distingue quatre facteurs clés de succès dont « la qualité ou la justesse de la conception (adéquation du projet avec le contexte local, une bonne analyse des risques, exploration de nouvelles avenues et idées originales pour atteindre les résultats) ». (ACDI, 1999b, p.8).

Au Burkina Faso, les principaux acteurs ou gestionnaires des projets et programmes de développement disent avoir des problèmes de planification de leurs activités. Cela a des conséquences sur l'objectif, les coûts et même la durée. De ce fait, certains responsables de projets estiment que la durée de leur projet pourrait être prorogée de un à trois mois. D'autres pensent que cette durée peut être prorogée de plus d'un an.

### 4.2.2. Impact de l'environnement externe sur la performance des projets et programmes de développement

L'environnement externe est constitué de tous les facteurs externes que sont la qualité des travaux livrés; le délai de livraison des travaux par les entreprises, le délai de décaissement, le délai de traitement des dossiers de passation des marchés et l'insécurité.

Dans nos estimations, nous avons trouvé que la qualité des travaux livrés a une influence positive sur la performance des projets et programmes. Nous avons abouti aux mêmes conclusions que des auteurs comme Svetlana Cicmil et Damian Hodgson (2006) ou « Standish Group » (2015), Remi Huppert (1981) qui rappellent l'importance de respecter la qualité aussi bien que d'autres facteurs dans le triangle d'or. Remi Huppert souligne l'importance accordée par la Banque Mondiale dans le respect de la qualité des infrastructures « la Banque mondiale accorde une préférence de 15 % aux producteurs nationaux et une préférence supérieure à 5%

pour les marchés de construction, toutes choses égales par ailleurs, c'est-à-dire sous réserve que la prestation s'effectuera dans des délais et selon des normes de qualités et d'efficacités comparables aux normes internationales » (p. 619).

Nous remarquons que plus de la moitié des projets et programmes de développement en exécution au Burkina Faso ont des difficultés avec les entreprises prestataires de service. Ces difficultés sont la plupart du temps liées à la qualité des infrastructures produites. Les entreprises ne sont pas le plus souvent performantes car elles manquent parfois de compétence ou présentent des défaillances techniques quant à l'exécution des travaux demandés.

Ainsi, selon les « travaux du Groupe de Réflexion sur le Management de Projet (GREMAP) » (1996) : « la performance en matière de projet est devenue une condition nécessaire pour mettre en œuvre ces nouvelles stratégies : sans management de projet efficace, les nouveaux produits ne sortent pas au rythme voulu, les défauts de qualité risquent de ruiner la réputation des marques, les coûts de développement explosent par le nombre et la complexité des projets... » (L'ingénierie concourante dans le Bâtiment, p.8).

La performance d'un projet/programme pourrait être mesurée par la qualité des extrants produits. Dans sa thèse de doctorat, Francique Pochette (2015) rapporte que Toor et Ogunlana(2010), Hassen et al. (2011) trouvent que le triangle de fer à savoir les contraintes de temps, coûts, performance sont insuffisantes pour parler de succès des projets. C'est pourquoi, ils ont suggéré de prendre également en compte tous les indicateurs pouvant contribuer au succès d'un projet à savoir la sécurité, l'efficacité, l'efficacité, la qualité des extrants la satisfaction des attentes des parties prenantes et la minimisation de tension et conflits (facteurs critiques des projets d'aide au développement en Haïti, 2015)

Le délai de livraison des travaux par les entreprises a une influence négative sur la performance des projets et programmes. Nous aboutissons aux mêmes conclusions que Svetlana Cicmil Damian Hodgson (2006) et le « Standish Group » (2015) qui ont trouvé que la réussite des projets et programmes doivent se faire dans le délai et dans le budget avec un résultat satisfaisant.

En effet, plusieurs responsables des projets et programmes de développement en exécution au Burkina affirment avoir eu des difficultés avec les délais de livraison des travaux par les entreprises prestataires de service. Ces difficultés sont liées au délai d'exécution des travaux. Ainsi, par exemple 58% des projets et programmes ont réceptionnés les travaux exécutés par les entreprises en hors délais. Le retard accusée dans la livraison des travaux par les entreprises peut aller de trois (03) à six (06) mois et souvent peut dépasser neuf (09) mois.

Le délai de décaissement a une influence négative sur la performance des projets et programmes de développement. Proulx et Brière (2014) et certains organismes tels la Gesellschaft für Technische Zusammenarbeit (GTZ) ont abouti aux mêmes résultats démontrant d'une part que les procédures de décaissement étaient lourdes du côté des bailleurs et d'autre part qu'il fallait accorder de l'attention aux conditions qui prévalent lors de l'exécution du projet.

En effet, les partenaires techniques et financiers n'appliquent pas la même procédure de décaissement malgré la Déclaration de Paris sur l'efficacité de l'aide adoptée en 2005 et qui recommandait une harmonisation des procédures. Plus de la moitié des PPD ont des difficultés liées au décaissement et indique avoir reçu le premier décaissement en hors délai. Ainsi, les retards accusés peuvent aller de six à neuf mois. Ce qui joue négativement sur la performance des PPD.

Aussi, Lawrence G. Boakye et Li Liu dégagent quelques paradoxes à propos des projets et programmes et qui conduisent aux échecs. Parmi ces paradoxes figurent « Le piège de la «responsabilisation pour les résultats» qui se produit lorsque l'on met trop l'accent sur des procédures et des directives rigoureuses, ce qui se traduit par une «responsabilisation pour les résultats» au détriment de la «gestion des projets pour les résultats» (2007).

Pour Ika Lavagnon dans son ouvrage intitulé « Les agences d'aide au développement font elles assez en matière de formulation des facteurs clés de succès des projets? », trouve également que les institutions financières ont dès fois des motivations différentes, des procédures et politiques souvent contradictoires (2015).

Le délai de traitement des dossiers de passation des marchés publics a une influence négative sur la performance des projets et programmes. Ainsi selon Hupper Remi « dans la gestion des projets et programmes de développement exécutés dans les pays en voie de développement, la passation des marchés et les différents modes d'acquisition constituent des éléments clés. C'est pourquoi les problèmes de passation de marchés ainsi que des acquisitions peuvent affecter durement les projets et souvent empiéter sur le délai imparti à celui-ci » (P.619)

La Banque Mondiale trouvait que « les échecs observés ont tenu : à l'impossibilité de surmonter les faiblesses systémiques du secteur public, et notamment au manque de coordination des actions au niveau des organismes gouvernementaux et entre eux, à l'inadéquation des structures organisationnelles et à l'incapacité de la fonction publique d'attirer et de fidéliser un personnel de qualité »

Presque tous les projets et programmes de développement affirment avoir rencontré des difficultés dans le processus de passation des marchés publics, soit un taux de plus de 83%. Pour ce faire, ils évoquent tout un ensemble de situations. Il s'agit entre autres des objections à répétition des bailleurs sur les rapports des Commission d'Attribution des Marchés (CAM), des plaintes des soumissionnaires et des longues procédures.

Toutefois, la responsabilité en ce qui concerne le délai de passation des marchés publics est partagée car, la faible capacité matérielle, technique et financière de certaines entreprises et bureaux d'études occasionne également des retards relatifs aux études et aux aménagements hydro-agricoles. En outre, certains fournisseurs ne respectent pas les délais d'exécution des contrats et marchés.

Nous pouvons donc affirmer que l'hypothèse H1 est vérifiée.

L'insécurité a une influence négative sur la performance des projets et programmes de développement. L'insécurité constitue un phénomène nouveau dans la gestion des projets et programmes de développement et devrait être pris en compte de toute évidence depuis l'idée de projet. Elle n'est donc pas à proprement parler abordé par les auteurs. Toutefois, nous pouvons bien la loger dans le contexte global. Les projets de développement sont caractérisés par leur grande complexité, des compromis pour leur planification. A cette complexité s'ajoutent les différents contextes socio-économiques, politiques et des objectifs tout aussi complexes tels l'amélioration du niveau de vie de la population.

Mamadou Oury Diallo (2017) pense que l'échec des projets et programmes de développement international découle en grande partie de quatre raisons dont l'inefficacité du discours sur le développement au regard du contexte politique global ;

Selon le « Rapport approfondi PMI Pulse of the Profession : Gestion de la complexité » de « Project Management Institute, Inc. PMI.org/pulse » explique que la complexité d'exploitation des projets et programmes dans un environnement de plus en plus volatile et incertain constitue le défi principal » (2013).

Les travaux de recherche de Lavagnon A. Ika a et Jennifer Donnelly intitulés « Success conditions for international development capacity building projects » publiés dans le « International Journal of Project Management » (2017) révèlent toute la difficulté de dégager les facteurs de réussite pour tous les projets de développement. Ces projets sont beaucoup influencés par le contexte dans lequel, ils évoluent. C'est pourquoi selon eux, il est donc difficile d'expliquer pourquoi un projet donné réussit dans un contexte plutôt que dans un autre contexte.

L'insécurité grandissante au Burkina Faso depuis 2015 avec des attaques terroristes sur son territoire particulièrement au Sahel, au Nord et à l'Est a occasionné un millier de décès. Ces attaques impactent sur l'exécution des PPD. Ainsi les difficultés rencontrées par les projets et programmes de développement enquêtés sont l'arrêt des travaux d'aménagement dans ces régions, l'arrêt des constructions d'écoles au Sahel, au Nord et à l'Est, l'abandon de plusieurs infrastructures construites ou en cours dans les mêmes régions.

Nous avons vu plus haut que le délai de traitement des dossiers de passation entrave la bonne exécution des projets et programmes de développement, nous pouvons donc affirmer que l'hypothèse H1 est vérifiée.

De ce qui précède, on note que l'environnement interne et externe influent sur le succès des projets et programmes de développement, l'hypothèse H2 est alors vérifiée. Birley et Westhead (1995), Weinzimmer (1993), Lohmann (1998), et Brillman (1998) ont abouti à la même conclusion. Ces auteurs, dans leur recherche, ont trouvé que l'environnement interne et externe joue sur la performance des organisations.

## V. CONCLUSION

Aux termes de notre étude, nous aboutissons à la remarque que la qualité des travaux livrés, le délai de livraison des travaux par les entreprises, le délai de décaissement, le délai de traitement des dossiers de passation des marchés publics, le niveau de la représentativité dans les comités de revue, le nombre d'activités sous financées et l'insécurité ont une influence sur la performance

des projets et programmes. Les hypothèses H1 (les longues procédures de passation des marchés publics entravent la bonne exécution des projets et programmes de développement) et H2 (l'environnement interne et externe influent sur le succès des projets et programmes de développement) sont vérifiées.

La mise en œuvre des projets et programmes de développement a un impact en termes d'amélioration de revenus, de création d'emplois, de création d'unités de production, d'autosuffisance alimentaire, d'accroissement de la production... De ce fait, les Projets/programmes contribuent à la lutte contre la pauvreté.

L'exécution des projets et programmes de développement (PPD) dans un contexte évolutifs est très complexe. Ce qui requiert que le personnel des PPD puisse avoir un niveau de qualification ou de compétence afin de les conduire vers le succès escompté. Dans nos contextes, l'accent est beaucoup mis sur les missions de supervision pour tenter d'améliorer la performance des PPD tout en ignorant que certains facteurs en amont pourraient empêcher leur performance. Toutefois, les projets et programmes demeurent des instruments opérationnels efficaces pour l'atteinte des objectifs de développement et constituent de ce fait les moyens privilégiés des partenaires.

Lorsque nous faisons une analyse des contributions des autres auteurs sur les facteurs de réussite ou d'échecs, nous remarquons qu'ils sont trop globalistes tels la conception, les outils de gestions, la coordination. Les auteurs ne précisent pas quels sont les aspects de la conception affectée, quels aspects de la gestion, il faut mettre un accent dessus.

Les conclusions de cette étude, qui s'appuient sur le contexte des PPD du Burkina Faso pourraient être généralisées et s'appliquer aux autres pays du Sud dans la mesure où l'échantillon aléatoire systématique est représentatif.

Cette recherche est une contribution à la problématique de la performance des projets et programmes de développement au travers de la détermination des facteurs bloquants. Elle est donc une contribution théorique et pratique ; un travail de référence.

Les résultats de cette recherche touchent directement les partenaires techniques et financiers ; l'Etat, les unités de gestion des projets et programmes

Sur le plan du management, cette contribution participe donc à l'amélioration des performances des PPD ainsi qu'à leur capacité d'adaptation. Le travail que nous avons réalisé pendant ces trois dernières années est aussi le résultat de la combinaison des attentes aussi bien des responsables des projets/programmes, des partenaires techniques et financiers ainsi que scientifiques du domaine dans l'optique de trouver un optimum opérationnel.

En termes de perspectives, les points suivants pourraient faire l'objet de recherches.

Dans un premier temps, en lien avec les délais de décaissement, il serait intéressant de chercher à comprendre pourquoi les partenaires techniques et financiers ne respectent pas les délais de délivrance des Avis non objections qui sont dans les conventions ; et provoquant du coup de possibles échecs des projets et programmes. Le constat aussi est que certains partenaires au développement retardent sans raison les décaissements au profit des PPD.

Dans un second temps, au niveau des marchés publics, il est important de voir comment alléger les procédures de ceux-ci en permettant leur déconcentration (régionalisation) ou en privilégiant le contrôle à posteriori.

Du reste, les échecs récurrents dans la gestion des projets et programmes au Burkina Faso et de manière plus large dans les pays du Sud doivent interpeller plus d'un, et conduire à revisiter les politiques de développement. Ce faisant pour une bonne mise en œuvre, couronnée de succès des projets et programmes, nous proposons ces quelques recommandations de politiques de développement:

- a) prendre en compte la donne sécuritaire non pas comme un risque mais plutôt comme une contrainte. Ceci implique les méthodes d'adaptation, l'utilisation du génie militaire dans l'exécution de certaines activités, l'utilisation de l'escorte militaire pour des activités dans les zones dangereuses. De nouvelles méthodes de travail pourraient être développées tel le suivi des activités à distance et la mise en contribution des acteurs vivants dans ces zones à risque.
- b) revoir le rôle et la place des marchés publics qui, loin d'être un instrument de développement s'apparente à un obstacle au développement ;
- c) mettre un accent sur la lutte contre la corruption qui est à l'origine des infrastructures de mauvaises qualités ;

- d) relire la réglementation générale des PPD en vue de tenir compte de la qualité de la représentativité dans les comités de revue. La qualité de la représentativité doit faire intervenir toutes les parties prenantes ; de même que les suivi-évaluateurs qui ont de la peine à participer aux comités puisque n'étant pas invités sous prétexte que le nombre étant limité à vingt (20).

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# *Documenting An Audit Of Financial Statements Based On International Auditing Standards*

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**Abstract – The article discusses International Auditing Standard No. 230, entitled "Auditor's Working Papers", which plays an important role in practical audit activities. It is noted that the audit is planned and conducted in accordance with international standards and relevant legal and regulatory requirements.**

**The article highlights the importance of the auditor's preparation of working papers in the development of the auditor's work plan, in the course of direct audit procedures and in the process of completing the audit and documenting its results, as well as the auditor's report.**

**Keywords – International Standards on Auditing, Auditor's Working Papers, Audit File, Current Documents, Permanent Documents, Special Documents, Classification of Audit Working Papers, Symbols, Indexes, Financial Statements, Non-Conformity Accounting, Quality Control, Storage of Audit Documents, Audit Procedures procedures**

## I. INTRODUCTION

One of the most important steps in conducting an audit of financial statements is to document the audit process that has taken place. Documentation of the audit not only confirms the level of completeness of the audit engagement, but also indicates that it was planned in accordance with international standards, how well it was conducted by qualified professionals, and how much evidence they collected for the audit opinion. Documentation is an important requirement for conducting audit practice, and the conditions for compliance with this requirement are set out in International Standard on Auditing No. 230, entitled “Audit Documentation”. This International Standard on Auditing sets out the auditor's obligation to prepare audit documentation for the audit of financial statements. Due to the importance of this issue, the cases in which the audit is not regulated by this standard are further highlighted in the following International Standards on Auditing (2) :

- Agreeing the Terms of Audit Engagements, Paragraphs 10-12 of the International Standard on Auditing No. 210;
- Quality Control for an Audit of Financial Statements, Paragraphs 24–25 of the International Standard on Auditing No. 220;
- The Auditor’s Responsibilities Relating to Fraud in an Audit of Financial Statements , Paragraphs 44-47 of the International Standard on Auditing No. 240;
- Consideration of laws and regulations in an audit of financial statements Paragraph 29 of the International Standard on Auditing No. 250;
- The Auditor's Communication with Those Charged with Governance ,Paragraph 23 of the International Standard on Auditing No. 260;
- Planning an Audit of Financial Statements, Paragraph 12 of the International Standard on Auditing No. 300;
- Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment, Paragraph 32 of the International Standard on Auditing No. 315;
- Materiality in Planning and Performing an Audit, Paragraph 14 of the International Standard on Auditing No. 320;
- The Auditor’s Responses to Assessed Risks, Paragraphs 28-30 of the International Standard on Auditing No. 330;

- Evaluation of Misstatements Identified during the Audit, Paragraph 15 of the International Standard on Auditing No. 450;
- Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures, Paragraph 23 of the International Standard on Auditing No. 540;
- Related Parties , Paragraph 28 of the International Standard on Auditing No. 550;
- “Special Considerations—Audits of Group Financial Statements (Including the Work of Component Auditors, Paragraph 50 of the International Standard on Auditing No. 600;
- Using the Work of Internal Auditors, Paragraph 13 of the International Standard on Auditing No. 610.

## **II. RESEARCH METHODS**

The International Standards on Auditing referred to above will be intended to clarify the application of documentation requirements in cases where these standards apply. However, they do not limit the application of International Standards on Auditing No. 230. In addition, the absence of specific requirements in any International Standards on Auditing to document the audit evidence obtained under this standard does not mean that it is not necessary to document the work performed.

The form and content of the auditor's report, which is the final document of the audit of financial statements, is set out in International Auditing Standards No. 700, Formation and final Conclusions on Financial Statements, and International Auditing Standards No. 705, Modification of Opinions in Financial Statements, and other standards governing this process.

The auditor's working papers are set out in International Standard on Auditing No. 230, "Audit Documentation" according to which the auditor's working papers are documents that record the audit procedures performed, the relevant audit evidence obtained and the auditor's conclusions(3). An example is audit programs for audit documentation; analyzes; notes on problematic issues;

a summary of important issues; confirmation letters and submissions, checklists, such as important correspondence (including email). Working documents are used for planning, monitoring, quality control of the work performed by the auditor, as well as for registering audit evidence obtained to confirm his opinion

## **III. RESEARCH RESULTS AND THEIR DISCUSSION**

The auditor's working papers are kept in the audit file. An audit file is an electronic file or other storage medium containing written information containing audit documents related to a specific agreement. The audit file includes a set of current, permanent, and special documents.

**The CURRENT DOCUMENT SET** is a list of documents, materials and issues collected during an ongoing audit, identified during an ongoing audit and subject to review during that audit.

**The PERMANENT DOCUMENT COLLECTION** stores information used in audits for a long time.

In practice, most audit firms keep documents in this collection in the following areas:

- Organizational information about the client
  - information on shareholders (property owners)
  - information on the heads of corporations
  - location of the management office
  - corporate charter, founding agreement, certificate, license and patent
- copies ...
- Information on the activities of the corporation
  - The main types of activity, its branches, subsidiaries
  - Laws and regulations related to the business of the enterprise, the features of taxation
  - Information on the history of the corporation
  - Aggregate data on previous performance
  - information on key employees of the administration
  - information on the features of accounting and internal control
  - Scheme of organization of corporate governance
  - Schematic of corporate business processes
  - Document flow chart in the corporation
- Description of the cooperation agreement with the client
  - Copies of contracts for audits and other services
  - description of special audit requirements
- Reference for audit services
  - customer contact information

- Customer service bank details
- information on the corporate lawyer
- information about the client's insurance company
- information on the main auditor and support staff of the project

**SPECIAL DOCUMENT COLLECTION.** Copies of decrees and resolutions of the President and the Government of the Republic of Uzbekistan issued specifically for the industry or enterprise, copies of correspondence with government and regulatory agencies, the State Tax Inspectorate, published in the press, technological documents, instructions, articles describing the industry

The grouping of audit working papers in audit practice is shown in the following diagram.

Drawing 1. Grouping of auditor working papers

Grouping signs	Description of the auditor's working papers
Depending on the time of use	<ul style="list-style-type: none"> <li>● Long - lasting use</li> <li>● Short-term use</li> </ul>
According to sources	<ul style="list-style-type: none"> <li>● Documents received from third parties</li> <li>● Documents received from the client company</li> <li>● Documents prepared by the auditor</li> </ul>
According to the appointment	<ul style="list-style-type: none"> <li>● Commentary documents</li> <li>● Informational documents</li> <li>● Invoice documents</li> <li>● Analytical documents</li> </ul>
According to the level of standardization	<ul style="list-style-type: none"> <li>● Standard forms of documents</li> <li>● Non- standard forms of documents</li> </ul>
According to the form of presentation	<ul style="list-style-type: none"> <li>● Graphs</li> <li>● Tables</li> <li>● Text documents</li> <li>● Combined documents</li> </ul>
On the technique of creating	<ul style="list-style-type: none"> <li>● Documents created manually</li> <li>● Documents created using technology</li> </ul>

**Source: 5. Konkov V.I. Basic audit. Moscow, Institute of Economics and Law. 2017th year**

One of the main requirements for the auditor's working papers is the timely preparation of audit documents. This helps to improve the quality of the audit and facilitates the effective review and evaluation of the audit evidence obtained and the conclusions reached prior to the formation of the auditor's opinion. The documentation performed after the audit is completed may be less accurate than the documentation prepared during the audit.

Due to the importance of the auditor's working papers in audit practice, the ISA sets a number of requirements for their form, content and scope. Audit documentation can be created on paper, electronically or in other media. Working papers should be so complete and exhaustive that the other auditor who introduces them has an understanding of the audit, and the information should be understandable.

In practice, the cases to be documented for each audit object, their form and scope are determined by the audit organizations themselves. In carrying out this process, they should take into account the following factors that affect the form, content and scope of audit documentation in accordance with Paragraph A2 of the International Standard on Auditing No. 230:

- the size and complexity of the business entity;
- the nature of the audit procedures performed;
- the risks identified in the report as material misstatements;
- the significance of the audit evidence obtained;
- the nature and extent of the identified exceptions;
- the need to document certain conclusions or observations that are not clearly visible or identifiable from the work performed or the audit evidence obtained.
- used audit methods and tools, etc...

In order for an auditor's working paper to be formalized, it must have at least the following details in accordance with Article 10 of International Auditing Standard No. 230:

- name of the document;
- name of the business entity;
- the period of the audit;
- the date of audit procedures or document preparation;
- the content of the document;
- signature of the person who drew up the document, First & Last Name;
- signature of the person who checked the document, First & Last Name.

Another important requirement for the auditor's working papers is that the source of the information contained in them should be indicated. In some cases, symbols are used in the auditor's working papers. In such cases, their contents should be disclosed at the bottom of the document. For example:

- √ - mix verified with report
- W- the mix is verified against the ledger
- ! - the information should be checked
- ? - no information
- F - information generated to compile a summary report etc (6)

Samples of conventional signs, the content and procedure for their use are set out in the internal documents of audit organizations, and all employees are required to comply with this rule.

In addition, in order to facilitate the use of international audit practice and the process of compiling documents into files, audit organizations are advised to put a unique index (code) on each working document (7). In practice, the use of indexes (codes) consisting of letters and numbers is widely used. In this case, too, the management of the audit organization develops a list of working documents to be compiled during the audit of financial statements, their indexes (codes) and the procedure for their use. For example,

- "FA" index for working documents on the audit of fixed assets;
- "CT" index for working documents prepared for audit of cash transactions;
- "RE" index can be assigned to working documents prepared for the audit of remuneration of employees of the company.

Accordingly, if the documents related to the "FA" index are coded, they will look like this:

- FA1 - documents on the right of ownership of fixed assets;
  - FA2 - documents on the receipt of fixed assets;
  - FA3 - documents on internal movement of fixed assets and etc.
- The documents related to the "CT" index are:

- CT 1 - documents on cash receipts;
- CT 2 - documents on cash expenditure transactions;
- CT 3 - documents related to cash reports and etc.

In the process of preparing the working papers, all auditors of the audit organization will have to use the indices and codes approved by the internal document in the audit of financial statements.

ISA No. 230 emphasizes the need to pay special attention to documenting significant issues that arise during the audit of financial statements and relevant professional considerations. Paragraph A8 of this standard cites the following as examples of important issues

- Issues that pose significant risks.
- The results of the audit procedures indicate which (a) the financial statements may be materially misstated, or (b) the auditor's prior assessment of significant misstatement risks needs to be modified and the auditor's response to those risks.
- Circumstances that create significant difficulties for the auditor in applying the required audit procedures.
- Information that may lead to a modification of the auditor's opinion or the inclusion of an explanation in the audit report.

The auditor should document the discussion of important issues with management, corporate governance officials, etc., including the nature of the important issues discussed and when and with whom the discussions took place. Documentation is not limited to documents prepared by the auditor in this regard, but may include other relevant documents, such as minutes of meetings prepared by the employee of the business entity and agreed with the auditor. Other people to whom the auditor may discuss important matters may be external parties, such as the entity's management and those who provide professional advice to the entity.



## **SECTION I. REPORT**

- A - Auditor's report
- B - Written information prepared as a result of the audit of the head of the business entity
- C - An explanatory letter attached to the financial statements of the business entity
- D - Statement of financial position and appendices to it
- E - Statement of profit or loss and other comprehensive income
- F - Cash flow statement and appendices to it
- G - Statement of changes in equity and appendices to it
- H - Documents relating to events after the date of issue of the auditor's report.

## **SECTION II. COMPLETION OF WORK**

- A - A request form prepared by the head of the audit team confirming the completion of the audit.
- B- A questionnaire signed by a business entity with an assessment of the work of the head of the audit group and auditors.
- C- Quality control questionnaire conducted by the responsible person of the audit organization during and after the audit.
- D - List of Delayed Jobs
- E - Reviews and guidelines for next year's audit
- F - Correspondence with the management of the business entity
- G - Acceptance and transfer certificates and other financial documents with the business entity

## **SECTION III. WORK PLANNING**

- A- Audit planning information
- B- Agreement with a business entity (Mandatory letter of consent of the audit organization to audit
  - 1. C- Information on the activities of an economic entity
  - 2. D- Checklist for describing the business entity's accounting system
- E- A checklist of changes in the business entity's accounting system
- F- Description of the means of the internal control system of an economic entity and a checklist for their assessment
- G- Information about the software used by the business entity
- H- Overall audit plan

## **SECTION IV. CONSIDERATIONS ON THE PERFORMANCE OF THE WORK**

- A - List of important issues
- B - Detected deviations table
- C - Working documents collected for written information to be submitted to the head of the business entity
- D - Documents related to the analysis of the duration of the business entity

## **SECTION V. AUDIT PROCEDURES USED**

- A - On the audit of fixed assets
- B - On the audit of intangible assets
- C - On the audit of financial investments
- D - On the audit of inventories
- E - On the audit of salaries and related deductions
- F - On the audit of receivables
- G - On a cash audit
- H - On private equity audit
- I - On the audit of debt funds
- J - On the audit of accounts payable
- K - Audit of product sales, work performed and services rendered
- L - Audit of operating income and other income and expenses
- M - On the audit of operating expenses, operating expenses and financial operating expenses
- N - On the audit of taxes and mandatory deductions
- O- Audit of financial results
- R - On the audit of events and happenings after the balance sheet date

## **SECTION VI. AUXILIARY FORMS**

- A - Audit strategy

- B - Documents related to checking the effectiveness of internal control tools
- S - Selection determination tables
- D - Forms of documentation of in-depth analytical procedures
- E - Schedule of working time spent for the audit and etc.

The auditor after the date of the auditor's report should complete all administrative processes for collecting audit documentation for the audit file.

The appropriate time to complete the formation of the final audit file is usually no more than 60 days after the date of the audit report.

Audit organizations may make changes to the audit files of the financial statements of business entities as soon as they have new or clarified information about them. However, it is not allowed to discard or destroy any document from the audit file formed on the basis of the audit of financial statements until the expiration of the period specified in the legislation on its storage and international standards (ISA No. 230, paragraphs 15-A23).

International Standards for Quality Control No. 1 requires audit organizations to establish policies and procedures for the storage of information obtained in the course of an audit, taking into account the confidentiality of the information obtained. In global audit practice, the retention period of an auditor's working papers is usually not less than five years from the date the audit opinion is issued. The same period is recognized in the Law of the Republic of Uzbekistan "On auditing" (1).

The last issue we need to consider on this topic is the signing of the auditor's working papers. International auditing standards do not require the auditor to sign all working papers. International Standard on Auditing No. 700, Commenting and Concluding on Financial Statements, shall be signed by the auditor on behalf of the audit organization, or on behalf of the auditor, or on behalf of the audit organization and the auditor, in accordance with the laws of the country where the audit is performed.

According to the Law of the Republic of Uzbekistan "On auditing activities", the audit report must be signed by the auditor (auditors), the head of the audit organization and certified by the seal of the audit organization (if it has) (1).

Hence, the question of whether or not to sign other working papers of the auditor is governed by the internal standards of each audit firm.

#### **IV. CONCLUSION**

In conclusion, the auditor's working papers confirm that the audits were planned, conducted by qualified professionals in accordance with international auditing standards, that sufficient audit evidence was gathered to support the auditor's opinion, and that all of them were duly documented.

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# *A Review of the relationship of Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration with Sustainable Employees Performance*

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**Abstract** – Organizations sustainability largely depends on employees performance. Organizations usually implement the more intense work system to gain their appropriate growth. But employees performance needs to sustain for the long term growth. This review study intending to identify how the individual component of Transformational leadership able to sustain employees performance. This is a review paper in nature, so this paper reviewed previous studies and identified the relationship of Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration with Sustainable Employees Performance. Based on the discussion this study has future direction for researchers to study further.

**Keywords** – Transformational Leadership, Sustainable Employees Performance, Idealized Influence, Inspirational Motivation, Intellectual Stimulation, Individual Consideration.

## I. INTRODUCTION

Sustainable Employee's performance has become the top priority for the organization. Over the last decade's organizations, sustainability was the top concern. But after that employees get the focus of the world. By Docherty et al.,(2002), first discuss workplace sustainability, where management and leaders will give priority to the employee's health, well-being to develop sustainability among employees performance (Sheehan et.al.,2020). at present researchers and practitioners are working on how to impose human sustainability? How to managing human resources for sustainability? How organizations, management and leaders can develop employee sustainability? (de Jonge & Peeters, 2019).

This study is aiming towards leaders contribute to the employee's sustainable performance (Jackson,2020). According to researchers, Transformational leadership is one of the complete leadership styles which works like a charm for employees (Yue et.al.,2019). Intensive work system reduced with the help of TFL. Where the leader with transformational skills helps employees to deal with the organization's changes. Transformational leaders understand and deal with every employee based on their perception. Which makes transformational leadership style one of the best style for organizations and employees both (Min et.al.,2020).

Transformational leadership style has four components; Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration. These four components develop the impact of transformational leadership (Buil et.al.,2019). This study will survey the previous literature to identify the relationships between Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration with sustainable employees performance.

## **II. LITERATURE REVIEW**

### **2.1 Idealized Influence (II)**

TFL was forwarded by Burns (1978) after that Bass (1985) develop this concept into a more wide range of leadership theories where leaders develop employee's performance through motivates and encouragement. After that Bass & Avolio (1995), develop four components of TFL. These four components act as a whole to develop the TFL style. At first Idealized influence, can develop employee performance by communicating collective purposes and values, demonstrating confidence and determination, and acting as charismatic role models (Yue et.al.,2019). Another study reveals that II develop managers as a role model for employees. Where managers set a standard for employees to follow and develop their performance according to that standard. Managers create a clear vision for the employees to make them give full effort to achieve a goal. II works as a tool for managers to develop employee's standardized performance (Boamah et.al.,2018).

Sheehan et.al.,(2020), develop a study based on TFL considering Idealized Influence and Inspirational Motivation. In that article, it was identified that II can develop collaboration among employees to perform tasks and share knowledge. Employee's collaboration is a good technique to develop an employee's performance by sharing between employees. This process includes the exchange of knowledge, expertise, experiences, and skills, where each employee will teach each other about performing a task. Transformational Leaders emphasize the employee's through II for their personal development to perform better at the workplace. TF leaders take care of the needs of employee's, thus employees feel important at the workplace and increase their engagement at work. II comes out better work to develop employees willing to perform itself at the workplace (Afsar et.al.,2019).

In II, the leader's concerns are more on charismatic actions. These actions impact the employee's behaviour. Employee's behaviour towards "I can do" feelings on any task. Leaders can develop beliefs on employee's ability to do more in their work. Leaders influence employee's by adding values and purpose in their work. Inspiring employee's in a way that employees have become concerned about their work itself (Jackson, 2020). According to Chen et.al., Idealized influencing has more strength than other components of TFL. Findings reveal a strong Cronbach's alpha score which entails that II's charismatic's actions can develop strong employee's performance at the workplace.

Mi et.al., (2019) explains idealized influence as the charisma of TFL that can make follower's to trust their leaders. Idealized influence develops respect towards their leader's decisions and makes the followers follow the leaders. According to this literature idealize influence enhances employee's identifications with their leaders.

### **2.2 Inspirational Motivation (IM)**

Another important component of TFL is inspirational motivation. Inspirational motivation is largely used by leaders to develop a collective vision of the organization among employees. by doing so, leaders create collective goals to achieve for employees. Through frequent interaction between employee's helps a lot to achieve the target. Transformational leaders inspire employees by giving them the meaning of work. This causes develop employee's achieving willingness. Leaders inspire employee's to work as a team and achieve the set goal by performing well (Afsar et.al.,2019). According to Chen et.al.,(2020), inspirational motivation is used to define organizational motives and vision to the employees. Through inspirational motivation, employee's performance is driven towards achieving the organization's vision by inspires and appeal the employees. Leaders inspire employees' motivational speech, words, by individually talk to them. Leaders also use symbolize and imagery processes to motivate employees for the development of their performance. According to findings where it clears that inspirational motivation has a very strong relation to employee performance development (Boamah et.al.,2018).

Jackson,(2020), said that inspirational motivation concerns the way to motivate employees. Inspirational motivation spread positivity towards employee's to develop their performance at work. Clear vision and goal setting are another way to inspire employee's performance. Communication develops a barrier-less environment for employees to get inspiration to do more. For employees, it is very important to know what they have to do. Employees need instruction or help to do their job appropriately.

Inspirational motivation helps employee's performance development in the workplace. IM develop employee's performance by providing future blueprint. Which is helpful to sustain employee's performance. Employee's performance remains stable until the achievement. IM stimulus employee's internally where the employee's ability to set and achieve the organizational vision. IM creates values for employee's, sets performance standards by this employee's performance gets better with time. IM shows the importance to all employees where the employees feel important, and the role provided by leaders also consider valuable (Mi et.al.,2019).

### **2.3 Intellectual Stimulation (IS)**

Intellectual stimulation 3<sup>rd</sup> the components of transformational leadership style, where leaders intellectually stimulate employees to perform at the workplace. Intellectual stimulation used by leaders to develop employee capabilities of exploring and capture opportunities to develop performance. IS develop employee's new perspective to think and make the decision on any problems, whether it is new or old (Afsar et.al.,2019). Employees get the opportunity to think from the new perspective of an old problem, where they can consider a wide variety of opinions to make decisions. IS solicits employee's perspective on problems in this way to develop more opportunities. Transformational leaders encourage employee's performance by developing critical thinking skills. The development of these skills and knowledge help employees take a challenging task at the workplace. IS develop empowering conditions among individuals. where the employees can get quality support to develop performance, information to create opportunities and resources to sustain their performance at the workplace (Boomah et.al.,2018).

Jack(2020), studied leadership and describe IS as the way of developing a challenging environment for performing tasks at the workplace. The challenging situation helps employee's to raise new ideas. This process stimulates the employee's performance to be sustained in the workplace. Various perceptions open up by employees to complete a challenging task. Intellectual stimulation develops employee's assumptions and encourages them to perform better at work (Chen et.al.,2020).

According to Carreiro et.al.,(2019), IS has employee behaviour which entails interest in solving problems with their ability in new ways. IS develops employee's conceptual, understanding, and analyzing abilities to improve the quality of performance. Employees become more focused internally and achieve explanatory power regarding the adaptation of new ways of thinking to solve a problem. So, intellectual stimulation helps employee's performance.

### **2.4 Individual Consideration (IC)**

The fourth component of transformational leadership is individualized consideration. Where individual employees are treated differently based on their needs to develop their performance at work. Every employee is different than another one, so employees needed to mentor or coach differently to make full potential of employee's performance (Boomah et.al.,2018). According to Chen et.al.,(2020), in terms of individual consideration, leaders treat individual employees based on their inter-cultural differences. Because of diverse workplaces, leader's approaches are also diverse. Employee's needs play a vital role in their performance. IC is all about how to understand and develop the employee's performance. The study reveals positive results about Individual Consideration and employee's performance. It is tough to maintain but for sustainable employee's performance it one of the important element (Afsar et.al.,2019). According to Jack,(2020), individual consideration is the leader's personalized support for employee's. where leaders give attention to follower's needs to perform tasks at the workplace. Based on the needs, advice provided on how to complete a specific task given.

Mi et.al.,(2019) studied on TFL and describe individual consideration as an employee cultivation process. Employee's personal needs will be in consideration. Even employee's private life including their family members is treated as a whole. According to the author, this process of IC will make employees feel an indebtedness and feeling of appropriateness. This will develop a strong sense of emotional bond with the organization, hence employee's remain loyal, and performance can be sustained. Previously individual consideration's focus was on employee career development, enhance potentials of employees, developing abilities, development of individuals based on the culture and personal needs (Monje Amor et.al.,2020, Afsar et.al.,2019, Chen et.al.,2020).

## **III. CONCLUSION AND FUTURE DIRECTION**

Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration are the components of Transformational Leadership (Carreiro et.al.,2019). As per the researchers, these components can develop sustainability on employee's performance. Through this review process, it has been clear that Idealized Influence, Inspirational Motivation,

Intellectual Stimulation, and Individual Consideration has a direct and significant impact on sustainable employee's performance (Afsar et.al.,2019).

Intensive work system force employees to perform in their full ability. But in the long run, employees become less loyal and organizations face low outcome from employees. The transformational leadership style works for employees to enhance their performance and help employees to cope with the needed changes in the organization (Chen et.al.,2020). Based on the discussion from the literature, it can be said that Idealized Influence component help employees to get influence from the leaders to work with their full potential. Leaders influence employees to perform the task which might very difficult but employees can perform (Boamah et.al.,2018).

Employees get inspiration and motivation from leaders, as leaders stimulate every employee's internal perception towards organizations objective. Thus employees are able to perform beyond their self-interest (Bass,1985). TFL style considered as one of the best because it deals with individual employees. Which help employees to express their issues, and leaders can take action based on the different employees perspective (Min et.al.,2020). These four components are effective to sustain employees performance (Buil et.al.,2019). As it is a review of previous research, so the result might be different at present due to the impact of COVID-19 pandemic. A more in-depth analysis will be recommended to measure the impact of Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration on SEP in the period of COVID-19 Pandemic.

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# *Pedagogical And Psychological Features Of The Small School Age*

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**Abstract – Theoretical information on the pedagogical and psychological features of the primary school age. Also, recommendations for the organization of social activities of teachers based on the pedagogical and psychological characteristics of the school age.**

**Keywords – Social Pedagogical Activity, Pedagogical-Psychological Features, Subculture.**

The formation of humane relations in society is the main goal of social pedagogical activity and the spiritual and moral basis.

In many countries, there are schools that operate on the concept of socialization based on the humane ideas of the individual. The pedagogical concept of holistic schools in Germany, the "School of the Little Districts" ("School microdistrict") in Sweden and the United States and Russia, are manifested as a humanitarian system.

Open schools are multi-faceted and open to children and adults throughout the day. They can come to this school at any time. These schools cooperate with social institutions such as family, spiritual and educational organizations, workplaces, local governments, community organizations.

Most importantly, the education and upbringing of the child is based on creative activity; school creates all conditions for the development of the child. New educators and social pedagogues work in the structure of open schools. It acts as a "mediator" between the individual and society.

Such schools are mainly;

- Enrichment of pedagogical knowledge of teachers
- Rivojlantirish To develop the general culture of parents using the opportunities of the society;
- Carries out the activity on the organization of socially useful cultural rest.
- Socio-pedagogical model of additional education for children

Extracurricular educational institutions, as one of the institutions of social education, play an important role in the organization of children's leisure time. Their main functions are:

- creation of conditions for children's self-development,
- Rehabilitation, career choice and creative activity,
- to promote the socialization of children with disabilities, etc.

The purpose of the article: to reveal the importance of the organization of social pedagogical activity in the pedagogical and psychological features of the early school age.

The problem in the article: How to properly organize the socialization of the child in the organization of social pedagogical activities.

In additional education institutions, children are mainly taught in the following forms; theoretical (lectures, talks, debates, etc.) and practical (expeditions, trips, conferences, trips). The purpose of social and pedagogical activities in these organizations is to educate, socialize and prepare children for life. In the process of socio-pedagogical activity in these organizations it is expedient to be based on the following principles:

1. Approach taking into account the age characteristics of children.
2. Personal and professional approach of the teacher.
3. Nature-friendly approach
4. Approach to cultural potential.

The process of these activities can use methods such as the method of social pedagogical educational activity, the method of changing activities and communication, changing attitudes.

In short, the model of social pedagogical activity in additional education institutions is implemented as follows.

Social pedagogical activity has its own peculiarities in rural areas. Its main purpose is to help protect the health and lifestyle of the rural population. In rural areas, she works with different age groups (children, youth, the elderly, the disabled, young families, etc.) and helps them find their place in that environment. Its main object is the formed person, and the microenvironment serves as a factor of upbringing and development of the person. Children are the most vulnerable members of this population and require social and pedagogical assistance in addition to social protection.

Social pedagogical work with school-age children is radically different from social pedagogical work in preschool institutions. It is not possible to cover all aspects of the social pedagogical activity in the school in one chapter as this activity is related to the continuous development and education of the students so we will try to reveal the most important situations. Social pedagogical work with schoolchildren is developing in the country. It is based in part on practical experience, in part on modern pedagogical, medical, psychological and legal activities. In recent years, pedagogical communities have also emerged in which the school solves not only educational issues but also a number of other social problems of the student.

The changes in our country have also affected the existing education system. Because it cannot but reflect the socio-economic and political crisis of the society. The secondary school should have given priority to the following social functions when considering its educational, upbringing and social functions:

1. The Law on Education was supposed to implement the National Training Program, but education is organized in the interests of children and adolescents.
2. To equate educational work with education at school.
3. Redirection of school activities.
4. Enhancing school work, children's activity, the creation of various children's clubs.

The main social function of the school is to exercise the child's right to education. In modern school conditions, social and pedagogical protection of children is carried out as follows:

The school administration, class teachers, group educators, financial assistance to children from low-income families, free meals. Class leaders study the child's situation in the family. specialize in difficult children.

At school, psychologists study a child's abilities and interests. Psychotherapists and psychologists counsel and help parents and children.

The health care system available at the school conducts medical examinations of schoolchildren, forms physical education groups, organizes special meals for vulnerable children, and supervises quarantine classes.

Social work at the school is supervised by one of the school's assistant principals. The Deputy Director for Educational Affairs pays great attention to the school's relationship with preschools and various government organizations.

*The Parents' Committee* also helps to work with difficult parenting. There are two approaches to the work of a social educator in different countries: he cooperates with the school or he is a staff member of the school.

In collaboration with the school, the social educator often attends school. Helps to improve the relationship between parents and students, identifies reasons for truancy. It identifies families with abusive children, children with physical and mental disabilities. In order to help the child or family, he inquires about the causes of the child's long-term illness, and treats the child separately at home and in the hospital so that he does not lag behind in school. He uses the services of a lawyer, a doctor and a police officer to solve the problems of child rearing.

In many Western European countries, the social educator is a staff member of the school. It identifies children in need of social assistance. These are children who are not able to cope with the school course. These children experience depression in school or family. These children are usually listed by the juvenile commission. Sometimes clarifying relationships with children and those around them is enough.

The social educator works with the parents to organize the student's extracurricular activities and to carry out their educational work. The partnership includes sections, clubs, various labor and tourism departments. The social educator regulates the work of the pedagogical team in dealing with difficult children. She regularly informs the school teaching staff about the psychological environment in the classroom. This is an important factor in creating a plan for social work at school.

The social educator should pay special attention to children who have been expelled from school. She helps them move to another school and get used to the new team. The social educator identifies children who are working illegally during school hours and solves their learning problems. It monitors the access of families with many children to all benefits and the participation of children in rehabilitation centers. Elementary students and class leaders survey families and students in the district. care for children in need of social assistance, help families in raising children with special needs.

In his work, the Deputy Director for Academic Affairs needs the organization of clubs, sections, clubs, individual work of the teacher with students, consultation with children at the place of residence, special pedagogical attention. oversees working with children.

Individual subject teachers explore children's interests and engage them in a variety of clubs and sections. There are various activities at the school. With the help of parents and alumni, celebrities are invited to the event.

The main socializing factor of school-age children is the peer community that forms the children's subculture. The social educator must be aware of the functions of these phenomena and be able to see their role in the development of students' personal characteristics and social relationships.

One of the conditions of a child's socialization is to enter into a relationship with peers. This relationship is formed in small groups such as kindergarten groups, school classes, various informal children's and adolescent associations. In groups of children and adolescents, functional, emotional personal relationships are established between peers.

Functional relationships are recorded in specific areas of children's activities (work, study) and are formed by mastering the norms of behavior in the group under the direct guidance of adults. Not all members of a peer group are the same age. This group may also include children of different ages, but with common values, relationship systems, or interests. The number of members of the peer group may vary. Tengkur groups are usually formed on the basis of the territorial proximity of their members. The group of Tengqurs is formed due to the combination of individual interests, the existence of a formal organization and the existence of personal relationships between the members of the group. These relationships are reflected in the character and interactions of group members, as well as in the distribution of roles in the classroom.

First, the leader stands out. No experimental group was identified in the experimental study. There may be industry leaders. For example, a mental, emotional, business leader can be a leader. We can classify a group of squirrels according to several parameters:

According to their legal status in the social system, peer groups are divided into formal, that is, groups recognized by society, affiliated with a state or public organization, and informally-self-existent groups. linadi.

According to their social psychological status, they are divided into two, that is, there are real members of the affiliation group (class, sports club, etc.) and the reference group is not human, but imaginary.

Depending on the stability and longevity of the activity is divided into permanent, temporary and incidental groups.

Territorially, they can operate within a courtyard, neighborhood, or any institution.

In terms of leadership, they are divided into democratic and authoritarian groups.

In the last 10 years, peasant groups have become one of the most important micro-groups in the socialization of the growing generation. Their role has become more serious than in previous periods, due to a number of processes.

Urbanization has led to more and more children and adolescents living in cities and being able to interact with more peers there. Adults do not have complete control over this behavior. The shrinking of a large family, the proliferation of single-parent and single-parent families, and the poor organization of families make it necessary for children to make up for the lack of emotional connections in the family outside the home. General secondary education The media leads to the fact that the younger generation has become more equal in terms of their level of literacy and cultural development. Not only clothes or style but also lifestyle influences children's ability to join peer groups.

Despite their different age and socio-cultural characteristics, the functions of the peer group in socialization are universal. First, it teaches group members the culture of that society, that is, adapts their behavior to the national, religious, regional, and social affiliation of the group members. Second, positive behaviors are taught in peer groups. This is done by showing them exemplary behaviors and taking action against non-social behaviors. Third, peer groups play an important role in the autonomy of children, adolescents, and adolescents from the influence of adults, especially parents. Fourth, the group allows its members to be independent of the young subculture.

Groups of friends and relatives try to fit in with their peers in terms of dress and behavior. At the same time, they are maintaining their independence. That is, they try not to include other children in their group. Fifth, peer groups create favorable or unfavorable conditions for children to address issues of self-awareness and self-determination. Sixth, the group is a specific social organization that is perceived by its members as an "environmental depth".

Emotional and personal relationships are also formed in the group. In groups of children and adolescents, the main function of emotional relationships is to adapt the behavior of peers to generally accepted norms of behavior. In this case, friendship and sympathy come first. In fact, they appeared much earlier in ontogeny. If a preschooler follows them, the situation will be positively perceived by other children.

A personal relationship is an interdependence in a group in which the reason for one child's behavior has a personal meaning for the other child. Personal relationships are most evident when a child plays the role of an adult in relationships with others.

The children's community is the carrier of children's subculture. A child subculture is a cultural area and environment that helps children adjust to society and create their own norms.

The children's subculture serves as the child's first socialization. The emergence of a subculture of adolescents includes the creation of new forms of social movement. This should be taken seriously by the social educator. Adolescents are more active than young children and are looking for new activities and behaviors to find their place. However, they are quite risky and unprepared. The crisis of adolescence is also largely due to the creation of new alternative norms of activity. Therefore, the adolescent subculture performs not only a socializing but also a constructive creative function. Factors that separate the subculture of adolescents and young people from the adult world are cultural and technological changes, loneliness, the negative impact of the media, the instability of the social environment. In these cases, groups of teenagers and adolescents may also engage in various non-social activities.

There are two directions in the development of the subculture of adolescents and adolescents. The first is that it has commonalities and is divided into different regions and directions. The second direction is related to the influence of non-cultures on the youth subculture. In this case, we may encounter young people who do not encroach on the legal foundations of the existing society, but oppose the generally accepted norms of morality. the existence and spread of a non-culture is a sign of the crisis of a society and the dissatisfaction of people.

A comprehensive approach to the upbringing process requires active exposure to the micro-environments in which adolescent groups emerge. According to criminologists, most crimes are committed by minors as a group. However, many of the recommendations for juvenile delinquency prevention are recommendations for individual prevention. As practice has shown, pedagogical activities aimed at eliminating juvenile delinquency do not always lead to the expected results. This is explained by the fact that the offender is a member of the group in the place of residence, and his behavior depends on the mood of the group, their

lifestyle, thinking, and other members. This means that while recognizing the importance of individual work with children with difficult pedagogical upbringing, we also emphasize the need to explore their interactions with the micro-environment that surrounds adolescents.

Expressing a complex system of pedagogical influences, educational tools, form and content, the purpose of this activity is the systematic reorganization of adolescent groups as a result of the normalization of the relationship of children with pedagogical difficulties with the classroom, teachers, classmates. The normalization of this relationship has a decisive influence on the formation of the adolescent.

Dealing with difficult adolescents is done by filling out a public questionnaire and questionnaire. These methods provide information on where groups of adolescents without pedagogical care have emerged.

When working with adolescents with special needs, the educator should take into account the following parameters: the size of the group, their age and social composition, places and time of treatment, the content and direction of group activities. Knowing these behavioral parameters will help the educator use the most appropriate and effective forms of working with adolescent groups in the district and city.

It is also important for the social educator to know the social composition of the adolescent group. It will be interesting to exchange information and interact with groups of teenagers with different social structures. However, these groups can also spread false information about life. The role of the educator:

1. To know the content of group treatment;
2. Organize the educational impact and direct the information in the right direction.

Groups can be divided into two types of activities that need to be studied and analyzed - in terms of time - permanent and non-permanent, in terms of direction - positive (work, sports, art) being a horse) and negative (smoking, alcohol consumption, gambling).

Methods and technologies of social pedagogical work with groups of adolescents with special needs are:

Using the school:

-Educational impact with the help of school and extracurricular groups (sections, clubs, clubs);

- Influence of disciplined, excellent students on pedagogically neglected classmates. This direction is the desire to make friends with each other, which is very successful when it comes to interaction, and is based on common interests (favorite sport, technique, music, etc.). The success of this endeavor depends largely on the skillful guidance of the teacher, the class teacher.

- The influence of the class community on adolescents without pedagogical care. This requires joint activities (travel, spartakiads, art festivals, exhibitions, team activities). Children without pedagogical care who are involved in teamwork in the classroom realize that they are working not only for themselves but also for the team, and that a lot depends on their participation. In such activities, fraternal relationships are formed, the right attitude towards others is formed, the sense of responsibility for the elevated task increases;

- The considered directions of educational influence on children without pedagogical care are carried out in the educational work of the microdistrict together with the school community and at the same time.

The following factors should be considered when organizing an educational outreach with the help of an out-of-school community of teenagers:

- First of all, the circle, section, club should not be limited to a single interest identified in adolescents (aquarium or sports), but should try to prepare pedagogical adolescents for normal relationships with others through work, various games, creative activities.

-Second, by influencing an informal group or most of its members, they can be transferred to a formal group. This process is called conditional "formalization." The process is that the informal group is transformed into a formal group by the educator without being noticeable to the adolescent.

Another feature of educational work with children without pedagogical care is the choice of activities that teenagers choose and are satisfied with its implementation. It is necessary to gradually meet and develop such a need in the activity, and then fill it with activities that increase the sense of responsibility for the work they do in adolescence.

Working with children or adolescents with special needs involves a process of pedagogical re-education.

Re-education is the process of overcoming or overcoming various restrictions on a child's or adolescent's behavior. retraining is a difficult process for both the educator and the trainees. The trainee should be interested in the prospects of the new year. The educator must analyze the student's past, present and imagine his future.

The process of preparing a teenager for re-education or self-education consists of several stages:

1. To study the pupil;
2. Mental preparation of the adolescent to change his behavior;
3. Gather positive moral qualities;
4. Get out of the crisis, move to self-education.

It is important to keep in mind that in addition to the educator, there is also a team of foster children. In doing so, the educator acts as a coordinator and directs the team to re-educate their peers. A social educator working with adolescents in a rehabilitation center uses one of the methods to set an ideal-like goal for the foster child. This morally mature person helps the adolescent to form positive behaviors.

Preschool and junior school age.

From the age of one to seven, parents have a decisive influence on the formation of habits in children. Therefore, at this age, it is important for the social educator to work with the family. It is based on the following principles:

1. Forming a culture of relationships between family members, as ethical anti-alcohol habits can only emerge in the context of a harmonious family relationship. In order for these habits to develop in preschool children, it is necessary for parents to develop optimal behavior.

2. Creating a healthy environment for the child's life.

The activities of the social educator should be aimed at forming healthy socio-psychological guidelines in parents and promoting the idea of personal responsibility of parents for children's alcohol consumption. The fight against alcoholism with parents should be done according to the age of the child. However, the result of this activity is that parents need to be involved in their children's anti-alcohol education \_\_\_\_\_. Dissemination of knowledge about parenting against alcoholism includes the following issues:

1. On the harm of alcohol to the human body, the incompletely formed organism of the child, the negative consequences of children's alcohol consumption, the moral and legal responsibility of teaching minors to consume alcohol.

2. Introduction to the specific features of small school age anatomical, morphological, psychophysiological features. Describe the first stage of schooling as the most critical stage in a child's life, the difficulties of adaptation to the initial stage, the beginning of active socialization of the young person, the social and psychological conditions of the learning environment.

3. Achieve optimal parental behaviors to shape the pursuit of a healthy lifestyle in children from primary school age. It is important to consider the family's drinking traditions, taking into account the imitative behavior typical of a small school age, to pay attention to the child's achievements in school, to help children spend their free time, to make it an unpleasant family to get rid of domestic disputes.

The social educator should also work with parents to develop a plan for leisure and alcohol-free holidays.

The main method of activity is family prevention in the form of interviews, consultations, trainings. The social educator must give a moral character to the actions of the parents. Family prevention should not be based on reprimands or threats. It should focus on improving the child's relationships with peers, engaging them in positive activities, and restoring their status in the family.

Adolescents (11-14 years old). This period is one of the most complex periods of human activity. During this period, the rapid development of all organs of the body is observed in the science of activation of harmonious activity. This process ends with the advent of sexual maturity. It continues with such reconstruction of organs and systems. Unlike a small school age where a child follows the instructions of an adult who is respectable to him, the adolescent tries to follow his own behavioral principles, his own views, there is a need for independence, adult advice is criticized negative attitude towards them is formed.

It is during adolescence that the onset of alcoholism can begin. Because it manifests itself in the context of adolescent groups, and therefore has the character of "collective alcohol dependence." A child this age is trying to grow up or look like an adult. This can be both positive and negative.

The tendency to grow up manifests itself in socially negative senses if not based on moral and social values: smoking, alcohol consumption, sexual irresponsibility, delinquency.

During adolescence, from the age of 11, adults are no longer able to influence the child as before, and for the child, communication with peers becomes more important. The lower the social status of the adolescent, the less impact he or she has on the group.

Therefore, at this age, the main emphasis in social pedagogy is on working with the group. This is done through the following activities:

1. Prevention of causes and consequences of alcoholism. This can be done by engaging in discussions about alcohol. The result of this exercise should be the formation of a group perspective that applies to all participants in the group.

In addition to debates, there are also drawing games. In such games, aimed at the prevention of alcoholism, it is possible to achieve the development of the child's personal development, teamwork skills. The basic social skills that a social educator can form in a group of adolescents are to be able to clearly present evidence against alcoholism and to resist peer pressure.

Forms of work: discussion, excursion, interview. It is not advisable to use methods that intimidate children.

2. Organize leisure time for adolescents, as meaningless leisure time increases the risk of adolescent alcohol consumption. It is necessary to brightly advertise the activities of clubs, sections, clubs, children's and youth organizations. The social educator should be aware of the adolescent's interests and help him or her to spend his or her free time meaningfully.

Due to the psychological characteristics of this age, it is necessary to develop collective forms of leisure. It should be noted that children with deviant behavior are mainly interested in sports, rather than intellectual activities. Therefore, it is necessary to create more conditions for their participation in sports.

3. Anti-alcohol education conducted by a social educator focuses on the formation of strong anti-alcohol attitudes in the child: the need for a healthy lifestyle, the inability to consume alcohol during the formation of the organism, the immorality of alcoholism.

4. It is also the task of the social educator to guide the school teaching staff against alcoholism. Based on the acquaintance with the curriculum of adolescent students, the social educator can promote the inclusion of elements of anti-alcohol education in school curricula.

Adolescence.

In contrast to adolescence, 17-18 year olds are less likely to be emotionally dependent on their peers and more likely to be individualized. It is important to look for a place in life, to realize oneself in any professional activity, as well as to form one's own social image.

The social educator focuses on individual work with adolescents who are addicted to alcohol. This activity is carried out through:

Carrying out individual consultations in order to eliminate the factors that negatively affect the child's life.

Social upbringing of the person. Through social pedagogical exercises, it helps the adolescent to acquire socially positive behavioral norms.

Adolescent anti-alcohol methods are divided into basic and auxiliary methods.

The main thing is that in the process of conversation the social pedagogue monologues his views, arguments, facts, reads lectures.

Independent work with the help of books, experiments, etc. These methods are implemented in different forms of work - collective, individual and in different micro-environments - family, school community, friends.

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# *Stages And Methods Of Analyzing The Texts Of A Book In Primary School*

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**Abstract – Acquisition of reading skills is an important condition for successful mastering of all subjects taught in school. Reading is a major activity that provides a great opportunity for pupils to develop ideologically, politically, intellectually, aesthetically and verbally. This article elucidates systematic and purposeful work to develop and improve reading skills.**

**Keywords – Context, Reading Skills, Speedy Reading, Conscious Reading, Expressive Reading, Tone, Speech, Meaning Of A Word, Correct Reading, Literacy Training, Text.**

## I. INTRODUCTION

In order to fully meet and implement the requirements of the program, it is first necessary to acquire and improve reading skills correctly and thoroughly.

Reading skills are formed in the process of teaching literacy and improve in the later stages of teaching.

Qualities of reading skills include accurate, fast, conscious and expressive reading of the text of a book. Reading lessons shape and improve students' reading skills. The qualities of reading skills are interrelated, the main of which is conscious reading: whether the reader reads the text quickly and correctly, or does not read consciously, or reads it quickly as a result, if others do not understand the content of the text, read it correctly, read it very slowly, and do not pay attention to the pauses between the units of speech, the idea expressed in the text will not be understood. Reading at a certain speed and correctly serves conscious reading; accurate, fast, and conscious reading is the foundation of expressive reading.

## II. LITERATURE REVIEW

Reading skills are more complex and take longer to develop. Psychologist T. G. Yegorov in his book "Essays on the psychology of learning children" divides the process of formation of reading skills into three stages: the analytical stage, the synthetic stage and the automated stage. The analytical phase coincides with the period of literacy training, in which the skills of word-for-word analysis and syllable reading are formed. For the synthetic stage, the word is read aloud; in which the perception of a word by sight and its pronunciation are largely consistent with the comprehension of the meaning of the word. Reading is about understanding the meaning of words. Pupils enter the synthetic phase in 3rd grade. In the years that followed, learning became more automated.

Reading lessons should be organized in such a way that the analysis of the content of the work is aimed at improving reading skills. Proper reading means reading without making mistakes, that is, correct reading without distorting the phonetic structure of the word, grammatical forms, sound or syllable in the word. It is to read without dropping the syllable, adding the suffix, changing

the position of the letters, pronouncing it clearly, and emphasizing the word correctly. M. Adilova and T. Ashrapova state that "all the requirements for the norms of literary pronunciation also apply to the ability to read correctly." The Russian Methodist Yakovleva described correct reading as follows: "Correct reading is the smooth copying of material." So, correct reading is reading on the basis of literary and orthoepic norms without distorting the sound structure and grammatical form of the word.

Elementary pupils make reading mistakes because they do not have a clear synthesis between comprehension, pronunciation, and comprehension. This makes it difficult to understand the content of the text.

### III. ANALYSIS

Correct reading depends on the length of the word, the vocabulary of the reader, that is, how much he knows the lexical meaning of the word, and the syllable and morpheme structure of the word. Pupils often make mistakes for the following reasons:

1. Because there is no clear synthesis between the pronunciation of a word and the understanding of its meaning, that is, the child sees the sound side before the word and rushes to pronounce it. It ignores the meaning of the word.
2. Due to the complexity of the syllable structure of the word. If a word has many syllables, the child will make a mistake if he has not heard it before.
3. Makes a mistake by not knowing the meaning of a word.
4. Makes the mistake of reading fast.
5. Proper reading also depends on the brightness and light.
6. Consonants are difficult to read with closed syllables in the middle and at the end of the word.

To prevent misreading, consider the following:

1. Before teaching a text, identify words, phrases and sentences that are difficult to read and identify ways to work on them. Practice reading words with complex structure.
2. Explain the lexical meaning of words before reading the text, which makes it difficult to understand its content. Identify ways to interpret the meaning of a word.
3. Make tasks clear and understandable
4. Create conditions for them to read the text carefully.
5. In-house teaching, then audio teaching.
6. Take into account the individual characteristics of pupils in teaching, that is, pre-distribute the text to students who can afford it, identifying easy, moderate and difficult places to read.
7. Regularly check students' reading.
8. Depending on the nature of the error, determine how to correct it methodically.
9. Warn pupils where mistakes can be made.
10. Using a letter stick.
11. Misreading also depends on the pupil's personal perception.

It is best for the teacher to write complex words in advance on a board or cardboard in syllables and teach them to the students in a chorus.

A mistake made by students can be corrected in two ways:

- 1) If a student misreads the suffix at the end of a word, correct the mistake without stopping the reader from reading;
- 2) If the content of the sentence is distorted by misreading, the method of re-teaching is used. In this case, if the student is asked a question about the text he reads, the student re-reads carefully.

### IV. DISCUSSION

Speedy reading dies at a normal speed, and the reading speed should not be separated from the comprehension of the text. The reading speed should increase in line with the reading comprehension rate. Fast reading is called reading, which allows you to master the content of the work being read, to consciously comprehend the content of the text.

Students' reading speeds vary depending on their reading skills. This does not mean that the program did not meet the requirements. The reading speed that corresponds to the pace of speech is the normal speed. Because reading too fast or too slow makes it difficult to master the content of the text.

Experiments show that if a child reads a text of 250 words per minute, he will remember 200 words. If he reads letters and syllables, his focus will be on syllables, not words. In the end he can't remember the words. If this is applied to the reading speed of 4th graders, they will remember 100 words out of 125 words. This allows for higher performance. In 4th grade, there are even students who read 170-180 words per minute.

The rate of reading gradually increases over four years in relation to correct and conscious reading. When checking the speed of reading, the teacher takes into account the nature of the material being read, i.e. the ideological-thematic complexity, the structure of words and phrases, their use in children's speech, the correctness and accuracy of reading. The reading speed of the students will be different, of course. It is the teacher's job to keep all students' reading as consistent as possible. This is achieved by practicing reading the text aloud.

Conscious reading is the key to good reading. Conscious reading is the ability to understand the exact content of the text, the ideological direction of the work, the images and the role of artistic means, as well as to express their attitude to the events described in the work. It depends on the students' necessary life experience, understanding the lexical meaning of the word, the connection of the words in the sentence, and a number of methodological conditions. Nowadays, the term conscious reading is used in the literature and in school practice in two senses: first, in the sense of reading technique in relation to mastering the reading process, and second, in the sense of one of the reading qualities in relation to reading in the broadest sense.

In order to read a text consciously, pupils need to have good reading skills, be able to read fluently, and have no difficulty in reading. The text is analyzed in terms of content and artistic means so that students can read it consciously.

An important condition for conscious reading is to understand the structure and content of the work. The teacher evaluates conscious reading based on the expressive reading of the text (if read aloud) and the correctness of the answers to questions about the content of the work. Conscious reading and expressive reading require each other, but they are not exactly the same.

Expressive reading is the ability to express the idea and charm of a work accurately, clearly, and in accordance with the writer's intentions, using intonation and tone. "Expressive reading is the first and foremost form of concrete and visual teaching of literature," says Methodist scholar M. A. Ribnikova. That is, "Expressive reading is the process of showing students the content and emotionality of a work through intonation. The basic premise of expressive reading is to explain in depth the idea and artistic value of the work being read."

Tone is the sum of the moving elements of oral speech: the accent, the tempo and rhythm of the speech, the pause, the pitch of the voice. These elements interact, and together they express the content of the work, the idea, the different moods of the protagonists, their inner experiences.

Important conditions for pupils to master the basics of expressive speech are:

1. Be able to breathe properly and distribute the speech process correctly.
2. Acquire the correct articulation and clear diction of each sound.
3. Mastering the rules of literary pronunciation.

These conditions apply not only to expressive reading, but also to expressive speech, that is, to storytelling. Any pupil's oral story should be expressive.

One of the main tools for expressive reading is the voice. Sound is inextricably linked with breathing. Therefore, the teacher begins by teaching children to control their breathing and use their voices correctly when working on expressive speech. Volume is characterized by high-low, long-short, speed (tempo), pleasant-unpleasant features. Depending on the content of the text, students learn to read (speak) aloud, choose a fast, medium or slow tempo in speech, and express an emotion. Students are also introduced to pause and logical emphasis in expressive reading.

Preparation for expressive reading is conventionally divided into three stages:

1. To understand the exact content of the work, to analyze the behavior of the participants, to determine the idea of the work, that is, to understand the ideological thematic basis of the work, its images as a whole by artistic means.
2. Determine where to pause the text, the place of logical emphasis, the pace of reading.
3. Practice reading. Reread the text to be able to voice the author's point of view, his or her reaction to the events described, and the participants.

### V. CONCLUSION

The analysis of the content and ideological direction of the work is connected with the teaching of expressive reading. The main task in teaching expressive reading is to understand the content of the text, to express their attitude to the events narrated by the author. The teacher's expressive reading of the work is important for developing students' expressive reading skills.

Reading is a means of activating pupils' learning and expanding their knowledge of the environment.

The emotional impact of the work must also be taken into account when analyzing the work. Let the reader not only read the text, but let the author be excited about the exciting story. Encourage pupils to think critically when analyzing text.

According to psychologists, understanding a book is not enough. Perception of a work is a complex process that involves some kind of relationship to the work, to the reality it portrays. Younger students have two attitudes toward a literary hero.

1. Emotional attitude to the literary hero.
2. Elementary analysis.

Pupils use their own insights to evaluate the characters in the play. They lack vocabulary and experience to evaluate other qualities of a hero. The teacher's task is to show the qualities that the students do not notice and to include them in the pupils' speech. Here's another thing to keep in mind:

1. Pupils do not take into account the circumstances in which they acted in expressing their attitude to the protagonist.
2. They don't understand why the protagonist has to do this, they have to do the right thing for him.

Working on a book is a complex process, and the educational tasks of teacher reading lessons require taking into account the specifics of the work of art and the readiness of students.

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# *Developing Intercultural Communicative Competence Using Different Techniques*

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**Abstract** – In this article we have tried to give information about modern methods of teaching EFL, teaching culture especially intercultural communicative competence in teaching English and the problems of their teaching ways in language classroom as well as to work out methodical recommendations for teaching processes.

**Keywords** – EFL, intercultural communication, teaching process, methods, competence, culture, multilingual, multinational.

Our groups are becoming more multilingual and more multinational under the irretrievable effects of globalization. This situation drastically increases the importance of culturally responsive pedagogy. Before explaining what culturally responsive pedagogy is, it should be noted that this term is used interchangeably with several terms such as culturally responsible, culturally appropriate, culturally congruent, culturally compatible, and culturally relevant. All these terms indicate that teachers need to be responsive to their students by integrating some elements of the learners' culture in their teaching. That means that teachers need to meet their teaching objective, making use of the concepts, speeches, images, films, and/or materials that are familiar to the students.

To exemplify, let's imagine a culturally responsive multinational writing group where students from diverse backgrounds coexist, and the target subject of the group is writing an expository paragraph. A culturally responsive task to do in this group would be, for example, utilizing the proverbs of students from different countries. Students might be given a piece of paper with a list of proverbs from the home countries of the students in the group. They may be asked to choose one of the proverbs (not the ones from their home country) and write an expository paragraph. This simple task would not only increase students' awareness of the cultural values and norms of other cultures but also might make them see that there are similarities between their and the other cultures since proverbs carry very similar messages across cultures. Another culturally responsive task to do in a multinational group is using a speech or text from the home country of some students. For instance, a reaction-response paragraph activity can be designed with such texts: students might be asked to react to some of the ideas presented in the texts.

Teacher trainer programs should prepare their trainees to work with diverse students in multinational groups. There are five important areas that need to be involved in teacher training programs. These areas are as follows: Developing culturally diverse knowledge base, designing culturally relevant curricula, demonstrating cultural caring and building a learning community, building effective cross-cultural communications, and delivering culturally responsive instruction. To be able to demonstrate cultural caring and building a learning community, teachers should use "cultural scaffolding—that is students' cultures and experiences—to expand their intellectual horizons and academic achievements". They also should emphasize holistic or integrated learning; rather than making different types or learning (cognitive, physical, emotional) discrete, deal with them in concert.

A responsive teacher is sensitive to the needs, interests, learning preferences, and abilities of their students. Moreover, these teachers do not implement the same kinds of activities in their groups all the time and never follow the same teaching methods and materials. Culturally responsive teachers need to utilize the three dimensions within the culturally responsive teaching framework:

a) Academic achievement: Teachers aim to make learning meticulous, exciting, and challenging.

b) Cultural competence: Teachers know and facilitate in the learning process the various range of students' cultural and linguistic groups.

c) Sociopolitical consciousness: Teachers need to recognize and assist students in the understanding that education and university do not occur in a vacuum. The interaction among these dimensions would help teachers considerably meet the needs and expectations of a diverse group. Culturally responsive teachers make use of the group and non-group time to have a better understanding of the cultures of their students. In or out of group, culturally responsive teachers try to develop personal relations with their students, and they do not do that at random intervals. Developing personal relation with students is one of the predominant characteristics of culturally diverse students. For example, they may go to field trips, join student nights at university, or they may celebrate their students' national, religious, or special days with them. Many teachers today find themselves facing an increasingly multicultural group which can sometimes prove challenging when keeping an atmosphere of equality and respect within the group. Despite these challenges, it is wonderful to have such diversity of culture within a group, as this variety of experience and background creates tolerance and mutual respect within the group that is transcribed into later life and can even improve academic results.

To fully embrace multiculturalism, there needs to be university-wide effort and an implemented policy for all groups to follow. Some teachers believe that they become culturally responsive when they organize special tasks or celebrations during, for example, Christmas or Shabbat times for their multinational students. Of course these are expected behaviors of a responsive teacher, but it should be remembered that being responsive is not limited to a couple of days. Every special occasion - national holidays and independence days - is a great opportunity to incorporate culture into group teaching and to let some learners express their culture while helping the others learn more about the other cultures. Through these remembrances, teachers would also enhance their own knowledge on their students' cultures.

Furthermore, culturally responsive teachers are very patient when it comes to listen to their students and let them share personal stories or anecdotes during group time. Personal story exchanges should not be seen as a problem because of time constraints; on the contrary, they should be regarded as learning opportunities for students (and even for teachers themselves) and students should be encouraged to share stories about their families, weekend activities, and even hobbies. Likewise, responsive teachers should consider sharing "appropriate stories about their personal lives and connect their own and their students' lives to the content of the instruction". Additionally, culturally responsive teachers promote equality and mutual respect among students and emphasize that no culture is superior to another. They also acknowledge students' differences as well as their commonalities. Last but not least, responsive teachers understand that they need to educate themselves in their students' values, history, and in any other element that constitutes the learners' culture. Teacher cannot teach and cannot increase awareness of something they do not know themselves.

In any EFL group which places intercultural communicative competence at the core, any FL teacher would raise the following question: how to integrate the intercultural dimension in an EFL group and how to acquire ICC? FL teaching which integrates an intercultural dimension combines between the two following objectives:

1. Helping learners to acquire the communicative competence needed to communicate in speaking or writing, to formulate what they want to say/write in correct and appropriate ways.

2. Developing the learners' intercultural competence i.e. their ability to ensure a shared understanding by people of different social identities, and their ability to interact with people as complex human beings with multiple identities and their own individuality.

As stated earlier, the teaching of culture will not be limited to the transmission of information about the people of the target culture and their general attitudes, as traditional thought in FL education suggests. Instead, EFL teachers should be concerned with following goals:

1. To help learners see relationships between their own and other cultures

2. To help them acquire interest in and curiosity about 'otherness', and an awareness of themselves and their own cultures seen from other people's perspectives.
3. To help learners to understand how intercultural interaction takes place,
4. How social identities are part of all interaction,
5. How their perceptions of other people and others people's perceptions of them influence the success of communication,
6. How they can find out for themselves more about the people with whom they are communicating.

To achieve these goals effectively, FL teachers should try to design suitable activities that would prepare FL learners to communicate with open minds with other intercultural speakers and tolerate differences.

One question germane to the present paper is how can we incorporate culture into the foreign language group, with a view to fostering cultural awareness? There are many possibilities to follow to develop Intercultural communicative competences in our learners; relevant methods, techniques are to be chosen. However, the subsequent practical part will not concentrate on this broad area, but present some specific techniques to be used in the group. Prior to considering some concrete techniques for teaching culture in the foreign language group, it is useful to provide some guidelines for culture teaching.

**First**, in tune with ICC and the dynamic view of culture, already discussed, receptive knowledge of cultural competence is not sufficient; learners will also need to acquire some skills in culturally appropriate communication

**Second**, to deal with culture teaching in a systematic and structured way

**Third**, to include evaluation of culture learning as a necessary component of the foreign culture teaching, providing students with feedback and keeping teachers accountable.

Acquiring ICC is a complex matter involving more than traditional language lessons. ICC is the best gained practically, just like learners acquire phonological accuracy, syntax or morphology through actual practice. Regular conversational topics should be about daily tasks, which should highlight identity, similarity and differences in comparable patterns of culture. Research findings indicate that teachers mainly teach socio-cultural aspects (factual information, holidays, traditions, food, housing, etc.) and pay little attention to sociolinguistic, pragmatic competences and non-verbal communication. Often only pleasant aspects of the target culture are presented, which creates an unrealistic picture in learners' perception. Realistic, accurate, contemporary and factual information should be presented.

### **1. Comparison method.**

The *comparison method* is one of the most used techniques for teaching cultures. This technique concentrates on discussing the differences between the native and target cultures. Not only features of different cultures, but also those within a single culture should be compared, because cultures never remain static, they are constantly changing and different generations interpret things differently. The following activity can be used for developing socio-cultural knowledge, sociolinguistic, pragmatic and non-verbal competences. A very popular example the topic of "University", including university routine, subjects, length of groups, clothes to wear, university buildings, homework, university meals, phrases, and ways of behavior. Learners watch a simple short video, which shows a typical British university day. The video presents a typical university day for students. It offers socio-cultural knowledge, but also sociolinguistic and pragmatic phrases (greetings, addressing people, polite requests, and proper use of please and thank you, formal register) and also non-verbal communication. Learners can discuss and compare the typical Uzbek and British University day, decide for pros and cons of each university system. It is also an important comparison between the phrases for requesting, offering, thanking, and addressing the teacher and also the differences of non-verbal communication.

### **2. Cultural assimilation.**

With the technique of *cultural assimilation* the learners are presented with a critical incident, which would probably be misunderstood. Learners are given several possibilities, from which they choose the one which they think is correct. Non-verbal greetings are probably the most common examples of misunderstanding. Cheek kissing is a common greeting, which people think is universal. However, cheek kissing varies from one to four kisses, depending on culture. The following activity practices non-verbal communication. A teacher can demonstrate on somebody different types of cheek kiss greetings: one kiss, two kisses, three and four kisses. Learners should decide which type of kiss greeting is correct. Based on their own experience, they would choose

the type of greeting typical for their own culture. Teacher should explain that all types of cheek kiss greetings are correct, but vary across different cultures. The teacher should acknowledge for the learners that there are differences even within one culture.

### 3. *Cultural capsule.*

The technique of *cultural capsule* demonstrates, for example a custom, which is different in two cultures. It can be accompanied by visual aids to show differences and a set of questions for group discussion. The following activity practices socio-cultural knowledge, sociolinguistic and pragmatic competences. For example, the issue of the main meal of the day could be discussed. For example, the main meal of the day in Uzbekistan is an evening meal consisting of national dishes followed by fruits, and in the UK it is generally the evening meal with a main course and a pudding. Pictures of different typical meals can be presented. Learners should discuss the pros and cons of the eating habits of each culture. Sociolinguistic and pragmatic phrases connected to eating habits should be also compared.

### 4. *Cultural island.*

*Cultural Island* is a very simple but effective technique, as it is always subconsciously effecting the learners. Contemporary posters and pictures of actors, singers, films, writers, books, and famous places should be put on the walls in the groups. Their aim is to attract the learners' attention, evoke comments and maintain the cultural atmosphere. Cultural Island focuses on socio-cultural knowledge. In most language groups grammar charts, vocabulary posters and other language connected pictures are present, which are not really attractive to learners. They should be replaced by attractive, popular posters and pictures.

### 5. *Reformulation*

*Reformulation* is retelling a story to a partner in his/her own words. *Noticing* is paying attention to particular features. Both techniques could be used with the previously mentioned video of the British university day. Learners could retell parts of the story, through which they practice speaking and their socio-cultural knowledge.

Noticing is a very effective technique, by which learners look for specific features connected to the topic (e.g. differences between British and Uzbek University, the number of times the word "please" is used, etc.). Reformulation and noticing can be used for practicing socio-cultural knowledge, sociolinguistic, pragmatic and nonverbal competences.

### 6. *Prediction.*

*Prediction* engages students actively by finishing (predicting) a half told story, guessing the contents of an article or a book based on the headlines, predicting the contents of a topic based on a few pieces of information. This should evoke the students' curiosity and interest to talk, no matter if their predictions are correct or not. For example, a headline from a magazine "Brad Pitt, Angelina Jolie to adopt again" already suggests the two famous people and the generally known knowledge of their adopted children. Learners discuss and predict what the article might be about. The topic of adoption can be discussed in deeper ways and different cultural views can be compared. This activity is more suitable for advanced mature learners and it can practice socio-cultural knowledge, but also system of values.

### 7. *TPR.*

*TPR* technique is designed to respond to oral commands in order to act out a cultural experience. TPR is very popular with small children, who love to act out songs, stories, and even grammar structures. TPR in cultural teaching is most suitable for non-verbal communication and can be used with different age groups. Learners need to acknowledge by practice, different gestures and their meanings in different cultures. Good examples, such as what was already mentioned, can be: kissing on the cheek, a hand shake, thumbs up, a thumb and forefinger sign, shaking of the head, etc. These actions often have different meanings in different cultures. A learner acts out various gestures and other learners assign it to the cultures where the gesture is appropriate or inappropriate.

### 8. *Role play.*

*Role play* is a very effective technique practicing sociolinguistic and pragmatic phrases, socio-cultural knowledge, but also non-verbal communication. For example, learners can practice situations in a restaurant, shop, bus station, etc. The role plays are the closest possible opportunities for learners to practice real life situations, which are necessary for intercultural communication. Role plays are suitable for all levels of language proficiency and age groups.

### 9. *Treasure hunt*

*Treasure hunt* involves searching for certain items set in advance, for example people, dates, events in a news or magazine article. *Research* is a powerful learning tool, which combines learning and interests. Students are asked to research any aspects of

the target culture which interest them, present their projects and also create and present posters. *Drama* is a technique where learners act out short scenes of misinterpretation and also clarification of something that happens between two cultures, which is caused by misunderstanding the target culture. An effective technique for the development of the intercultural perspective is the use of *personal diaries, journals and portfolio*. Learners should make notes of their own understanding of intercultural elements; describe encounters with someone in the foreign language, experiences from visiting a foreign country, etc. They can retrospectively look at the development of their ICC. Also most of the standard EFL activities (games, field trips, songs, etc.) could be adapted for teaching culture.

By way of conclusion, we should note the main premise of the present study: the teaching of culture should become an integral part of foreign language instruction. Culture should be our message to students and language our medium. In order to avoid this embarrassing cultural and political disintegration, and encourage empathy and understanding, teachers should present students with a true picture or representation of another culture and language. And this will be achieved only if cultural awareness is viewed as something more than merely a compartmentalized subject within the foreign language curriculum. Language teachers ought to receive both experiential and academic training, with the aim of becoming 'mediators in culture teaching'. At any rate, culture teaching should aim to foster empathy with the cultural norms of the target language community and an increased awareness of one's own 'cultural logic' in relation to others. This cultural logic, though, is achieved through a recognition of 'otherness', and of the limitations of one's own cultural identity.

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# *Results Of Research On Fire-Technical Indications Determination Of Fire Resistant Textile Materials*

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**Abstract – In this article it is described the composition properties of the new synthesis on the basis of collagen based textile materials, the fire-technical classifications of the new recommended fireproof clothes and the results of the experimental tests.**

**Keywords – Fire, Burning, Smoke, Textile Materials, Collagen, Composite Compounds, Fireproof Clothes.**

## I. INTRODUCTION

The textile industry in Uzbekistan is developing day by day. Modern enterprises are being built on the basis of the special attention of the head of our state and the adopted state programs. Nevertheless, the production of high-demand special clothing and flammable fabrics for services designed to perform specific tasks remains a pressing issue. The demand for fabrics for special protective clothing in the world market is growing year by year. In 2010, this figure increased by 15%, while in 2012 the figure was 22%. Currently, the demand for flammable fabrics in the world market is 5,000 tons per year. In this new technology era, new biotechnology, nanotechnology, artificial intelligence, new technologies have been discovered in every field, as well as in the textile industry[1].

As a result of our research, other foreign research works in this area have been studied in detail. Scientific research aimed at the development of techniques and technologies for the production of flammable fabrics in the textile and light industry, the expansion of the range of such fabrics, comprehensive research to improve quality indicators, the world's leading research centers and higher education institutions, held at the All-Russian Academy of Fire Service, St. Petersburg State Fire University, IPNK NAS of Belarus (Белоруссия), Kazan National Research Technological University (Russia), Goman P.N. (Republic of Belarus), Oerlikon Barmag (Germany), National Institute of Materials and Chemical Research (Japan), Beijing Institute of Technology (China), Polymer Research Institute (USA), National Institute of Technology (India), Institute of Applied Chemistry of the Chinese Academy of Sciences, Chanchun (China), National Institute of Pharmaceutical Education and Research (India), Institute of Green Chemical Engineering (China), Zhongkai University of Agriculture and Engineering Guangzhou (China), University of Melbourne (Australia), Indian Institute of Technology (India) [2].

## II. METHOD AND MATERIAL

One of the main components of the composition for the flame retardant treatment of textile materials has been identified by scientists Francis Creek, Linus Pauling, Alexander Rich, Ada Jonat, Helen Berman, Wallace D.G., Holmes D.F., Graham H.K on the composition and application of collagen. Tang K., Wang F., Iia P., Liu J., Wang K, Berkhaut X.Y., Garcia Del Rio X.R. developed methods of degreasing and drying animal skins, Poluboyarov V.A., Voloskovaya E.V., Yankovoya V.V., Guryanova

T.I. proposed a method of mechanochemical separation of collagen. Research on the production of welded copolymers of synthetic polymer monomers with cellulose has been carried out by Wang Li Li, Hong Kyung Hwan, Yan Lifeng, Ishihara Kazuhiko, Cheng Qian, Eromosele I.C., Eromosele C.O., Teramoto Y., Thakur V.K. and other researchers.

Research on the synthesis and determination of properties of welded copolymers of natural polymers in Uzbekistan is carried out in the scientific schools of M.Askarov, A.Magrupov, S.Sh.Rashidova and scientists of the Chemical technology institute, National university of Uzbekistan, Tashkent institute of textile and light industry.

The creation of highly effective compositions for fire protection of textile materials, scientific solutions to theoretical and practical problems in the production of flammable textile materials, the development of modern methods of testing materials are a number of scientists: Baratov A.N., Konstantinova N.I., Molchadskiy I.S., Zubkova N.S., Perepelkin K.E., Kozinda Z.Yu., Gorbacheva I.N., Bolodyan G.I., Brenda J., Traek, John V., Vorater Monty, Konkin A.A., Edward D. Well, Elizabeth Ranuchchi and others in their studies.

A number of researches were carried out by A.T. Djalilov, I.I. Ismailov, A.S. Maksumova, E.Abdurahmanov, M.Kh.Usmanov and other researchers on synthesis, determination of properties, application in textile materials of inorganic and organic antipyretics containing nitrogen, phosphorus, halogen, boron, silicon in Uzbekistan [3].

### III. CONCLUSIONS AND DISCUSSIONS

Obtaining flammable, waterproof fabrics based on 3-D technology and protective clothing with self-cleaning properties of the obtained fabrics are entering the world markets. All offered flammable textile fabrics must meet the requirements for non-flammable and non-flammable substances, such as fire time, flammability value, moderate flammability, toxicity and flammability, regardless of the field in which they are used [ 4].

During our research, we conducted experiments on the basis of samples of some materials imported from foreign countries. As an example, here are examples of materials produced by the Russian company "Favorit-textile", which are recommended as high temperature, humidity, fire-resistant and waterproof fabric.



In accordance with ISO 9001:2008, ISO 14001:2004 OHSAS-18001: 2007 requirements, materials sample entering the country caught fire during the experimental process and continued to burn even after the end of the fire. Tests on the “Determination of smoke formation coefficient” and “Determining the rate of flame spread” devices showed that the sample was completely burned to ashes and that the flame spread at a high rate.



*Samples of refractory fabrics from Tashkent markets*

In recent years, a number of materials and fabrics made of various chemical, natural synthetic fibers have been produced to create flammable materials: polyamide (polyaramid), polyester, polyacrylonitrile, etc.

However, test results of imported and domestic materials and fabrics show that they typically protect against heat flux at a density not exceeding  $5 \text{ kW/m}^2$ , with a exposure time of approximately 4 minutes.

However, the standard combat clothing of firefighters does not provide protection for the face and neck area, which in turn reduces the possibility of its effective use under the influence of strong heat. The heat effect can withstand a heat flux of no more than  $0.56 \text{ kW/m}^2$  from long-term exposure to humans, and a heat flux of up to  $1.12 \text{ kW/m}^2$  from short-term exposure[5].

In our country, firefighting uniforms are mainly imported from the Russian Federation and the Republic of Belarus. The average cost of firefighting uniforms for one firefighter is 223 (300) US dollars or 2.3 million soums.

Over the past period, it has become clear in firefighting practice that today, firefighters' combat clothing designed for firefighters has some shortcomings such as discomfort in its human body, water permeability, and relative heat transfer.

From this point of view, now, firefighters are comfortable in all respects, do not cause discomfort to the human body, waterproof, heat-retaining, beautiful appearance and, of course, equipped with new and modern tools for working in fire conditions, using innovative technologies, most importantly local raw materials using firefighters to create combat clothing.

To this end we, we are conducting research in creating flammable textile materials that can be used not only in the field of fire safety, but in all areas and the study of such materials and the analysis of their physicochemical properties and, if necessary, the development of methods of application of flammable textile materials treated with a new composition and to recommend it to relevant fields.



Re-tested samples

It is known that textile materials recommended as flammable fabrics change their properties over time. The main reason for this is that the flame retardants do not fully penetrate into the fabric, as well as the methods of increasing the fire resistance of the recommended flame retardants to textile materials have not been fully studied.

For the creation and use of flammable fabrics in Russia for the first time in 1995 SS R 50810-95 «Fire safety of textile materials. Decorative fabrics. Flammability test method and classification »has been developed and flammable fabrics must meet this standard[6].

In accordance with current SS requirements, samples must be retested after a long period of time and the performance must be compared in order for the fabric to have fire resistance or flammability properties. We also retested the samples taken after 2 years and concluded that the above parameters did not change and the fabric did not lose its properties.

Samples were cut to size 125x12x0.1 mm on request. The experiment was previously performed according to the A-method given by SS. In this case, when all samples (in the horizontal position) were tested for 30 seconds, the part of the sample that was in contact with the flame burned, and the fabric stopped igniting after the burner was removed.

According to the SS requirement, if the sample ceases to ignite when exposed to flame by means of a torch using an A-method, this experiment should be carried out according to the B-method.

Therefore, the fabrics were inspected according to the B-method (in the vertical position). The flame is applied to the bottom of the sample for 10 seconds. If the sample still does not burn, the sample will ignite again

It is affected for 10 seconds. If the sample burns, then its burning time and incubation time are measured.

In the later study stages, the exposure process to the fabric by changing the amount of components in the mixture was studied. When the specific properties of the components used to form the composition were studied, it was found that the coefficient of smoke formation was higher in acrylic emulsion. Based on the results, in the later stages of the experiment, a composition was prepared by increasing the amount of collagen and reducing the amount of acrylic emulsion.

Table 1 Fire protection composition of textile materials

Name of components	Content component share options, %				
	1	2	3	4	5
Acrylic emulsion	2	4	6	8	10
Boric acid	2,5	3	5	4	6
Collogen solution	16	18	22	30	32

Potassium persulfate	0,02	0,02	0,025	0,025	0,03
Water	89,48	74,98	68,975	64,975	58,97

IV. CONCLUSIONS AND RECOMMENDATIONS

In order to increase the flammability properties of the recommended fabric, as well as to reduce the smoke emission coefficient from the recommended fabric when exposed to flame, the results were obtained by completely immersing the recommended composition on the fabric surface (Table 2). The results showed that the sample began to ignite in 13 seconds and that the flammable fabric properties increased as the amount of collagen increased. After testing, the sample did not turn to ash, but it was observed that the fabric was crumbling due to the hand brittleness. This condition was thought to be due to the high amount of collagen. Based on the result, it is considered necessary to use a certain amount of replacement component of the acrylic emulsion in the process of bonding the fabric with the mixture.

The effects of several chemical components were studied and polyacrylamide was selected. Polyacrylamide is a non-toxic product, but when in contact, it can cause eye damage.

Table 2: Investigation of fire resistance properties of textile materials

Sample serial number	The exposure time of the flame to the sample, sec	Free burning time of the sample, sec	Burning time to the end of the sample, sec	Condensation time, sec	conclusion
1.	20	3	-	-	burned
2.	20	3	-	-	burned
3.	20	2	-	-	burned
4.	20	1	-	-	did not burn
5.	20	-	-	-	did not burn

The action scope of polyacrylamide on the textile fabric, which acts as a non-combustible barrier between air and material during combustion, was studied. To do this, the polyacrylic-amide in the composition was prepared in different concentrations and its effect on the flammability properties of the fabric was studied.

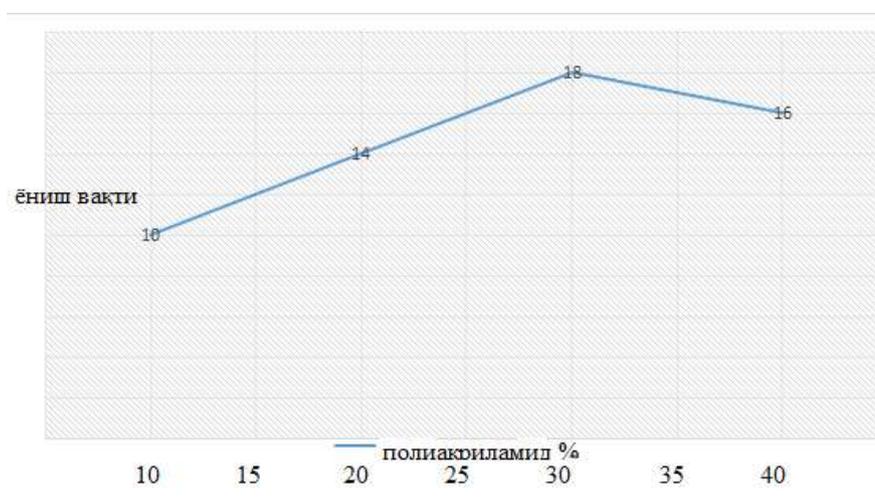


Figure. Binding effect of polyacrylamide prepared in different concentrations in collagen solution on the fabric flammability

The following composition of the composition with the polyacrylamide addition was determined.

Table 3 : Fire protection composition of textile materials

Name of components	Content component share options, %				
	1	2	3	4	5
Acrylic emulsion	2	4	6	8	10
Boratic acid	2,5	3	5	4	6
Collogen solution	20	25	30	35	40
Polyacrylamide	10	20	25	30	40
Potassium persulfate	0,02	0,02	0,025	0,025	0,03
Water	65,48	58,98	46,98	29,97	21,97

The sample bottom treated with the selected composition was exposed to flame for 10 s. As the sample did not burn, the sample was once again exposed to the flame for 10 s.

The following results were obtained during the inspection of the samples.

Table 4. Investigation of fire resistance properties of textile materials

№	Sample size, mm	Sample mass, m, g		Mass loss, %	Flame exposure time, s	Burning time, s	Note
		before	after				
1	2,8 x 10	2,35	2,1	11	10	-	smokes
2	2,8 x 10	2,4	2,2	8	10	-	did not burn
3	2,8 x 10	2,6	2,5	4	10	-	did not burn
4	2,8 x 10	2,75	2,6	5	10	-	did not burn
5	2,8 x 10	2,9	2,7	7	10	-	did not burn

When the sample was exposed to the flame, the sample began to ignite in 25 seconds. After testing, the sample did not turn to ash. No abrasion was observed even when the fabric was captured. Based on the results, the smoke formation coefficient of the sample was determined (Table 5) and the results were obtained.

On the basis of SS 12.1.044-89 "Combustion and explosion hazard of substances and materials" and Urban planning norms and rules 2.01.02-04 "Fire safety of buildings and structures" the coefficient of smoke formation of textile materials was determined the indicators and corresponds to the group of collagen-impregnated fabric T1 (had little grip) (has a low holding capacity when the value is less than 50). Based on the value, fire safety meets the requirements [7].

Table 5. Recommended smoke formation coefficient of flammable fabrics

Test result	Sample №	Sample mass, m, g		Lighting, conductivity %		Continuity, min	Smoke formation coefficient $Dm$ , m <sup>2</sup> /kg
		Before the test	After the test				
Condensation	1	0,8	0,3	59,0	55,7	15	46,0
	2	0,82	0,31	58,9	55,7	15	44,6

	3	0,81	0,3	59,0	55,5	15	45,9
Average		<b>≈ 0,8</b>	<b>≈ 0,3</b>	<b>≈ 59,0</b>	<b>≈ 55,7</b>	<b>15</b>	<b>≈ 45,8</b>

It should be noted that in 2016, the intellectual property agency applied for a patent for this project and a patent for utility model FAP 2019 0103 was obtained by the agency's decision on 18 January 2021.

Taking into account the urgency of improving and expanding the range of high temperature resistant protective clothing, it is only natural that it in turn imposes several requirements on flame retardants. For example: fire resistance (the treated tissue material is able to extinguish the grass freely and retain its structure after partial combustion), the selected flame retardant is definitely cheaper, long service life of woven material treated with flame retardant (at least 5-7 years or more), The fabric treated with flame retardant has a good appearance (the fabric should have no restrictions on the material color and the product quality), the material treated with flame retardant must have a high tolerance to the cleaning agents during cleaning and the ability to easily clean from household contaminants.

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# *English Explanation Of Medical Hybrid Terms With French Prefix "Anti"*

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**Abstract – This article provides a comparative analysis of medical terms used in French. This article examines French medical terms that begin with the prefix "anti", explained along with Uzbek alternatives.**

**Keywords – Terminology, Term, Medical Term, Hybrid, "Anti" Prefix, Medical Term, Neologism, Dictionary.**

## I. INTRODUCTION

The need for a responsible approach to the development of terminological systems of the Uzbek language is reflected in the following opinion of the first President I.A.Karimov: The publication of a large number of scientific and popular books, textbooks, dictionaries dedicated to the peculiarities of the society contributes to the development of public opinion. It is especially noteworthy that the state language is becoming an active means of communication at the international level. The fact that the Uzbek language is widely used in areas that require special terms and concepts, such as computers, the Internet, the exact sciences, medicine, economics, shows how great its potential is."

## II. LITERATURE REVIEW

Many scientists from around the world have been researching terminology for many years. U. Tursunov was one of the first to conduct a deeper study of the terminology of the Uzbek language. He is the author of such works as terminology, "Language - against the bourgeois aspirations in terminology", "Problems of Uzbek terminology", "Problems of terminology", "Principles of word-term selection in the Uzbek literary language".

Terminology as a science in the world The Austrian scientist O.V. Nubasov and the Russian scientist it dates back to D.S. Lotte's first work, published in 1930. Currently, terminology schools have emerged in countries such as Austria, Germany, France, Russia, and the Czech Republic.

The main purpose of the study of terms is to ensure the transparency of the language and the ability to use words from foreign languages, to replace them with words that exactly correspond to our language.

## III. ANALYSIS

It is known that the Uzbek language has some components, such as Arabic, Persian, Russian and French. These terms have their own prefixes, suffixes and infixes. "Although some prefixes and suffixes are involved in the formation of a large number of hybrids (for example: -algia, anti-, -ectomy and -tomy, -gene, -graphy, hyper- and hypo;) has never been used in common medicine to form such terms," meaning that it refers to compound (hybrid) terms formed from word units belonging to different

languages. Some prefixes that enrich medical terminology are derived from Greek, Greek, and Latin and have their own meanings:

- *an* (**yun.** negative) → an + aima = du sang (blood) – anemie – chlorosis;
- *anti* (**grek.** antonym) → anti + pyrétique = combat la fièvre (fight fever) – - Antipyretique - fever, lowering the temperature. The prefix term "anti" ("*en face de, contre et de onoma*"), which is essentially derived from the Greek language, serves to express opposite meanings. (4.46 (5));
- *bar* (Greek weight) → baros + mètre = mesure la pression (pressure gauge) - Barometer - a device that measures atmospheric pressure;
- *bio* (Greek bios) → bio + logie = science de la vie (life science) - Biologie - a set of sciences about living nature;
- *brady* (Greek slowly, slow) → brady + cardie = ralentissement du rythme cardiaque (slow heartbeat) - Bradycardie - slowing of heart contractions, slow (*less than 60 beats per minute*) heartbeat;
- *bronch* (Greek: breath) → bronch + ite = inflammation des bronches (bronchitis) - Bronchitis - inflammation of the respiratory organs;
- *cardi* (Greek: cardiovascular) → cardi + opathie = toute affection du coeur (heart disease);
- *caryo* (Greek cell) → caryo + type = ensemble des chromosomes de la cellule (cell set of chromosomes) - Caryotype - a set of chromosomes of an organism of a certain size, shape and number;
- *céphal* (Greek skull) → céphal + ées = douleurs à la tête, violentes et tenaces (headache, violent and constant) - Céphalées - feeling of pain in the head;
- *col* (Greek glove) → col + ique = douleur aigüe du côlon (acute colon pain) - Colique - inflammation of the colon and other similar prefixes contribute to the development of medical terms.

The prefix "anti" is a prefix to linguistic units that can form many hybrid compound medical terms that have opposite, opposite meanings.

And the anti prefix renews the meaning associated with the word. In words beginning with the letter "i", the vowel is connected by a dash (-) (anti (+) - inflammatoire = anti - inflammatoire). Dictionaries define this prefix as follows:

**anti** prefix - (Greek. anti - against, contradict) a suffix added to certain words from the front, denoting the opposite of what the word means (sign, action). (2.47);

**anti** prefix - (Greek) a prefix that means to be opposed to something, to be directed against it(1.41);

**anti** prefix - (Greek. anti - against, contradict) is added to certain words from the front, and the meaning of the word itself is the opposite of something (3,546);

**anti** prefix does not mean "against" but "instead". (11);

**anti** prefix Greek against, oppose, conflicting, contradictory, versus, agin, dissenting (4.46 (6)).

#### IV. DISCUSSION

Some words that begin with anti do not have opposite meanings: "antelope" - the name of an antelope (deer), "antiquité" - an ancient period, "antidater" - a verb; such as formalizing with a past, expired date (letter, document), (4, 46 (3)).

Here are some French medical terms that start with the prefix "**anti**":

In French	In Uzbek	Definition
<b>anti-adrénergiques</b>	<i>antiadrenergic agents</i> ( <i>lot - antiadrenergy</i> )	adrenergic - drugs that prevent or eliminate the action of the sympathetic nerve;
<b>antiacide</b>	<i>antacids</i> ( <i>anti and lot. aciditas - acid</i> )	drugs that are alkaline and are used to neutralize hydrochloric acid in gastric juice. Antacids include sodium bicarbonate, magnesium oxide, and other gastric juices for acid-induced gastritis, gastric, and duodenal ulcers.
<b>antibiotique (nm)</b>	<i>antibiotics</i>	organic substances, drugs that stop or kill some microbes and bacteria.
<b>anticorps (nm)</b>	<i>antibodies</i>	substances that are formed by the formation of antigens in the body and lose their effect.

<i>antisepsie (nf)</i>	<i>antiseptic</i>	decontamination of the wound with chemical drugs, protection from bites, pus.
<i>antitoxine (nf)</i>	<i>antitoxin (Greek)</i>	specific proteins (antibodies) that neutralize microorganism toxins (eg, tetanus, diphtheria A), plant toxins (ricin, abrin), and animal toxins (snake, blackbird venom).
<i>antitétanique (adj)</i> (- une piqûre <i>antitétanique</i> )	<i>antianemic agents (anemia)</i> ( <i>lat. antianaemica</i> )	drugs used to treat anemia; ( <b>injection against anemia.</b> )
<i>antirabique (adj)</i> (- vaccination <i>antirabique</i> )	<i>antirabic</i> (- <b>antirabic vaccine</b> )	anti-rabies, anti-rabies; (Repeated subcutaneous vaccination of a person infected with rabies to prevent rabies.)
<i>antibactériennes</i>	<i>antibacterial effect</i>	the effect of physical, chemical, or biological factors that have the property of killing or suppressing bacteria.
<i>antibiotiques</i>	<i>antibiotics - (anti. + Greek bios - life)</i>	substances that inhibit the growth and development of various microbes that are developed during the life of some microorganisms, animals and plants.
<i>anticoagulantes</i>	<i>anticoagulants (Greek, lot)</i>	blood clotting drugs.
<i>antirhumatismaux</i>	<i>antirheumatic agents (lot. antirheumatica)</i>	drugs with immunodepressive, anti-inflammatory and analgesic effects.
<i>antihelminthiques</i>	<i>anthelmintics</i> ( <i>anti and Greek. helmins - worm</i> )	<i>Drugs used for the prevention and treatment of worm diseases in humans and animals: pipe-razin adipinate, chloxy, vermoz and others</i>
<i>antifongique</i>	<i>antifungal</i>	The antifungal drug is used to treat and prevent serious systemic infections such as candidiasis (nettle), cryptococcal meningitis and others.
<i>antimicrobiennes</i>	<i>antimicrobial agents (lat. antimierobica) -</i>	substances used to kill or disrupt microorganisms; antiseptics, disinfectants and other means.
<i>antimigraine</i>	<b>antimigren</b> ( <i>frans.anti + migraine</i> )	<i>It is said to be a remedy for brain pain (hemisrania - occasional headache).</i>
<i>anti-obésité</i>	<b>antihypertension</b>	It is the most common (up to 75%) antihypertensive drug in humans.
<i>antigène (nm)</i> (-analyse d' <i>antigène</i> )	<i>antigen (anti ... + Greek genos - generation; origin)</i> (-antigen analysis)	When ingested, substances that can cause antibodies to develop in the blood and other tissues and build immunity. (Determination of antigenic properties of cells, tissues, microorganisms, etc. by conducting various serological reactions)
<i>antiprotozoaire</i>	<i>antiprotozoic (lot. antiprotozoica)</i>	drugs that stop the activity of simple animals and are used in the treatment of protozoal infections.
<i>antioxydants</i>	<i>antioxidants</i>	substances that prevent or attenuate oxidation by molecular oxygen, which are usually a necessary component of all tissues and cells in humans and animals;
<i>antiovlatoire</i>	<i>antiovilator</i> ( <i>lot. antiavulatoryia</i> )	It is used to prevent pregnancy and to trace the menstrual cycle;
<i>antimutagenes</i>	<i>antimutagens</i> ( <i>Greek, lot</i> )	Genetic changes in the body are chemical and medical factors that reduce the recurrence of mutations.

<b>antialcoolique</b> (adj)	<i>against alcohol</i>	against alcohol, against alcoholism; directed against alcoholism, drunkenness;
<b>anticancéreux, euse</b> (adj)	<i>anticancer</i>	anti-cancer, anti-cancer focused; aimed at combating cancer.
<b>antidiphthérique</b> (adj)	<i>antidifteria</i>	anti-asthma drugs.
<b>antimite</b> (adj)	<i>against moth</i>	naphthalene
<b>antihormonales</b>	<i>antihormonal substances</i> (lot. <i>antihormonalia</i> )	<i>drugs that have the property of blocking or weakening the action of hormones.</i>
<b>antihistaminiques</b>	<i>antihistamines</i>	drugs that partially or completely block the physiological effects of histamine; used in allergic reactions and skin diseases.
<b>antidotes</b>	<i>antidotes (Greek)</i>	<i>antidotes - drugs that neutralize toxins that enter the body.</i>
<b>antituberculeux, -euse</b> (adj) (- vaccin antituberculeux - un traitement antituberculeux)	<i>against tuberculosis</i> (Greek. <b>anti</b> + <b>tuberculosis</b> )	anti-tuberculosis, anti-tuberculosis; (- tuberculosis vaccine; - treatment of tuberculosis.)
<b>antispasmodique</b>	<i>antispasmodic</i>	<b>I.</b> (adj) against spasms, spasms, cramps, aches and pains; <b>II.</b> (nm) anticonvulsant drug.
<b>antirides</b> (adj)	<i>against wrinkles</i>	wrinkle, against wrinkle pressing; wrinkle remover;
<b>anticonceptionnel, elle</b> (adj)	<i>contraceptive tool</i>	Contraceptive.
<b>anti-inflammatoire</b>	<i>antiflogistics</i>	anti-inflammatory drugs;
<b>antiangineux</b>	<i>antianginal agents</i> (lot. <b>antianginalia</b> )	drugs that increase blood flow to the heart or reduce the heart's need for oxygen; used to prevent or suppress angina attacks;
<b>antimétabolites</b>	<i>antimetabolites</i> ( <i>anti</i> and <b>Greek. metabole - change</b> )	substances that disrupt the absorption of intermediate compounds formed during metabolism in living organisms. It is a foreign substance to the body.
<b>antipéristaltique</b>	<i>antiperistaltika</i> ( <b>ant.</b> and <b>Greek. peristaltikos - the force that pushes intestinal fluid</b> )	contraction of the esophagus, stomach and intestines from below.
<b>antithrombine</b>	<i>antithrombin</i> (Greek. <i>anti - anti + thrombin</i> )	the common name for a group of substances that are present in blood plasma and are considered antagonists of thrombin.
<b>antivitamines</b>	<i>antivitamins</i>	substances that prevent a living cell from using vitamins. They break down vitamins, turning them into an inactive form; although chemically similar to vitamins, it has the opposite biological effect.

## V. CONCLUSION

Apparently, international terms with the prefix "anti" are very important. It is also very important for the science of medicine and plays an important role in the proper organization of treatment. Therefore, from a comparative point of view, the definition of the lexical-terminological feature of this prefix serves to define the important tasks of linguistics.

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# *Western Media's Representation of Palestine*

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**Abstract** – Media is considered as an important social institution in society as it is the main source of knowledge about what is going on across the world influencing people and shaping their points of view concerning a given event. More specifically, this study is a textual analysis of the coverage of an international event, the Palestinian membership in the United Nations as seen from two western media networks of CNN, and BBC. It investigates the discourse of each network regarding the Palestinian and Israeli people, through the two analytical angles of transitivity and Critical Linguistics to demonstrate that news is socially constructed and that reality in the press is more about opinions and propositions than facts.

**Keywords** – Critical discourse analysis, media discourse, Systemic functional grammar.

## I. INTRODUCTION

Media language has been studied from different approaches (semiotics, content analysis, critical linguistics, and critical discourse analysis....) (Fairclough, 1995). These linguistic approaches have tried to unveil the ideologies that cover the news discourse and to prove that these ideologies constitute a prominent feature of this type of discourse (Fowler, 1981; Van Dijk, 1988; Bell, 1991; Fairclough, 1995).

A major role of the critical analyst as stated by Fairclough (1995) is to help the reader become aware of the tools used by powerful groups in society to exercise their control through discourse. In fact, the language we are exposed to as listeners or readers, is the product of control and domination issued by broadcasters and journalists to shape their own view. Starting with the micro analysis of grammatical features of the text, the analyst arrives at its macro analysis of social discursive practice.

In fact, various studies state that the media coverage of Palestine's membership in the UN is biased and unbalanced. Thus, this study deals with the Palestinian bid to enter the UN reporting two famous media companies which have influence on people's views of the event. These networks are the CNN (Cable Network News) and the BBC (British Broadcasting Corporation).

## II. CRITICAL DISCOURSE ANALYSIS

Wodak (2001) defines Critical Discourse Analysis as an approach “ being fundamentally concerned with analyzing opaque as well as transparent structural relationships of dominance, discrimination, power and control as manifested in language” (p. 2).

As for Van Dijk, CDA is a field that deals with analyzing written and spoken texts to unveil the discursive sources of power, dominance, and inequality. Hence he asserts: “critical discourse analysis is a type of discourse analytical research that primarily

studies the way social power abuse, dominance, and inequality are enacted, reproduced, and resisted by text and talk in the social and political context" (Van Dijk 2003, p. 352).

CDA is then defined as a field of linguistics which focuses on the connection between linguistic behavior and attitudes and concerns itself with the discursive practices that are typical of text and talk in any given society. Hart (2014) states that there are assumptions in both Critical Theory and Post-structuralism which assert that discourse is instrumental in the construction of society and that discourse analysis and CDA in particular may, in turn, be instrumental in its deconstruction (p.3). He argues that one crucial way in which language effects social actions and relations is through the 'normalization' of ideology. Hart (2014) also claims that models of grammar are useful for CDA. Martin (2000) points out that grammar provides critical discourse analysts with a technical language for talking about language- to make it possible to look very closely at meaning, to be explicit and precise in terms that can be shared by others, and to engage in quantitative analysis where this is appropriate (257-6).

### III. CDA AND SYSTEMIC FUNCTIONAL GRAMMAR

Halliday's functional grammar has been used as a tool for doing critical discourse analysis. The relevance of such a tool is based on the assumption that linguistic forms and choices convey social and ideological meanings as stated by Fairclough (2003), Systemic Functional Grammar (henceforth SFG) is a valuable resource for critical discourse analysis and that the major contributions to CDA have developed out of SFG.

Similarly, Hart (2014, p. 6) defines the similarities between CDA and SFG. He asserts that both fields share fundamental commonalities which are not found between CDA and Generative Grammar (GG). Both SFG and CDA, for example, see language as a primary social resource. Both fields view the forms of language (at all levels) as well as the contents as meaningful. Besides, both see the relation between language and social contexts as dialectical where linguistic 'choices' (register) are governed by the communicative situation (setting), but those choices at the same time define the nature of the communicative event (genre), including the interpersonal relationship between participants. This dialectical view is extended in CDA where language is seen as constitutive not only of the immediate situational context but also of wider social structures and relations (Discourses) which, in their turn, determine ways of using language. Most fundamentally, both SFG and CDA examine language in relation to its performative purposes.

#### 3.1. Transitivity

The transitivity system proposed by Halliday interprets the world experience into a set of processes. English transitivity system comprises three main types of processes: material, mental and relational. There are also three subsidiary types: behavioral, verbal and existential. Each situation type is made up of three components: a process, participants and circumstances. It is the kind of the process that determines the nature and number of participants.

Transitivity processes are made up of six major ones.

- 1- The material processes are 'simply processes of doing' (Simpson, 1993: 89). Participants may have an active or passive role. They may be the 'doers' or the 'goal'. Sometimes, they are the 'beneficiaries', "the one to whom or for whom the process is said to take place" (Halliday, 1994: 144), or the 'range'.
- 2- The mental processes are processes of 'sensing' (Simpson, 1993: 91) which can be processes of perception (see, hear), processes of reaction (like, fear) and processes of cognition (think, believe). The major participant is the 'senser' or 'experiencer' in Toolan's words (1988: 114). The phenomenon is "that which is perceived, reacted to or thought about" (Simpson, 1993: 91).
- 3- The verbal processes or 'processes of saying' (Simpson, 1993: 90) where the participants may either be 'sayers' (the individual speaker) or 'targets' (the addressee) (ibid.) or 'receiver' (Martin et.al., 1997: 113; Thompson, 1996: 97; Toolan, 1988: 115). The 'verbiage' is the message both sayers and targets exchange.
- 4- The relational processes are defined by Halliday (1994: 119) as "processes of being" suggesting that one participant affects the other in anyway. They may be 'intensive' (x is A); possessive (X has A) or 'circumstantial' (X is at/on A). Participants are either 'carriers'/attributants or 'attributes'.

- 5- The existential “posits existence” (Benson & Greaves). It is usually “straight forward” as they are headed by the empty particle ‘there’.
- 6- The behavioral process draws aspects from verbal and mental processes. So sensing and saying are considered as behaviors for verbs like gossip, chat, watch, listen, grin, smile etc. Behavioral processes are similar to mental processes because one participant is endowed with human consciousness.

**IV. METHODOLOGY**

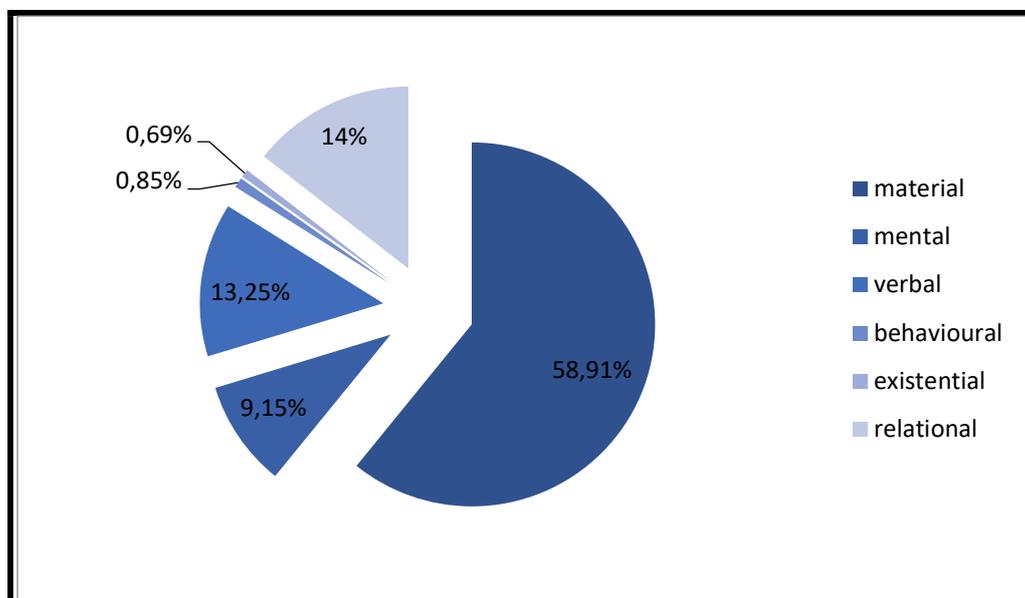
Since this study is concerned with unmasking the ideological practices used to produce power, dominance, and resistance, two approaches are used for the analysis of data: the socio-cognitive approach and the socio-cultural approach

This study relies also on Halliday’s transitivity system as it tries to reveal how language structures can produce certain meanings and ideology which are not always explicit for readers.

**V. DATA ANALYSIS**

**5.1.Process types findings**

Analysis of the types of processes in CNN corpus has shown that the kinds of actions that are frequently involved in are material, relational, and verbal.



*Fig 1: Process types in CNN corpus*

In other words, as presented in figure 1, actions of doing and happening (58.91%), then relational process type by 14.00 % and in a lower proportion actions implying verbal production (13.25 %). However, there is also use of processes that do not belong to the realm of actions but to that of the inner consciousness. These are mental processes and are the fourth in occurrence in this corpus by 9.15 %. Hence, the six grammatical process types were characterized by an uneven distribution in the CNN corpus. Indeed, the focus on actions and sayings is very significant vis-à-vis CNN’s attitude concerning the participants filing the role of actors and sayers.

Concerning the BBC data (Fig 2), the material process type is the most frequent type in the BBC corpus with 59.37%. The second type used is the verbal process type at around 18.07% followed by the relational process type with 10.54%. The percentage of the other three types: the mental, behavioral and existential process types are respectively 6.12%, 1.68% and 1.28%. The material process type in the BBC network is used to show the on going situation and to stress two main facts: the first one is associated to the event under study which is the submission of the bid for statehood in the United Nations. The second fact has to do with the opposition of the US and Israel and the importance of the US veto.

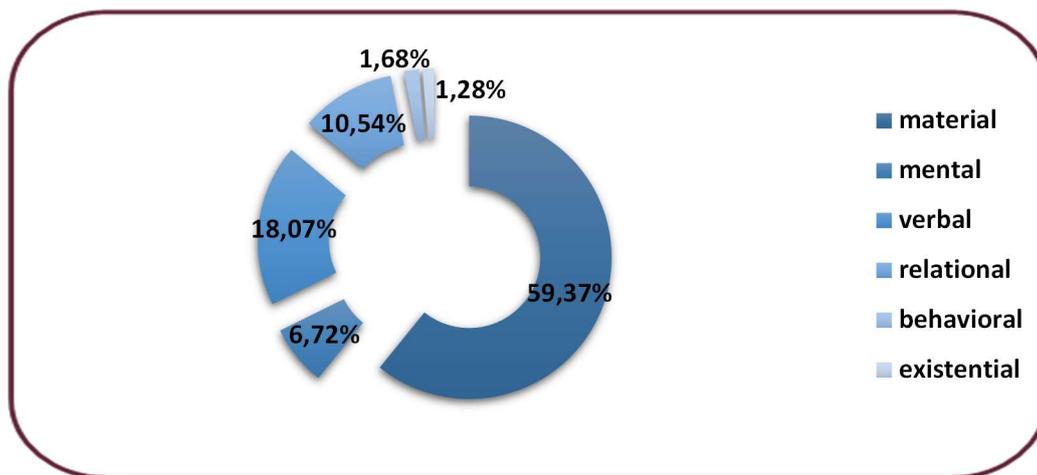


Fig 2: Process types BBC corpus

The second type of processes presents in the corpus is the verbal type. The BBC network tries to state the two opposing viewpoints subjectively. On the one hand, the Palestinian leaders who are advocating their commitments to argue for their case in the United Nations and trying to get the support of other states who are already members in the UN. On the other hand, the Israeli leaders who are insisting on the drawbacks of the unilateral procedure of Palestinian Authority and arguing on the need to return to the negotiating table between the two sides.

Regarding the relational process type, the BBC subjectively states the opinions of the two sides concerning the Palestinian's membership in the UN by describing the unilateral move of Palestinians to the UN and the symbolism of such initiative for the Palestinian who are hopeful about the support of other countries for their case, and the Israeli side who are opposing this membership with the support of the United States.

## 5.2. Findings related to Lexical Analysis

The analysis of the keyword lists obtained from the CNN, and BBC corpora led to the identification of two main categories under which most of the key keywords fall. These categories are as follow:

- Political aspect of the conflict
- Military aspect of the conflict

### 5.2.1. Political aspect of the conflict

The keywords related to the political aspect of the event under study, the Palestinian membership in the United Nations are: resolution, veto, vote, international law, peace talks, met, meetings. These keywords are present in the two subcorpus. The words veto and vote are associated with the US as they pertain to the importance of the US's veto in the admission of Palestine in the United Nations. As stated by Browne (2014) “ as one of the five permanent members of the Security Council, the United States can play a key role in determining membership in the United Nations. It has a more limited role in determining membership in U.N. specialized agencies. A decision to admit a new member in these bodies is generally made by the entire membership, where each member—including the United States— has one vote”.

From the corpus, it is clear that the US is opposing the Palestinian bid. When reporting the event in the CNN, there is intention to insist on the fact that the Obama Administration is opposing this membership because they think that a Palestinian state would fail to bring peace and stability to the region. And also it will increase the tension and cause permanent instability to the region.

5.2.2. The Military Aspect of the Conflict

The words related to the military aspect of the Palestine-Israel conflict include words related to the agents and methods of violence. The following table presents the lexis related to Palestine and Israel in relation to who is responsible for the violent actions and what are the methods utilized by both sides in doing these actions.

Table 1: Lexis related to violence

	CNN	BBC
<b>Agents of violence</b>	<p>Hamas fighters, militant factions, Hamas, the Islamist group, Israeli Security forces, Israeli Defence Forces, Israeli settlers, Israeli soldiers, IDF, IDF forces, military occupation, military operations, Israeli troops, Israeli assault, Israeli army</p>	<p>Israeli Security Forces, Israeli Defence Forces, Israeli military offensive, Illegal occupation, colonial occupation, militant group, militant Hamas movement, militant Islam, Israeli troops</p>
<b>Methods of violence</b>	<p>Israeli bombing, act of terrorism, stone throwers, airstrikes, terror attacks, grad rockets, Hamas rockets, missiles, violence, lethal weapons, nuclear</p>	<p>Hamas rocket attacks, violence Palestinian rocket fire</p>

Referring to the above table, concerning the agents responsible for violence between Palestine and Israel, the BBC list shows rather a negative image of Israel as it uses words like occupation, illegal, offensive, colonialial to refer to Israel, however, less negative image is associated to Palestine as it is referred to as militant groups.

For the CNN, there is a neutral image of Israel as the list includes words such as militant factions, Israeli Security forces, Israeli Defence Forces, Israeli settlers, Israeli soldiers, IDF, IDF forces, , military operations, Israeli troops. These words are often used in relation to Israel and they do not reflect positive or negative connotations. In the other hand, sometimes Israel is referred to as military occupation, Israeli assault which has negative meanings. The Palestinians are referred to as fighters and military factions. In the CNN list, there is a use of various ideological items to name Hamas. The most frequent name is the ‘Islamist’ group in order to focus on Hamas’s Islamic origin and principals.

The language surrounding the Israeli military is important as in both networks, the CNN and BBC, Israeli military is referred to as Israeli forces. In this way, the power of Israel is highlighted. Even the Israeli military actions are referred to as offensive which also denotes the invasive power of Israel and implying a position of strength. In fact, the approach adopted in the CNN is to justify the Israeli negative actions by giving reasons for such actions. It is the Israeli troops, the legitimate defense of a nation under attack. Israelis are not terrorists or murders instead their military force has to protect the nation’s legitimate interests.

The second list includes the methods of violence related to the type of operations as well as the weapons used to carry out the act of violence, in the CNN corpus, as it is an Islamist group, Hamas’s actions of violence are referred to as ‘terrorist actions’. Indeed, the Palestinian factions are described as terrorists who conduct violent actions against Israel. The words terrorist and terror attacks are present only in the CNN corpus. This can be explained by the fact that CNN wants to reflect the image of Hamas as a radical Islamist group seeking to destroy Israel and this is the message this network seeks to spread to its audience.

Another point should be stressed is the reference to Iran and its nuclear weapon provided to Palestine in the CNN corpus. In fact, the reference to Iran nuclear weapons can reveal another major argument which can explain US’s opposition to Palestinian membership. The US fears from the ally between Palestine and Iran which will harm the security of America and Israel.

As for the BBC list, there are only hints to Palestine rockets and this explains the neutral position of BBC concerning the Palestine-Israel conflict. The BBC remains objective and reports in ways that enable its audience to make their own assessments about who is doing what to whom.

5.3. Naming Palestine

To better understand the ideological traces of the news, there must be an examination of the way the networks characterize the two sides Palestine and Israel. The focus in this section will be on the naming choices of Palestine. The following table shows the ways Palestine and its officials were referred to in the two networks.

Table 2: Naming Palestine in CNN and BBC corpus

Naming choices	Extreme Formal	Neutral	Ideological and stereotypical naming
	Palestinian Leader Mahmoud Abbas	Hamas	Hamas, Fatah Islamist rivals
	The Palestinian Authority Mahmoud Abbas	Mahmoud Abbas	Hamas, the dominant group
	The Palestinian Leaders	Abbas	Hamas fighters (cnn)
	President Abbas	Palestine	Hamas, the dominant of two Palestinian political group
	The Palestinian authority	Fatah	Hamas, the main face of Palestine (cnn)
	Palestinian government	Palestinian	Militant factions
	Palestinian Ambassador	Abu Mazen	Hamas rockets
	Palestinian Liberation Organization		Hamas terrorists’ attacks
			Fatah (secular, peace-oriented, non-violence)

The analysis of naming choices indicates that the two networks are extremely neutral or neutral when dealing with Palestinian Authority or Mahmoud Abbas, but when dealing with Hamas, the naming choices in the two networks are ideological or stereotypical. In addition, a significant association was found among the two networks in mentioning the political leaders of both sides either by name or title :the Palestinian Prime Minister Abbas (245 times) more often than the Israeli Prime Minister Netanyahu (65 times) . In fact, for the CNN, Abbas is mentioned almost four times as often as Netanyahu. For the BBC, Abbas is mentioned almost three times as often as Netanyahu.

The frequent reference to Hamas more than Fatah in the corpus is significant as illustrated in figure. For the CNN and BBC, this fact reveals that these networks place the agency, causality and responsibility on Hamas and its destroying actions. Such representation is ideologically present because the CNN and BBC networks blame the ‘Islamist party’ for the terrorist attacks on Israel. Hence this islamist movement is blamed for the failure of the peace process and negotiation between Palestine and Israel.

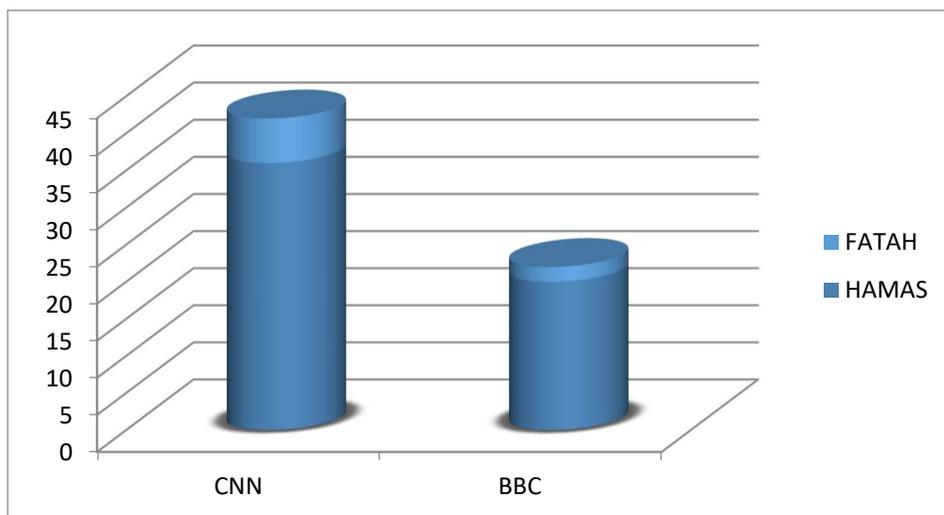


Fig3: Reference to Hamas and Fath in the two networks

Hamas as an Islamist movement is portrayed as a negative entity in the American media. In the CNN corpus, Hamas is responsible for 'war crimes, sending missiles, creating fear and trauma for millions of Israelis'. However, Fatah is depicted as a secular, peace-oriented, non-violence committed political party. This dichotomy between the two political parties Hamas and Fatah who are battling for dominance within the Palestinian community reveals the division in the Palestinian community that the American media try to foreground.

### VI. CONCLUSION

while the findings overall support two different orientations regarding this issue, viz. that CNN sides with a position of refusal on this bid, and the BBC with a rather neutral position, it would seem that the question is more complex than that. Indeed, there are also areas which are shared between the two channels; there are cases where CNN tries its best to show neutrality; there are also instances where the BBC shows some sympathy with the Palestinians, without altogether making it so flagrant that the Israeli side would take it very negatively. This is not very surprising, it would seem, as influential news stations also care about an image of objectivity and neutrality in spite of the editorial lines they might have and the agendas that guide them. By way of illustration, some of the findings in this study were to the effect that Palestine can be 'doer', judging by certain material processes found in the corpus. But on closer scrutiny, it was found that the verbs used were not very strong verbs of acting. When this was compared with the verbs used about Israel or the USA, most of these verbs were found to be related to strong actions, which again show the hidden agenda of the channel in spite of pointing to a sense of objectivity on the surface. In addition to this, the findings pertaining to verbal processes corroborate this complex pattern whereby, for example, the two stations emphasize the US power and its influence in the question, and where the CNN, for instance, attempts to foreground its neutrality through using verbs such as 'tell' and 'say' when reference is made to Palestine.

So while the general patterns appear to be bias and neutrality, relating to the CNN and the BBC respectively, one would need to be more careful in handling the data, and to lay bare the intricacies of media discourse, first in terms of description (the lowest level in Fairclough's model), then in terms of the following, more complex stages, namely explanation and interpretation.

In addition, particular choices and selections are made by power holders at the level of lexis and vocabulary. The lexical categories to use or not to use are selected according to the ideological viewpoint of the network which is often adjusted by power elite. The specific lexis used by the networks has as objective to reflect a specific representation. In the case of the CNN network, the positive representation of the in-group and their allies typically applies to representing the Israeli side. One strategy adopted to mitigate Israeli acts is justifying these acts under the excuse of defending the right to exist.

The Palestinian is referred to as the out group who is represented negatively. The most obvious example which emphasizes Palestinian bad actions is the reference to Hamas terrorists' attacks. This is further emphasized by ignoring the reference to the main reason for the conflict which is the Israeli illegal occupation of Palestinian territories. In fact, in the CNN network, Hamas is described as the Islamist movement responsible for the terrorist attacks on Israel, then, this movement is referred to as 'the main face of Palestine' in order to persuade the audience of the Palestinian bad actions and generalize the image to Palestine

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# *Strengthening Professionalism Teacher A Necessity*

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**Abstract** – The techno-science era is an era that touches the various joints of life. Therefore, it is the duty of educational institutions to produce outsiders who are ready to face the dynamically developed era. Improvement in the field of education that includes all systems in it is an inevitability. This paper tries to rationalize the importance of strengthening teacher professionalism as well as the efforts that need to be made for it. One of these efforts is to strengthen the professionalism of educators to be more ready to take part in their duties that prepare learners to live in their day. Because we realize that the professionalism of a teacher is usually characterized by the effective implementation of his work.

**Keywords** – Strengthening, teachers, professionalism, education.

## I. RATIONAL

The pace of development of science and technology in various fields will continue and will be unstoppable. Innovations and breakthroughs will spark competition in various fields. Like it or not, these developments will touch various aspects of people's lives, including the needs of the world of work. This shows that nowadays we live in a very fast-changing world. Advances in science and technology have had an unpredictable impact on change. Such changes will affect the needs and activities of each individual to live in his or her day. The logical consequences of knowledge and skills need to be adjusted in the face of the challenges of the times. In that regard, educational institutions are required to prepare educational outsiders to be able to adapt to the developments that are and may occur. In other words, this development must be able to be responded to by the world of education in earnest if it does not want its graduates to be spectators of different progress than before. Graduates resulting from an educational institution must be eligible for the ability to succeed with the work they face. Freire (2000) in this case reminded,

If people are not able to critically see the themes of their time, thus unable to actively handle reality, they will be carried away by the currents of change. They see the times are changing, but they are immersed in change and can't see the dramatic meaning of that change.

With that in regard, effective and innovative learning must be done by implementing the necessary changes. The future is certainly not the same as the present. The complexity of the problems and phenomena that will occur will be so diverse that all of them need to be available to today's learners. The problem is, what is skills that the younger generation needs to be successful in this rapidly changing world? Furthermore, the problem that accompanied is what competencies teachers need to effectively be able to teach the knowledge and skills their students need to be ready for the growing age? Thus, teachers must be fully aware that the students are ready to pick up and take part in their time, a little bit will be influenced by the results of education and learning. It was stated by Stronge, Tucker, and Hindman (2004:7) in his Handbook for Qualities of Effective Teacher that “*Effective teaching is a*

*continuous learning process, and each school year brings about changes that require competent teachers to adapt. Changes can occur in terms of students, curriculum, development issues, colleagues, administrators, financial issues, health and safety, families, communities, and several other influences on the daily lives of teachers.”* It is this kind of perspective that has triggered many countries in the world that reform curriculum, teaching, and assessment with a view to preparing for a better education that is in line with the needs of learners and higher education that they may be pursued.

Concerning the teacher who is a key factor or spearhead in maintaining and improving the quality of education and its results, the effort to identify priorities to improve the quality of the education system and teachers must be a must be done to realize it. Efforts to improve the quality of teachers are in place when directed to the formation and development of professionalism. This is based on the assumption that professional teachers will be able to respond to the development of science and technology as well as the needs that arise from the developments that occur in society. As Stronge, Tucker, and Hindman (2004:7) put it, teachers will adapt to change and successfully navigate class complexities that largely stem from their own personal abilities and experiences. This personal ability and experience can be classified as a prerequisite for teaching, namely, the competencies it has.

This issue we discussed, however, needs to be answered when this with real action as a logical consequence of the condition... Teacher as one of the determining factors of the success of the education process and with the professional position he held, of course, always follow the developments that occur that are followed by efforts to always adapt to the development. This means that teachers should continue to strive to improve the knowledge and skills needed to respond to these developments. Richard and Farrell (2005) stated that *“Teachers during their careers have different needs at different times, as well as the needs of the schools and institutions where they work will change over time. Pressure for teachers is the necessity to always even their knowledge.”*

This suggests that teachers should be better prepared and supported in dealing with the problems that arise as a result of these developments. More than that, teachers must be creative and able to make innovations in the learning and education process. The habit of carrying out tasks routinely without creativity and breakthrough, it is time to leave, because teachers are not amateur positions, but professional positions. Therefore, teachers must be equipped and equip themselves with new skills, including things that may not have been familiar with them or have never been taught before. In this regard, a teacher has a necessity to constantly try to improve his knowledge continuously. Of course, it is also the duty of competent parties to find strategies to improve the quality of teachers, so that teachers can carry out their duties properly and under the needs of their times. Besides, the state government must put teachers in the most important position to advance the nation manifested in a real policy. Appreciation for teachers who have done their duty to educate and teach should get serious attention.

Learning from other countries related to the implementation of education and coaching and improving the quality of teachers is certainly not prohibited, but the formulation of policies must be adjusted to existing conditions. As one of the comparative study materials on quality learning we can study the reference stated by the Commission on Teacher Credentialing California (2009), on California Standards for the Teaching Professional, namely

*The quality of teaching relates to what matters most to the development and learning of students in schools. Teaching itself is a professional endeavor. Effective learning is driven by an understanding in the field and a commitment to all students and their families. Good learning requires knowledge, skill, artistry, passion and commitment. Effective teachers will integrate the following: (1) ethical concern for children and society, (2) broad subject matter competence, (3) selected pedagogical practice seriously, and (4) depth of knowledge about students them, including knowledge of the child and adolescent development and learning, understanding of their respective strengths, interests and needs, and knowledge of their families and communities.*

The quote above gives an idea that professional teachers are attached to several competencies that are interconnected in supporting their professional duties. In this case, the teacher must be willing and able to make changes in the learning process that he/she implements which is solely aimed at the efforts of debriefing and developing the competencies of the learners. as an example, Schleicher. ( 2012) states that during this time,

*Traditionally way of mathematics is often taught in the world of abstract mathematics, using formalism first, removed from the authentic context, and discouraged to students who do not see its relevance--- for example, students are taught arithmetic techniques, then given many arithmetic calculations to complete, or they point out how to solve a particular type of equation, then given many similar equations to solve. Thus, in the 21st century, students need to have an understanding of the basic concepts of mathematics, they must be able to translate new situations or problems they face into forms that show*

*the relevance of mathematics, make problems appropriate to be processed with mathematics, identify and use relevant mathematical knowledge to solve mawrong, and then evaluate solutions in the context of actual problems. Furthermore, their creativity can be enhanced by designing new solutions, and even new problems with non– standard solutions.*

Efforts to improve the quality and professional teachers, certainly not limited to efforts made only by teachers personally, the government -- including local governments -- as one of the elements that are also responsible for teachers should be able to determine comprehensive policies related to improving the quality and development of teacher professionalism. Education and teacher issues should be a concern and earn a major place in the development program launched on each budget period. Complaints about the quality of graduates should not be solely directed at teachers and educational institutions, as the real problem is not limited to teachers and schools. The problem of placement of teachers proportionally needs is the responsibility of the Government (local) including the problem of facilities and infrastructure that must be available evenly in each school following the needs of learning. Thus, the role of the Government is not only limited as a policymaker but must be followed by completing the needs of the implementation of education as a logical contingency of a policy.

We cannot deny the current reality that the covid-19 pandemic era has brought its own wisdom to the world of education. This condition has dismantled a reality that has never been cared for, namely many teachers turn out to be "stuttering" when having to teach their students online. The wide selection of learning application tools available is not able to maximize its use so that the learning process runs as is following the ability and skills of teachers in using existing online learning applications. While the tendency to teach students face-to-face still stands out because it is considered more effective. The fact of the meaning of the effectiveness of a learning process is still understood to the extent that the achievements of students' learning outcomes are measured from the evaluation of learning outcomes carried out. While the true meaning of effectiveness is not placed properly, namely how to create learning conditions that can teach students.

The stated condition indicates that competencies in the field of information and communication technology should still be of particular concern. The ability of teachers to adapt to the developments in the community has not happened as expected. Self-development efforts independently do not seem to be a necessity that needs to be done. The attitude of "waiting" and "hoping" for activities carried out by the authorities is still a feature that arises in many of our teachers.

Related to the quality of outside education that is the responsibility of educational institutions will certainly be very concerned if this condition is allowed. Future challenges should be seen as common problems that require comprehensive thinking in dealing with them, including efforts to update the assessment standards used.

## **II. THE CHALLENGES OF THE AGE TO EDUCATION**

We have agreed that era techno-science has now penetrated various aspects of people's lives, both economic, social, cultural, and technological. The tendency of today's people who want to be instantaneous is one of the characteristics that mark it. This shows that there has been a change in the attitudes and needs of the community. This condition should be treated by the world of education by adjusting the external quality of education to the needs of its time, both related to the knowledge, skills, and attitudes that must be possessed by learners. So, in this case, education has a very strategic and important position and role in the sense that education should be able to produce graduates who are competitive and comparative when dealing with the needs of society today and in the future.

Along with that, it is worth remembering that when talking about education, then we will talk about a system not only about teachers but also supporting facilities and infrastructure, as many people highlight. Although in this case, teachers have a central role in the quality of education, teachers will not be able to do more without adequate supporting facilities. Teachers are just one of the determining elements of the quality of outside education. However, teachers still have limitations in maximizing their performance. Therefore, the strengthening of professional ability must still be done on an ongoing basis.

The need for new skills and abilities for learners to be able to adapt in the future is a challenge for educational institutions, Wagner (2010, Bourn, 2017: 76) identifies seven skills, namely:

1. Think critically and solve problems;
2. Collaboration and leadership;
3. Agility and adaptability

4. Initiative and have an entrepreneurial spirit
5. Effective oral and written communication
6. Accessing and lysis information
7. Curiosity and imagination

These seven skills are commonly referred to as soft skills (soft skills)implying the demands of teacher professional competence, namely the necessity to adapt and improve their knowledge and skills to meet the needs of these learners.

Binkley et al. (2010) of the University of Melbourne In the Draft White Paper 1 Defining 21st-century skills on Assessment and Teaching of 21st Century states that knowledge itself is growing increasingly specialized and growing exponentially. Information and communication technology changes the nature of how work is done and the meaning of social relationships. Decentralized decision making, information sharing, teamwork, and innovation are key in today's enterprise. Furthermore, he added that the success of a technician or a professional lies in the ability to communicate, share, and use the information to solve complex problems, the ability to adapt and innovate in response to new demands amid changing circumstances, the ability to marshal. and expand the power of technology to create new knowledge and expand human capacity and productivity.

He said Team has compiled ten must-have skills in the 21st century that are packaged in 4 groups namely:

### **How to Think**

1. Creativity and innovation
2. Critical thinking, problem-solving, decision making
3. Learning to learn, Metacognition

### **How it works**

1. Communication
2. Collaboration (teamwork)

### **Tools to Work**

1. Information literacy
2. ICT Literacy

### **Life in the World**

1. Community - local and global
2. Life and career
3. Personal & social responsibility – including cultural awareness and competence.

What Binkley et al. formulated show that what is needed in education is not only "hard skills", but also "soft skills", including communication and collaboration skills. So, Education not only equips knowledge and skills but also how to form attitudes to be able to create and develop themselves. As quoted by Forde and McMahan (2019: 7) of the OECD (2000) that an effective education system has gone from building routine cognitive skills for lifelong work to learning and developing complex ways of thinking and ways of working.

Thus, although education focuses on skills, it does not mean that knowledge, values, and attitudes are ignored. Precisely these values and attitudes are needed to understand the developments that occur. In this case, the main task of the teacher is how to teach the student to become a learner.

The conditions stated above, suggest that changes in the education model and learning curriculum are things that must be done. A traditional learning model that has been running, it is time to gradually be diverted by innovation in the field of education. The curriculum and learning model that currently applies, should be made a significant improvement.

As a reflection of the importance of this approach, we can weigh what Stehlik (2018) has to say about education in Ireland that the program is recognized in trinity college's Bridge21 program in Dublin, which has been developed to offer a new learning model to secondary schools in Ireland and reflected in the key values of the "innovative team-based education model for the 21st century, is technology-mediated learning". Based on the idea that the main purpose of education is learning to learn, then:

1. Young people should be trusted to learn from each other
2. Building positive relationships is essential for success in education

3. Educational practices must follow the best theory
4. Young people benefit from experience working with mixed team skills
5. Young people grow up being given responsibility
6. Technology is the 21st teaching and learning center (Bridge21 2017)

Some of these are quite relevant challenges and that must be answered for a change in the coaching and education of our teachers today.

### **III. TEACHER PROFESSIONAL COMPETENCY DEMANDS**

The previous description has given us an understanding that the position of teacher is a profession. As a profession, teachers are certainly not attached without going through an educational process. Thus, the position of the profession will in turn become a position that is heavy but "professional" with all competencies attached to it...

Meanwhile, the desire to prepare qualified professional teachers is always a challenge faced by many countries, including Indonesia. Improving the quality of teacher professionalism is expected to bring changes in the readiness of future generations in the face of the future accompanied by the phenomenon of the needs of the growing community.

On the other hand, we see a very rapid change that is different from the previous circumstances in various aspects of life, such as social, economic, cultural, and technological life in various fields, especially communication and information technology that needs to be reached by the world of education. The change is inseparable from the development of science and technology. Therefore, of course, the teacher should not be carried away with the comfort of the traditional learning process that he has been doing. Teachers as educators must improve in line with the changes that occur. This means that the competence of teacher professionalism should be a concern because not all teachers can themselves rise following the changes that occur. Many of them need training and coaching assistance, however, we still assume that professional teachers will be able to carry out learning tasks effectively. Therefore, professional teachers will also be meaningful as effective teachers in carrying out learning tasks.

Related to the effectiveness of the implementation of learning related to teacher professionalism, some research results cited by Stronge, Tucker., and Hindman (2004) showed that the following prerequisites related to effective teachers, namely:

1. Verbal ability of teachers has a positive effect on student learning achievement ( Darling-Hammond, 2000; Haberman, 1995; Hanushek, 1971)
2. Knowledge content measured by majors or minoring in regional subjects or participating in professional development in contributing student learning improvement content (Fetler, 1999; Wenglinsky, 2000).
3. Education and training are strong predictors of the effectiveness of teaching from average grades or test scores (Ferguson & Womack, 1993). For teachers who embrace the concept of lifelong learning, professional development continues in their field results increased student achievement ( Wenglinsky, 2002)
4. Teacher certification, regardless of the type of certification held, the teacher certification program has produced teachers more effectively than their uncertified counterparts (Darling-Hammond, 2000; Darling- Hammond, Berry, & Thoreson, 2001; Goldhaber & Brewer, 2000; Hawk, Coble, & Swanson, 1985).
5. Teaching experience, up to a certain point, affects the effectiveness of teachers, especially in the field of planning, classroom management, questions, and reflection ( Covino & Iwanicki, 1996; Fetler, 1999; Reynolds, 1992).

The prerequisite characteristics confiscated by Stronge, Tucker, and Hindman (2004) regarding effective teachers suggest that a teacher should always be active in participating in various activities related to his duties and creative in developing his professional abilities, especially those related to education and learning activities. The attitude of silence and waiting or 'nrimo' circumstances faced in his place of duty, is not a wise act. On the contrary, teachers should always strive to make the environment faced a challenge to create. Lack or limited condition must be treated as a gift of the Almighty because the shortcomings and limitations are in fact stimuli that will spur us to do. Nothingness and limitations will always exist wherever we are and that will make us think and act to overcome them. Therefore, teachers should be aware that the lack and lack of available facilities is not an obstacle to doing. In that regard, teachers must be able to develop their competencies in utilizing all the potentials in their environment.

#### IV. PROFESSIONAL CAPABILITY DEVELOPMENT

It has been revealed before that today we live in a very rapidly changing world. Advances in science and technology have had an impact on an unpredictable change. Such changes will affect the needs and activities of each individual to live in his or her day. Having the same knowledge and skills as today will not be enough to face the challenges of the future. We must equip it with other knowledge that supports and has a correlation with the future we predicted; A generation ago, teachers could still hope that what they taught would equip their students for life. However, that assumption is no longer significant to do at this time. The rapid economic and social changes that occur today require schools to prepare students to be able to make breakthroughs with their knowledge, even if it is possible to find and create technologies that do not yet exist. Therefore, schools must adequately organize and equip the necessary learning facilities for the benefit of students' learning and learning independently. In line with this, then if we talk about the development of teacher professionalism certainly can not be separated from global development. This is because the teacher's wrong task is to prepare the generation that will live and act in the future. We certainly do not want our generation to be spectators of the changes that occur without being able to participate in the processing and playing a role in it.

Thus, the provision of knowledge and skills by the theme of his time should be a part that must be prepared for the teachers, including the principals. The ability to integrate developments that occur outside the classroom in the learning process in the classroom is a reasonable demand that must be met by teachers who hold professional predicates. Besides, a teacher's professional duties may go beyond his formal duties. Outside the classroom, a teacher may accompany and guide his students on field visits, supervise the study, assist with school organizational functions, and may also serve as a supervisor for extracurricular activities. In some education systems, teachers can have a responsibility to foster and supervise student discipline. Therefore, the integration of tasks outside of routine tasks must be carried out comprehensively in line with existing educational standards, curriculum, and progress needs.

Contrary to the reality stated above, teachers must have adequate skills in the field of information and communication technology to support their duties as professional teachers. Hightower.et.al (2011) revealed the results of their review of literature from the Center for High Impact Philanthropy (2010: 7) that

*Qualified teachers are lifelong learners in their field of study, teaching with commitment, and reflective of their work. They transfer knowledge of subject matter and learning processes through good communication, have diagnostic skills, understand different learning styles and understand cultural influences, knowledge of a child's development, and the ability to devise a broad array of techniques to meet student needs. They set high expectations and support students in achieving their learning goals. They build an environment conducive to learning, and resources available both outside and in the classroom.*

Based on the results of the Hightower.et.al review, we can propose several characteristics related to the development of professional teachers, namely:

1. Teachers should understand the importance of integrating the development of science and technology as well as the needs of the community in the learning process.
2. Teachers should get creative opportunities to build a learning model needed in their time.
3. Collaborating between teachers and other competent parties needs to be done to develop educational activities in schools.
4. There needs to be an emphasis on teachers' skills in managing learning in schools.
5. There needs to support from related parties in the development of professional teachers, both about funds and facilities.
6. The orientation of coaching carried out on teachers should be oriented towards the development of future needs.
7. Education programs should include mastery of information and communication technology programs to access and process the latest information for the benefit of education and learning.

Referring to the exposure expressed in advance, the development program that supports the improvement of quality and professional teachers is time to get more serious attention from all competent parties. The desire for qualified and professional teachers by the community is not excessive, but it is natural. In line with that, innovation in the teacher professional education model, both pre-task and in-task, becomes an important thing to do. Therefore, research related to efforts to strengthen the professional performance of teachers becomes a necessity if it cannot be said as a necessity. Development efforts should be based entirely on the needs of teachers in carrying out their professional duties so that they are not based on forecasts packaged in a policy.

In this case, we must conduct evaluation research on teacher performance. For that purpose, it is necessary to use various instruments to obtain comprehensive results on teacher abilities (Goe et al., 2008; Peterson, 1987; Rockoff and Speroni, 2011, in the OECD, 2013: 39), although this cost a considerable fee because it had to involve a lot of resources and stakeholders.

The Bill and Melinda Gates Foundation in the United States has funded a three-year study, the Measures of Effective Teaching (MET) Project, to help "establish and test effective teaching measures to find out how evaluation methods are best used to inform teachers more about the skills that make the most effective" The foundation has released its third and final report of the MET study in early 2013. The study developed and tested various teaching sizes to determine how such measures could be used to predict student performance. More than 3,000 teachers in six U.S. states voluntarily recorded their lessons. Teacher effectiveness is assessed using three types of measures: classroom observation, a student opinion survey, and student achievement progress.

Thus, in this case, the needs of pedagogical and non-pedagogical must be known first before a program is carried out. The Center for Education Innovations (CEI) presents several considerations in the teacher professional development program, namely: *Professional development programs should take into account existing teacher experience, knowledge, and professional interests while providing opportunities to apply new concepts into the classroom. ... participation explores how professional development can be achieved through online learning, direct collaboration, or mixed learning approaches*

However, this does not mean that the teacher is just waiting or being passive. On the contrary, teachers must actively strive to develop their professionalism in carrying out their professional duties by constantly self-evaluating the learning process they carry out even if possible to innovate in learning proposes. Therefore, self-development efforts by teachers personally as well as efforts that should be continuous and sustainable.

Self-development efforts are meant as stated by Cranton (1996 in Steward, 2009: 234) that "Professional development is a process of critical self-reflection and self-directed learning, potentially leading to the revision of one's assumptions about teaching or a greater perspective on education"

So, consciously, we must be honest that there are still many latent problems that are not raised by many parties except complaints and disappointments against the external education, although we together also know that expressing complaints, blasphemy, disappointment will not mean much without being followed by real actions to overcome the problems faced. Therefore, it should also be if the desire is accompanied by concrete actions in the form of support for the improvement of teacher skills and the implementation of education in schools by all stakeholders. For example, in Norway, which evaluates teacher performance through feedback from students working together between the Union of Education Norway (the largest union of teachers and school leaders in the country) and the Norwegian Student Organization in initiating nationally to development teacher assessment principles and guidelines by students (OECD, 2013:41)

In China, teachers are judged on four aspects of their performance: integrity or professional value; abilities, including skills and competencies (virtues); perseverance; achievements and their students. The emphasis in this evaluation tends to be on the professional integrity of the teacher and the student's learning outcomes.

Teachers are evaluated by an elected task force that includes union representatives, party leaders, teachers, and other elected officials. The task force looks at teacher self-assessment and peer and parent reviews to assess a teacher's integrity and ability. For perseverance, teacher attendance records are reviewed. To assess teacher achievement, student outcomes are reviewed, and any awards or certificates the teacher has received, all papers he or she has published, and teacher participation in research projects are considered.

Assessment results inform a range of decisions about a teacher's future career, including salary and professional degrees, and are added to the teacher's portfolio as evidence of teaching experience. The Director of Teaching may also use this information to reduce a teacher's workload if he or she is identified as underperforming or even to move the teacher to another post.

On the other hand, teachers must also understand that students have different learning styles. Various research results have shown that the importance of adjusting the learning style of learners and this is also the task of the teachers. This means that teachers and schools must make innovations in the implementation of education. It is worth realizing that the success of a learner is not solely born from teachers who are categorized as "smart" but from the process of how a teacher can teach his students. The progress and progress of the student are basically very determined by the student himself.

## V. RECOMMENDATIONS (STRENGTHENING TEACHER PROFESSIONALISM)

Planning professional development to meet the needs of teachers in the face of the challenges of developing science and technology advances and improving student achievement is a complex task. Therefore, the development of teacher professionalism must be a serious effort to be made, both by private teachers and those responsible in the field of education. It's time to abandon the traditional coaching-routine that produces an instantaneous attitude to teachers. Today, all that is needed is new thinking and breakthroughs that are expected to provide more effective products in the world of education and learning. So, it is not just training that then provides a certificate as a professional teacher without being followed by the competencies inherent in it. It would be sadder if it was only oriented towards obtaining certification allowances. It's something that all of us would never expect if this was the goal. The latest information states many teachers have been declared graduated and certified professionals who show no meaningful change. The Teacher Enhancement Education and Training (PLPG) program in Indonesia, which has been carried out on teachers at considerable cost in recent years, has shown no significant results for improving the quality of learning in schools.

Teacher development and development should not stop just obtaining a professional certificate, but must be continued with efforts to foster and sustainable development. The challenges of the development of science and technology will never stop. The inventions and development of technology products continue without being able to be stopped by anyone. Therefore, improving the quality and development of teacher professionalism is an inevitable necessity so that the ability and quality of teachers following the developments that occur, both through pieces of training and education in the position.

It must be acknowledged that in fact, the Government has done many ways to create professional teachers. Among others, it requires teachers to be at least qualified for undergraduate education (S1). It also requires teachers to attend and conduct various seminars, workshops, conduct class action research, and write in journals associated with promotion requirements. Especially concerning research and writing, it is unfortunate that this has not received serious attention from many teachers for various reasons. One of the reasons raised in the demand for the number of teaching hours required to obtain certification allowances has taken their time to work on others. However, there are also many "who feel" that they do not have the ability to do research and write in journals that have qualified "professional teachers". On the other hand, there is a condition of confusion of teachers to obtain the legality of the resulting work, both in the form of scientific research and writing. This obscurity plays a role in burying the teacher's motivation to be creative in carrying out his functional tasks when this should not be the case. However, it must be recognized that self-coaching and self-development have not been done by teachers. The tradition of "instant" is still more coloring the teacher's daily life in carrying out his duties. Teaching routines take precedence over the development of professionalism.

These things are a real picture of the current state of our education. Of course, we must not stand by accepting this fact. The needs and challenges of our students in the future should be the basis of our orientation in developing various programs to improve and improve the quality of education. Teachers, of course, feed one of the subjects that need attention, especially to competence, and commit to carrying out the task of educating and teaching. Equitable placement of teachers is also a part that should be of concern. Lameness of terms of the number and needs of teachers in schools can be a trigger for the inequality of external quality produced. Un results that are said to be used for mapping the quality of education should not stop by only looking at the results of education in schools, but should also concern mapping the needs of teachers, especially in remote and isolated areas. The right man in the right place should be the main consideration rather than nepotism and primordial narrow in the menem-patkan teachers.

The future is not ours, but it is the time of our children and grandchildren. Daed Yoesoef once stated, "This country is not the legacy of our ancestors, but is the deposition of our children and grandchildren to us". Therefore, education and coaching must be directed to the future. We must make the future the present. Hopefully.

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# *Role Of Mahalla's Participation In The Development Of Education*

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**Abstract** – This article shows the development of education and upbringing of young people in the area, based on the participation of older people, which can improve the outlook and spirituality of young people.

**Keywords** – Family, Community, Society, State, Upbringing, Education, Neighborhood, Elderly People, Worldview, Pedagogy, Thinking, Education, Question And Answer.

## I. INTRODUCTION

Modern pedagogy requires the establishment of teaching based on improving the relationship between teacher and student, especially on the basis of increasing student activity. On this basis, the teaching process of teaching is central. Because pedagogical communication can be an important factor in student education.

The pre-school and primary education stages of youth upbringing are the most relevant and basic. At the same time, it is important to pay attention to the fact that the control over family upbringing and community support is effective. Because the upbringing of the family and society, the views of the nation, the traditions of the mentality have a place in the development of the child.

## II. THE MAIN PART

Family upbringing stems from the fact that the family is the foundation of society. The family has centuries-old strong spiritual foundations. The first concepts inherent in our national ideology, first of all, are absorbed into the minds of children in a family environment. This process is carried out through the teachings of the ancestors, the example of the father, the love of the mother. A healthy family environment is a source of forming a healthy ideology. It should be noted that in the life of the peoples of the East, the concepts of homeland, land, family, parents, children, relatives, in general, loyalty to state independence, respect for man, trust, memory, conscience, freedom have a wide meaning. If a person considers himself a part of the nation, thinks of the nation, and works for its benefit, he will be related to spiritual morality. In general, the issues of creating a healthy family and creating the necessary conditions for a high moral and ethical environment in the family, preparing young people for marriage, ensuring the strength and interests of families, raising healthy children have risen to the level of state policy. At the same time, first of all, the

sanctity of the family and the responsibility of the marriage are the main and the main issues for the future youth, which must be considered in advance for their upbringing.

It can be said that, first of all, the family is an important central cell of society, providing the normative development of society, physical and spiritual upbringing of the younger generation, the natural needs of man - love, affection and communication. Secondly, the Uzbek people's peaceful family relations, religious sources, folklore, the works of great thinkers and enlightened intellectuals of the East contain valuable information, which is a key factor in the development of family upbringing. They can be used effectively in preparing today's youth for family marriage and in the direction of a healthy family life. Third, today the family is a combination of national and universal values in its upbringing.

Along with the family, the role of the mahalla in the upbringing of schoolchildren is invaluable. For example, it is very important to teach a child going to or from school on the street, such as greeting, shaking hands, behaving in front of adults, based on the specific traditions of our people. These are:

- a person traveling in a vehicle greets a pedestrian, a person older than himself, a person walking a person sitting;
- to shake hands with a person who is older than him, to shake hands with him;
- not to suddenly enter the circle of adults from the outside;
- In front of adults they should be in the form of speaking, etc. after they have given the word turn.

In the works of Abu Nasr al-Farabi (873-950), such as "The City of Noble People", "Instructions on Achieving Happiness", "On Achieving Happiness", "Civil Policy", "Aphorisms of a statesman", the origin, purpose and created a philosophical doctrine about its functions. In doing so, man has created a system of scientific knowledge about the role of human communities in the family and society, the state and the family, their management. According to him, human societies and societies are the result of the aspirations of people to meet the material and spiritual needs necessary for their survival and maturity. The role of each person in society has fully demonstrated the role of the family and the community in being creative and destructive.

In his works, Farabi focuses on the human factor, arguing that man alone cannot achieve anything. Only the development of the child in the family, community, and the state as a whole, based on factors such as family morality, the status of the community in society, their level of education, has shown the main factors in the development of children at the state level.

It is well known that the highest qualities of a person are an important element of moral culture. At the same time, the descriptive aspects of a person in such areas as culture, ethics, aesthetics, of course, depend on the theoretical and practical knowledge they receive from the teacher.

As a poet, Abdullah Avloni (1878-1934) wrote about man and upbringing, moral beauty and spiritual wealth, whether it was about old traditions, love or school-education. That is why in his poems the pedagogy of the new age is combined with the didactics of the people. In particular, in the poem "In our country" he condemns the greed of those who squandered money for a living, but did not turn a blind eye to his wealth for the upbringing of children. Or in the poem "School":

The school makes copper gold,  
School makes you a mullah –

by saying that school reveals to man that it is a way of salvation, a deliverance from oppression, injustice, injustice. In particular, his book "Literature" (1915) stands out in this regard. As A. Avloni wrote:

The idea is that if you get a good upbringing,  
The dagger is as sharp as a diamond.

With these words, he was able to show how high the position of an educated person in the development of the family, state and society is.

Addressing the Oliy Majlis on December 29, 2020, President of Uzbekistan Shavkat Mirmonovich Miziyoiev said: "We have set a great goal to build the foundations of the Third Renaissance in our country. we need to create an environment and conditions that provide. At the same time, first of all, the development of education and upbringing, healthy lifestyle decisions, the development of science and innovation should serve as the main pillars of our national idea.

To achieve this goal, our young people must set great goals, create ample opportunities for them to achieve them and provide them with all possible support - the highest priority for all of us. Only then will our children become a great and powerful force that will realize the age-old dreams of our people. " Thus, the role of education and upbringing in the development of young people into educated, highly thinking people has shown that it is necessary to create conditions for them at an early stage.

To this end, we will carry out large-scale reforms on the basis of the idea that "New Uzbekistan - begins at the doorstep, the education system" ... If we take it, we will definitely achieve our goals, "he said, emphasizing the skills and abilities of the older generation in education.

Indeed, the most perfect way to educate young people is to teach in school. If the child is given knowledge and additional reinforcement work is done in a timely manner, it will become solid knowledge. this requires the effective use of habits inherent in our mentality.

The role of the mahalla citizens' assembly in educating the youth, recognized by the humanity of the Uzbek people and the head of our state, is invaluable. The essence of this is seen in the control of the child with the participation of elderly veterans of the neighborhood, through the extensive use of methods to test their knowledge.

It is known that schoolchildren are in different categories, that is - curious, aspiring, innovative, and vice versa. Each neighborhood citizens' assembly now has its own father's teahouse, recreation area.

To students who are coming to class by adults:

-Where are you going?

-Where are you from? The very readiness of the child to answer the question leads to a logical approach to their reading.

With these two questions shown in the first stage, it is possible to motivate the child to read. For example, where are you going? After the question, what subjects do you teach today, what topics do you teach today? What topics did you cover in the last lesson? Based on the answers received from them, the active reader can be encouraged by the words - "Barakalla, thank you father." Where are you from "What subjects did you learn today, and what did you learn?" - his answer based on the question - firstly, he remembers a new topic, and secondly, as soon as he remembers the previous topic, the topics covered become a solid knowledge as soon as it is repeated in his brain. The advantage of this method is that the student is alert, preparing both at the end of the lesson and before going to class in order to remember the topics covered when he sees the adults.

It is known that the citizens of our country know the elderly who have lived in the area where they live. Every old man encouraged them to read well when he saw the young. Because they knew from the written legacy of their past that governing the state through study and working in enterprises or organizations would be effective. In this regard, the President said in his Address - "It would be expedient to increase the number and enrich the content of the program" Father's word - the eye of the mind "on our central TV channels, as well as to create new programs such as" Advice of the Enlightened "and" Gurung in the neighborhood. " he pointed out. Indeed, it is possible to facilitate the education of young people by developing their spiritual outlook.

Experience shows that the presence of a knowledge-oriented idea in the attitudes of older people towards school children improves the interactions of young people with the elderly. If the question-and-answer dialogue of the elders about the school and the sciences is established in relation to the child, the descriptive aspects of the student, who is a participant in it, will develop in the future, such as managerial, administrative.

In order to increase the tourism potential of Uzbekistan, in connection with the development of "Obod Qishloq", "Obod Mahalla", etc., it will be useful for the elderly to have seats at the entrances to their homes. Since it is on the edge of the sidewalk, it is very convenient for the elderly to relax in this seat while communicating with the young.

### III. CONCLUSION.

In conclusion, ensuring the participation of the elderly in the development of education in educating young people, by paying attention to this, will be an important factor in raising both knowledge and worldview, as well as spirituality in students.

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# On A Cauchy Problem In A Hilbert Space With Operator Coefficients

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**Abstract – This article provides feedback on the operator coefficients of the Cauchy problem in the Hilbert phase.**

**Keywords – Function Of Scalar Argument, Generating Vector, Inverse Differentiation.**

Consider the following Cauchy problem in Hilbert space  $H$

$$\frac{d^n u(t)}{dt^n} + \sum_{k=1}^n A_k(t) \frac{d^{n-k} u(t)}{dt^{n-k}} = f(t), \quad (1)$$

$$\left. \frac{d^k u(t)}{dt^k} \right|_{t=0} = u^{(k)}(0), \quad k = 0, 1, \dots, k-1, \quad (2)$$

Where  $u(t), f(t)$  – scalar argument functions  $t \in [0, T]$  with values in  $D(A) = \cap D(A_k(t)) \subset H$ ,  $A_k(t)$  – generally speaking, linear unbounded operators acting in  $H$ . As is known [1], such problems are usually ill-posed in the classical sense. Therefore, we will investigate for conditional correctness.

Previously, such a problem for “l-correctness” was considered in [2]. In this work, the conditional stability is estimated in another way.

Let be  $H$  - separable Hilbert space. Let us recall some concepts that we will use in what follows.

The decomposition of unity is a one-parameter family of projecting operators  $E_t$ , given in a finite or infinite interval  $[\alpha, \beta]$  and satisfying the following conditions:

- a)  $E_\lambda E_\mu = E_s \quad (S = \min \{ \lambda, \mu \})$ ;
- b) in the sense of strong convergence  $E_{\lambda-0} = E_\lambda \quad (\alpha < \lambda < \beta)$ ;
- c)  $E_\alpha = 0, E_\beta = I$ .

Having an interval  $\Delta = [\lambda', \lambda''] \subset [\alpha, \beta]$ , we will be the difference  $E_{\lambda''} - E_{\lambda'}$  denote  $E_\Delta$ .

The spectrum of a self-adjoint operator is called simple if there is such a vector  $g \in H$  (generating vector), which is dense in  $H$  linear span of a set of vectors  $E(\Delta)g$ , Where  $\Delta$  runs through the set of all intervals on the number axis.

Let the operators  $A_k(t)$  in equation (1) have strongly continuous derivatives up to the order  $n - k$  ( $k = 1, 2, \dots, n$ ) inclusive. To equation (1) we apply  $n$  times the inverse differentiation operator

$$u(t) + \frac{1}{(n-1)!} \left\{ \int_0^t (t-\tau)^{n-1} A_1(\tau) u^{(n-1)}(\tau) d\tau + \dots + \int_0^t (t-\tau)^{n-1} A_n(\tau) u(\tau) d\tau \right\} =$$

$$= \frac{1}{(n-1)!} \int_0^t (t-\tau)^{n-1} \cdot f(\tau) d\tau + \sum_{k=0}^{n-1} \frac{t^k}{k!} u^{(k)}(0).$$

In each integral of the last equation, the derivatives  $u^{(k)}(t)$  we transfer to other factors. Then we get

$$u(t) + (Nu)(t) = \varphi(t), \quad (3)$$

Where

$$(Nu)(t) = \int_0^t N_1(t, \tau) u(\tau) d\tau,$$

$$N_1(t, \tau) = \frac{1}{(n-1)!} \sum_{m=0}^{n-1} \sum_{k=0}^m (-1)^{k+m-1} \frac{C_m^k}{(n-k-1)!} (t-\tau)^{n-k-1} A_{n-m}^{(m-k)}(\tau),$$

$$\varphi(t) = \frac{1}{(n-1)!} \int_0^t (t-\tau)^{n-1} f(\tau) d\tau + \sum_{k=0}^{n-1} \frac{t^k}{k!} u^{(k)}(0) +$$

$$+ \sum_{l=1}^{n-1} \sum_{k=1}^{n-l} \sum_{m=1}^k (-1)^m \frac{t^{n+m-k-1}}{(n+m-k-1)!} A_l^{(m-1)}(0) u^{(n-l-k)}(0).$$

Suppose now that there is a constant self-adjoint completely continuous operator with simple spectrum such that

$$\|S\| < 1, \quad \|SN_1\| \leq M, \quad \|SN\| = \|NS\| \leq 1. \quad (4)$$

By condition  $S = \int f(\lambda) dE_\lambda$  and  $u(t) = \int u(\lambda, t) dE_\lambda g$  in  $D(S)$ , Where  $g$  – generating vector.

We will assume that  $|f(\lambda)| \geq \lambda^{-1}$ , then the following holds.

Theorem. Let be  $\|\varphi(t)\| \leq \varepsilon$  and for some  $a, c > 0$

$$|u(\lambda, t)| \leq c \cdot \lambda^{-a}.$$

Then

$$\|u(t)\| \leq 2c^{k_\varepsilon + a} \cdot (2k_\varepsilon \cdot \varepsilon)^{\frac{a}{k_\varepsilon + a}},$$

Where  $k_\varepsilon$  equation solution  $(k!)^{-1} = k \cdot \varepsilon$ .

Evidence. From equation (3) after applying the operator  $S$ , get

$$Su(t) = A(t) \cdot u(t) + S\varphi(t), \quad (5)$$

Where  $A(t) = N(t) \cdot S$ .

We apply to equation (5) the operator  $S$  :

$$S^2 u(t) = S A(t)u(t) + S^2 \varphi(t).$$

Hence, taking into account (5)

$$S^2 u(t) = A(t)S u(t) + S^2 \varphi(t) = A^2(t)u(t) + [A(t)S + S^2]\varphi(t).$$

To the last equality we apply again the operator  $S$

$$\begin{aligned} S^3 u(t) &= A^2(t)S u(t) + [A(t)S^2 + S^3]\varphi(t) = \\ &= A^3(t)u(t) + [A^2(t)S + A(t)S^2 + S^3]\varphi(t). \end{aligned}$$

By doing the same  $k$  once we arrive at the following equation

$$S^k u(t) = A^k(t)u(t) + \left[ \sum_{l=1}^k A^{k-l}(t)S^l \right] \varphi(t).$$

Hence, using (4), we obtain

$$\|S^k u(t)\| \leq \|A^k(t)\| \cdot \|u(t)\| + k \cdot \varepsilon \quad (6)$$

Applying the Cauchy formula, taking into account (4), it is easy to verify that

$$\|A^k(t)\| \leq (Mt)^k \cdot (k!)^{-1} \leq (k!)^{-1}.$$

Now if  $c$  is such that  $\|u(t)\| \leq 1$ , from (6) it follows

$$\|S^k u(t)\| \leq 2k\varepsilon. \quad (7)$$

Hence we conclude for a fixed  $\lambda_0$

$$\int_{|\lambda| < \lambda_0} |u(\lambda, t)|^2 (dE_\lambda g, g) \leq 4k^2 \varepsilon^2 \cdot \lambda_0^{2k}. \quad (8)$$

Really,

$$\begin{aligned} \lambda_0^{-2k} \int_{|\lambda| \leq \lambda_0} |u(\lambda, t)|^2 (dE_\lambda g, g) &\leq \int_{|\lambda| \leq \lambda_0} |\lambda|^{-2k} |u(\lambda, t)|^2 (dE_\lambda g, g) \leq \\ &\leq \int \lambda^{-2k} |u(\lambda, t)|^2 (dE_\lambda g, g) \leq \int |f(\lambda)|^{2k} |u(\lambda, t)|^2 (dE_\lambda g, g) \leq 4k^2 \varepsilon^2. \end{aligned}$$

On the other hand

$$\int_{|\lambda| > \lambda_0} |u(\lambda, t)|^2 (dE_\lambda g, g) \leq c^2 \int_{|\lambda| > \lambda_0} |\lambda|^{-2a} (dE_\lambda g, g) \leq c^2 \cdot |\lambda|_0^{-2a} \int (dE_\lambda g, g) \leq c^2 \lambda_0^{-2a}.$$

From here and from inequality (8) we obtain:

$$\|u(t)\|^2 = \int |u(\lambda, t)|^2 (dE_\lambda g, g) = \left( \int_{|\lambda| \leq \lambda_0} + \int_{|\lambda| > \lambda_0} \right) |u(\lambda, t)|^2 (dE_\lambda g, g) \leq 4k^2 \varepsilon^2 \lambda_0^{2k} + c^2 \lambda_0^{-2a}.$$

Finding the optimal  $\lambda_0$  (equating the terms on the right-hand side of the last inequality) we obtain the statement of the theorem.

Comment. It should be noted that from the equation  $(k!)^{-1} = k \cdot \varepsilon$  follows that  $k_\varepsilon \rightarrow \infty$

at  $\varepsilon \rightarrow 0$ . Hence, it is easy to see that

$$c^{\frac{k_\varepsilon}{k_\varepsilon+a}} \cdot (2k_\varepsilon \cdot \varepsilon)^{\frac{a}{k_\varepsilon+a}} \rightarrow 0 \text{ at } \varepsilon \rightarrow 0. (*)$$

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# *Student Perception Of The Use Of Remote Control Application In Guidance On Completion Of Lecture Assignments Learning Evaluation*

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**Abstract** – This study aims to describe students' perception of online-based learning with remote control applications. The research method used is a descriptive method, with a sample of 40 students of the Indonesian Language and Literature Education Study Program. Research instruments use questionnaires and interviews. The results showed that students' perception of online-based learning with remote control is very positive and this learning model provides a very significant learning experience and can improve students' understanding of the courses taught.

**Keywords** – Perception, Remote Control,

## I. INTRODUCTION

The increasing use of the internet as a medium of learning online is basically part of the advancement of science and technology in the field of information and communication. Several studies have revealed that pure online learning has been on par with face-to-face teaching ineffectiveness, and mixed approaches are more effective than teaching offered entirely in face-to-face models (Toyama cs, in Hurnult, 2018: 35). Hurnult (2018) also edited terras, Chiasson, and Sansale's research (2012) which stated that mixed learning--now known as blended learning approach—is considered an effective method of learning among students in the field of teacher education, course instructor involvement, media elements, and overall learning experience. Furthermore, Hurnult also edited the results of Kennedy and Archambault's research (2012) which revealed that online education continues to gain momentum as the preferred method of higher education. Another study also conducted by Fitriana (2017) revealed that learning with a blended learning model of learning activities is higher than face-to-face.

The results of the research presented above give an idea that learners are comfortable with learning with a virtual learning approach because it is considered more interesting. However, the results of Hurnult's research do not reveal how online learning techniques are done, but only reveal that learning is done with a mixed face-to-face approach and online.

Based on these things, this research tries to develop a Blended Learning model by using remote control application in the implementation of online-based learning to improve understanding and meaning by learners. The development of the blended learning model is expected to further improve the activities of learners. However, in this study only focused on the perception of learners towards online learning with remote control instruments, because so far online-based learning many only use an asynchronous approach, such as a caption or video impressions, so that learners tend to be passive or more receptive. This is characterized by interaction in learners occurring only one way without the opportunity to ask questions or discuss. So if there are

things related to learning materials that are poorly understood or require further explanation, you have to wait for the opportunity to be face-to-face. About these matters, the purpose of this research is to find out the perception of learners towards blended learning models using the remote control.

## **II. LIBRARY REVIEW**

The development of a blended learning model by using the remote control in online-based learning sessions is based on the idea that remote control itself is one of the features that allows its users to connect to a remote computer as if they were sitting face to face, thus resulting in a more open interaction process and can reduce psychological constraints compared to face-to-face. In this way, it is expected that there will be interaction and collaboration between students and educators. Thus, the use of remote control itself can be understood as conditioning in a learning process.

The learning activities presented are basically an effort to create a condition so that there is a learning process by providing a stimulus that is considered as something new by the learner so that it can trigger curiosity and encourage the emergence of new motivations in learners. In this connection, this research refers to several learning theories related to learning to the condition as follows.

About the need for conditioning of a learning process expressed by Gagne (1970) in his conditioning theory that the creation of learning conditions, including the learning environment, especially media-based conditions, namely covering the type of presentation delivered to learners by scheduling, sorting, and organizing is an important thing to do. A learning event occurs when a stimulus situation affects a learner in such a way that his or her performance changes over time before being in that situation to the time after being in it. So, in this case, the learning event occurs due to the conditioning through the provision of the stimulus. He further explained through one type of learning that he expressed the type of S-R (stimuli-response) which in essence states that the onset of response is also due to the encouragement that comes from within and the strengthening so that one wants to do something repeatedly (Gagne, 1970).

In addition to the theory of conditioning learning, Ivan Pavlov's Classical Conditioning theory presents the following learning principles:

Learning is the formation of habits by linking/linking stronger stimulants with weaker stimulants.

The learning process occurs if there is an interaction between the organism and the environment

Learning is a process of change that occurs due to conditions that then give rise to a response

Learning closely related to the principle of re-strengthening or with other words and replays in terms of learning is important

Each stimulant will give rise to U.S. brain activity and CS will give rise to brain activity. The activities generated by the U.S. are more dominant than those generated by CS. Therefore the U.S. and CS must be installed together, which over time will occur relationships (<https://senandungbiru.wordpress.com/2014/10/18/teori-classical-conditioning-ivan-pavlov/>)

John B. Watson (1919: ) championed the learning views suggested by Pavlov's work in his study of dog conditioning. In Watson's writing, learning is seen as a matter of building individual associations (conditioned responses) that are strongly based on the nervous system. More complex human actions are considered conditioned response chains.

Furthermore, about the role of the environment to the conditioning of the learning process, Bandura (in Gredler, 1994:377-378) related to the theory of social learning suggests that individual behavior is not only an automatic reflex stimulus (S-R Bond), but also the result of reactions arising as a result of interactions between the environment and the cognitive schemes of the individual itself. Bandura also stated that conditioning is an important thing to do. Gredler (1994:51) also corroborates by referring to Thorndike's Theory of Law Effect which states that satisfactory circumstances following the response reinforce the link between stimulus and behavior

The Law Effect theory illustrates that the stimulus used will give birth to certain perceptions in learners. Perception itself according to Robbins and Judge (2013: 166) the process by which individuals manage and interpret their senses to give meaning to their environment. He also added that perception can change due to several factors that influence, including attitude, personality, motives, experience, and expectations, target characteristics, and situation factors. In addition to the S-R theories presented, we are

actually also familiar with the theories of S-R Skinner and Pavlov. However, in this study, the theory in question is not used with some rational considerations of researchers.

By referring to some of the theories presented above, the frame of thought built in this research is the conditioning of learning activities will attract attention and evoke a separate response for learners. On that basis, the assumption used in this study that conditioning learning activities using the new stimulus will be able to build the perception of learners to study will awaken the curiosity and learning motivation of learners that can then affect the learning outcomes achieved.

This can be illustrated by the diagram as follows:



**III. METHOD**

This study used a descriptive quantitative and qualitative method with data collection instruments using questionnaires and interviews on a sample of 40 data sources. The response assessment indicators set out are as follows:

- 31 - 40    very Positive/very easy
- 21 - 30    Pretty positive/fairly easy
- 11 - 20    Less Positive/difficult
- 1 - 10     Very less positive/very difficult

The research subjects are students of the Indonesia Language and the Literature Education Program at FKIP University of Bengkulu. The research procedure is to provide tasks on face-to-face learning, and guidance in completing tasks is carried out online with remote control using the Team Viewer application. Mentoring is carried out in groups and individuals. Data analysis is done descriptively quantitatively and qualitatively.

**IV. RESULTS AND DISCUSSION**

Data revealed from this study provides information that more than half of students have attended e-learning lectures using an unsynchronous approach. While lectures with direct interaction through a kind of remote control application has never been done. The overview obtained in this study is as follows:

Table 1 Student Response Data

No	Observed Aspects	Number of Positive Responses	Response Percentage	Perception Category
1	Ease of operationalize remote control applications	39	97	Very Easy
2	Lecture guidance with remote control application is the first time	27	67,5	Very Positive
3	Guidance with Remote control increases learning motivation	40	100	Very Positive
4	Lecture guidance with remote control application is very useful	35	87,5	Very Positive
5	Remote control learning guidance greatly helps understanding the material studied	32	80	Very Positive
6	Guidance time is more effective and efficient	32	80	Very positive
7	Very helpful in overcoming the difficulty of understanding the material studied	35	87,5	Very Positive
8	Implementation of guidance is very effective	40	100	Very Positive

9	Can improve the achievement of learning outcomes	40	100	Very Positive
10	Remote control learning models need to continue	40	100	Very Positive

The results of the descriptive analysis of data acquisition in table 1 above are as follows:

Table 2 Descriptive Analysis

Mean	36,80
Standard Error	1,42
Median	39,50
Mode	40,00
Standard Deviation	4,49
Range	13,00
Minimum	27,00
Maximum	40,00
Sum	368,00
Count	10,00

The stated mean positive responses (36.80), Mode (40), and median (39.50), indicate that students' perceptions of remote control applications are very positive and significant. This condition is corroborated by the standard deviation value (4.49), which illustrates that the tendency for perceptions to be reduced to a very positive response. In addition, several aspects observed, namely numbers (3,4,5,6,7,8, and 9) in Table 1, inform that the use of remote control applications in learning can contribute significantly to the quality of the learning process, both with regard to with motivation and learning outcomes.

The data above is strengthened by the results of interviews conducted by researchers. The summary of statements of 36 (90%) sample students are as follows: (1) The application used is very easy to access and operationalize; (2) The use of remote control applications for guidance in completing tasks for the first time, so that it is more challenging to curiosity; (3) This learning model can increase learning motivation; (4) Guidance using remote control applications is very useful; (5) The use of remote control applications is more effective and efficient because the communication between lecturers and students is more open than face-to-face learning; (6) This open communication is very helpful for students to overcome difficulties with the material being studied; (7) Guidance by remote control is very effective, because students know firsthand the existing errors and receive corrective guidance on the spot; and (8) Students are more optimistic about achieving better learning outcomes.

The data presented above indicate that the conditioning of online learning with remote control media is able to build significant student perceptions which in turn will affect the learning process, learning motivation, and student learning outcomes. Thus, a learning process really needs a meaningful engineering that can affect the perceptions of students which will then change their attitudes for the better.

The revealed research results basically state that the use of internet-based applications using remote control has a positive impact on increasing student motivation and learning outcomes. This is consistent with the opinion of Graham (2005; and 2006) which states that internet-based learning can improve the learning process, is effective, provides convenience, and is cheap in financing, including several research results cited by Hurnult that have been previously disclosed. The same thing was also expressed by Poe and Stassen (ed. Without year: 8) regarding the advantages of online learning which will be learner-centered and the conditioning that is carried out will support learning styles and flexibility. The conditioning itself is in accordance with Thorndike's S-R theory and Bandura's social learning theory that the conditioning of a process by providing the right stimulus can form positive responses and perceptions and will form cognitive schemas in individuals. As also stated by Gagne (1977), that the conditioning of the learning environment both internally and externally will affect the learning outcomes achieved. In this case, online-based learning with

remote control is a conditioning process with the use of stimuli as expressed. Thus, engineering the conditions of the learning environment in the online learning process is needed to be carried out by a teacher as well as learning in class. Related to this research, which engineered learning conditions by utilizing remote control, it turned out that it not only provided an interesting learning experience for students, but also made a significant contribution to the achievement of learning objectives. Therefore, the positive response of students to the online learning process with remote control instruments is quite significant for the development of a learning model with a blended learning approach. However, this research is needed to find an effective form of learning strategy which of course can be developed with a larger number of samples as well as several similar applications to test its effectiveness.

### V. CONCLUSION

Students' perceptions of the use of remote control applications are very positive, because the use of remote control provides a significant learning experience and is able to increase student understanding and make it easier to complete lecture assignments, in addition to providing a freer space for interaction between lecturers and students. However, this research is still very limited in terms of the number of samples and the diversity of study programs. Therefore, a survey with a significant number of respondents will certainly provide different results and it is possible that these findings will be generalized to a larger population.

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# *Integrated Quality Management of The State Islamic University of North Sumatra, Medan in The Development of Graduation Skills Based on Soft Skills*

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**Abstract** – This study found an integrated quality management model at UIN North Sumatra Medan in developing soft skills-based graduate competencies. The research instrument is the researcher himself as a key instrument. Data collection was carried out in three ways, namely; observation, interview, and documentation study. To analyze the data, several steps were taken, namely; compiling data, linking data, producing data, presenting data, and making conclusions. To achieve a reliable level of research data that has been collected, credibility and triangulation tests were carried out. The results showed that UIN SU Medan implements quality management in developing soft skills-based graduate quality through the effectiveness of the implementation of management functions.

**Keywords** – Managing, Quality, Soft Skills, Wahdatul 'Ulum, Graduates, Ulul Albab.

## I. INTRODUCTION

It's a necessity to change. The presence of change is also accompanied by progress and development. In addition, the flow of globalization requires advances in science and technology to meet these changing needs. These changes cannot, of course, be separated from the developments in science that Indonesia must follow.

The term change in each period has its own name, as it is now known as the era of the Industrial Revolution 4.0, which emphasizes the pattern of "digital economy, artificial intelligence, big data, robotic" etc. or known as the phenomenon of "disruptive innovation" Mohammad Nasir explained that, based on an initial assessment of the state's readiness to face the industrial revolution 4.0, Indonesia was estimated to be a country with high potential. Although still under the State of Singapore, Indonesia's position at the level of Southeast Asia is well taken into account. Meanwhile, at the global level of the "competitiveness index at the World Economic Forum 2017-2018" Indonesia is 36th, up from the 41st position of 137 countries in the previous year's 41st position (Schwab, 2019).

The above information shows that improving the quality of human resources and improving the quality of human life is primarily achieved through education. Marimba (Tafsir, 2013) argues that education is the conscious guidance or guidance of educators on the physical and spiritual development of students towards the formation of the main personality. Education is the most important indicator of a country's progress (Asvio et al, 2019). Education is a conscious effort to build quality human resources to compete (Tobari et al, 2018).

In other words, education is an effort that will accelerate the development of human potential in order to be able to carry out the tasks assigned to it. Because human beings are creatures that can be educated and educated. Education can therefore have an impact on physical, mental, emotional and moral development, as well as on human faith and devotion (Saud, 2011). The importance of this education was stated in the Koran: Q.S. Al-Mujadalah verse 11 (Anonymous, 2013).

Referring to the above verse, Fadjar (2005) argues that the future must be taken up, the means of which are education. Education must therefore refer to the future of mankind. This is because education will be able to improve the quality and competitiveness of human resources at global level. This statement is consistent with the view of Jalal and Supriyadi (2007) that the success of development in the field of education can be known not only from the quality of individual citizens, but also closely linked to the quality of life of the community, nation and state. Quality education is an education that is capable of carrying out a process of maturing the quality of students developed by freeing students from ignorance, incompetence, helplessness, untruth, dishonesty, bad behavior, bad morals and low faith (Mulyasana, 2012).

From the explanation above, it can be concluded that education is the main investment in changing people from ignorance to knowledge, from immoral to ethical, from being unconscious to enlightened people, and increasingly understanding what it means to be human. This is supported by the Fadjar explanation (2009) that developed countries are not dependent on their natural resource wealth because many countries with limited natural resources can become developed countries due to human resource investments. For this reason, in order to prepare human resources, as Japan has done, it means that "it cannot be" Indonesia must be able to place education as a vehicle for the processing of human resources through the education system and model. An integrated quality education system and a model are part of the solution for the education of the Indonesian nation.

Higher education is a basic need of society, entering the era of globalization today. On this basis, the relationship between universities and the community must be close, open and mutually supportive, as a logical consequence. Higher education must therefore improve and focus on clients or the community as users of education. Education in tertiary institutions has at least the same meaning and scope, that is to say, high-quality higher education must be able to deliver the 'output' of graduates who have a set of knowledge, both 'hard skills' and 'soft skills,' character or maturity intellectually, emotionally and spiritually, and who are able to master and compete in an increasingly competitive world of work. In fact, graduates are capable of creating creative and productive jobs.

As Mulyasa (2014) points out, character education aims to improve the quality of education processes and outcomes that lead to the formation, integrated and balanced, of the character and noble character of students as a whole, in accordance with the standards of competency of graduates in educational units. Efforts to realize institutional quality and graduate quality are formulated by the government in Law number 12 of 2012 concerning higher education, Government Regulation number 4 of 2014 concerning the implementation of higher education institutions and management of tertiary institutions, as well as Permenristekdikti number 44 of 2015 concerning National Standards for Higher Education which includes: standards graduate competencies, learning content standards, learning process standards, learning assessment standards, lecturers and education staff standards, learning infrastructure standards, learning management standards, learning financing standards (Permenristekdikti, 2015). This standard becomes a reference for higher education institutions in the implementation of education management activities.

Furthermore, through Permenristekdikti No. 62/2016 on higher education quality assurance systems, article 5, has mandated that the evaluation of the implementation of higher education standards is carried out through internal quality audits. Internal quality audit is a systematic, independent and documented testing process to ensure that the implementation of activities in tertiary institutions is in accordance with procedures and the results are in accordance with established standards to achieve institutional goals and national education goals. Among the objectives of the internal quality audit are as one of the steps to determine the conformity of standards with the implementation that has been carried out in various determined aspects (Ristekdikti, 2018). With this internal quality audit, it is hoped that the quality of national higher education can contribute to the improvement of the nation's competency capabilities along with the realization of a healthy and competitive higher education organization.

In higher education, lecturers act as facilitators, consultants and motivators to students, not only in terms of "transfer of knowledge", but also to ensure that students have a better future, while students act as actors of active and independent learning who have " three skills ", namely: " learning skills, thinking skills, living skills "(Sailah, 2008). The position of the lecturer is not

the only source of educational material but as one of the sources of educational material, and the position of students as users of educational materials.

The steps necessary to realize this, begin with the design of the curriculum, the educational process to the standard of assessment. Formulation of both "real curriculum" and "hidden curriculum" curriculum designs. Overall, directed towards meeting user satisfaction and needs.

The implementation of education is divided into several stages of learning activities. In each learning activity, an indicator of its achievement is determined, and these achievement indicators are the basic components of the assessment. Based on this assessment component, students' final grades can be determined and assigned. To measure the level of success of a lecturer in the learning process, it is necessary to target the quality of education of the courses he is teaching. If each lecturer sets the target for the quality of education that is carried out in each semester, the overall process in a study program can be known.

If all the lecturers have done this, the target for the quality of education can be further increased to become the target for the quality of education for the study program. Next, to the faculty level and finally to the university level. Herein lies the role of the lecturer in improving the achievement of the quality objectives of the university or college. In other words, the lecturers in improving the achievement of the university's quality objectives begin by arranging the education quality objectives for the subjects they are teaching. This educational quality target needs to be stated in the lecture guidelines for students. This is so that students also know and are able to control lecturers in teaching.

The challenges that undoubtedly emerge quality assurance are identified through at least three factors, namely: (1) the emergence of changing demands on higher education institutions due to the increasingly proper sources of community funding in them; (2) the need for public accountability and (3) qualification requirements for graduates by the job market (Olssen, 2004).

Education is seen as a resource investment that never loses and at the same time has added value which is guaranteed to have a beneficial return. This phenomenon is starting to strengthen in the Indonesian people who are increasingly aware of investing in human resources for the benefit of competition as well as efforts to increase competition and excellence, especially in entering globalization and competition in the economy (Thune, 2001). Another opinion was expressed by Hammond, that the mobilization of individual status is through the search for scientific and technological excellence as well as "financial" advantages (Darling, 2005).

To create quality graduates / alumni who have good qualifications, universities are obliged to provide good education and teaching. Good, not only in "content" and delivery methods, but more importantly good or in accordance with what is needed by the world of work, because the ultimate goal of the birth of alumni is to get a job in accordance with the field of knowledge / expertise. For this reason, tertiary institutions are required to provide various "skills" to students or prospective alumni, including both "hard skills" and "soft skills".

"Hard skills" are the mastery of science, technology and technical skills related to their field of knowledge. Meanwhile, "soft skills" are a person's skills in dealing with other people and skills in managing themselves that are able to develop maximum performance. "Soft skills" are often referred to as soft skills, namely skills used in dealing and collaborating with other people.

"Soft skills" are the skills of a person in dealing with other people, including himself. The attribute "soft skills", thus includes the values adopted, motivation, behavior, habits, character and attitudes. Each person has the attribute "soft skills" with varying degrees, influenced by habits of thinking, saying, acting and behaving. However, this attribute can change if the person concerned wants to change it by practicing to familiarize himself with new things.

Other examples of skills that are included in the "soft skills" category are integrity, initiative, motivation, ethics, teamwork, leadership, willingness to learn, commitment, listening, tough, flexible, oral communication, honest, logical argumentation and others. These skills generally develop in social life (Assingkily and Mesiono, 2019).

The importance of "soft skills" education is demonstrated through a study from Harvard University, United States which found that a person's success is not determined solely by technical knowledge and skills, but by self-management skills and other people's "soft skills". This research reveals that success is determined only about 20% with hard skills and the remaining 80% with "soft skills".

Similar research and results were also carried out by Pereira who found that "soft skills" are a necessary skill in the world of work (Pereira, 2013). Furthermore, Peggy Klaus said that "soft skills" are needed in the world of work, the percentage of which is 75 percent soft skills and 25 percent "hard skills" (Klaus, 2007). To mobilize "hard skills" competencies, "soft skills" are required.

The results of a survey by the weekly magazine Tempo also found that a person's success reaches the peak of his career because he has characters: willing to work hard, have high self-confidence, have a vision for the future, can work in a team, have mature confidence, are able to think analytically, are adaptable, able to work under pressure, fluent in English and able to organize work (Widyawati, 2011). While the survey on 457 leaders, about 20 important qualities of a champion. The results are communication skills, honesty, integrity, cooperation skills, interpersonal skills, ethics, motivation / initiative, adaptability, analytical power, organizational skills, detail-oriented leadership, self-confidence, friendly, polite, thoughtful, index practice (IP => 3.00), creative, humorous, and entrepreneurial skills. IP, which is often considered as proof of students' prowess in indicators of successful people, is in the last position, namely number 17 (Utomo, 2010).

Based on the above reality, tertiary institutions in Indonesia face considerable challenges in preparing the competencies of their graduates, providing creative, innovative and characteristic lecturer qualifications, providing educational infrastructure and curriculum adjustments on an ongoing basis, linking and matching with the world of work and the industrial world. However, it also provides sufficient "hard skills and soft skills" knowledge and skills so that graduates are able to compete.

In line with the high expectations of the community for the role of Islamic higher education institutions, now the community's demands for the quality of Islamic education are getting stronger. The demand for quality is getting stronger when in society there is a change in the macro paradigm from the effects of globalization with an increasingly transparent economic logic pattern (Olssen, 2004). The reality is that in Islamic tertiary institutions there has not been an appropriate quality assurance. Islamic universities should also function as public services like other public universities (Milddlehurst, 2011). Systemic findings and quality assurance in Islamic higher education institutions that are based on Islam that accommodate the basic elements of quality assurance that exist are needed.

Educational figure Tilaar said that the education crisis revolved around a management crisis. As the culmination of this crisis, the quality of education is still low and the management of resources is still inefficient (Tilaar, 2011).

According to Arcaro, there are 5 "Pilars Quality" that must be implemented in realizing the quality of graduates in educational institutions, namely: 1) Focus on customers, 2) Total involvement, 3) Measurement, 4) Commitment, and 5) Continuous improvement (Arcaro, 2015). These quality characteristics are identified as quality pillars which reinforce one another. These quality pillars are based on the beliefs and values of the institution.

The application of integrated quality management in education is carried out through continuous improvement of services, people, products and the environment to optimize competitiveness. According to Usman (2010), which is also in line with the ideas of West Burbham and Sallis states that integrated quality management is "a management system concerning quality as a business strategy and oriented to customer satisfaction by involving all members of the organization." Furthermore, it is argued that integrated quality management in education concerns philosophy and methodology. The philosophy is to improve the mindset to make continuous improvements, while the methodology is a force field activity that is used as a means of making these improvements. Integrated quality management in education is concerned with the holistic philosophy of organizational functions based on productivity and achievement, the concept of quality, teamwork, and customer satisfaction (Febiyanti et al, 2020; Abdullah et al, 2020).

The concept of Integrated Quality Management in Education is derived from TQM "Total Quality Management". According to Sallis (2010), TQM in the context of education is a methodological philosophy of continuous improvement, which can provide a set of practical tools for every educational institution in meeting the needs, wants and expectations of customers, present and future.

To optimize organizational competitiveness through continuous improvement of products, services, people, workforce, processes, and the environment using the TQM "Total Quality Management" approach in running its business (Nasution, 2004). Creating and maintaining customer satisfaction is one of the goals of educational institutions. In "Total Quality Management", the satisfaction of educational institutions is determined by the stakeholders of the educational institution. For this reason, only by understanding the process and customer satisfaction, the institution can realize and appreciate quality. All efforts of "Total Quality

Management", must be directed at the main goal, namely customer satisfaction. "Stakeholders" if they get something that is of great benefit from higher education, it can be believed that they will give full appreciation and support.

According to Sallis as one of the TQM experts, teamwork is a very important element and has fundamental strength. "A team is a group of people who work together and have the same goal, namely to give satisfaction to all" stakeholders". Teamwork in an organization is an important component in TQM, because teamwork will increase self-confidence and optimal results (2011).

The energy or strength of a teamwork is comprehensive and integrative in campus institutions. A well-functioning educational institution must consist of teams that complement one another. In a team, a combination of academic and non-academic staff has an important role to synergize in creating quality collective performance. Distribution of tasks according to capacity and proportion, some focus on long-term strategic plans and short-term technical implementers.

The strategy developed in the utilization of "Total Quality Management" in the context of education is by positioning educational institutions as service institutions or also known as the service industry. Therefore, a management concept is needed that is able to empower educational institutions to excel. As the main source of integrated quality education management, it rests on customer satisfaction. The customer can be divided into two parts, namely: internal "internal customer" and "external customer" outside.

The grand theory in this study uses the quality management theory by Deming. This is based on the TQM objectives referred to in this study based on the process to achieve this quality. Deming said that a product or service has quality if it helps someone and can be enjoyed well and sustainably. For this reason, researchers used the theory model of the PDCA cycle quality management. PDCA stands for Plan, Do, Check and Act, namely a continuous Process Improvement cycle or continuously like an endless circle (Deming, 2010).

The results of observations and the initial grand tour of researchers that: North Sumatra State Islamic University was founded on October 12, 1968 and has been the UIN since 2014, currently UIN SU has 8 faculties and more than 52 undergraduate and postgraduate study programs. Accreditation data for study programs / departments are as follows.

The accreditation data above shows that the accreditation with a score of "A" still amounts to 4 study programs, accreditation with a value of "B" totals 28 study programs, accreditation with a value of "C" is 5 study programs and those still in the permit category of study programs are 7 study programs. As for the number of students from undergraduate, postgraduate, and doctoral programs, there are approximately 27,000 students (UIN SU Strategic Plan, 2020).

The joint leadership of the academic community has formulated the Vision of the State Islamic University of North Sumatra using the science development model "Wahdatul" Ulum "with the aim of producing graduates with" Ulul Albab "characteristics. With this vision and mission, we aspire to become a learning society based on the Islamic Learning Society and become a world-class university in the Word Class University. Mission To carry out superior education, teaching, research and community service in various fields of science, technology and art based on Islamic values. The goals of UIN North Sumatra are: (1) The birth of scholars who excel in various fields of science, technology and art studies based on Islamic values, (2) Develop various branches of science, technology and art based on Islamic values. (3) The development of a human civilization based on Islamic values. With the motto and belief "Kampus JUARA", namely the campus is advanced, superior, glorious, great and prosperous.

The curriculum that is prioritized at UIN North Sumatra is the "Wahdatul 'Ulum" Integrated Curriculum which is Transdisciplinary oriented and has implemented a national curriculum policy based on the Indonesian National Qualifications Framework (Asari, 2015). From these documents, it confirms that UIN North Sumatra has obtained accreditation "B" as an institution with a value of 321 points issued by the National Accreditation Board for Higher Education Number: 40561 / SK / BAN-PT / Akred / PT / X / 2017. In terms of integrated quality management, since its establishment as a State Islamic University in 2014, UIN North Sumatra, it can be seen from the data obtained that two years ago, the transition to UIN of this university has compiled the 2016-2020 Strategic Plan.

UIN North Sumatra in order to carry out the vision, mission and work program using Standard Operating Procedures which include: UIN SOP, Vision, Mission, Objectives, Student and Alumni SOPs, Lecturers and Education Personnel SOPs, SOP for Lectures and Curriculum, SOP for Finance, SOP for Facilities and Infrastructure, SOP for Cooperation, SOP for Research and Community Service, SOP for University Quality Assurance Institutions, Faculties and Departments, SOP for Postgraduate institutions and SOP for Libraries.

Standard Operating Procedure is very important for the success of education services in higher education. SOP is a document related to the process that is carried out sequentially. SOP is structured to complete a job with the aim of obtaining the most optimal work results: effective & efficient. Standard Operating Procedures can also be said to be a reference for carrying out work or duties in accordance with the functions & performance appraisal tools. SOPs are implemented according to administrative, technical and procedural indicators based on work procedures, work systems and work procedures in related work units.

UIN North Sumatra, through information from the Quality Assurance Institute, said that in order to develop and improve the quality of the institution and the quality of graduates, it has carried out continuous quality measurements by conducting research and surveys including: student satisfaction surveys of administrative services, UIN vision and mission surveys, lecturer evaluation surveys, a survey on the satisfaction of lecturers and education staff on HR management and a survey on user satisfaction for UIN SU graduates in 2017.

Based on the results of survey document observations conducted by UIN North Sumatra for the results of a survey on student satisfaction with academic administration services, the survey results were "satisfied" with an interval range of 3.00-3.59 as stated in the document. The results of this survey indicate that UIN SU has made improvements to service management and quality management, although it still needs to be improved. The results of the survey on the satisfaction of lecturers and education staff on human resource management resulted in a survey score of "satisfied" with an interval range of 3.00-3.59.

Furthermore, for the results of the user satisfaction survey of UIN SU graduates in 2017, it was carried out on 41 institutions including educational institutions, financial institutions, companies, government and TNI / POLRI scattered in North Sumatra Province and outside the province. The survey of graduate users emphasizes several aspects of Soft Skills, which are shown in the following table.

Table of User Satisfaction Survey Results for UIN SU Graduates for the 2017-2018 Academic Year

No	Item	Average	Performance
(1)	(2)	(3)	(4)
1	Passion	3.19-3.20	Satisfied / Good
2	Integrity, Ethics, Morals	3.11-3.09	Satisfied / Good
3	Expertise Based on Field of Science	3.15-3.17	Satisfied / Good
4	Foreign Language Skills	2.52-2.57	Satisfied / Good
5	Communication Skills	3.20-3.30	Satisfied / Good
6	Managerial Abilities	2.94-3.13	Satisfied / Good
7	Mastery of Information Technology	2.57-2.59	Satisfied / Good
8	TEAM Cooperation Capability	2.96-3.19	Satisfied / Good
9	Self Development Ability	3.06-3.11	Satisfied / Good

From the results of a survey conducted on users who graduated from the State Islamic University of North Sumatra in 2017-2018 above, it can be seen that the survey results are in the average category of "satisfied" with an interval range of 2.52-3.20. Looking at the data on the percentage of user satisfaction of UIN SU graduates with the above graduate competencies, it can be seen that there are still aspects both Hard Skills and Soft Skills that must be improved in the context of graduate user satisfaction, namely in terms of mastery of foreign languages, mastery of information technology, managerial abilities and abilities teamwork.

Based on the author's provisional observations, the implementation of integrated quality management in developing the quality of graduates based on soft skills can be seen from the seriousness of the UIN SU leadership in formulating a vision, mission, strategic planning, curriculum development with Wahdatul 'Ulum paradigm, and carrying out education and teaching, research, community service, conducting coaching through the activities of the Special Activity Unit and Student Activity Unit as well as providing a dormitory "Ma'had Al-Jami'ah and requiring all new students to live in the dormitory for two semesters in order to provide additional learning in mastery of Arabic, the yellow book, the language English and strengthen the spirit of religion, leadership and student independence. Furthermore, it provides standard classroom facilities and infrastructure, Wi-fi, E-Learning Website, e-journal, repository, library, laboratory: computers, languages, micro teaching, counseling and biology. Furthermore, the

campus provides a health service center, a student and community entrepreneurship development center, an international service center, an information technology center and a database.

To develop the spirit of organization, cooperation, interests and talents and creativity of students, the North Sumatra UIN has optimized the budget and support and assistance through vice chancellor III to the University Level Student Executive Board, University Level Student Senate, Faculty Level Student Council, Student Senate Level Faculty, Department Student Association. In addition, it is also fostered in UKK-UKM institutions in the form of Menwa, Paskibra, Scouts, PMI, MAPASTA, Dynamics, Student Cooperatives, LKSM, and so on.

The role of the leadership and academicians of the North Sumatra UIN institution in developing the quality of graduates with the Wahdatul al-Ulum scientific paradigm which is oriented towards graduates with the character of 'Ulul Albab is seen from the activities, student achievements and the number of student enthusiasts who enter UIN North Sumatra increasing every year .

In the last three years, UIN North Sumatra has received a Muri record three times, including Khatam reading the Koran 17 times in 17 minutes by approximately 6663 students, Muri Record for the most number of activists, and Muri Record for reading 1 million prayers.

In 2019, UIN North Sumatra was designated as the 4th favorite campus from all PTKIN throughout Indonesia, Director General of Islamic Education, Ministry of Religion, 2019). In 2016 the number of UIN SU students was 14,982 students, in 2017 there were 18,988 students, in 2018 the number of students increased by 23,928 people, then in 2019 UIN SU students increased by approximately 25%, namely 2,7485 people (UIN North Sumatra Medan Renstra, 2024).

In terms of the achievements of the last four years starting from 2017-2020, UIN North Sumatra students have started to make achievements that make the university proud at both the provincial, national and international levels. At least 18 achievements have been made, this shows the concern of the leadership, campus institutions to all student institutions and organizations, so that students are enthusiastically motivated to participate in activities or competitions at both the national and international levels. With the interaction between students and competition, it becomes a space for information to enter, and the enthusiasm, interests, talents and creativity of students will grow. Based on the explanation of the flow of thoughts and findings and symptoms above, it is important to conduct research with the title Integrated Quality Management of the State Islamic University of North Sumatra in Developing Soft Skill-Based Graduate Competencies.

## **II. METHODS**

Research on integrated quality management of education at the State Islamic University of North Sumatra, Medan in improving the competence of soft skills-based graduates using a qualitative approach. Creswell defines qualitative research in the form of methods to explore and understand meanings that are thought to come from social problems by involving important efforts such as asking questions and procedures to collect specific data from participants (Creswell, 2017). The research approach is structured, planned and procedural ways to conduct scientific research by combining all the potential and resources that have been prepared. The research approach is largely determined by the research paradigm, which is a perspective that has been chosen by the researcher. Through this qualitative approach, it is hoped that a picture of the quality, social reality and target perceptions of the integrated quality management of education at the State Islamic University of North Sumatra, Medan will be raised in improving the competence of soft skills-based graduates.

Through this qualitative approach, the researcher hopes that quality, social reality and perceptions of the researcher's target can be described without being contaminated by formal measurements. In this qualitative research, the researcher strives for the presence of the researcher not to change the situation and behavior of the person being studied who has been discovered through observation and interviews.

This qualitative research subject, the research is conducted centrally on the angle of the subject under study. The secondary data desired by the author are the first historical data of UIN North Sumatra Medan, second geographic data, the third organizational structure, the four lecturers' conditions, the five student conditions, the six curricula, the seven facilities and infrastructure at UIN SU Medan, the eight visions and missions. UIN SU Medan, the ninth planning and quality management efforts of graduates based on hard skills and soft skills.

The data source is the subject from which data can be obtained. As for the source of data to obtain research information consists of: first, data sources in the form of humans: it is obtained from informants, namely from university and faculty leaders and study program leaders. The main data sources in this study are words and actions. The two data sources are documents related to research, in the form of archives, official documents, brochures, guidebooks, university profile data, university programs, university and faculty leadership programs, monthly reports, annual reports and other documents at the State Islamic University of North Sumatra. Field. The data collection methods that will be taken by researchers are through: 1) observation; 2) interview; 3) documentation.

Meanwhile, the data analysis to be carried out in this study by following the steps: 1) processing and preparing the data for analysis, this step involves transcripts of interviews, scanning material, typing field data or sorting and compiling the data into types- different types depending on the source of information; 2) read the entire data. The first step is that the information obtained is reflected in its overall meaning; 3) analyze in more detail by coding data; 4) apply a coding process to describe the settings, people, categories and themes to be analyzed; 5) describe these themes for restatement in the form of a qualitative narrative / report. The most popular approach is to apply a narrative approach in presenting the results of the analysis; and 6) Data interpretation, namely interpreting the data that has been collected in the research location. Interpretation / meaning can be in the form of new questions that need to be answered (Creswell, 2017).

### **III. RESULT**

Integrated quality management of UIN North Sumatra in Developing Soft Skills Competencies is carried out by implementing management functions through; planning, organizing, implementing and monitoring. Planning and policy making at the North Sumatra State Islamic University campus is carried out in a participatory manner in the form of: RAPIM, RAKER, RAKOR, EVALUATION MEETING, CRITICAL MEETING, MONITORING / CONTROL MEETING in designing a vision and mission a Strategic Plan, Master Plan for the Development of UIN North Sumatra. The vision and mission of UIN North Sumatra is "To become a world-class university that excels in creating a learning society and contributing to the independence of the nation". Then it has the goal of becoming a world-class university that excels in realizing a learning society and contributing to the independence of the nation in 2045. So that it emphasizes the three prime programs of UIN North Sumatra, Accreditation, Digitalization and Internationalization. The organization is carried out based on the organization and work procedures of UIN North Sumatra, with each carrying out their duties fully responsibly in accordance with their respective main duties and functions. Implementation is carried out based on standard operating procedures. With the principle of each one who accepts the responsibility of working wholeheartedly through hard work, thorough work and sincere work. Supervision is carried out through the internal supervisory organ which is carried out for every activity carried out periodically.

From the planning of UIN North Sumatra, it can be seen that it is in accordance with Manap Somantri's opinion, namely that good university planning is the most likely and more rational planning to be implemented which is called a priority scale. Through planning, it can be explained that the objectives to be achieved, the scope of work to be carried out, who are the people involved in the work, how many and various resources are needed, as well as the stages of steps and work methods selected based on their urgency and priority ( Somantri, 2014).

Islam also teaches the concept of the need to compile a list of potential / priority scales in an organization. One of the indicators of success in setting the priority scale of leaders in an organization is openness. The Koran has provided a foundation for Muslims to act honestly and fairly as the key to openness, because openness cannot be done if these two elements are not integrated (Hidayat and Wijaya, 2017). The verse of the Koran which instructs mankind to act honestly and fairly, both of which are the keys to openness, are contained in Surah An-Nisa verse 58.

The principle of improving integrated quality management carried out by UIN North Sumatra in developing soft skills-based graduate competencies refers to the work culture values of the Ministry of Religion of the Republic of Indonesia, namely: 1) integrity: harmony between good and right hearts, thoughts, words and deeds]; 2) professionalism: work in a disciplined, competent and timely manner with the best results; 3) innovation: improving existing ones and creating new and better things; 4) responsibility: to work thoroughly and consistently; and 5) modeling: being a good example for others. In addition, UIN North Sumatra emphasized the principle through commitments that were built, especially from the leadership to the bottom in sequence. Each of them made a work commitment to be accounted for for a certain period. The principle of management improvement carried out by UIN North

Sumatra also emphasizes customer orientation. So, every program and activity that will be carried out is in order to address customer aspirations.

The integrated quality management development model of the North Sumatra National Examination in Medan in developing soft skills-based graduate competences is to use the scientific development paradigm "Wahdatul 'ulum" with the hope that graduates will have "ulul albab" character with soft skills-based competencies. The scientific development paradigm is applied through the activities of the Tri Dharma of Higher Education: teaching, research and community service, empowering lecturers and optimizing student activities. In addition, requiring new students to live in the ma'had dormitory for one year, UIN SU also provides guidance to the activities of the Campus Activity Unit and Student Activity Unit. And also the empowerment of the development institutions of UIN North Sumatra: PUSTIPADA, Libraries, Ma'had Al-Jami'ah, Business Development Center, International Institutions, Language Development and Student and Community Entrepreneurship Development Center.

Constraints and challenges in developing integrated quality management at UIN North Sumatra in developing soft skills-based graduate competencies are; secularization, attitudes and actions of corruption, collusion and nepotism, dichotomous knowledge, creativity of human resources that must be able to keep up with developments in science and technology and the number of human resource qualifications that must be encouraged and improved, state-of-the-art infrastructure that must be equalized, and recruitment models that are in accordance with UIN development needs.

This research study is supported by Widarto's theory (2011) which states that vocational education graduates in the soft skills aspect are not yet according to community expectations because in the learning process they do not emphasize the soft skills aspect. According to Widarto, this is very possible because so far there has been no soft skills learning model for vocational education students that is believed to be effective. The absence of this model is due to the fact that the vision, mission, and goals of vocational education have not fully supported the development of student soft skills. If traced further, it turns out that not all vocational education managers and lecturers have a commitment to developing student soft skills.

This research study is also supported by research conducted by Khoeroni (2017) entitled Basic Education Soft Skills Problems. The results revealed that the problem of soft skills in basic education is the competence of the teacher profession, although it is rich in the concept of education in general and Islamic education. However, when it is not balanced with teacher competence, it will have implications for readiness to face the social environment as an adult.

Furthermore, this research is also supported by research conducted by Muhmin (2018) entitled The Importance of Student Soft Skills Development in Higher Education. The results showed that the constraints for higher education in developing student soft skills lies in the lecturers who are not ready to become role models for students.

Based on several studies that support this research study, it can be analyzed that the obstacle in developing the soft skills competence of graduates lies in the HR of the educational institution. Thus, the quality of human resources is important to improve first in implementing integrated quality management of higher education in developing soft skills-based graduate competencies.

#### **IV. CONCLUSION**

Integrated quality management of UIN North Sumatra in Developing Soft Skills Competencies is carried out by implementing the management function properly through; planning, organizing, implementing and monitoring.

#### **V. IMPLICATION**

The results of this study provide several implications, including: 1) The implications of developing a scientific paradigm; 2) Implications of the management function in universities; 3) Implications of fostering and optimizing the activities of the Special Activity Unit and Student Activity Unit; 4) Implications of empowering quality development institutions in universities. Therefore, the researcher offers a reconstruction model for the development of quality management at UIN North Sumatra in developing soft skills-based graduate competencies without changing the essence of the model that has been implemented by UIN North Sumatra, but offers soft skills-based graduate competencies, as follows.

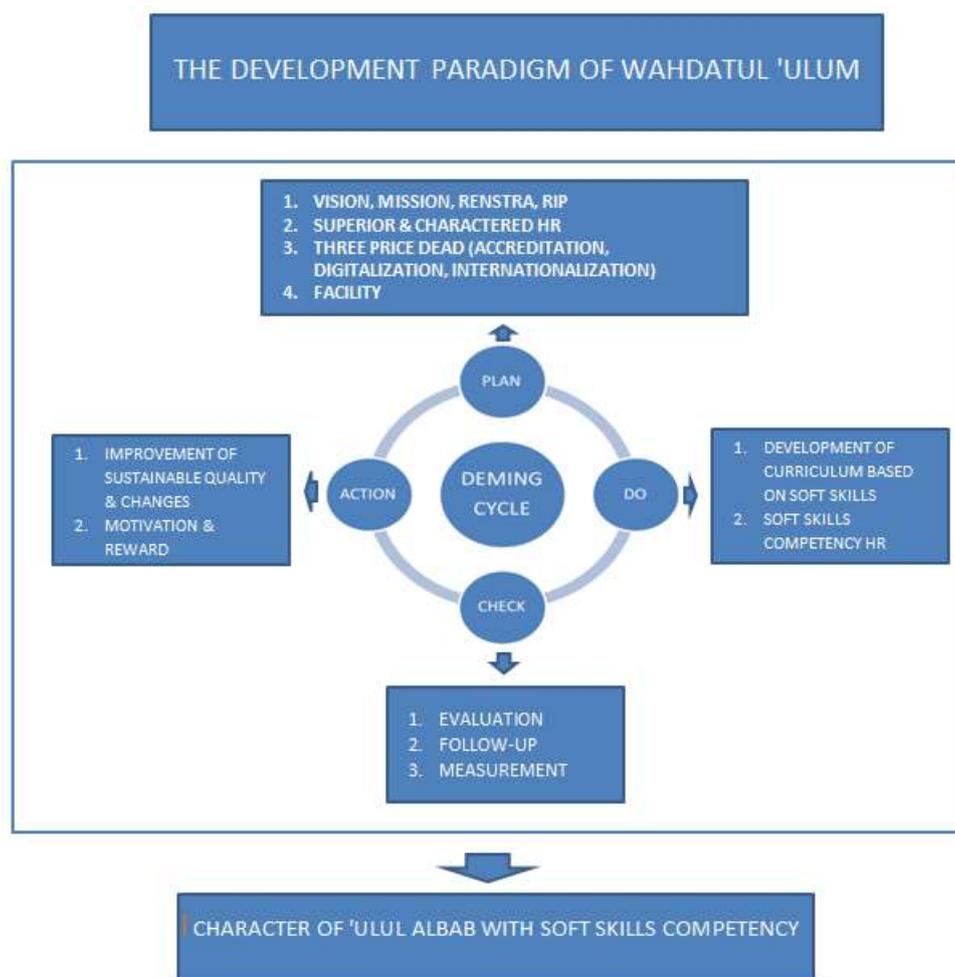


Figure 1. Reconstruction of Quality Management Development Model UIN North Sumatra Medan in Developing Competencies of Graduates Based on Soft Skills Offered by Researchers

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# *Evaluation des Caractéristiques Biophysiques des Ressources Ligneuses du Mont Gangan dans la Préfecture de Kindia, Guinée*

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**Résumé** - Dans le cadre de cette étude, la richesse et les groupements floristiques ont été identifiés dans les trois sites ainsi que la structure du peuplement. La méthodologie a consisté d'abord en un relevé floristique dans des placettes circulaires de 25m de rayon implantées dans une zone la plus homogène possible. L'étude du couvert arboré actuel a permis : (i) d'identifier dans 12 placettes 118 arbres de 49 espèces, reparti en 19 familles ; (ii) de définir six types de formation végétale relativement dégradés et (iii) de mettre en lumière leurs liens avec les principaux facteurs du milieu (sols, topographie). La densité est de 50 tiges par hectare dans l'ensemble des surfaces échantillonnées. Des caractéristiques biophysiques comme le diamètre, la hauteur, la surface terrière et l'indice de valeur d'importance des arbres ont été calculé par site. Des enquêtes ont porté sur la perception de la Direction National des Eaux & Forêts des habitants du village au sujet des milieux, des espèces et des changements en cours. Ils sont très conscients des énormes services que procurent le milieu et les espèces végétales, de l'ampleur des changements en cours (dégradation du couvert végétal et baisse de la disponibilité des espèces végétales spontanées) et des risques pour leur bien-être et celui des générations futures.

**Mots clés** - Mont Gangan, Ressources ligneuses, Caractéristiques, Biophysiques.

**Abstract** - As part of this study, the richness and the floristic groupings were identified in the three sites as well as the structure of the stand. The methodology consisted first of a floristic survey in circular plots of 25m in radius established in an area as homogeneous as possible. The study of the current tree cover enabled: (i) to identify in 12 plots 118 trees of 49 species, divided into 19 families; (ii) to define six types of relatively degraded vegetation and (iii) to highlight their links with the main environmental factors (soils, topography). The density is 50 stems per hectare in all the areas sampled. Biophysical characteristics such as diameter, height, basal area and importance value index of trees were calculated per site. Surveys focused on the perception of the National Directorate of Water & Forests and the inhabitants of the village about the environments, species and changes underway. They are very aware of the enormous services provided by the environment and plant species, of the extent of the changes underway (degradation of the plant cover and decrease in the availability of spontaneous plant species) and of the risks to their well-being and that of people future generations.

**Keywords** - Mount Gangan, Wood resources, Characteristics, Biophysics.

## I. INTRODUCTION

Depuis les années 1970 - 1980, l'Afrique de l'Ouest a connu des perturbations climatiques importantes (fortes précipitations, inondations dévastatrices, sécheresse,...). Ces perturbations ont eu des incidences néfastes sur les productions agricoles, forestières et pastorales. Les pertes économiques ont été estimées à plusieurs milliards de dollars. Ces perturbations ont suscité une réelle préoccupation au niveau régional et international qui s'est traduite par la mise en place d'initiatives pour lutter contre la désertification et le changement climatique [1]. La Guinée étant l'un des pays côtier de l'Afrique de l'Ouest, avec une superficie de 245857 km<sup>2</sup>, et une population de 11780162 habitants, subie aussi ces perturbations. De par sa situation géographique, 7°30 et 12°30 le pays appartient à deux zones climatiques : la zone tropicale pour la majeure partie du territoire et la zone subéquatoriale pour la Guinée du Sud-Est caractérisée par d'importants aléas pluviométriques et un environnement naturel fragile à risques. Cette situation physique et climatique rend vulnérable les ressources naturelles (terres, végétales, eaux).

Du point de vue géo-écologique, la Guinée est subdivisée en quatre régions naturelles assez bien distinctes et intérieurement homogènes qui sont : la Basse Guinée, la Moyenne Guinée, la Haute Guinée et la Guinée forestière. Le pays doit cette originalité à son milieu naturel qui se caractérise par des contrastes climatiques, des barrières montagneuses et l'orientation des reliefs qui se combinent pour donner à chaque région des particularités du point de vue climat, sols, et végétation [2]. Aujourd'hui, la problématique de l'environnement en Guinée ne se pose plus au niveau d'une ville ou d'une région naturelle mais elle a atteint plutôt une dimension nationale et nécessite des réponses pratiques et appropriées. Avec l'avènement de nombreuses sociétés industrielles et minières dont le nombre ne fait que croître et l'urbanisation incontrôlée de nos villes suite à l'accroissement de la population, la dégradation de l'environnement et des écosystèmes se fait de plus en plus sentir. En effet, l'exploitation anarchique et sans mesure d'accompagnement des ressources du sol et du sous-sol en Guinée contribue énormément à la dégradation de la faune et de la flore [3].

Dans les forêts de la région de basse côte à l'Ouest de la Guinée, la végétation naturelle s'amenuise à un rythme accéléré au profit des champs et vergers. Pour la satisfaction de leurs besoins quotidiens (alimentaires, financiers, médicaux, etc.) les hommes utilisent les ressources naturelles, ce qui cause des dommages dans leur milieu de vie. Dans les quatre régions naturelles, une pratique et des techniques de système d'exploitation ont existé. Particulièrement en Basse Guinée, aujourd'hui la situation de la forêt du Mont Gangan est encore plus qu'alarmante. Elle se caractérise par : une insécurité alimentaire de plus en plus dramatique, une population en croissance rapide, une production agricole et pastorale insuffisante, une dégradation accélérée des sols déjà fragilisés par tant d'aléas.

L'analyse approfondie de la situation de ces ressources naturelles laisse apparaître que la dégradation de l'environnement s'est accélérée à un rythme sans précédent. Cette dégradation a provoqué non seulement la réduction et la baisse du potentiel productif de ces ressources naturelles, mais aussi, la désarticulation des systèmes séculaires de production et de gestion des milieux naturels. La dégradation de la couverture herbacée, arbustive et arborée, la forte évaporation, entraînent d'intenses pertes de la biodiversité [4]. Face à cette situation désolante et alarmante, nous nous sommes proposé de faire une évaluation de la composition des espèces d'arbres dans la forêt du Mont Gangan.

## II. MATERIEL ET METHODES

### 2.1 Matériel

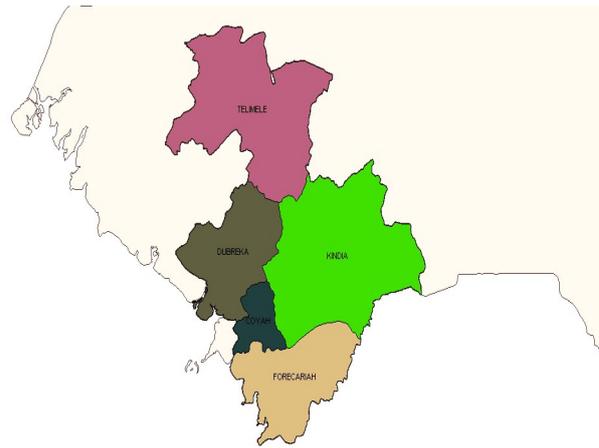
#### ✓ Milieu d'étude

La région administrative de Kindia couvre une superficie totale de 30987km<sup>2</sup>. Elle compte les préfectures suivantes : Coyah 3215 km<sup>2</sup>, Dubréka 5672 km<sup>2</sup>, Forécariah 4250 km<sup>2</sup>, Kindia 8850 km<sup>2</sup> et Télémélé 9000 km<sup>2</sup>. Elle est située à une altitude moyenne de 458,18 mètres comprise entre 12°30 et 13°30 de longitude ouest, 9°5 et 11°15 de latitude nord. La population totale de la région réactualisée en 2015 est de 1607520 habitants, celle de la préfecture de Kindia est de 240870 habitants (2014) [5].

Les montagnes de grès du mont Gangan, sont situées au nord-est de la ville de Kindia. La zone centrale est de 33,4 km de large et 26,5 km de long. Elle est constituée d'une série de marches de grès escarpées, entrecoupée de vallées, et entourée par des bowés gréseux de basse altitude. Il existe deux espèces presque endémiques au Mont Gangan. Les bowés gréseux sont souvent utilisés pour la culture à petite échelle de produits maraîchers. Ce mont comporte encore des parcelles de forêt sub-montagnarde près du sommet. Une grande partie de cette forêt a presque disparue et une autre partie a été désignée comme forêt classée, plusieurs menaces pèsent sur cette zone. Les images de la figure 1 montrent localisent le milieu d'étude [4, 6].



Afrique de l'Ouest



Région Administrative de Kindia



Montagnes de grès du mont Gangan, Kindia



Maraîchage à la bordure de bowal du mont Gangan

Figure 1 : Localisation du milieu d'étude

✓ **Matériels biologiques**

Pour l'installation des placettes on s'est servi d'un GPS pour relever la position exacte des sites et du centre des placettes de relevés, un appareil photo numérique a été utilisé pour les prises de vue des différentes formations végétales et d'autres phénomènes remarquables. Un mètre ruban de 50m, des clés de détermination des Flores et d'autres ont été utilisées pour l'identification des formations végétales. Des fiches d'inventaires ont été établies pour la collecte systématique des descripteurs et des informations. Des échantillons botaniques ont été prélevés à l'aide d'un sécateur et mis en herbier (presse et papiers journaux) pour séchage et identification ultérieure.

**2.2 Méthodes**

Lors de l'étude, nous avons fait allusion à la Direction Nationale des Eaux et Forêts de Kindia, au villageois qui cultivent dans la forêt de Gangan pour avoir des informations, en enregistrant les coordonnées des points des terroirs et des villages. Dans chacun des sites, des placettes sont choisies. Le choix de ces sites s'est fait en fonction des altitudes.

L'échantillonnage de l'arbre pour la collecte des données a été réalisé de façon aléatoire dans 12 parcelles de 25 m de rayon. Dans chaque parcelle, tous les arbres d'un diamètre à hauteur de poitrine [(Diameter at Breast Height "DBH")  $\geq 10$  cm] mesurée à 1,3 m au-dessus du sol ont été comptés, identifiés et DBH enregistrés. Les arbres avec des tiges multiples à 1,3 m de hauteur ont été traités comme un seul individu et les diamètres de toutes les tiges ont été obtenus et en moyenne. Si un arbre a des contreforts ou des anomalies à 1,3 m de hauteur, le diamètre a été mesuré juste au-dessus du contrefort et la tige a été supposée avoir une forme cylindrique.

Un herbier portatif a été constitué petit à petit, en prélevant des échantillons botaniques, au moins pour les espèces non parfaitement connues. Dans cet herbier aux numéros et aux noms vernaculaires, ont progressivement été ajoutés les binômes latins. Tout au long de l’inventaire cet herbier a été un outil capital pour mémoriser les espèces, vérifier les identifications et opérer des rapprochements entre les différents sites [7, 8].

Dans le cadre de l’étude dendrométrique de la strate ligneuse au niveau de chaque placette, le dénombrement des tiges a été effectué et les caractéristiques dendrométriques (hauteur totale, diamètre du tronc des arbres et le diamètre du Houppier) ont été mesurées.

La densité correspond au nombre d’individus pour une surface donnée a été mesurée, la fréquence des espèces a été calculée comme étant le rapport, exprimé en pourcentage, du nombre de relevés où l’espèce observée, au nombre total de relevés faits dans le terroir.

Pour le traitement des données, dans un premier temps, nous avons comparé globalement les différents sites et en seconde étape, nous avons mené une étude détaillée par placette afin d’appréhender les facteurs stationnels qui sous-tendent les dynamiques. L’analyse globale ou inter site a consisté à comparer les trois sites. Les analyses intra site ont consisté à déterminer des groupements par sites en fonction des caractéristiques floristiques et stationnels [9, 10].

### III. RESULTATS ET DISCUSSIONS

#### 3.1 Formations végétales et la structuration spatiale

Cette étude sur la forêt classée du mont Gangan nous a permis de définir sur les trois sites, six (6) types de formation végétale sur sept.

Tableau 1 : Types de formation végétale rencontrée dans les sites

No	Types de formation végétale	Site I				Site II					Site III		
		P1	P2	P3	P4	P1	P2	P3	P4	P5	P1	P2	P3
1	Galerie											×	
2	Forêt dense												×
3	Forêt claire		×						×		×		
4	Savane arbustive												
5	Touffu			×			×						
6	Zone herbeuse	×			×								
7	Formation anthropique					×		×		×			

La forêt claire et la formation anthropique sont deux types de formation dominante, suivi de touffu et de zone herbeuse tandis que certaines de nos de placettes se sont retrouvées dans la galerie et la forêt dense (tableau 1).

L’analyse de la structure spatiale des forêts (avec les profils structuraux), présente différents niveaux de structuration spatiale et la structuration à l’échelle de la placette n’est pas forcément pertinente à l’échelle du massif ou de la région.

#### ✓ Flore

L’inventaire floristique des ligneux de la forêt du Mont Gangan a donné 118 arbres de 49 espèces reparti en 19 familles. Les figures 1 et 2 donnent respectivement les familles par ordre d’importance et les courbes aire-espèces des trois sites.

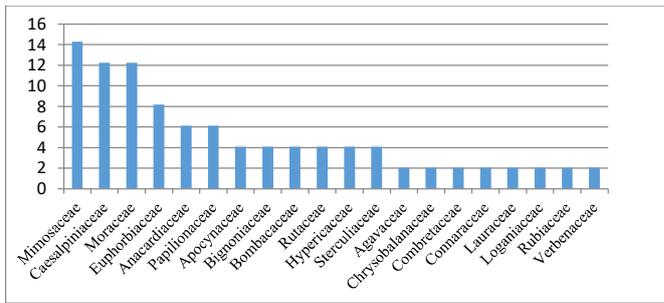


Figure 2 : Distribution de fréquence des espèces

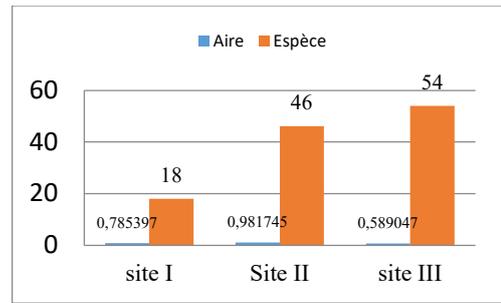


Figure 3: Courbe aire-espèces des trois sites

Le diagramme de la figure 2 montrent que les familles les plus représentées sont les Mimosaceae (7 espèces) les Caesalpiniaceae (6 espèces), les Moraceae (6 espèces), les Euphorbiaceae (4 espèces), les Anacardiaceae (3 espèces), les Papilionaceae (3 espèces), les Apocynaceae, les Bignoniaceae, les Bombacaceae, les Hypericaceae, les Rubiaceae, et les Sterculiaceae, (2 espèces) chacune et les autres familles une espèce.

Le diagramme de la figure 3 montre que 45,76 % des espèces recensées dans cette étude sont rencontrées seulement dans le site III et 38% des espèces dans le site II. Ainsi, chaque site étudié renferme une composition spécifique propre. Les courbes aires-espèces (Figure 3) montrent que les nombres de placette mise en place sont suffisants et sont représentatifs et que les résultats permettent de faire les comparaisons et de mieux comprendre la structure et la flore de chaque formation.

✓ **Structure diamétrique**

Au total, six classes de diamètre ont été définies et montrent pour l'ensemble une répartition à courbe portant plus d'individus dans les basses classes et décroît suivant les classes suivantes. Ainsi, la structure globale du peuplement se présente comme suit (figure 4, 5 et 6).

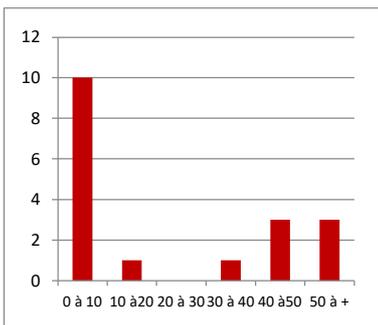


Figure 4 : Classes DBH des arbres du site I

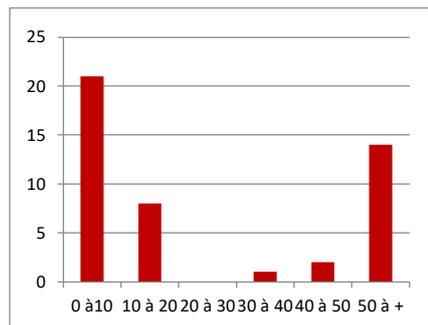


Figure 5 : Classes DBH des arbres du site II.

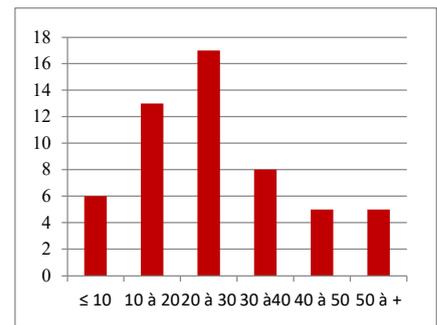


Figure 6 : Classes DBH des arbres du site III

Le diagramme de la figure 4 du site I montre que, la classe  $[\leq 10 \text{ cm}]$  de diamètre, se démarque en nombre d'individus (10 tiges) soit 55,55% du total des tiges. Elle est suivie de celle de  $[40-50 \text{ cm}]$  et de  $[\geq 50 \text{ cm}]$  de diamètre (3 tiges), soit 16,66% du total de tiges. Par contre, les classes de diamètre  $[20 - 30 \text{ cm}]$  ne renferment aucune tige. La courbe montre une allure à L, ceci implique une bonne régénération dans ce site.

De la figure 5 du site II, la classe  $[\leq 10 \text{ cm}]$  de diamètre, se démarque en nombre d'individus (21 tiges) soit 45,65% du total des tiges inventoriées. Elle est suivie de celle de  $[\geq 50 \text{ cm}]$  (14 tiges), soit 30,43% et de  $[10-20 \text{ cm}]$  de diamètre (8 tiges), soit 17,39%. Par contre, les classes de diamètre  $[20-30 \text{ cm}]$  ne renferment aucune tige. La courbe montre une allure à U, ceci implique une bonne régénération dans ce site.

Partant de la figure 6 du site III, contrairement aux deux premiers sites, la classe  $[20-30 \text{ cm}]$  de diamètre, se démarque en nombre d'individus (17 tiges), soit 31,48% du total des tiges inventoriées. Elle est suivie de celle de  $[10-20 \text{ cm}]$  (13 tiges), soit 24,07% et de  $[30-40 \text{ cm}]$  de diamètre (8 tiges), soit 14,81% du total de tiges) dans ce site. Par contre, les classes de diamètre  $[40-50 \text{ cm}]$  et

[ $\geq 50$ cm] ne renferment que 5 tiges chacune soit 9,25%. La courbe montre une allure pyramidale, ceci implique une bonne régénération dans le site.

✓ **Hauteur**

Les classes de hauteur des arbres des différents sites de la forêt classée du mont Gangan sont illustrées par les figures 7, 8 et 9.

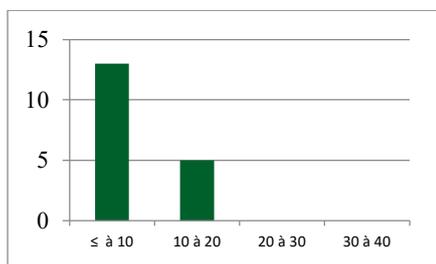


Figure 7 : Classes de hauteur des arbres du site I

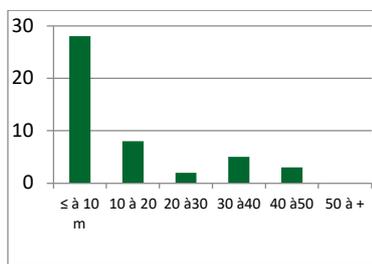


Figure 8 : Classes de hauteur des arbres du site II

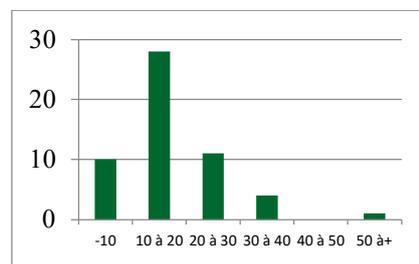


Figure 9 : Classes de hauteur des arbres du site III

Dans le site I (figure 7), l'essentiel des ligneux est groupé dans la classe de [ $\leq 10$ m], ils présentent une densité de 16 tiges par hectare soit 72,22% et la classe [10-20m] qui a une densité de 6 tiges par hectare soit 27,77% du total des individus recensés dans la zone. Les individus des classes [30 - 40 m], [40 - 50 m] et [ $\geq 50$  m] ne sont pas représentés.

La Figure 8 montre la structure verticale du peuplement ligneux (site II). Dans ce site, l'essentiel des ligneux est groupé dans les classes de [ $\leq 10$ m]. Ils représentent une densité de 29 tiges par hectare soit 60,86% du total des individus recensés, suivi des individus de la classe [10-20m], huit tiges par hectare soit 17,39%, les individus de la classe [30-40m] (cinq tiges par hectare soit 10,86%) et les individus de classe [40-50m] (3 tiges par hectare) ne représentent que 6,52% et représentent la strate supérieure de la zone II et est donc constitué de gros arbres. Il est à noter que des individus de classe [ $\geq 50$ m] de hauteur ne sont pas représentés, ce qui témoigne aussi d'une anthropisation accrue de cette zone de la forêt de Gangan.

La Figure 9 montre la structure verticale du peuplement ligneux du III<sup>ème</sup> site. Dans cette zone, l'essentiel des ligneux est groupé dans les classes de [10-20m]. Ils représentent 51,85% du total des individus recensés et sont plus nombreux dans ce site, et les individus à hauteur de classe [25-29m] représentent 14,81% suivi des arbres de la classe [5-9m] qui représente 9,25%. Les individus des classes [35-39m] et [+40m] ne représentent que 3,70% et 1,85% chacune. Les arbres à hauteur supérieure à 30 m représentent 12,96%. C'est la strate supérieure de la zone d'étude du site III. Il a été constaté que des individus de hauteur inférieure à 5m sont très rares, ce qui démontre que cette zone est une forêt dense, peu anthropisées.

La strate ligneuse de la zone d'étude est donc dominée par des arbustes. En général la plus part des individus de hauteur inférieure à  $\leq 10$ m témoigne aussi d'une régénération naturelle accrue.

✓ **Composition floristique, surface terrière et l'indice de valeur d'importance**

La valeur la plus importante est Indice de Valeur d'Importance (IVI) finale calculée. Elle représente la somme de la densité relative, la fréquence relative et la dominance relative tel que publié par Phillips (1959). Ceci permet d'obtenir une valeur pour l'importance écologique et de la domination d'une espèce dans le type de végétation étudié. Sur un total de 118 arbres représentant 50 tiges/ha, 49 espèces appartenant à 39 genres et 19 familles ont été identifiées dans une zone d'étude de 2,3562 ha. La famille des Mimosaceae représentait 14,28% des individus au total, suivis par Caesalpiniaceae et Moraceae (12,24%). Parmi les espèces de la famille des Mimosaceae, le genre *Albizia* (avec 8,16% des individus au total).

🚩 **Site I**

Pour la végétation du site I (Figure 10), nous avons mesuré 18 arbres sur les quatre placettes de 0,785397 ha. La densité est donc 23 tiges par hectare et la surface terrière totale des classes de DBH des arbres de 1,736 m<sup>2</sup>/ha. *Ceiba pentandra* est l'espèce de plus grande surface terrière avec 1,03 m<sup>2</sup>/ha suivit de *Ricinodendron heudelotii* avec 0,654m<sup>2</sup>/ha. *Ceiba pentandra* est l'espèce ayant la plus forte valeur de IVI 86,65, suivi par *Ricinodendron heudelotii* (62,04) et *Holarrhena floribunda* (26,86), tandis que 15 autres espèces ont un IVI supérieur à 13,0. Les trois premières espèces ont représenté 58,52% de l'ensemble IVI.

La zone basale totale des parcelles étudiées dans le site I de la forêt du mont Gangan était de 1,736 m<sup>2</sup>/ha (figure 11). Sur ce total, les membres de la famille des Bombacaceae constituaient 59,73% de la surface terrière totale, suivis par Euphorbiaceae 37,68%.

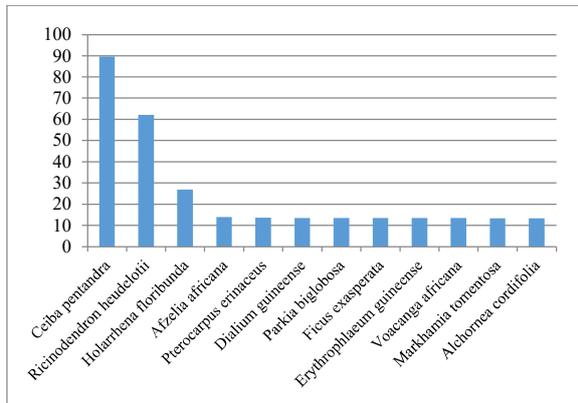


Figure 10 : Représentation des IVI des espèces du site I

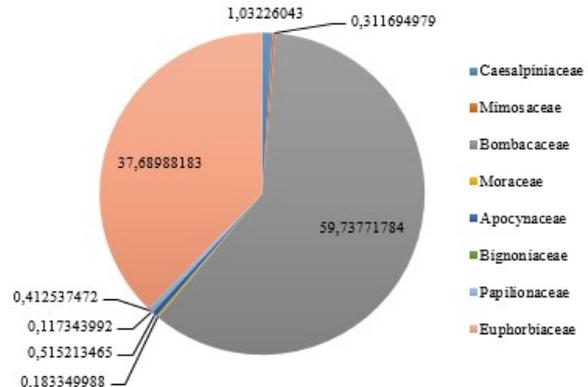


Figure 11 : Représentation des aires basales par famille du site I

Site II

Dans le site II, nous avons mesuré 46 arbres sur cinq placettes de 9817,45 m<sup>2</sup> (0,981745 ha). La densité est de 47 tiges par hectare et une surface terrière totale de 9,4735m<sup>2</sup>/ha (figure 12). *Parkia bicolor* est l'espèce la plus forte valeur IVI 27,3623 avec une surface terrière de 1,497m<sup>2</sup>/ha, suivi par *Ricinodendron heudelotii*(25,5169) avec une surface terrière de 1,73m<sup>2</sup>/ha, de *Antiaris africana* (24,6912) avec une surface terrière de 1,179m<sup>2</sup>/ha et de *Cola cordifolia*(19,1514) avec une surface terrière de 1,337m<sup>2</sup>/ha, *Parinari excelsa* et *Spondias microcarpa* ont respectivement 14,53 et 14,17 de l'IVI, *Gmelina arborea* et *Terminalia asp* ont aussi un IVI respectif de 13,74 et 13,63, une seule espèce *Uapaca togoensis* a un IVI de 12,50 avec une surface terrière de 0,50m<sup>2</sup>/ha tandis que cinq espèces *Albizia ferruginea*, *Alchornea cordifolia*, *Ceiba pentandra*, *Macaranga heterophylla* et *Mangifera indica* ont leur IVI supérieur 10,0 (Tableau8). Les 14 premières espèces ont représentés 67,47% de l'ensemble IVI.

La zone basale totale des parcelles étudiées dans le site II de la forêt du mont Gangan était de 9,473m<sup>2</sup>/ha. Sur ce total, les membres de la famille des Euphorbiaceae constituaient 24% de la surface terrière totale, suivis par Mimosaceae 21% et Sterculiaceae avec 14% puis Moraceae 13%, les familles Anacardiaceae, Combretaceae constituent 9% chacune puis Chrysobalanaceae et Caesalpiniaceae 4% chacune (figure 13).

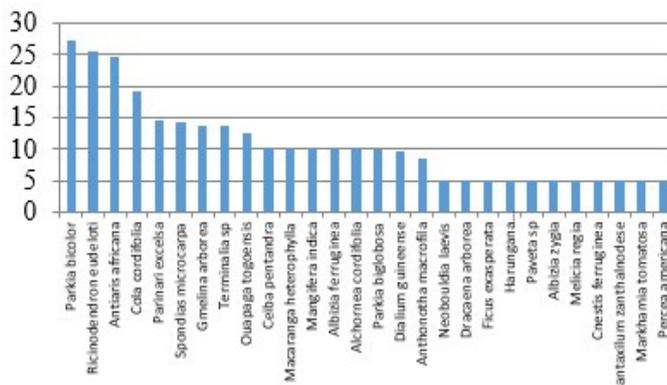


Figure 12 : Représentation des IVI des espèces du site II

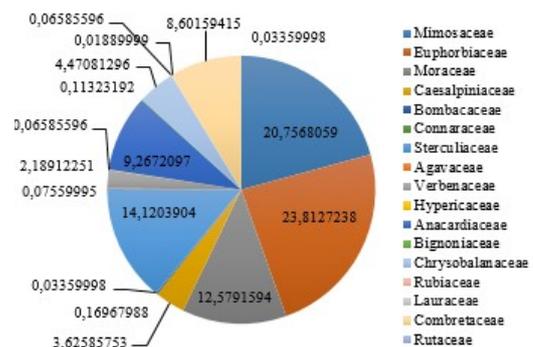


Figure 13 : Représentation des aires basales par famille du site II

**Site III**

Dans le site III, nous avons mesuré 54 arbres sur trois placettes de 5890,47 m<sup>2</sup>. La densité est de 92 tiges par hectare et la surface terrière totale est de 5,28m<sup>2</sup>/ha (Figure14). *Antiarisafricana* était l'espèce de la plus forte valeur IVI 35,2751 avec une surface terrière de 0,58m<sup>2</sup>/ha, suivi de *Piptadenistrumafricana* (31,56) avec une surface terrière de 1,40m<sup>2</sup>/ha, *Mangiferaindica* (29,983) avec une surface terrière de 0,56m<sup>2</sup>/ha, *Meliciaregia* (25,255) avec une surface terrière de 0,612m<sup>2</sup>/ha, *Ceibapentandra* (19,791) avec une surface terrière de 0,488m<sup>2</sup>/ha, *Cola nitida* (17,652) avec une surface terrière de 0,113m<sup>2</sup>/ha, *Fucus mucoso* (16,375) avec une surface terrière de 0,241m<sup>2</sup>/ha, *Meliciaexcelsa* (14,629) avec une surface terrière de 0,246m<sup>2</sup>/ha, *Erithrophilumguineens* (13,219) avec une surface terrière de 0,074m<sup>2</sup>/ha et *Albiziaadiantifolia* (12,578) avec une surface terrière de 0,2m<sup>2</sup>/ha, tandis que les 44 autres espèces présentent des surfaces terrières inférieures à 10. Les dix premières espèces ont représenté 72% de l'ensemble IVI.

La zone basale totale des parcelles étudiées dans le site III de la forêt du mont Gangan était de 5,28m<sup>2</sup>/ha. Sur ce total, les membres de la famille des Moraceae constituaient 36% de la surface terrière totale, suivis par Mimosaceae 33% et Anacardiaceae et Bombacaceae avec 11% chacune (figure 15).

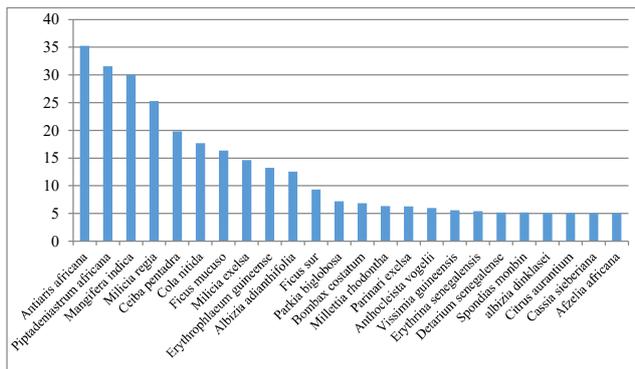


Figure 14 : Représentation des IVI des espèces du Site III

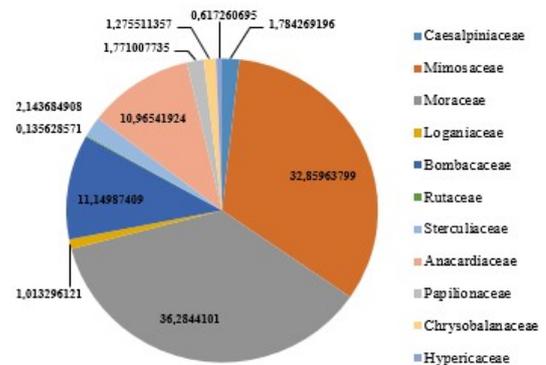


Figure 15 : Représentation des aires basales par famille du site III

Du point de vue comparaison entre les trois sites, nous remarquons que, dans le site I (dégradé), tous les individus restant représentent 15,25% des individus recensés avec une densité de 7,63 individus/ha. Dans le deuxième site, caractérisé par différents type de formation anthropique (les jachères jeunes, les touffus, les champs et autre forme de déforestation par les coupe de bois les individus représentes 38,98% des individus recensés avec une densité de 19,52 individus/ha. On note particulièrement dans le site III la présence de beaucoup d'individus représentant 45,77% avec une densité de 22,92 individus/ha et des individus ayant un diamètre supérieur 50 représentant 4,23% avec une densité de 2,12 individus/ha.

La densité des individus présentant un diamètre inférieur à 5cm s'élève à 1,27 individus/ha dans les trois sites. La pression exercée sur un certain nombre d'espèces comme le *Albizia zygia*, *Dialium guineense*, *Antiaris africana* notamment lors de la préparation des champs d'une part, et la régénération naturelle observée au niveau de la majorité des ligneux inventoriés d'autre part, explique cet état de fait.

Le constat est que les individus de la classe de diamètre [20-30cm] sont absents dans les sites I et II se justifie non seulement par les coupes abusives mais aussi du fait que, dans ces sites, on a jamais pratiqué un système d'aménagement ou de restauration de la forêt depuis le 26/07/1930 date de mise en réserve et 16/12/1942 date de classement. Nous avons aussi constaté que les arbres présentent un gros diamètre plus dans les forêts péri villageoises, les hautes altitudes et dans les champs cultivés que dans les zones de pâturages, surtout quand il s'agit des espèces sous surveillance qui sont plus appréciées par les cultivateurs comme *Piptadeniastrum africanum*, *Parkia biglobosa*...

En général, certaines familles sont majoritairement présentes dans deux sites à la fois, tel est le cas de la famille des *Euphorbiaceae* qui représente 38% et 24% des aires basales respectivement dans les sites I et II, *Mimosaceae* 21% et 33% dans les sites II et III, *Moraceae* 13% et 36% dans les sites II et III, *Bombacaceae* 60% et 11% dans les sites I et III, *Anacardiaceae* 9% et 11% dans les sites II et III. Par contre, certaines familles sont spécifiques à leur site telles que : *Apocynaceae* au site I, *Combretaceae*,

*Connaraceae, Lauraceae, Verbenaceae, Agavaceae* et *Rubiaceae* au site II et *Loganiaceae* au site III. Les résultats obtenus au cours de cette recherche sont relativement conformes à ceux d'autres auteurs de certains pays de l'Afrique [11, 12, 13, 14].

#### IV. CONCLUSION

Le développement durable reste un idéal à atteindre et la conservation de la biodiversité demeure une priorité pour la communauté internationale. Le changement global, bien perceptible, peut être considéré comme la cause générale de la dégradation des ressources végétales. Cependant les déterminants et modalités des évolutions environnementale et sociétale actuelles et leurs conséquences sur l'état et la dynamique de la biodiversité restent à quantifier de manière bien plus précise. Dans ce contexte, nous nous sommes interrogés sur l'évolution future de la biodiversité végétale dans les paysages fortement anthropisés par l'agriculture intensive dans la forêt classée de Gangan à Kindia en basse Guinée. Nous nous sommes donnés comme objectif d'étudier les caractéristiques biophysiques des ressources ligneuses dans la forêt classée de Gangan en combinant des données écologiques.

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# *Usefulness of E-module Based on Experiential Learning in Physics Learning*

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**Abstract**— Education is defined as a process using certain methods to produce knowledge. The era of the industrial revolution 4.0 has an impact on education, namely learning is influenced by technology. Generations that are influenced by technological developments are called digital natives. Digital native characteristics have an influence on the learning of students, where technology cannot be separated from their lives. So that we need teaching materials that can facilitate the learning characteristics of the digital native generation, namely teaching materials based interactive multimedia, such as e-modules. The aim of this study was to determine the usefulness level of e-module based on experiential learning in physics learning. This type of research is Research and Development (R&D). The method used is descriptive method with data collection instruments, namely the e-module usefulness questionnaire assessed by the teacher. The results showed that experiential learning-based e-modules were very useful in learning physics.

**Keywords**—Usefulness; E-module; Experiential Learning; Physics Learning.

## I. INTRODUCTION

Education is an effort taken to be able to educate the nation's life. For this reason, Law No. 20 of 2003 concerning National Education was enacted in order to build a democratic, decentralized, and autonomous education that can uphold human rights [1]. In order to achieve educational goals, one of the efforts that can be made by the government is to improve the curriculum. Completion of the curriculum must follow the developments and changes of the times [2]. This is done so that human resources (HR) in Indonesia can compete globally with other countries.

The implementation of the curriculum can be seen in learning in schools, both primary and secondary schools. The essence of learning is a two-way communication process between teachers and students through media or certain teaching materials [3]. Learning must be able to involve students to be active, in order to explore and explore the potential that exists within them [4]. For this reason, the creativity of the teacher as a facilitator for students is needed.

In the era of the industrial revolution 4.0, there were technological developments that had an impact on the ease of accessing information. The very rapid development of technology allows information originating from the real world to be copied into virtual form [5]. The development of technology also has an impact on the field of education, where student learning is often referred to as digital native which is different from the learning of students in the previous era [6]. Characteristics of digital native, namely being

able to perform various activities at once and accustomed to skipping cognitive structures [7]. The digital native generation is technology, flexible, smarter, and tolerant of cultural differences [8]. For digital natives, technology cannot be separated from their lives. It can be seen from the use of computers, digital music players, the use of smartphones and various other digital devices in filling their lives [9].

These special naive digital characteristics will have an impact on the learning styles of students. This generation is more interested in teaching materials that can be accessed through digital devices. Thus, teachers are challenged to literacy terhadap p change learners' learning style that is almost entirely a digital native generation. The teacher has an important role in learning, the success or failure of learning depends on the activities and creativity of the teacher in realizing learning, such as being able to develop teaching materials that are in accordance with digital native characteristics.

One of the teaching materials that can facilitate the learning characteristics of the digital native generation is interactive multimedia-based teaching materials, such as e-modules. E-module is a form of independent teaching materials that are systematically arranged in the learning section presented in an electronic format [10]. E-modules are essentially the same as print modules, which are planned learning programs to help students achieve their learning goals [11]. The use of e-modules in learning can be a solution to the monotonous shortage of teaching materials in schools [12]. The e-module in this study uses an experiential learning model.

Experiential learning model is a learning model that activates students in constructing or arranging knowledge, skills, and values through direct experience so that learning is meaningful. Experiential learning model is learning in which knowledge is created through the transformation of experiences [13]. Learning based on the experience of students can make students able to guide themselves and develop critical thinking [14; 15].

Experiential learning-based e-module used in physics learning is a practical e-module. E-modules are said to be practical if e-modules are easy to use in learning [16]. Therefore, this study discusses the usefulness of e-module based on experiential learning in learning physics.

## II. METHODS

The type of research used is research and development (R&D). The development of e-modules uses the Plomp model which consists of three stages, namely *preliminary research, development or prototyping phase*, and *assessment phase* (Plomp, 2013). The practicality test is part of the Plomp model phase, namely the *development or prototyping phase*. The instrument used to collect data was the teacher's usefulness sheet.

This research was conducted in July-August 2019. Usability analysis uses a Likert scale with usability values determined using the formula:

$$P = \frac{f}{N} \times 100\%$$

Information:

P = usefulness value

f = earned score

N = maximum score

The usability value interpretation is based on Table 1.

Table 1. Usefulness Category

No.	Value	Category
1	$81\% \leq x \leq 100\%$	Very useful
2	$61\% \leq x \leq 80\%$	Useful
3	$41\% \leq x \leq 60\%$	Quite useful
4	$21\% \leq x \leq 40\%$	Less useful
5	$0\% \leq x \leq 20\%$	Not useful

Source: [17]

III. RESULT AND DISCUSSION

The data obtained in this study were useful data on the e-module based on experiential learning which was assessed by two physics teachers at SMAN 2 Padang. The usefulness assessment consists of four components, namely ease of use, attractiveness, efficiency of learning time, and usability. The results of the usefulness test analysis of the e-module ease of use can be seen in Figure 1.

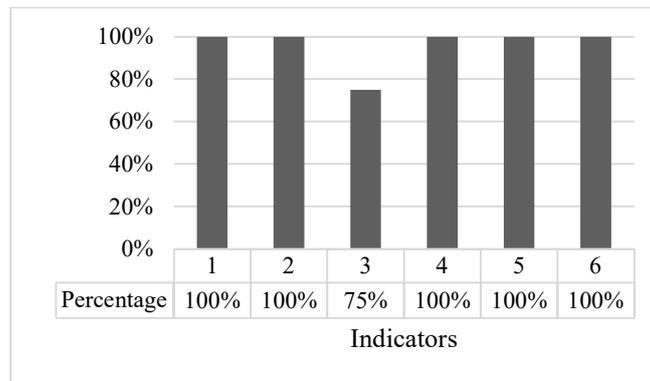


Figure 1. Ease of use component

Figure 1 is the result of usefulness test analysis for ease of using e-module. The indicators contained in the ease of use of the e-module consist of six indicators. The first indicator is that the material presented in the e-module is clear with a usefulness value of 100% which is in very useful category. The second indicator is the material presented in a simple e-module with a usefulness value of 100% on very useful category. The third indicator is that the teacher easily understands the contents of the e-module as a whole with a usefulness value of 75% with useful category. The fourth indicator is that the teacher can clearly see the letters used in the e-module with a usefulness value of 100 with very useful category. The fifth indicator is that the teacher is easy to read the letters used in the e-module with a usefulness value of 100% with very useful category. The sixth indicator is that the teacher easily understands the language used in the e-module with a usefulness value of 100% with very useful category.

Based on Figure 1, it can be concluded that the usefulness of the ease of use component is in the very useful category with an average of 96%.

The second component in the usefulness assessment is attractiveness, where the usefulness test results can be seen in Figure 2.

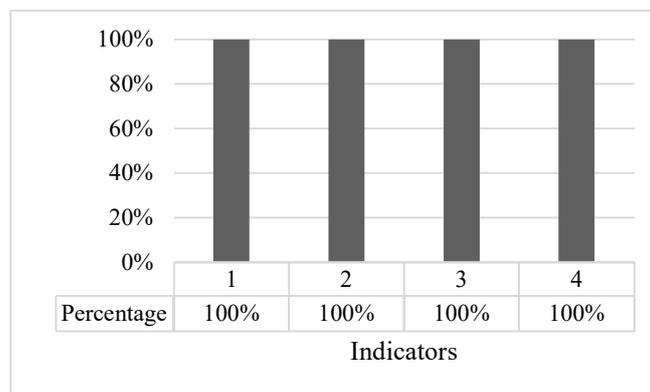


Figure 2. Attractiveness component

Figure 2 shows the results of the usefulness analysis test for the component of attraction which consists of four indicators. The first indicator, namely the pictures in the e-module, can motivate teachers to understand the material. The second indicator, namely the video in the e-module, can motivate teachers to understand the material. The third indicator, namely the reading in the e-module, can motivate teachers to understand the material. The fourth indicator, the e-module, can increase interest in learning. The usefulness value for the four indicators is 100% with very useful category.

Based on Figure 2, it can be concluded that the usefulness of the attractiveness component is in the very useful category with an average of 100%.

The results of the usefulness analysis of the components of the learning time efficiency can be seen in Figure 3.

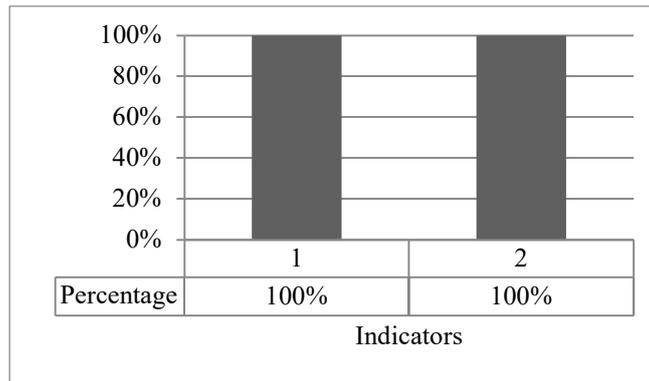


Figure 3. Learning time efficiency component

Figure 3 is the result of usefulness analysis test for the component of learning time efficiency which consists of two indicators. The first indicator is the use of e-modules to make learning more efficient. The second indicator, the e-module, can be used according to the allocation of learning time. The usefulness test value for both indicators is 100% with very useful category.

Based on Figure 3, it can be concluded that the usefulness of the learning time efficiency component is in the very useful category with an average of 100%.

The results of the usefulness test analysis for the usability component can be seen in Figure 4.

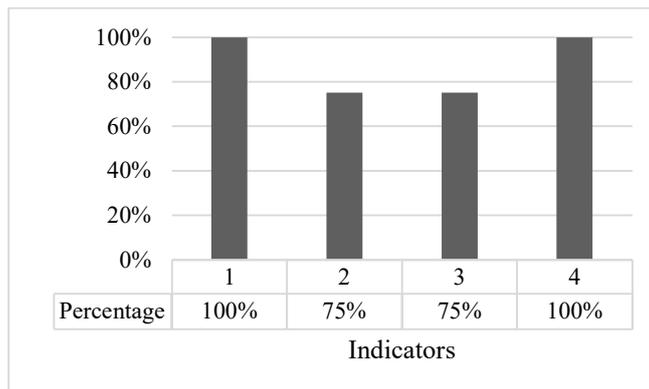


Figure 4. Usability component

Figure 4 is the result of usefulness test analysis for the usability component which consists of four indicators. The first indicator is the e-module supports the role of the teacher as a facilitator with a usefulness value of 100% with very useful category. The second indicator, namely e-module, reduces the workload of the teacher to explain material repeatedly with a usefulness value of 75% with useful category. The third indicator, namely e-module, can help in independent learning with a usefulness value of 75% with useful category. The fourth indicator of e-module can improve the disaster knowledge competence of students with a usefulness value of 100% with very useful category.

Based on Figure 4, it can be concluded that the usefulness of the usability component is very useful category with an average of 88%.

Usefulness level of e-module is a very useful category with an average value of 96%. This is in accordance with the theoretical study that the e-module is useful if it has a percentage of >80%. In addition, e-modules are said to be useful if they have attractiveness, letters and images are easy to understand, and can increase students' independent activities [18].

#### IV. CONCLUSION

Based on the results and discussion in this study, it is concluded that the e-module based on experiential learning is very useful to use in learning physics in terms of teacher responses.

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# *Perceptions Et Adaptation Des Femmes Agricultrices Aux Risques Climatiques Dans La Commune De Ouèssè*

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**Résumé –** En dehors des innombrables problèmes auxquels les communautés rurales sont confrontées dans l'exercice de leurs activités, les changements climatiques constituent pour elles au cours de ces dernières décennies une préoccupation majeure. La présente recherche vise à étudier les perceptions et la capacité d'adaptation des femmes agricultrices de la Commune de Ouèssè aux risques climatiques, afin de proposer des mesures rationnelles leur permettant de mieux faire face aux effets néfastes changements climatiques.

La méthodologie appliquée à cette recherche comprend quatre étapes essentielles à savoir : la recherche documentaire, les enquêtes de terrain, le traitement des données et l'analyse des résultats. Outre les données de terrain, celles liées aux températures et aux hauteurs de pluie ont été utilisées pour réaliser cette étude. Les enquêtes socio-anthropologiques se sont déroulées dans quatre arrondissements de la Commune de Ouèssè et portent sur un échantillon constitué par sondage au niveau des chefs d'exploitation agricoles.

De cette recherche, il ressort que les femmes agricultrices ont des perceptions semblables sur le début tardif de saison de pluie (52 % des femmes agricultrices), la fin précoce de saison de pluie (94 % des femmes agricultrices), les poches de sécheresse prolongée (94 % des femmes agricultrices), la hausse de température (94 % des femmes agricultrices) et les vents forts et violents (95 % des femmes agricultrices). Les résultats de l'analyse des données climatologiques ont montré une augmentation de la température, un démarrage tardif des pluies, un raccourcissement de la longueur des saisons et une augmentation de la sécheresse. Ces résultats sont, dans l'ensemble, conformes à la perception des femmes agricultrices. La baisse des rendements (90 % des enquêtés), la dégradation des terres sont, entre autres, les impacts de ces risques climatiques. Les limites des stratégies adaptées par les agricultrices a permis de montrer leur vulnérabilité. Des options d'adaptation sont enfin proposées pour aider les agricultrices à faire face aux effets néfastes du changement climatique.

**Mots clés –** Ouèssè, perception, risque climatique, adaptation

**Abstract –** Apart from the countless problems that rural communities face in carrying out their activities, climate change has been a major concern for them in recent decades. The present research aims to study the perceptions and the adaptability of women farmers in the Commune of Ouèssè to climate risks, in order to propose rational measures allowing them to better face the harmful effects of climate change.

The methodology applied to this research includes four essential steps: documentary research, field surveys, data processing and results analysis. In addition to field data, those related to temperature and rainfalls were used to conduct this study. The socio-anthropological surveys were carried out in four districts of the municipality of Ouèssè and relate to a sample surveyed at the level of farm managers.

From this research, it appears that women farmers have similar perceptions about the late start of the rainy season (52% of women farmers), the early end of the rainy season (94% of women farmers), the pockets of prolonged drought. (94% of women farmers), rising temperatures (94% of women farmers) and strong and violent winds (95% of women farmers). The results of the analysis of the climatological data showed an increase in temperature, a late start of the rains, a shortening of the length of the seasons and an increase of the drought. These results are, on the whole, consistent with the perception of women farmers. Declining yields (90% of respondents) and land degradation are, among other things, the impacts of these climatic risks. The limits of the strategies adapted by the women farmers made it possible to show their vulnerability. Adaptation options are finally proposed to help women farmers cope with the adverse effects of climate change.

**Keywords –** Ouèssè, perception, climate risk, vulnerability, adaptation.

## I. INTRODUCTION

Dans les pays ouest africains en général et au Bénin en particulier, les perturbations climatiques se manifestent par de fréquentes sécheresses affectant le milieu rural et par des inondations dans les villes. Elle se manifeste aussi par des vagues de chaleur et des pluies hors saison, une diminution des rendements agricoles et par conséquent une fragilisation de l'équilibre précaire des économies domestiques et des écosystèmes soumis aux catastrophes et désastres (Diarra D. M. et Monimart M. (2004).

Au Bénin, comme dans de nombreux pays en développement, les contraintes économiques et les normes culturelles qui empêchent les femmes d'accéder à un emploi rémunéré impliquent que leurs moyens de subsistance dépendent de secteurs sensibles au climat, comme l'agriculture vivrière et la collecte de l'eau (Etienne *et al.*, 1993). Par ailleurs, les inégalités de genre dans la répartition des biens et opportunités signifient que leurs choix sont sérieusement limités face au changement climatique.

Si du fait de leur manque de moyens, les femmes notamment agricultrices ont moins de possibilités d'investir dans des mesures de mitigation et d'adaptation, elles sont néanmoins des actrices incontournables à l'atténuation du changement climatique qui affecte aujourd'hui l'agriculture béninoise et surtout celle de la Commune de Ouèssè où parallèlement à la détérioration du couvert végétal, on assiste presque impuissant à l'amenuisement des sols et par ricochet à la raréfaction des terres fertiles cultivables (Yaha, 2014).

Face à cette situation, il urge de comprendre et d'analyser les perceptions des femmes agricultrices des changements climatiques vécus par elles et les stratégies d'adaptation développées par ces dernières pour faire face aux effets néfastes des risques climatiques, aux fins de mieux les accompagner dans l'adaptation aux changements climatiques. C'est ce qui explique le choix de ce thème de recherche intitulé « Perceptions et adaptation des femmes agricultrices aux risques climatiques dans la Commune de Ouèssè ».

## II. APPROCHE MÉTHODOLOGIQUE

### 2.1. Cadre géographique de l'étude

Située entre 8°15' et 8°45' de latitude nord, 2°15' et 2°45' de longitude est, La Commune de Ouèssè est limitée par les Communes de Savè et Glazoué au sud, la commune Tchaourou au nord, la Commune de Basila à l'ouest et à l'est par l'Okpara qui la sépare de la République Fédérale du Nigéria (figure 1)

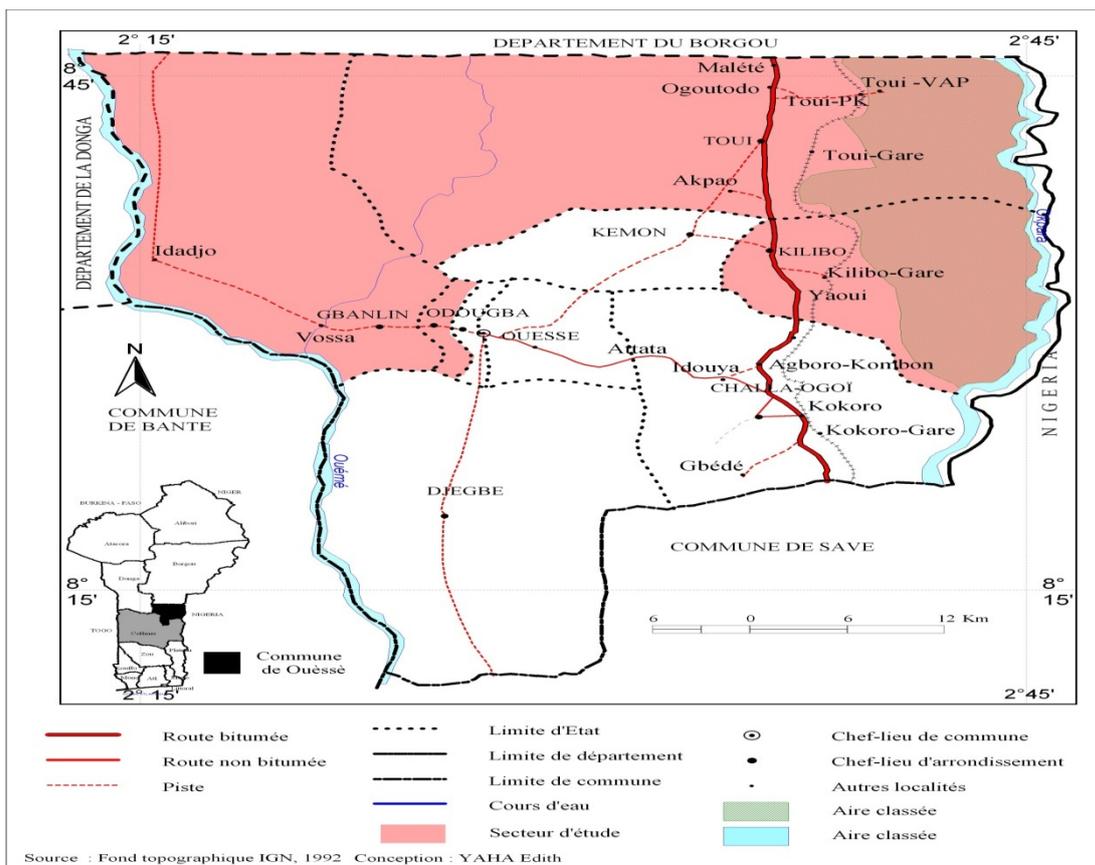


Figure 1: Situation géographique de la commune de Ouèssè

De part sa position géographique, la Commune de Ouèssè est classée dans la 5<sup>ème</sup> zone agro-écologique du Bénin et se situe dans la zone tropicale humide. Elle jouit d'un climat tropical intermédiaire entre le climat guinéen et le climat soudanien, avec la tendance ces trois dernières décennies vers une saison de culture au lieu de deux par an. La pluviométrie annuelle varie entre 1100 et 1200 mm.

Le relief à Ouèssè présente aussi des affleurements rocheux qui constituent une contrainte pour le développement de l'agriculture. Il est remarqué sur le relief de la Commune de Ouèssè, des fermes agricoles et champs enclavés par endroits. Ce relief peu accidenté libère essentiellement des sols ferrugineux tropicaux sur socle cristallin et des sols colluviaux. Ce relief, fait de diverses unités topographiques est favorable à la pratique de plusieurs systèmes de culture.

Dans la Commune de Ouèssè, les sols se révèlent indispensables à toute agriculture. Mais la pression humaine marquée par la surexploitation des terres, participe non seulement à la réduction des superficies cultivables mais aussi à la dégradation de l'environnement.

Le réseau hydrographique de la commune s'articule autour du fleuve Ouémé (ofé), qui sert de frontière naturelle avec la commune de Glazoué et de Savè avec des affluents tels que Gbéfa Okpara, Kilibo, Liga, Nonomi et Toumi), etc. Il favorise également en dehors de la production agricole d'autres activités agricoles telles que la pêche et l'élevage. Mais, depuis quelques décennies, ces cours d'eau connaissent un début d'étiage précoce à cause du climat local qui de nos jours subit des modifications.

Ouèssè a une végétation caractérisée par une savane boisée recouverte par un tapis herbacé et parsemé de quelques grands arbres comme le caïllédrot (*Khaya Sénégalensis*), le karité (*Vitellaria paradoxa*), le baobab (*Adansonia digitata*) et le néré (*Parkia biglobosa*).

Cette démographie constitue un véritable facteur de dynamisme pour le développement de la production vivrière. La population de la Commune étant majoritairement rurale, il s'ensuit que ses performances économiques essentielles sont du ressort du secteur primaire (INSAE, 2013). Deux grands ensembles socioculturels et ethniques cohabitent sur l'espace communal de Ouèssè. Il s'agit des Shabè (plus concentrés à l'Est) et des Mahi (plus présents à l'Ouest). A ces deux grands groupes s'ajoutent les migrants agricoles provenant des aires culturelles Fon, Otamari, Yom, Lokpa d'une part, et les éleveurs Peuhls sédentaires, d'autre part.

La Commune de Ouèssè bénéficie de véritables atouts pour son agriculture. En effet, elle dispose de 150 000 ha de terres cultivables (CeCPA Ouèssè, 2016), soit 52.10 % de la superficie totale de la commune. L'agriculture est pratiquée aussi bien par les hommes que les femmes et sont confrontés presque aux mêmes problèmes. L'élevage concerne celui du gros bétail que celui des petits ruminants et des volailles.

### 2.2. Approche méthodologique

Dans le cadre de cette étude, le travail s'est déroulé dans quatre arrondissements de la Commune de Ouèssè (Gbanlin, Odougba, Kilibo et Toui). L'identification des arrondissements et villages à enquêter est réalisée sur la base de deux critères : le poids agricole de l'arrondissement ou du village et l'appartenance sociocommunautaire de la majorité des productrices (Mahi et Nagot) dans la Commune de Ouèssè. A cet effet, les statistiques agricoles disponibles (superficies emblavées par saison), les statistiques démographiques et des observations faites lors de l'enquête exploratoire, ont été mises à contribution.

Les populations cibles sont les femmes agricultrices de la Commune de Ouèssè qui ont au moins 5 ans d'expérience dans la production agricole et sont âgées d'au moins 30 ans.

La taille de l'échantillon au niveau de chaque arrondissement est déterminée suivant la formule :  $T = M \times F$  ; avec T la taille de l'échantillon ; M, l'effectif des ménages par quartier et F, le taux d'échantillonnage fixé à 5 % pour cette étude. Ainsi la taille de l'échantillon des ménages agricoles enquêtés est 197.

En plus de cette population cible, 13 autres personnes intervenant dans le domaine agricole dans le secteur d'étude sont également interviewés. Au total, 210 personnes ont été enquêtées dans le cadre de cette étude.

Au nombre des techniques utilisées, on peut citer : la Méthode Active de Recherche Participative (MARP), la méthode du focus group, des entretiens individuels et des observations. Les outils et matériels de collecte des données sont : les guides d'entretien et d'observation, des questionnaires, un appareil photographique numérique et l'enregistreur de son. Le traitement statistique est réalisé à l'aide du logiciel Excel. L'analyse des résultats est faite grâce aux tests de différences et de corrélation et à l'AFC. Les logiciels SPSS et Nstat ont été aussi utilisés. L'analyse des résultats a été faite à base du modèle PEIR.

## III. RÉSULTATS

### 3.1. Perception des femmes agricultrices de l'évolution du climat

#### 3.1.1. Perception des femmes agricultrices de l'évolution du climat

La figure 7 présente le mois de démarrage de la grande saison des pluies dans le passé et actuellement selon les femmes agricultrices dans la Commune de Ouèssè (Figure 2).

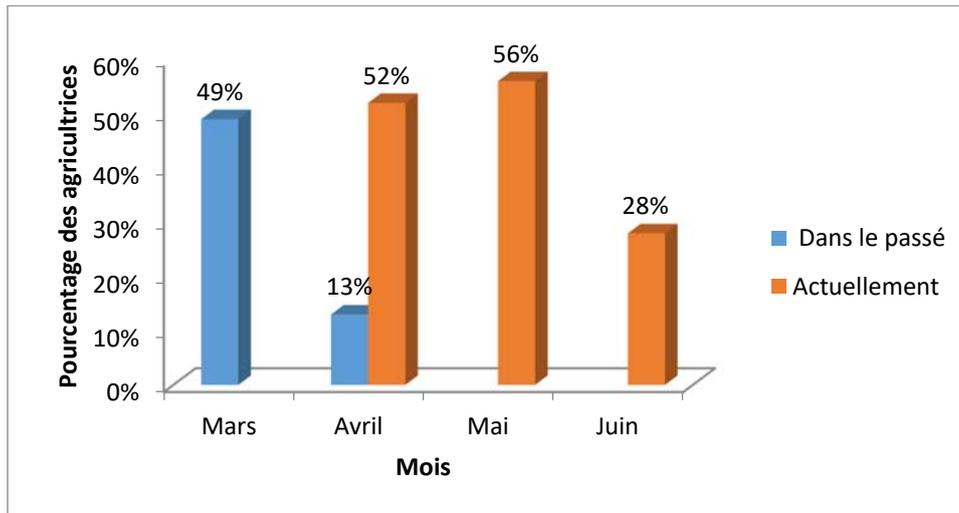


Figure 2: Mois de démarrage de la grande saison des pluies dans le passé et actuellement selon les femmes agricultrices dans la commune de Ouèssè.

Source : Enquête de terrain, octobre 2016

De l'analyse de la figure 7, il ressort que certaines femmes agricultrices (52 %) ont indiqué que la saison démarre actuellement en avril. Selon la majorité (56 %), c'est plutôt en mai mais, d'autres (28 %) affirment qu'elle commence en juin. La quasi-totalité des femmes agricultrices enquêtées (99 %) a indiqué que les saisons deviennent de moins en moins pluvieuses et de plus en plus courtes tout en ajoutant (94 %) qu'elles sont conjuguées à de séquences sèches de plus en plus longues. Une minorité des agricultrices (12 %) a soutenu que quelques indicateurs de l'arrivée des pluies restent encore valables. Selon 94 % de ces femmes, les journées sont de plus en plus chaudes pendant la saison sèche et 98 % d'entre elles indique que les nuits sont de moins en moins froides au début de la saison sèche. Pour ce qui concerne les vents, la majorité (95 %) a affirmé qu'ils deviennent de plus en plus forts notamment au début de la saison des pluies.

Nous pouvons retenir que les femmes agricultrices de la Commune de Ouèssè ont une bonne perception du changement climatique.

### 3.1.2. Analyse des risques climatiques dans la commune de Ouèssè

#### 3.1.2.1. Augmentation de la température

L'évolution des températures minimale, maximale et moyenne, observée dans la Commune de Ouèssè est traduite par la figure 8.

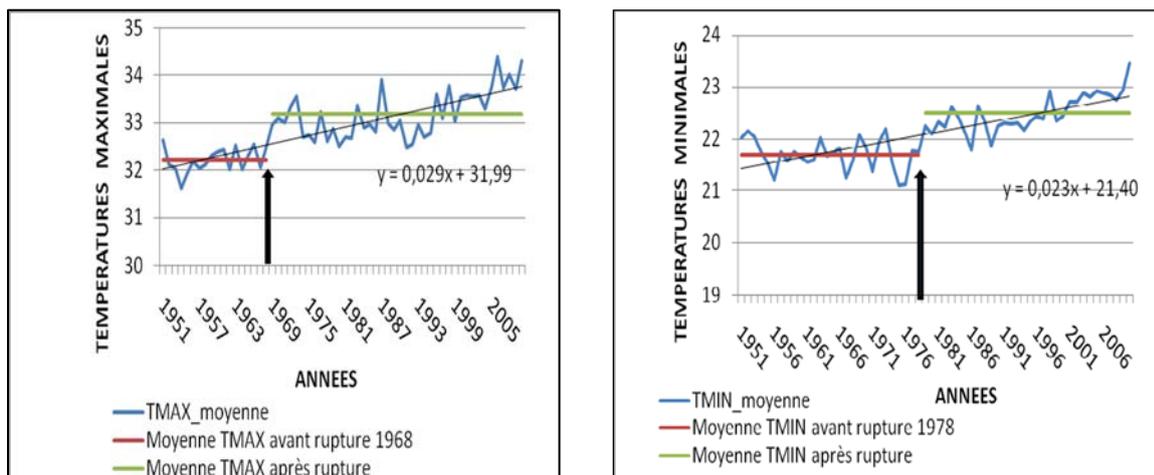


Figure 3: Evolution interannuelle des températures maximales et minimales moyennes à Ouèssè de 1951 à 2010

Source : Station synoptique de Savè, octobre 2016

Les températures (maximales et minimales) ont une tendance globalement à la hausse sur la période 1951-2010. Une tendance à la hausse du nombre de jours chauds a été notée sur la période choisie.

La variation de la température confirme que l'augmentation de la température est un risque climatique dans la localité. Ce constat confirme les informations fournies par les agricultrices enquêtées.

### 3.1.2.2. Démarrage des pluies

#### ❖ Démarrage de la grande saison des pluies

L'évolution interannuelle des dates de début de la grande saison des pluies de 1955 à 2010 observée dans la Commune de Ouèssè est traduite par la figure 9.

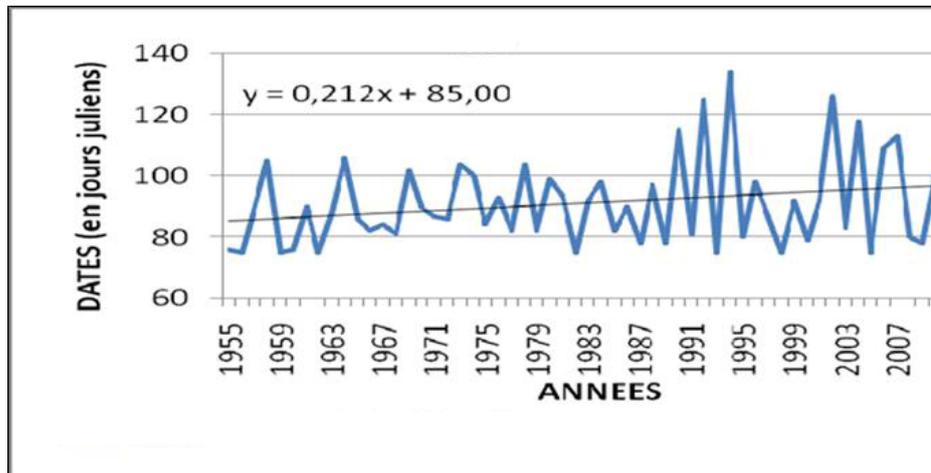


Figure 4: Evolution interannuelle des dates de début de la grande saison des pluies de 1955 à 2010 à Ouèssè

Source : Station synoptique, octobre 2016

La tendance du démarrage de la grande saison des pluies est à la hausse dans la Commune de Ouèssè. En moyenne, la grande saison démarre le 1er avril. Pour ce qui concerne la petite Saison, la tendance du démarrage est plutôt à la baisse dans le milieu d'étude, soit un démarrage de plus en plus tôt. La petite saison des pluies démarre en moyenne le 18 août. La grande saison des pluies au cours de laquelle se déroule l'essentiel des activités agricoles démarre de plus en plus tard ; le démarrage tardif des pluies reste donc un risque climatique à Ouèssè.

#### ❖ Raccourcissement de la saison des pluies

L'évolution interannuelle des longueurs de la grande saison des pluies dans la Commune de Ouèssè de 1955 à 2010 est présentée sur la figure 6.

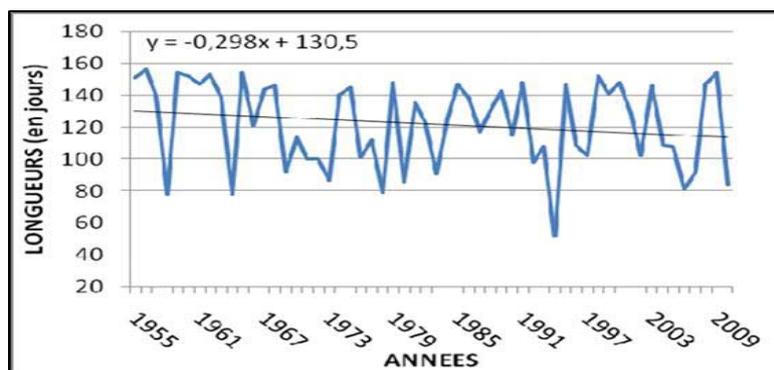


Figure 5: Evolution interannuelle des longueurs de la grande saison des pluies à Ouèssè de 1955 à 2010

Source : Station de Savè, octobre 2016

La variation des longueurs de la grande saison des pluies est en diminution. La longueur moyenne de la grande saison est 123 jours à Ouèssè. L'évolution des longueurs de la petite saison des pluies présente une faible tendance à la baisse. Au regard de l'évolution des longueurs de la grande et de la petite saison des pluies, on peut retenir que le raccourcissement des saisons est un risque climatique à Ouèssè.

### 3.1.2.3. Sécheresse

La figure 6 présente l'évolution interannuelle des séquences sèches les plus longues pendant les mois de mai, juin, juillet, septembre et octobre de 1955 à 2010 à Ouèssè.

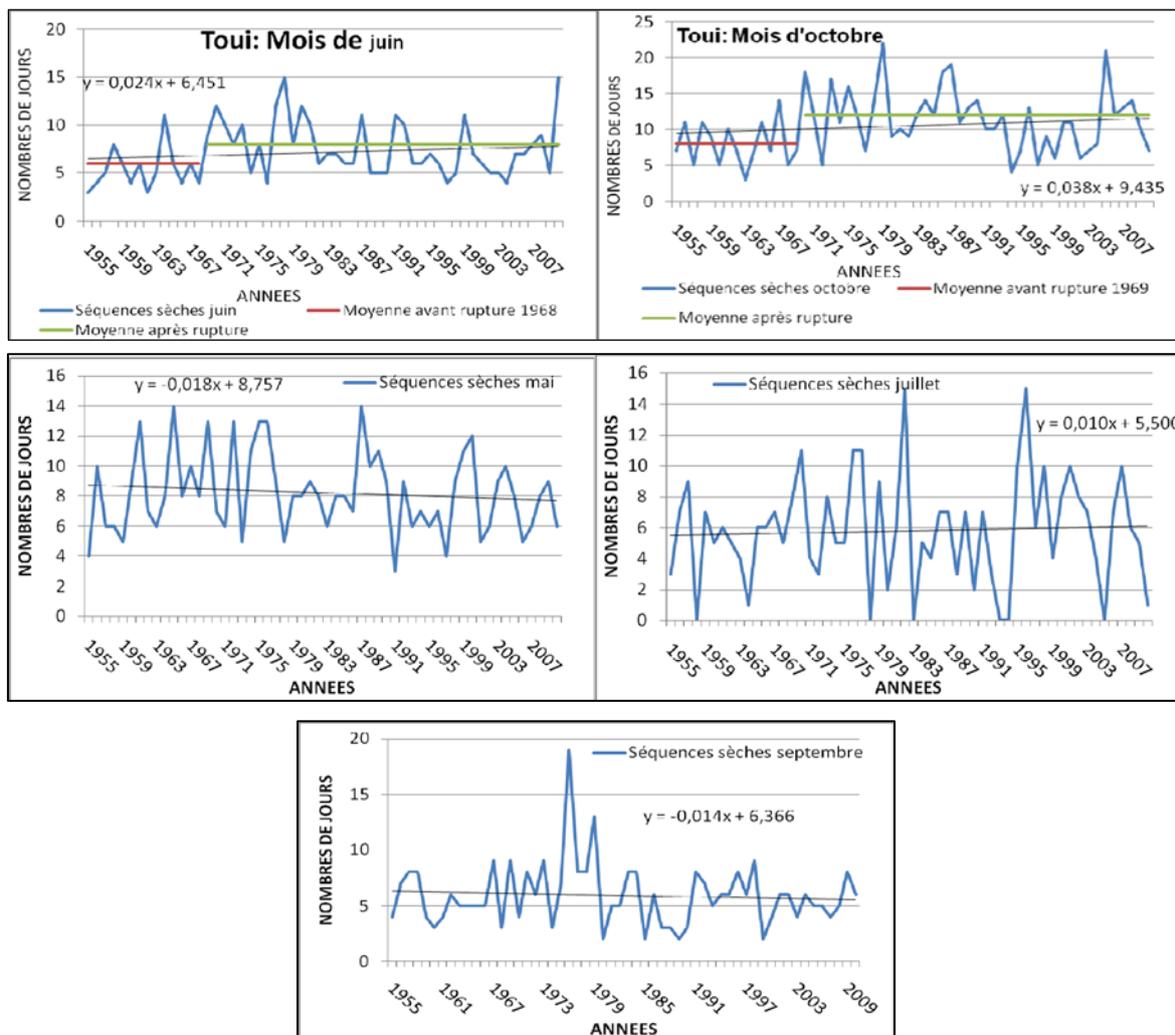


Figure 7: Evolution interannuelle des séquences sèches les plus longues pendant les mois de mai, juin, juillet, septembre et octobre de 1955 à 2010 à Ouèssè

Source : Station synoptique de Savè, octobre 2016

La figure 7 présente l'évolution interannuelle des séquences sèches les plus longues pendant les mois de mai, juin, juillet, septembre et octobre de 1955 à 2010 à Ouèssè. Dans l'ensemble, l'évolution des séquences sèches les plus longues au cours de chacun de ces cinq mois est à la hausse dans la Commune de Ouèssè. Parmi les cinq mois, une rupture a eu lieu dans la série du mois de juin et une rupture dans celle du mois d'octobre.

### 3.2. Des effets socioéconomiques de la variabilité climatique sur les femmes agricultrices

L'accès à la terre cultivable est difficile pour les femmes agricultrices. 85 % de ces femmes estiment que le capital foncier dont elles disposent est très insuffisant pour couvrir leurs besoins. 90 % des agricultrices affirment que la baisse des rendements est liée à la baisse de la pluviométrie et 76 % pensent que c'est plutôt la baisse de la fertilité de sol qui en est la cause. Selon 87 % des

enquêtés, les p<sup>é</sup>rorations pluviométriques et la hausse des températures, contribuent à la perte des récoltes. Les cultures les plus touchées sont : le maïs, le sorgho et le niébé.

Toutes les femmes agricultrices interviewées dans le cadre de cette étude sont unanimes sur cette situation (figure 8).

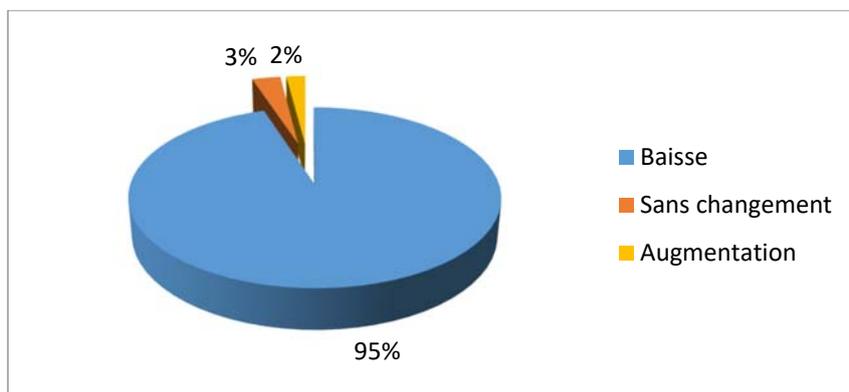


Figure 8: Perception des femmes agricultrices des impacts des changements climatiques sur les rendements agricoles

Source : Enquête de terrain, octobre 2016

De l'analyse de la figure 8, il ressort que les rendements ont baissé du fait des changements climatiques surtout la baisse des précipitations selon 90 % des femmes enquêtées.

En dehors de ces impacts présentés, on peut évoquer d'autres effets comme la dégradation des terres, le tarissement précoce des marres et cours d'eau, l'insuffisance des revenus issus des activités agricoles. La photo 2 présente une parcelle érodée à Odougba, Commune de Ouèssè.



Photo 1: Parcelle fortement érodée dans l'arrondissement de Odougba

Prise de vue : Yaha, octobre 2016

La photo 2 présente une parcelle érodée dans la Commune de Ouèssè. L'importance de cette érosion est fonction de l'unité de paysage. Par exemple, les parcelles situées en haut et en milieu de pente sont plus sujettes à l'érosion. L'érosion entraîne le découpage progressif de la couche du sol. Le manque de pluies et les poches de sécheresse au cours de la saison pluvieuse ont des répercussions négatives sur la disponibilité en eau des sols. Ces effets sont beaucoup plus perceptibles sur les sols situés en haut de pente, qui pour la plupart se dessèchent sous l'effet des rayons solaires intenses.

Toutes les femmes agricultrices enquêtées ont déclaré que les revenus des activités agricoles sont, de nos jours, loin de couvrir leurs besoins même si malgré cela certaines (37 %) trouvent intéressants les prix de vente des produits de récolte actuellement tout en déplorant toutefois que les rendements ne suivent pas. Elles affirment n'être pas en mesure de couvrir leurs besoins quotidiens avec leurs revenus, car 32 % seulement ont un revenu annuel estimé entre 100 000 et 200 000 F CFA.

83 % des femmes déclarent n'avoir pas reçu d'aide ni de l'Etat ni des ONG et 71 % déclarent n'avoir pas aussi accès au crédit et sont presque sans ressources additionnelles. Ceux qui ont des enfants à l'extérieur (6 %) n'attendent d'eux que de petits gestes en fin d'année pour les fêtes. Dans l'ensemble, ils font face à de nombreuses difficultés pour se soigner, assurer la scolarité des enfants et autres besoins de la famille.

#### IV. STRATEGIES D'ADAPTATION DES FEMMES AGRICULTRICES A LA VARIABILITE CLIMATIQUE ET MESURES DE RENFORCEMENT

##### 4.1. Stratégies d'adaptation des femmes agricultrices à la variabilité climatique

Dans le but de s'adapter à la nouvelle donne climatique qui a des effets sur la production agricole, les femmes agricultrices de la Commune de Ouèssè ont développé diverses stratégies. Parmi celles-ci, on peut citer :

###### 4.1.1. Adoption de nouvelles cultures ou variétés de culture

Pour pallier les retards criards de pluies lors de la grande saison des pluies et le raccourcissement de cette saison, les femmes agricultrices (87 %) ont progressivement abandonné les variétés locales de maïs, qui sont des variétés à cycle long pour adopter de nouvelles variétés à cycle court. Cette stratégie concerne également le niébé pour ceux qui continuent de le cultiver pour répondre aux péjorations climatiques enregistrées. Le semis en ligne est de plus en plus pratiqué pour une bonne gestion de l'espace et un meilleur rendement (planche 1).



Planche 1: Champs d'association de cultures vivrières à Ouèssè

Prise de vues : Yaha, octobre 2016

L'observation de la photo (a) montre un champ du riz à Gbanlin. La photo (b) illustre une vue partielle d'un champ de piment à Kilibo. L'adoption de ces nouvelles variétés de cultures permet aux femmes agricultrices d'améliorer le rendement.

###### 4.1.2. Déplacement de cultures

Il s'agit ici d'un déplacement de cultures d'une unité de paysage à une autre dans le même terroir villageois.

Cette stratégie est développée dans la Commune de Ouèssè par 56 % des femmes agricultrices pour gérer les stress hydriques au niveau des cultures.

###### 4.1.3. Modification des associations / rotations culturales

Les rotations de maïs-niébé, maïs-arachide, etc. ont fait place à des types de rotation comme maïs - soja. Avec la situation antérieure, il y avait la culture de relais du maïs par le coton : maïs au début de saison et coton dans le maïs avant sa récolte. Mais actuellement, chaque spéculation a sa superficie propre. Les autres pratiques culturales n'ont pas fondamentalement connu de modifications par rapport à la situation antérieure.

###### 4.1.4. Modification des emblavures

La modification des emblavures concerne aussi bien les extensions des superficies totales cultivées que les diminutions de superficie. Des enquêtes réalisées sur le terrain, il ressort que l'augmentation des emblavures comme stratégie est plus dominante que la diminution. En effet, plus de 86 % des femmes agricultrices enquêtées dans la Commune de Ouèssè, ont augmenté leur superficie de cultures.

###### 4.1.5. Activités secondaires développées

Plusieurs activités génératrices de revenus sont développées par les femmes agricultrices. Il s'agit de la vente d'essence frelatée par 49 % contre 37 % pour le commerce. La transformation des matières premières (poisson, bois, fruits, céréales, etc.) est aussi une stratégie développée par les femmes afin de valoriser et de conserver des produits qui se font de plus en plus rares, mais aussi de laisser les ressources se régénérer. Elles permettent ainsi de préserver une biodiversité menacée par le réchauffement climatique.

**V. LIMITES DES STRATEGIES D'ADAPTATION DES AGRICULTRICES A LA VARIABILITE CLIMATIQUE**

Le tableau III expose les limites des stratégies d'adaptation à la variabilité climatique.

Tableau I: Limites des stratégies paysannes à la variabilité climatique

Stratégies d'adaptation paysanne	Limite des stratégies d'adaptation
<b>Abandon des cultures</b>	- Mauvais choix de nouvelles variétés - Embarra de choix de la nouvelle culture
<b>Adoption de nouvelles variétés</b>	- Les producteurs sont sous informés sur les exigences thermiques et hydriques des nouvelles variétés - Manque de formation sur l'itinéraire technique de production de nouvelles variétés - Non résistance des nouvelles variétés au stress hydrique - Manque d'information sur la rentabilité économique des nouvelles variétés à l'hectare
<b>Changement du calendrier agricole</b>	- Peu adapté au rythme climatique actuel - Pas opérationnel en cas de la persistance de la variabilité climatique - Non prévisible des pluies hors saison
<b>Augmentation des superficies</b>	- Présence des superficies non ensemencées dans les exploitations agricoles - L'augmentation des superficies ne tient lieu de l'abondance ou pas des pluies - Enormes pertes de qualité et ou de récolte en cas de pluies hors saison ou leur concentration en une période courte - Dépense d'énergie physique
<b>Association des cultures</b>	- Manque d'eau pour les cultures associées - Ralentissement de la croissance des plantes - Risque de pertes de la production en cas d'attaque de maladies - Technique culturale non résistant à la variabilité climatique
<b>Activités secondaires</b>	- Faibles revenus - Activités à haut risque mortel - Manque de formation pour ces activités - Non maîtrise des stratégies de développement de chaque activité - Activités non productrices des aliments de base des populations

Source : Enquête de terrain, octobre 2016

L'analyse du tableau montre que les stratégies développées par les femmes agricultrices présentent des limites.

**VI. MESURES D'ADAPTIONS DURABLE DE LA PRODUCTION AGRICOLE A LA VARIABILITE CLIMATIQUE**

- Améliorer l'accès et le contrôle des femmes sur les ressources et les moyens (formation, crédit, technologies...) afin qu'elles puissent réaliser leurs activités de production sans contrainte ;
- s'assurer que les lois relatives à l'héritage accordent des droits de propriété égaux aux hommes et aux femmes et que ces lois soient respectées.
- favoriser l'accès à la formation et l'information des femmes sur le changement climatique et sur les stratégies d'adaptation.
- développer l'agroforesterie qui permet de gérer et de maintenir un nombre suffisant d'arbres existants déjà sur les champs.

**VII. CONCLUSION**

Les femmes agricultrices de la Commune de Ouèssè sont très vulnérables aux variabilités et changements climatiques du fait de leur situation d'extrême précarité. Des options d'adaptation ont été proposées pour renforcer leur capacité.

Au nombre de ces options, on peut citer : l'utilisation des variétés précoces et résistantes à la sécheresse, le développement de nouvelles techniques culturales, l'agroforesterie, le développement des techniques d'irrigation. Les populations et l'Etat central sont aussi vivement interpellés pour une meilleure prise en compte des questions climatiques dans la Commune de Ouèssè et ses conséquences sur les populations agricoles notamment les femmes agricultrices.

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# *Interplay of Different Parameters in COVID-19 Infection and Novel Results of Possible Prevention and Treatment (Review of the Literature)*

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**Abstract – Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and the resulting coronavirus disease 2019 (Covid-19) remains a global challenge. There are intense studies for finding effective prevention and treatment options worldwide. Therefore, infection prevention, prognostic parameters of infection complication and identification of successful treatment protocols need more investigations.**

**Interpretation of laboratory parameters may support clinicians in prevention and treatment of the disease, will improve COVID 19 infection outcomes and may potentially decrease the death rate overall.**

**Study results have shown that different laboratory parameters during the disease course are significantly changed. In critically ill patients, coagulation complications and coagulation/anticoagulation imbalance are characteristic also. According to the research results, vaccination offers the best option for COVID-19 control.**

**In this review, some parameters, current therapeutic options, preventive methods of COVID 19 infection are discussed.**

**Keywords – COVID-19 infection, SARS-CoV-2 virus, laboratory parameters, prevention, treatment.**

Coronavirus disease 2019 (COVID-19) - as a new infection was firstly described in Wuhan, China in December 2019. [41]. The causative agent was SARS-CoV-2 virus similar to Severe acute respiratory syndrome coronavirus (SARS-CoV) reported before in November 2002 to June 2003 in China. [60]. SARS-CoV-2 started with local, later with epidemic outbreak and has rapidly spread all over the world reaching pandemic. Consequently, WHO declared the outbreak as a Public Health Emergency of International Concern on January 30, 2020, and a pandemic on 11 March [2,15,74].

SARS-CoV-2 invades host human cells by binding to the angiotensin-converting enzyme 2 (ACE2) receptor [31]. The spike glycoprotein (glycoprotein S) on the virion surface targeting towards ACE2 receptor is essential in the process of SARS-CoV-2 infection. Down-regulation of ACE2 receptors and systemic renin-angiotensin system imbalance occurs promoting of multi-organ failure [1,6,27,29,51].

This replication cycle of the virus has numerous steps: attachment and entry, genome transcription and replication of the virus, structural protein translation, accumulation and release of the virus [41,43].

COVID-19 is basically considered as a respiratory tract infection, but apparent data shows that it should be viewed as a polysystemic disease involving multiple systems (cardiovascular, respiratory, gastrointestinal, neurological and immune systems) [4,31,52,59]. Elderly people, especially with comorbidities are at increased risk of lethal outcome from COVID-19, though, should

be noted, that younger individuals without considerable underlying diseases may also develop potentially lethal complications such as fulminant myocarditis and disseminated intravascular coagulopathy (DIC) [37,58].

After approximately 5–6 days of symptoms debut, SARS-CoV-2 viral load reaches its highest point. According to statistics, disease may progress to acute respiratory distress syndrome, averagely after 8–9 days after symptom onset [62,65,69,70].

Different studies revealed numerous hematologic findings and complications of COVID-19. In the incubation period (1 to 14 days), or the early phase of the disease, with non-specific symptoms peripheral blood leukocyte and lymphocyte counts are normal or slightly reduced. Gradually, along with viremia, SARS-CoV-2 mainly attacks those tissues with high levels of ACE2 (lungs, heart and gastrointestinal tract). Mostly, 7 to 14 days from the initial symptoms, there is an efflux in the clinical manifestations of the disease [16].

The clinical manifestations of COVID-19 are various starting with mild upper respiratory tract infection, lower respiratory tract infection including non-life-threatening pneumonia, and life-threatening pneumonia with acute respiratory distress syndrome. During hospitalization COVID-19 patients mostly show the following symptoms: impaired smell and taste, fever, coughing, dyspnea, general weakness, myalgia, diarrhea, severe lymphopenia, prolonged coagulation profiles. Neutrophilia and lymphopenia may correlate with the disease severity and mortality in COVID-19 patients [58, 63,67,70].

Moreover, patients requiring intensive care units (ICU) care have increased plasma levels of several innate cytokines e.g. TNF $\alpha$  [24, 50]. The immune response to SARS-CoV-2 indicate equity between protective effects and harmful pathological reactions [4].

This is with a prominent systemic increase of inflammatory mediators and cytokines that indicates a “cytokine storm” [30]. In this stage, significant lymphopenia develops. Several factors cause COVID-19 associated lymphopenia. It has been shown that lymphocytes express the ACE2 receptor on their surface [72]; thus SARS-CoV-2 may directly invade those cells and consequently lead to their degradation. The cytokine storm is characterized by remarkable increased levels of interleukins (mostly IL-6, IL-2, IL-7, granulocyte colony stimulating factor, interferon- $\gamma$  inducible protein 10 and tumor necrosis factor (TNF)-alpha, which may promote lymphocyte apoptosis [2,32,47,54].

Another reason is that substantial cytokine activation may also be associated with atrophy of lymphoid organs, including the spleen, and further impairs lymphocyte turnover [9]. Coexisting lactic acidosis is more apparent among cancer patients who are at increased risk for complications from COVID-19 [73] may also inhibit lymphocyte proliferation [17].

Patients with severe COVID-19 infection, in ICU exhibit higher blood plasma levels of IL-2, IL-7, IL-10, granulocyte colony-stimulating factor (G-CSF), IP-10, MCP1, macrophage inflammatory protein 1 $\alpha$  (MIP1 $\alpha$ ) and tumor necrosis factor (TNF) [24]. IL-6 levels in these patients increase along with time and are in higher figures in non-survivors rather than in survivors [78].

Previously, some correlations were found between clinical symptoms of common cold and altered zinc homeostasis. Results indicate that zinc may prevent or reduce those symptoms. Studies showed decreased symptom severity, frequency, and duration of the common cold after zinc administration [12,22,24,25] depending on dosage, zinc compound and the start time after initial symptoms [64].

Several studies reveal melatonin to be an effective antiviral agent in COVID-19 pandemic [3]. Despite of significant increase of inflammatory cytokines, COVID 19 induces reactive oxygen species, meanwhile melatonin, excellent natural antioxidant and anti-inflammatory-cytoprotector, is very low in elderly patients [57]. In severe cases of COVID-19 melatonin stimulates immunity. Therefore, as considered, the use of melatonin in proper doses can potentially avoid the development of severe symptoms in coronavirus patients, reduce the severity of their symptoms, and/or reduce the immuno-pathological consequences of infection in convalescent patients. Some studies also suggest that in addition, melatonin may help to prevent reinfections and serve as a powerful immunomodulator for future vaccines [6].

Currently, there are more and more investigations directed to the survey of Vitamin D and its possible use as treatment in COVID 19 patients. There are reported some retrospective cohort studies indicating deficient vitamin D status was associated with increased COVID-19 risk, though more randomized trials are needed to detect whether vitamin D affects COVID-19 risk [39,40].

Mentioned before, coagulation complications and coagulation/anticoagulation imbalance together with thrombocytopenia is mainly associated with the intensive symptoms of the COVID-19 disease; significant drop in platelet count was observed especially in non-survivors. [11,34,78].

Meanwhile, the D-dimer and the surveillance of its dynamics became one of the most widespread and notable indicators for thrombogenesis in covid 19 patients. Before SARS-CoV-2 outbreak, numerous data has shown D-dimer increased levels were associated with unfavorable outcomes among patients with community-acquired pneumonia [55]. In another previous studies in community-acquired pneumonia (CAP) and chronic obstructive pulmonary disease (COPD) patients have revealed that D-dimer level is increased in their severe cases and may be used as one of the prognostic biomarkers [19,47,55]. D-dimer > 1 µg/ml is mentioned to be one of the risk factors of mortality in adult inpatients with COVID-19. [74].

Novel study results showed that D-dimer and prothrombin time (PT) levels were higher on admission among COVID-19 patients requiring ICU support [24]. Patients requiring ICU treatment had significantly higher D-dimers compared with less severe cases [63,64].

Patients with several cardiac injury in the context of COVID-19 infection are more inclined to coagulation disorders compared with those without cardiac involvement. Also patients with high troponin-T levels often represent elevated PT, activated partial thromboplastin time, and D-dimer [21,53]. The risk of venous thromboembolism (VTE) in hospitalized COVID-19 patients is highly important issue. The rate of symptomatic VTE in hospitalized acute patients reaches even 10% [28]. Another important concern is a high platelet to lymphocyte ratio indicating more noticeable cytokine storm, due to enhanced platelet activation [46]. Extended immobilization during the disease, dehydration, other cardiovascular risks (ie, hypertension, diabetes, obesity, coronary artery disease, history of ischemic stroke or peripheral artery disease, previous history of VTE and classical genetic thrombophilia, such as Factor V Leiden mutation are comorbidities found in hospitalized COVID-19 patients that potentially increase VTE risk [16]. Endothelial cell activation/damage due to ACE receptor may further increase VTE risk. The release of numerous inflammatory mediators and the use of hormones and immunoglobulins in severe or critically ill patients may promote an increased blood viscosity also. Moreover, mechanical ventilation, central venous catheterization may induce vascular endothelial damage. The combination of all the above factors may lead to DVT (deep venous thrombosis) occurrence or even the possibility of lethal outcome due to thrombus detachment and migration [14]. Melatonin does not have viricidal properties; however, it has indirect antiviral effects through anti-inflammatory, antioxidant and immunity-enhancing effects [76]. Previously, melatonin was shown to suppress the features of viral infections [36].

SARS-CoV-2-ACE2 interaction has generated great interest in the development of renin-angiotensin system-based therapeutic strategies for COVID-19 treatment. In general, the renin-angiotensin system activation induces vasoconstriction, hypertension, inflammation, fibrosis, and proliferation via the ACE/angiotensin II/angiotensin II type 1 receptor (AT1R) axis and induces the opposite effects via the ACE2/angiotensin (1-7)/Mas axis function [1,51].

Melatonin is an effective inhibitor of the angiotensin II activation and presumably facilitates angiotensin (1-7) action [26,48]. Thus, the two hits to the renin-angiotensin system can both be inhibited by melatonin administration.

We can summarize that although there is no completely clear immunopathogenetic mechanisms of COVID-19 infection, several viral, and host-related parameters are pivotal and have high prognostic value of convalescence and survival of the patients. So called out-of-control immune response to the SARS-CoV-2 virus, hematologic parameters change and consequent coagulation impairment may lead not only to pulmonary tissue injury but systemic organ failure also. Due to current corona pandemic issue and rapid spread of affected people, better understanding of the interactions among host parameters and viral factors of SARS-CoV-2, safe and globally available treatment of the disease is extremely needed.

New approaches of treatment of acute and chronic infections in addition involve also management of neurological and mental manifestations, noncommunicable diseases, rehabilitation, palliative care, ethical principles [67]. The great concern is the case of absence of vaccination, the lack of medicines and specific treatment methods, therefore, the ways to solve the problem at this stage are aimed at taking defensive measures against coronavirus [35,36].

Social distancing, hand hygiene and quarantine are considered to be the main points in this regard. Increased testing and detecting more positive cases will also serve to decrease of secondary transmission throughout society [23,62].

Together with investigations of SARS-CoV-2 virology, main pathogenetic mechanisms and immunological responses underlying the clinical manifestations of COVID-19 is essential for determination of immunoregulation and rational therapies against SARS-CoV-2 [8,24,43,49].

The release of cytokines in response to the viral infection and/or secondary infections can result in a cytokine storm and symptoms of sepsis that are the cause of death in 28% of fatal COVID-19 cases [71]. Thus, uncontrolled inflammation leads to multi-organ failure, especially of the cardiac, hepatic and renal systems.

Ways to overcome the pandemic: The immune layer or the so-called "Development of herd immunity" (By infecting large numbers of the population or by vaccination) and creating a new target medication or selection from existing antiviral or antiprotozoal agents or antibiotics or their optimally effective combinations (Hydroxychloroquine, Hydroxychloroquine+Azithromycin, Remdesivir, Ritonavir / Lopinavir, Ritonavir / Lopinavir with Interferon Beta, IL-6 pathway inhibitors - Tocilizumab, Favipiravir, Interferon beta etc.) From the randomized clinical trials conducted to date, the above drugs and drug-combinations have not yet shown statistically significant efficacy in reducing both hospitalization days and mortality rates and some mediate severe toxicities and side effects, especially in patients with concomitant diseases [44,56].

A recombinant new potential drug of angiotensin converting enzyme (ACE2) lowers infection and virus growth in cell cultures and organelles; in particular, it is a trap for SARS-CoV-2 virus. Modern research has shown that a potential drug can inhibit the growth and development of the virus by inhibiting specific proteins that bind to the human angiotensin-converting enzyme (ACE2) and reach the cell [29,76].

As it turned out, hrsACE2 has a dose-dependent effect on the growth and development of the virus, and in cell cultures it has been reduced by 1000-5000 times, addition of hrsACE2 to cell cultures reduced the concentration of the virus in the organelles in multi organ damage. A copy of the angiotensin-converting enzyme hrsACE2 is a bait for the virus, in particular, the virus binds to it instead of the endogenous angiotensin-converting enzyme, which "misleads" the virus and prevents from infecting normal cells, especially in the lungs and kidneys [45,75]. These studies are limited by cell cultures and organelles. The scientists involved in the study conducted pilot clinical trials in patients infected with COVID-19 in China with a potential drug (APN001) containing hrsACE2 as the active ingredient. This potential drug has already undergone the second phase of clinical trials. The effectiveness of the drug has been studied only in the early stages of disease development, which requires further studies at later stages [13,14,38].

Other important and noteworthy issues related to the treatment of Covid-19 is monitoring of the following clinical variables: general blood test, creatinine kinase, C-reactive protein, ferritin, prothrombin time, partial thromboplastin time, D-dimer, fibrinogen, lactate dehydrogenase, troponin and electrocardiogram [5,20,27].

The following considerations should be taken into account in the treatment and management of COVID-19 infection:

- Empiric treatment for bacterial pneumonia in selected patients;
- Prevention of and evaluation for venous thromboembolism;
- Uncertainty about NSAID use;
- Avoiding nebulized medications;
- Limited role of glucocorticoids;
- Managing chronic medications: ACE inhibitors/ARBs, Statins.

Vaccination probably offers the best option for COVID-19 control. It is undoubtedly the most effective widespread opportunity of fighting against the infection. Today there are different types of vaccines and mass vaccination of the world's population has already begun. There are some vaccines already available today [66].

1) Nucleic Acid Vaccines - Such vaccines contain genetic material - DNA (deoxyribonucleic acid) or RNA (ribonucleic acid), which contains instructions for creating the virus antigen (the protein or protein component of the virus). The advantages of such vaccines are as follows: 1. They can be created relatively quickly and easily, Since the antigen is produced by a large number of cells in the human host, the immune response is strong. 2. It does not contain living components, so there is no risk of disease.

The negative side of this group of vaccines includes: 1) usually requires low temperatures for transportation and storage, 2) has never been licensed for large-scale vaccination in humans, and 3) usually requires repeated dosing (so-called "boosting").

2) RNA vaccines, given their mechanism of action, should be considered less dangerous than DNA vaccines. As DNA is a much stable molecule than RNA, transportation and storage of DNA vaccines can be more easily managed. However, in order to assess the effectiveness of the vaccine, logistical issues alone should not be taken into account, and first of all, it is vital to consider the long term consequences of the vaccine and its effects on the human body.

3) Viral vector-based (carrier) vaccines - for the synthesis of virus (in the case of corona virus) antigen. The advantages of such vaccines are as follows: 1. this technology has been elaborated already around decades, 2) triggers a strong immune response, 3) does not require special conditions for transportation and storage. The disadvantage of these vaccines is that its production is more complicated as it requires more complex technology.

4) Protein containing vaccines - such vaccines contain a purified part of the virus (subunit) that can trigger an immune response in the body but does not contain the whole virus and therefore cannot cause an infectious process. This so-called non-cellular or acellular type vaccines have already been used in medical practice for long time (e.g., hepatitis B vaccine, pertussis and pneumococcal vaccines). The advantages of this group of vaccines are: 1) extensive experience in their use (including for large scale vaccination), 2) many years of experience in the safety of such vaccines for immunocompromised patients, 3) due to their non-cellular nature, inability to cause infectious processes, 4) relative stability, which facilitates logistical problems. Disadvantages of this group of vaccines: 1) complexity of its production - therefore, less flexibility in terms of production, 2) requires repeated vaccination (boosting) and the use of adjuvants (immune response enhancer molecules), 3) antigen combinations identification requires time and resources and may become an obstacle in terms of synchronizing with the emergence of new genetic variants of the virus.

5) Vaccines containing whole particles of the virus. Such vaccines can be divided into two subgroups: 1. Live-attenuated and 2. Vaccines containing inactivated viral particles. The advantages of these vaccines are: 1) Extensive experience in their application (including for largescale vaccination), 2) Ability to elicit a strong immune response, 3) Relative ease in production, 4) Relative stability, which alleviates logistical problems. The disadvantages of this group of vaccines are: 1) live vaccines are not designated for immunocompromised patients, 2) in rare cases, they may aggravate the existing infectious process.

From the above mentioned vaccines the 3rd phase of the study have reached: Nucleic Acid Vaccines (Pfizer-BioNTech, Moderna – approved by US (FDA) and EU ), Viral vector-based (carrier) vaccines (Oxford-AstraZeneca – approved by UK and India, Gamaleya – approved by Russia, CanSino – approved by China), Protein containing vaccines (Novavax, Vector Institute – approved by Russia), Vaccines containing whole particles of the virus (Sinopharm, Sinovac, Sinopharm-Wuhan, Bharat Biotech – approved by china) [42,77].

Based on the latest research, scientists say that there may be mutated variants of the corona virus against which existing vaccines will be ineffective and will need to be updated [7,33]. The COVID-19 vaccine may spell the end of the pandemic. But until large scale vaccination is not available, it is vital to stop community transmission. In early tests on animals, the new antiviral drug MK-4482 / EIDD-2801 or Molnupiravir, has managed "complete" suppression of the coronavirus transmission in just 24 hours. Molnupiravir was originally designed to treat the flu and prevent the virus from making copies of itself, creating errors during viral RNA replication. Reduction in the amount of COVID 19 particles was observed during the trials [10].

As it is known, acute COVID-19 patients with associated systemic inflammatory response may lead to multisystem damage. The use of corticosteroids (glucocorticoids) according to modern guidelines has been shown to be highly anti-inflammatory. Based on the results of randomized studies, it was shown that the mortality rate was significantly reduced in patients receiving dexamethasone compared with patients receiving COV-19 standard treatment. In particular, the benefits of glucocorticoid use were observed in patients who were on artificial respiration (i.e., artificially supplied with oxygen), while the benefits of dexamethasone were not observed in patients who did not require artificial respiration [18,61,68].

In conclusion, COVID-19 disease has manifestations from the hematopoietic system associated with a major blood hypercoagulability. Evaluation of laboratory parameters during the disease course may support clinicians in providing spot on treatment and intensive care to critically ill patients especially. Thromboprophylaxis and timely detection of life threatening complications including DIC in will improve COVID 19 infection outcomes, and may potentially decrease the death rate overall and among infected patients without significant comorbidities.

Studies have shown that levels of lactate dehydrogenase, aspartate aminotransferase, C-reactive protein, creatine kinase, D-dimer, procalcitonin, creatinine and some other parameters increases. Decreases in hemoglobin, lymphocyte count, eosinophil count, and serum albumin have been detected in COVID-19 patients. Neutrophilia and lymphopenia, coagulation complications and coagulation/anticoagulation imbalance together with thrombocytopenia are characteristic also, especially in severe clinical cases.

Currently treatment and management of COVID-19 patients during all phases of their disease has been expanded to meet the needs of front-line clinicians and promotes a multi-disciplinary approach to care for patients with COVID-19, including those with mild, moderate, severe, and critical disease.

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# *The Development of an Online Guided Inquiry-based Biology Practicum Guide Using the Geschool Application for Students Grade XI*

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**Abstract** – The problem faced in the world of education is the weakness of the learning process, that is, students are not encouraged to develop thinking skills. This affects their understanding and skills in the learning process. Practical activities are laboratory activities that are an integral part of learning biology. The implementation of practicum activities in XI MAN 2 Pesisir Selatan was not optimal. This is due to the unavailability of practical guides and pandemic conditions which have resulted in practicum activities: not being able to be carried out in schools. This research aims to develop an online guided inquiry-based biology practicum guide by using the Geschool Application. The application of guided inquiry in learning allows students to have the opportunity to broaden their knowledge and help develop conceptual understanding. This research is a developmental research using the Plomp model. The object of this research was the students Grade XI MAN 2 Pesisir Selatan. The sample was taken by using a random sampling technique. The material developed was the transport substance and food testing material. The results showed that the practicum guide developed met the criteria of validity, practicality, and effectiveness. Inquiry learning is a learning strategy that emphasizes the development of the cognitive, affective, and psychomotor aspects in a balanced manner.

**Keywords** – Guided Inquiry Based Learning, Biology Practicum Guide, Geschool

## I. INTRODUCTION

The development of science and technology has brought significant changes to various dimensions of life, one of which is in the field of education. The problem faced in the world of education is the weakness of the learning process, that is, students are not encouraged to develop thinking skills. This affects their understanding and skills in the learning process. Practical activities are laboratory activities that are an integral part of learning biology. According to Novana (2014), the purpose of practicum activities is to train skills, integrate knowledge and skills, and to be able to appreciate the knowledge and skills that are possessed.

The coronavirus pandemic (COVID-19) that occurred in Indonesia requires every school to implement an online learning model. One of them is MAN 2 Pesisir Selatan. Learning in these schools is carried out using the Geschool application. Based on the results of observations and interviews with teachers and students, it was known that the students like practicum activities. However, the implementation of practicum activities was not optimal. This is due to the unavailability of practical guides and pandemic conditions which have resulted in practicum activities: not being able to be carried out in schools. One of the biological practicum activities that can be carried out without laboratory equipment is membrane transport and food substance testing material. In this material the equipment needed is available in everyday life.

Practical activities can be optimized by using a practicum guide. Kenengsih (2014) states that the use of practicum guides helps teachers to optimize learning readiness and independence and can direct students to work continuously and directed. One suitable approach from the constraints of practicum implementation is Guided Inquiry. The use of an inquiry approach emphasizes students to find knowledge, ideas, and information through their own efforts by using scientific steps. The Inquiry Approach is essentially a process of finding something scientifically so that inquiry learning is identical to science process skills (Ozdilek (2009).

Based on these problems, the researcher develops a practical guide that can make it easier for teachers to transfer concepts, theories, and practices that need proof. As the result, the biology teacher teaching class XI at MAN 2 Pesisir Selatan will not have any problems in conditioning the students during practicum implementation.

## **II. METHODOLOGY**

### **A. Subjects and Methods**

This type of research was a Plomp model development research which consisted of preliminary research phase, development or prototyping phase, and assessment phase. This research was aimed at producing products an online guided inquiry-based biology practicum guide using the geschool application for membrane transport and food substance testing material subjects. This research was conducted at the Faculty of Mathematics and Natural Sciences (FMIPA) of Universitas Negeri Padang (UNP) and MAN 2 Pesisir Selatan. The data in this research were obtained from the validity, practicality and affectivity test questionnaire. These data were included in the primary data, i.e. the data obtained directly from research subjects. The instruments used included: 1) self-evaluation sheets, 2) validation questionnaires, 3) one to one evaluation questionnaires, 4) small group evaluation questionnaires, 5) practicality questionnaires, and 6) effectiveness questionnaires.

#### **1. Preliminary Research Phase**

The preliminary research phase aims to find out the basic problems in learning biology in schools. Activities at this phase were in the form of observation, analytical gathering and defining the problems that occurred in the learning process. This phase began with an analysis of problems and needs in learning, curriculum, students, and teaching subjects used in schools.

#### **2. Development or Prototyping Phase**

This phase started after the preliminary research phase was completed. This phase consisted of microscopes that helped in developing and improving products. This phase consisted of several stages of making a prototype as follows.

##### **a. Development of Prototype I**

The results of the prototype design in the initial stages are called prototype I. The initial design is done by researchers based on the results of preliminary research that has been done.

##### **b. Development of Prototype II**

Prototype II was the development phase by conducting a self-evaluation using a checklist. Self-evaluation (self-evaluation) was revising the biology practicum guide that have been designed. The evaluation method itself carried out was aimed at examining the errors that exist in the biology practicum guide, so it obtained relevant product criteria based on science and consistent with expected.

##### **c. Development Prototype III**

Prototype II was then consulted with experts (expert review) and one to one evaluation. Consultation with experts (expert review) was carried out based on expert judgment (validator) from the didactic, construct, and technical aspects. This evaluation was carried out using an expert validation sheet. The data validity was obtained by analyzing the validation questionnaire that has been filled out by the validator. The analysis was carried out with the following steps.

- 1) Give a score of answers to each indicator with criteria based on scale 1-4.
- 2) All items given a score were then tabulated and the percentage was searched using the following formula.

$$\text{Validity} = \frac{\text{Item score obtained}}{\text{Maximum score}} \times 100\%$$

Table 1.The Biology Practicum Guide Validity Criteria

<u>Validity (%)</u>	<u>Category</u>
81 – 100	Very Valid
61 – 80	Valid
41 – 60	Adequate Valid
21 – 40	Less Valid
<u>0 – 20</u>	<u>Invalid</u>

Modified from Riduwan (2009)

**d. Development Prototype IV**

At the same time one to one evaluations were carried out on three students at grade XI using interview guide sheets. The results of the revised Prototype II are called Prototype III.

Prototype III was evaluated through small group evaluation. At this phase an evaluation of six high school students at grade XI was low, medium, high ability levels; each consisting of two members. This formative evaluation used a student practice questionnaire sheet. The results of the revised Prototype III were called Prototype IV.

**3. The Assessment Phase**

Field tests or large group trials (field tests) were carried out to see the practicality and effectiveness of the biology practicum guide that have been designed. Practicality is the level of practicality of the biology practicum guide when it is used in the learning process The research data obtained were analyzed by qualitative and quantitative analysis. Data for the initial investigation, design and construction stages were analyzed qualitatively and presented in descriptive form. The practicality data of the use of the learning biology practicum guide is analyzed by percentage (%), using the following formula.

$$\text{Practicality} = \frac{\text{Item score obtained}}{\text{Maximum score}} \times 100\%$$

After the percentage was obtained, grouping was done according to the following criteria.

Table 2.The Biology Practicum Guide Practicality Criteria

<u>Practicality (%)</u>	<u>Category</u>
81 – 100	Very Practical
61 – 80	Practical
41 – 60	Adequate Practical
21 – 40	Less Practical
<u>0 – 20</u>	<u>Unpractical</u>

Modified from Riduwan (2009)

Effectiveness data obtained in the form of data on learning outcomes on the competence of knowledge, attitudes, and skills of students. Data on knowledge competencies were obtained through lab test results, while data on attitude competencies were obtained from non-test techniques in the form of attitude observation sheets, and skill competencies were also obtained from non-test techniques in the form of observation sheets on practicum activities carried out by students.

**III. RESULTS AND DISCUSSION**

**A. Results**

An Online Guided Inquiry-based Biology Practicum Guide by using the *Geschool* Application for the studentsGrade XI developed through validity, practicality, and effectiveness tests. The validity of the product was assessed by three validators, while the practicality test was assessed by students and teacher. The results of the validity and practicality tests can be seen in Table 1.

Table 1.The validity and practicality Tests of the product

<u>Aspects</u>	<u>Average Value(%)</u>	<u>Criteria</u>
Validity	85.84	Very Valid
Practicality from students	90,15	Very

		Practical
Practicality from teacher	91.15	Very Practical

After passing the validity and practicality tests, the product developed was tested for its effectiveness. The effectiveness test was carried out in two classes, namely the control class (not given a treatment) and the experimental class (given a treatment: using a practicum guide). The results of the effectiveness test can be seen in Table 2.

Table 2. The Effectiveness Test.

Aspects	Control Class	Experimental Class
Knowledge	73,65	83,12
Attitudes	83,82	91,36
Skills	82,54	90,07

**B. 2. Discussion**

A developmental research consists of three stages: the initial investigation, development and prototyping, and assessment (Nieveen and Plomp. 2013). In this research, the data collection techniques were carried out through observation and interviews. Sugiyono (2012: 137) states that interview is a data collection technique used in a preliminary study to find the problems to be studied. Based on observations and interviews, it was known that the problem in learning is the limitations of learning carried out online and the unavailability of practicum guides. Practical activities are one of the important factors in efforts to improve learning outcomes.

During the Covid-19 pandemic, learning activities were carried out online, so practicum activities must also be carried out at home. Materials that can be practiced at home using the tools and materials available in everyday life included the membrane transport sand food substance testing material. In developing a practicum guide on this material, a curriculum analysis was carried out first. This is done because the curriculum is a guideline for organizing teaching and learning activities (Hamalik. 2010: 66). An approach that suits the learning needs of students in developing a practicum guide is a guided inquiry approach.

The application of guided inquiry in learning allows students to have the opportunity to broaden their knowledge and help develop conceptual understanding (Brown. 2010). The developed guided inquiry-based practicum guide was created by using the Microsoft publisher application. The type of font used is Berlin Sans FB, Cambria, and Aharoni with various sizes. The practicum guide used is dominated by white and blue. The white color represents freedom and the blue symbolizes intelligence and conscientiousness (Basuki, 2013).

After the product was developed, the product was assessed for its validity level by three validators. According to Lufri (2017: 113), validity refers to the accuracy, meaning and usefulness of a thing that is made by researchers. The aspects assessed were the appropriateness of the content, the appropriateness of the guided inquiry approach, language, presentation, and graphics. The average result obtained in the validity test was 85.84%. Furthermore, a one-to-one evaluation was carried out.

The results of the one to one evaluation trial showed that a practicum guide can help students do scientific work. In terms of the ease of use, efficiency of study time, and benefits tested in small groups, an average result was 88.92% categorized in the very practical category. Sukardi (2012: 52) states that practicality can be seen from the implementation time which should be short, fast, and precise. Furthermore, the practicality test was carried out on a large scale (field test). The average practicality assessment by students was 90.15%. Meanwhile, the average practicality assessment by biology teachers was 91.15%. This shows that the guided inquiry-based practicum guide is practically used in the biology learning process.

Furthermore, the effectiveness test was carried out on the students' cognitive, affective, and psychomotor. The data on the cognitive competence were obtained through lab test results, while data on affective and psychomotor competences were obtained from non-test techniques in the form of observation sheets. The average result of the cognitive competence in the experimental class was higher than the control class. The average result of the experimental class was 83.12. The highest score was 92 and the lowest was 72. Meanwhile, the average result of the control class was 73.65. The highest score was 88 and the lowest was 64. The results of the t-test for the students' cognitive competence showed the use of guides. The guided inquiry-based practicum has an effect on the cognitive competence of students.

The average result of the students' affective competence in the experimental class was higher than the control class. The average result of the experimental class was 91.36. Then, The average result of the control class was 83.82. The average result of the students'

psychomotor competence in the experimental class was also higher than the control class. The average for the experimental class was 90.07 while the average for the control class was 82.54. Furthermore, the hypothesis test was carried out for affective and psychomotor competences by using the non-parametric test, namely the *Mann Whitney U-Test*. The calculation results showed that the use of the guided inquiry-based practicum guide affects the competence of the students' affective and psychomotor. This is in accordance with the opinion of Kurniasih (2017: 114) which states that inquiry learning is a learning strategy that emphasizes the development of the cognitive, affective, and psychomotor aspects in a balanced manner.

#### IV. CONCLUSION

Based on the research that has been done, it can be concluded that a learning design has been produced an online guided inquiry-based biology practicum guide using the geschool application on membrane transport and food substance testing material in valid, practical, and effective criteria for high school students at grade XI.

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# *Sociocultural Approach: Adaptations For Teaching English At Middle School*

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**Abstract** – English learning has changed its role in Mexican Education throughout the years. Recently, in 2011, but with initial proof programs since 2009, the Federal Office of Public Education in Mexico proposed the National English Program in Basic Education, which included K-9.

National English Program was new for some states, while others had to migrate and adjust the ones they had. Recently in 2017 some adaptations were made, the most important was the name of the program, but maintained its essence. In Zacatecas state, there was not a background regarding English learning, at least for K-6 students. In middle school (7-9 grades) most of the schools have teachers. Currently there are still some struggles in Zacatecas, English teachers for K-6 have not been hired to cover all schools, although its number has been increasing since 2011.

This situation has broadened the proficiency levels of English commonly obtained by students. The study was carried out in Middle School #48 in the city of Zacatecas considering three 7<sup>th</sup> grade groups. The research is a mixed study, which considered different information gathered during the 2017-2018 school year, the intervention was based on Vygotsky's theory, and planning according to the National English Program, at the end of the school year, results were collected, demonstrating the importance of effective planning based on context and students' abilities.

**Keywords** – Planning, Intervention, EFL, Contextual Factors, Crosslinguistic Influence.

## I. BACKGROUND

### 1.1. Introduction

Throughout time, teaching English at middle school has been underestimated for the fact that it is not Mexico's first language. There are actually many teachers who do not have the clear idea about what teaching English involves. It is necessary to be competent to face challenges that arise when teaching a second or foreign language, but the first step is to have an optimum profile; which means enough training in didactics and pedagogical themes. Another important factor to demonstrate an adequate profile is to show mastery on second or foreign language use, according to different skill levels based on *Certificación Nacional de Nivel de Idioma (CENNI)*. This is required to ensure that the teacher in charge of a group has the tools to establish learning environments, this certification has equivalents with the Common European Framework of Reference for Languages [1].

In addition to teacher's expertise, reference [2] expresses that principals in schools are in charge of checking teachers' planning, which are going to be implemented in classes. Another problem arises, many principals do not have a clear knowledge for approval or in other situations, experience is not enough.

Research in this area, has shown that teaching English and specially the National English Program for Basic Education (NEPBE) is inefficient, state office does not have enough resources to hire professionals and in schools, English teachers are evaluated by principals with insufficient knowledge [3].

As mentioned before, the process of teaching English has been considered an extra-curricular activity and reality is different because it is something which complements professional training and developing language skills is important to face globalized world. Nowadays, English is the lingua franca, thus the language with political, social and influential power which is spoken around the globe, it is almost an obligation for all people to have basic knowledge in order to perform everyday tasks efficiently [4].

As stated, there are many problems, but the most important one is that there is not enough money to pay the teachers properly, nor for temporal training and extra-academic courses as a way of upgrade to improve their teaching skills. The investment and management of the financial sector have an influential role within education in all levels. In the same way there are not proper conditions to hire teachers because of the financial, political and social situations in which education has been involved [5].

### 1.2. Contextual Factors

The middle high school chosen to take part within the investigation was number 48 at Zacatecas city, it opened 36 years ago, there are 18 groups, six per grade and every group is made up of approximately 45 students. There are some important social factors surrounding the school such as; low income, vandalism, drug addiction problems and violence in general; for up to half of the student population this is a reality, there are clear differences between students' conditions, the same as elementary schools where they come from.

According to *Planea* exam 2017<sup>1</sup>, the final results obtained by students before entering middle school are described in the nationwide exam, this showed that Francisco Villa primary got 54.5% a non-satisfactory knowledge level, one of the lowest results, the same as Flores Magón primary. In the same situations elementary schools Maria M. Murillo and Lazaro Cardenas appeared with non-sufficient level, results between 62% and 67%, these schools provide more than 95% of middles schools population.

The diagnostic exam is a regular practice at the beginning of the school year; students took it during the last week of August, 2017. The test contained the following topics; basic expressions to obtain and give information in which students develop current questions and phrases used in daily life. The second sections included simple vocabulary, such as days of week, months, numbers, nationalities and school supplies. The third one was about reading comprehension skills in which students answered true/false exercises and finally the last part was about grammatical knowledge, in other words verb conjugation (especially past tense).

Results were irregular, per group, just one or two students who represent 4% of the total, showed a basic knowledge overall, 48% demonstrated a moderate level and the 47% revealed a low level in the English language. In the same way English was evaluated, Spanish diagnostic exam was applied, the results were the following; 72% had problems with reading comprehension and 78% did not use grammar correctly.

### 1.3. Theoretical Background

Whenever talking about education it is important to highlight that for Mexico from some time up to now the competency model has been included in all education levels, in this case, *doing*, which means, communicative actions carried out in concrete interactive situations; *knowing* involves the contents as well as the characteristics, functions and elements of language, finally, *being* presumes the importance of intercultural-social diversity in education, the oral and written interaction and the attitudes and values related to language [6].

The approach taken in the research was Constructivism which involves giving students the required tools to make them participants on their own learning, being able to select and transform information. As a result, mental structures need to be modified after its learning process and the role of socio-cultural aspects impacting on students learning [7].

Within constructivism theory, the social cultural approach states the influence that context has on people, this means that there is a connection between social interaction and learning. Teachers then have the responsibility to enable students to develop certain skills [8]. Planning classes should be a result of the present conditions, teacher should take into account individual characteristics

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<sup>1</sup> [http://planea.sep.gob.mx/ba/informe\\_de\\_resultados\\_2017/](http://planea.sep.gob.mx/ba/informe_de_resultados_2017/) , webpage were nationwide results can be consulted.

and decide what would be suitable for students to develop with help, teacher becomes an active participant of students learning process.

The Crosslinguistic influence is the impact and the effect of a native language when learning a second or foreign language. According to [9] the metaphorical use of the terms crosslinguistic influence and transfer both imply physical movement, despite the psychological nature of the phenomenon.

### 1.4. Objective

Taking into consideration contextual factors and theory related to teaching and learning a second or foreign language, the following objective was set in order to develop intervention during the school year:

*Improve English proficiency level at junior high school 48 based on the National English Program in basic Education.*

## II. METHODOLOGY

An investigation is a gathering and analysis of data focused on a specific topic and objective. It takes present information and aims to expand it by providing “an original contribution to the existing stock of knowledge making for its advancement, so the goal is the pursuit of truth with the help of study, observation, comparison and experiment” [10]. It contains *un conjunto de procesos sistemáticos, críticos y empíricos que se aplican al estudio de un fenómeno* [11] and it requires to be supported by *teorías, métodos, técnicas e instrumentos adecuados y precisos para poder alcanzar un conocimiento objetivo* [12]. This means that to perform an investigation there must be order and discipline, it should be based on experience and include an analysis of the information at play.

In this research the selected approach was mixed method [13] in order to have a deeper understanding of the phenomenon. The method selected was the action research, based on the adaptation of activities considering background and data collected during class time in a binnacle. The quantitative part was taken from exams designed to measure the linguistic competencies developed by students during specific periods.

The participants selected for the study were seventh graders at Junior High School #48 located in the city of Zacatecas. The students were not notified about the study, because this would not affect in any way the progress of the class, because the themes that should be covered and the competencies that should be developed during class time are based on NEPBE. Moreover, it was a study that had the proposal to enhance their English communication skills.

Data was collected during the school year in different stages. First, the background data helped to identify the problems students had towards learning, then at the beginning of the school year, the diagnostic exam was another tool to make decisions towards intervention. During the school year two types of data were collected, first in a journal important information of students’ reactions towards activities, but also related to needs or lack of knowledge. The other data was a result of the previous information, because of the adaptations, the follow up process and test results. Finally, at the end of the school year data was collected considering the same areas than on the beginning but considering the required level after finishing first grade but with an open questionnaire, this was revised and authorized by expert’s technique.

It is important to mention that the intervention was held according to the aspects described by [14], these refer to activity diversification, learning through participation and collaboration. The principle is that learning should be significant and functional and it should be adapted to the different learning environments for the development of self-conception and self-esteem.

## III. RESULTS

Research process contributes to finding new data and to explain reality in an organized and truthful manner. Regarding the results obtained during the proposed research they were collected in different stages considering the mixed approach, but finally all of them were gathered and converted into numbers to show students’ development during the school year.

### 3.1. Qualitative data

Data obtained during classes was necessary to plan lessons in a different way, considering the social context of the participants. An important factor in order to develop these units was to explain whenever required, parts of the speech and relate them with Spanish language functions in order to develop language ability in general. Due to these adaptations some of the projects proposed are described.

The first unit the project was about identifying different services in the community or city, in order to make it more significant the strategy was to use a general map of the city of Zacatecas, students then had to gather according to their neighborhood and design a map that included the services that were offered. This activity was carried well by students, because it was related to what they observe in their daily life, and there was a chance to do it in groups, helping each other when required.

Another project that students had to work on was on a Radio Program, as an example for them, they listened to a radio program related to “love at first sight” something that is familiar to adolescents, due to their age and biological development. After analyzing the radio program, they had to develop a questionnaire with doubts they had about love at first sight, and then in small groups they asked for further information on this topic provided by the social workers at school.

During this time the information collected was about their likes, interests, their thoughts, their needs, academic issues in order to integrate them in the following projects. There was another activity related to reading about different stories that are important in English speaking countries and analyzing them. The project consisted of working on a design of a *big book*, the adaptations were different because they were asked to look for local stories, at least Mexican ones that involved moral or values.

Projects’ construction was varied but the main purposes were still present and fulfilled. There was a project about English songs. There are some classical songs, but old versions are not appealing for students, this is why, the best way to do it was to find classical songs in a recent version and songs related to important topics that are current as well. It is important to mention that some of the songs were proposed by the students, because they listened to English music although they did not understand it. They had to look for the lyrics and describe the emotions or feelings expressed and decide if it was positive or not.

Finally, the only way to measure qualitatively students’ performance in English was by doing an exam where they had to write and by means of this measure their general competence in English. This is mainly because in order to write, first they have to understand the question, then they have to write an answer using adequate vocabulary and grammar. Writings were checked considering rubrics related to the abilities evaluated at the beginning of the school year and after deciding if they had developed those skills were turned into numbers to compare them with the exams results that were given during the school year.

### 3.2. Quantitative data

Numerical data was collected during the school year and then summed up, here it was easy to do the follow up because of the numbers. Grade scales in Mexico function from 0-10, but in basic education, if the grade is less than 5, then it is a 5; for example, if a student sums up a 3 during a period it does not matter, he will have a 5 as a final grade.

In order to collect the quantitative data, numbers had different meanings according to what was evaluated in the diagnostic exam. 8 or more meaning that the student had developed language skills, 6-8 meaning that their skills were moderately developed and finally less than 6 meaning that their skills were not developed. At the end of the school year the results were summed up for each student and categorized according to the final score they obtained.

### 3.3. Qualitative and quantitative data correspondence

As mentioned, qualitative data, based on rubrics was classified in categories like the quantitative data and the following results were obtained considering the initial results and categories, but according to their performance in what they were supposed to develop when finishing first grade, in table 1 results can be observed.

Table 1. School year beginning and ending results.

Language ability	School year	School year Ending	
	Beginning	Quantitative	Qualitative
<b>Developed</b>	4%	15%	19%
<b>Moderately developed</b>	45%	57%	48%
<b>Not Developed</b>	51%	28%	33%

Table 1 shows the difference between the abilities developed at the beginning of the school year, taking into consideration 6<sup>th</sup> grade goals in the NEPBE program, at the end of the school year data shows abilities developed in relation with 7<sup>th</sup> grade. Qualitative data is shown in percentages, these were taken from the rubrics, it is observable that they correspond with the quantitative data.

Moreover, there is a growth on the percentage of students that have developed or moderately developed their English proficiency level.

### IV. DISCUSSION

This research gave light to the fact that the national English program has deficiencies, although it began almost ten years ago, the program does not present results on students' skills development. As observed in the research, being capable as a teacher to conduct a class and organize it properly will benefit students [3],[4],[5].

In addition to qualified professionals, understanding the teaching and learning process is fundamental to establish a link between previous knowledge on students and the required one. The qualitative section, demonstrated that by means of understanding students' context and proficiency level, it is possible to develop suitable planning in order to cope with variable conditions and develop effective learning [2].

Quantitative results contrasted with the *Planea* exam ones, show that there were advances in students, resulting in better results. More than half of students had lack of basic knowledge, while having worked in the intervention process resulted in 28% of students that did not develop basic skills or abilities.

### V. CONCLUSIONS

Taking into account the obtained data in the mixed research process, it can be established that there was an advancement considering how students started, this can be shown with both quantitative and qualitative results. The intervention was positive because the percentage of participants that had not developed English skills decreased. On the other hand, the number of students that developed English skills increased.

These results also demonstrate that integrating social-cultural information and proposing it within classes and give certain freedom for students on selecting what and how to learn. This validates that if teachers look for as much information as possible in order to have better knowledge of their students and use this information to adapt teaching activities, this will result could be useful to increase students proficiency levels.

It is observable that NEPBE program is more demanding than previous programs, this means that the gap is wider between students that develop abilities and those who do not. Higher levels are expected so most of the students will not develop the required skills, but there is a notable difference if there is an adequate intervention.

Although results were positive, there some issues that must be tackled in order to make NEPBE work. There should be a deep analysis on Cycles 1-3 regarding teachers' profile and based on results, work on the development of training courses. In addition, teachers should apply intervention strategies that impact positively the proficiency level of their students. As a final proposal, a complete intervention during Cycle 4 should be done to ensure the efficiency, having as a base the sociocultural background.

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# *Vulnérabilité Future Des Systèmes De Productions Agricoles Face Aux Changements Climatiques Dans Le 4<sup>ème</sup> PDA : Cas Des Communes De Djidja Et De Djougou*

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**Résumé** – La variabilité climatique dans les communes de Djidja et de Djougou engendre des conséquences aussi bien sur les niveaux de productivités, de production que sur les revenus des exploitants agricoles. L'objectif de cette recherche est d'étudier la vulnérabilité future des systèmes de productions agricoles face aux changements climatiques dans les Communes de Djidja et de Djougou. L'approche méthodologique utilisée comprend la collecte des données, leur traitement et l'analyse des résultats. Les enquêtes ont été faites dans les villages choisis sur la base de critères bien définis (la taille de la population agricole et son implication dans la production agricole). La méthode de D. Schwartz (1995, p. 94) a permis de constituer l'échantillon de 377 producteurs. Enfin, une projection climatique sur la période 2019-2050/2075 est faite au moyen du logiciel climatique « Climate explorer ». Il ressort des résultats de l'étude que, dans la commune de Djougou, la variation au niveau de la température minimale actuelle (RCP8.5) est comprise entre -1,62°C en 1992 et 2,29°C en 2075. La température maximale quant à elle varie entre -1,40°C en 1994 à 2,18°C en 2075. C'est à partir de 2071 que l'augmentation de la température minimale va dépasser les 2°C et si rien n'est fait cette hausse va s'accroître et devenir permanente. De même, dans la commune de Djidja, la température minimale la plus élevée est observée en 2075 avec des variations de 1 à 2°C pour les RCP4.5 et RCP8.5. Au niveau de la température maximale, l'année la moins chaude est 1992 (-1,33mm/jour) pour RCP8.5 et 1991 (-1,02mm/jour) pour RCP4.5. La même évolution s'observe au niveau des températures maximales. L'année 1992 reste la plus déficitaire avec une chute de -1,60°C et l'année la plus excédentaire sera l'année 2075 avec une hausse de 2,18 mm par jour, sur la période 1992-2080. La corrélation est observée en 2042 avec une valeur de 0,322 mm par jour. L'examen des résultats révèle que les valeurs des paramètres climatiques à savoir précipitations et évaporation sont à la hausse sur la période 1980-2080 dans la commune de Djidja. Suivant la trajectoire actuelle, RCP8.5, les années les plus arrosées sont 2037, 2070 et 2073 avec respectivement des variations égales à 0,17mm et 0,27mm de pluie par jour. Face à ces difficultés, les populations agricoles adoptent des mesures pour contrer les contraintes climatiques.

**Mots-clés** – Djidja, Djougou, vulnérabilité, système de production, agricole, changement climatique.

**Abstract** – Climatic variability in the communes of Djidja and Djougou has consequences both on the levels of productivity and production and on the income of farmers. The objective of this research is to study the vulnerability of agricultural production systems to climate change in the Communes of Djidja and Djougou. The methodological approach used includes data collection, processing and analysis of the results. The surveys were carried out in the villages chosen on the basis of well-defined criteria (the size of the agricultural population and its involvement in agricultural production). The method of D. Schwartz (1995, p. 94) made it possible to constitute the sample of 377 producers. Finally, a climate projection over the period 2019-2050 / 2075 is made using the climate software "Climate explorer". The results of the study show that, in the municipality of Djougou, the variation in the current minimum temperature (RCP8.5) is between -1.62 ° C in 1992 and 2.29 ° C in 2075. The maximum temperature varies between -1.40 ° C in 1994 to 2.18 ° C in 2075. It is from 2071 that the increase in the minimum temperature will exceed 2 ° C and if nothing is In fact, this increase will increase and become permanent. Similarly, in the municipality of Djidja, the highest minimum temperature is observed in 2075 with variations of 1 to 2 ° C for RCP4.5 and RCP8.5. At maximum temperature, the coolest year is 1992 (-1.33mm / day) for RCP8.5 and 1991 (-1.02mm / day) for RCP4.5. The same development can be observed at the level of maximum temperatures. The year 1992 remains the most in deficit with a fall of -1.60 ° C and the year the most in surplus will be the year 2075 with an increase of 2.18mm per day, over the period 1992-2080. The correlation

is observed in 2042 with a value of 0.322 mm per day. Examination of the results reveals that the values of climatic parameters, namely precipitation and evaporation, are on the rise over the period 1980-2080 in the municipality of Djidja. Following the current trajectory, RCP8.5, the wettest years are 2037, 2070 and 2073 with respectively variations equal to 0.17mm and 0.27mm of rain per day. Faced with these difficulties, agricultural populations are adopting measures to counter climatic constraints.

**Keywords – Djidja, Djougou, vulnerability, production system, agriculture, climate change.**

## INTRODUCTION

L'un des enjeux majeurs du monde de ces dernières années est incontestablement le changement climatique. Cette problématique qui domine tous les débats est omni présente dans tous les secteurs d'activité dans un contexte où l'Afrique a comme principal défi, le développement d'une agriculture autonome et durable (FAO, 2018, p. 12). En effet, l'Afrique est un continent faiblement émetteur de Gaz à Effets de Serre (GES) et pourtant elle est et sera sans doute le plus touché par les effets du changement climatique (Tinlot, *et al.*, 2010 cité par PAS-PNA, 2017, p. 21). Ces changements climatiques ont entraîné naturellement un changement dans la variabilité des paramètres climatiques comme la température, l'humidité relative, la tension des vapeurs et le changement de régime pluviométrique.

Au Bénin, le secteur agricole est un levier majeur du développement de l'économie. Il contribue à près de 28,3 % au Produit Intérieur Brut (PIB), à 1 % au taux de croissance, à plus de 50 % aux emplois, à 75 % aux recettes d'exportation et constitue la principale source de devises du pays (Boko *et al.* Cité par Orou Nikki, 2019, p. 13) et (MAEP, 2019, p. 49). Selon la même source, cette agriculture est caractérisée par de petites exploitations agricoles de type familial avec une production essentiellement pluviale et tributaire des éléments naturels qui sont de plus en plus affectés par la variabilité et le changement climatique ; ce qui a pour conséquence la faible productivité des différentes spéculations.

D'une manière générale dans le pays, les incidences du changement climatique sur le secteur agricole sont entre autres : « (i) la baisse d'environ 7 % en moyenne du rendement des principales cultures (maïs, riz, sorgho, igname, manioc, tomate, coton, ananas), (ii) apparition de nouveaux ravageurs qui déciment les cultures (cas des chenilles légionnaires qui ont dévasté les cultures de maïs au Bénin en 2016), (iii) perturbation du calendrier agricole, (iv) apparition de nouvelles infections dont la grippe aviaire et les pestes, (v) réduction de la productivité des parcours dans la zone septentrionale, dégradation des pâturages et couloirs de transhumance et l'accentuation des conflits y afférents, (vi) altération des paramètres écologiques propices à la reproduction et à la croissance de certaines espèces de poissons entraînant la baisse de la production halieutique, (vii) comblement des cours et plans d'eau et prolifération des plantes envahissantes (viii) accentuation de la vulnérabilité et dégradation des moyens de subsistance des femmes et des jeunes» (PANA, 2015, Akponipkè *et al.* 2018 p. 68). Ces effets et impacts pourraient s'aggraver puisque le cinquième rapport du GIEC annonce qu'il est probable que notre région connaisse plus d'évènements extrêmes tels que les pluies abondantes, les vagues de chaleurs, les inondations et les sécheresses avec des disparités.

L'objectif global de cette recherche est d'étudier la vulnérabilité future des systèmes de productions agricoles face aux changements climatiques dans les Communes de Djidja et de Djougou.

### I. ZONE D'ETUDE

Le pôle de Développement Agricole n°4 couvre environ une superficie de 53097 km<sup>2</sup> soit 46,27% du territoire national. Au plan géographique, cette zone d'intervention occupe la portion centrale du territoire national. Du point de vue administratif, le pôle de développement agricole (4) s'étend sur quatre départements (Borgou sud, Donga, Zou et les Collines) avec seize (16) Communes. Il est limité au Nord par les PDA n°2 (Alibori Sud -Borgou Nord- 2KP) et PDA n°3 (Atacora Ouest), au Sud par les PDA n° 5 (Zou-Couffo) et 6 (Plateau), à l'Est par la République Fédérale du Nigéria et à l'Ouest par la République du Togo. La figure 1 met en exergue le cadre d'étude.

La commune de Djidja est située dans département du Zou à l'ouest du PDA 4 tandis que la commune de Djoudjou est située dans le département de la Donga au Nord-Ouest du PDA 4.

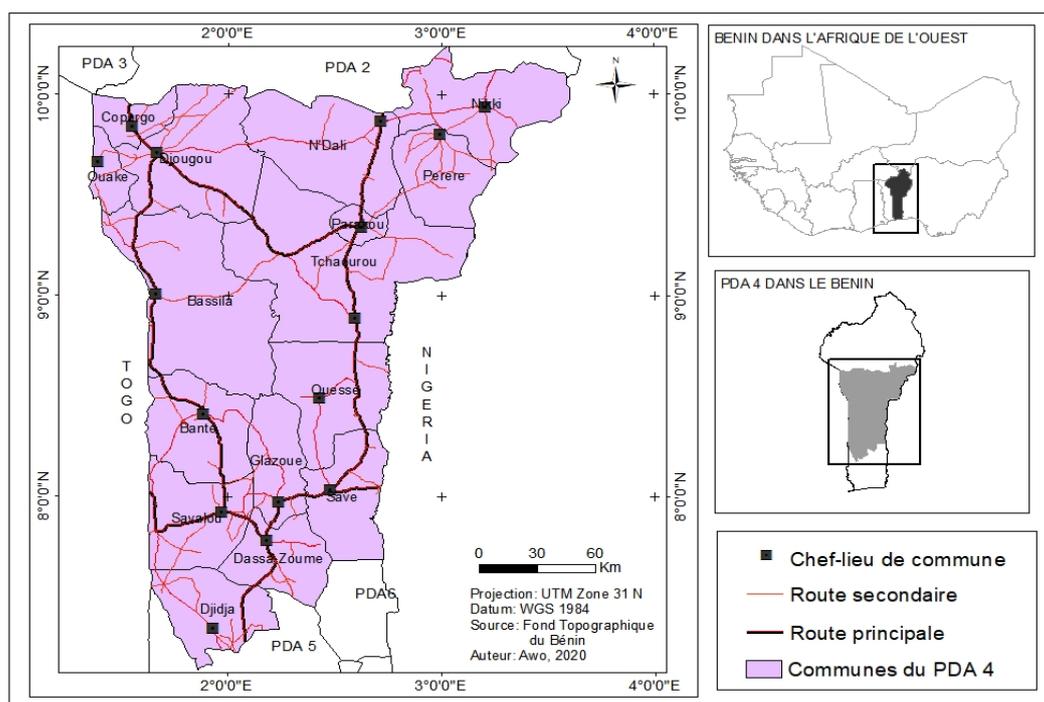


Figure 1 : Situation géographique et administrative du Pôle de Développement Agricole n°4

## II. MATERIELS ET METHODE

Pour la projection climatique dans le cadre de cette étude, l'outil KNMI climate explorer conçu par le Groupe Intergouvernemental des Experts en Changements climatiques (GIEC) a été utilisé. Les paramètres climatiques retenus sont d'une part : Tas, Tasmin, Tasmax, Pr et evspbl, AltCdd et AltCwd d'autre part. Les données de ces différents paramètres climatiques sus mentionnés, sont extraites de la base de l'Organisation Mondiale de Météorologie (OMM) à partir des coordonnées géographiques de de la zone d'étude qui est ici le Pôle de Développement Agricole qui contient 16 communes dont les communes de Djidja et de Djougou. Ces extractions sont faites sur la base de la référence mondiale climatique qui est 1981-2010 proposée par l'outil KNMI climate explorer. Ensuite les données extraites sont enregistrés au niveau de l'ordinateur et de préférence au niveau de la partie « documents » et importées sur Excel après les avoir transformées et traitées en fichier Word Pad. Ce qui a permis de réaliser les graphes relatifs aux scénarios climatiques du secteur d'étude sur la période 1981-2075 à partir des RCP4.5 (Representative Concentration Pathways /Trajectoire Représentative des concentrations souhaitées) et RCP8.5 (Trajectoire Représentative des Concentrations actuelles) utilisés dans le cadre de la cinquième phase du Projet de comparaison de modèles couplés (Coupled Model Intercomparison Project), base AR4 (Assessment Report CMIP5) de 2013 qui inclut plus de modèles, plus de diagnostics et une documentation plus complète.

L'analyse de ces graphes a permis de faire ressortir les écarts entre les différentes RCP4.5 et RCP8.5 et leurs conséquences probables sur les spéculations choisies dans la zone d'étude au regard de leur préférendum thermique et pluviométrique respectif et des types de sols en présence.

Par ailleurs, les données climatologique (températures, précipitations, évaporation, humidité relative) couvrant tous le PDA4 et recueillies par les stations synoptiques de Savè, Bohicon, Natitingou et Parakou de l'ASECNA ont été utilisées pour analyser l'évolution du climat actuel sur la période 1981-2010 et la vulnérabilité des spéculations choisies aux stress hydriques au regard de leur capacité de rétention des eaux du sol. Mieux elles permettent de faire, dans une certaine mesure, une analyse comparative par rapport aux projections climatiques futures réalisées avec les scénarii climatiques RCP4.5 et RCP8.5 entre trois (03) temps à savoir 1981-2010 ; 2010-2040 et de 2040-2070..

## 2.1. Méthode d'élaboration des fiches opérationnelles de gestion de risques agro-météorologiques

Pour renforcer la résilience des systèmes de production de l'anacarde, du manioc, du maïs et de l'igname des fiches opérationnelles sont élaborées par spéculation. Elles combinent des aspects liés à l'utilisation de l'information climatique et météorologique pour renforcer le conseil agricole et l'application des innovations technologiques appropriées pour l'amélioration durable des rendements.

### ➤ Utilisation de l'information climatique et météorologique pour le conseil agricole

Pendant la collecte des données sur le terrain, les besoins en informations climatiques et météorologiques spécifiques sont recensés auprès de tous les acteurs des chaînes de valeur des filières ciblées. Ces besoins sont analysés et suivant les normes et pratiques existantes et les atouts disponibles, des solutions sont proposées et intégrées aux fiches.

### ➤ Technologies appropriées d'amélioration durable des rendements

Au regard des pratiques culturelles défavorables à la protection de l'environnement et face aux contraintes climatiques, les approches de solutions endogènes ou novatrices en cours d'adoption sont recensées sur le terrain. Elles sont analysées et croisées avec les technologies éprouvées, développées par les centres et institutions de recherche afin de choisir les plus appropriées. L'objectif ultime visé est d'augmenter durablement les rendements tout en réduisant les émissions de gaz à effets de serre.

### ➤ Etude de la croissance démographique des ménages agricoles actuels et futurs

- Calcul du taux d'accroissement des exploitants des filières étudiées dans la zone de recherche.

Pour mener ces travaux de terrain un échantillon a été défini dans toutes les communes suivant la méthode de Schwartz (1995). En effet, selon les premiers résultats du Recensement National de l'Agriculture (RNA 2019), dans le pôle 4, un ménage agricole sur deux dispose d'une exploitation de cultures pérennes (soit 95.561 ménages) et près d'un ménage sur deux, disposant d'une exploitation de cultures pérennes dispose d'une plantation d'anacardier. Au total, on peut donc dénombrer dans la zone d'étude 47.780 ménages agricoles disposant de plantation d'anacardier.

Ainsi, suivant la méthode de Schwartz (1995). La formule est : 
$$N = \frac{Z\alpha^2 PQ}{d^2}$$

Avec : N = Taille de l'échantillon par commune ;  $Z\alpha$  = écart fixé à 1,96 qui correspond à un degré de confiance de 95 % ; P = nombre de ménages agricoles de la commune produisant des filières retenues / nombre total de ménages agricole, Q = 1 - P ; d = marge d'erreur qui est égale à 5 %. La taille de l'échantillon enquêté est présentée dans le Tableau 1.

Tableau 1 : Echantillonnage par commune.

Communes	Nombre de ménages agricoles	Nombre de ménages disposant de cultures pérennes	Nombre de ménages produisant des filières retenues	$Z\alpha^2$	P	Q	D <sup>2</sup>	N
Tchaourou	20181,07	10090,535	5045,2675	3,8416	0,0263981	0,9736019	0,0025	39,4935524
Parakou	21705,07	10852,535	5426,2675	3,8416	0,02839159	0,97160841	0,0025	42,3889887
N'Dali	9422,21	4711,105	2355,5525	3,8416	0,01232484	0,98767516	0,0025	18,7054219
Nikki	11525,07	5762,535	2881,2675	3,8416	0,01507551	0,98492449	0,0025	22,8163991
Pèrèrè	6729,84	3364,92	1682,46	3,8416	0,00880305	0,99119695	0,0025	13,4080399
Djougou	18721,45	9360,725	4680,3625	3,8416	0,02448882	0,97551118	0,0025	36,708981
Ouaké	5425,86	2712,93	1356,465	3,8416	0,00709736	0,99290264	0,0025	10,8286881
Bassila	9817,66	4908,83	2454,415	3,8416	0,01284211	0,98715789	0,0025	19,4802805
Copargo	5506,96	2753,48	1376,74	3,8416	0,00720345	0,99279655	0,0025	10,9893696
Savalou	14840,53	7420,265	3710,1325	3,8416	0,01941234	0,98058766	0,0025	29,2507114
Bantè	10382,55	5191,275	2595,6375	3,8416	0,01358102	0,98641898	0,0025	20,5857193

Dassa-Zoumè	11323,5	5661,75	2830,875	3,8416	0,01481184	0,98518816	0,0025	22,4233484
Glazoué	11166,5	5583,25	2791,625	3,8416	0,01460648	0,98539352	0,0025	22,1170587
Savè	7565,12	3782,56	1891,28	3,8416	0,00989565	0,99010435	0,0025	15,0555764
Ouèssè	12464,19	6232,095	3116,0475	3,8416	0,01630394	0,98369606	0,0025	24,6448166
Djidja	14344,8	7172,4	3586,2	3,8416	0,01876389	0,98123611	0,0025	28,2923235
<b>TOTAL</b>	<b>191122,38</b>	<b>95561,19</b>	<b>47780,595</b>		<b>0,25</b>	<b>0,75</b>		<b>377,189276</b>

Source : d'après données de l'INSAE, 2019

Au total, la taille de l'échantillon considéré pour la recherche est estimée à 377 chefs d'exploitation disposant au moins une exploitation agricole.

### III. RESULTATS

#### 3.1. Vulnérabilité des systèmes de productions agricoles dans Commune de Djougou

La commune de Djougou s'étend sur une superficie de 3.966 km<sup>2</sup> et fait partie des quatre communes qui composent le département de la Donga au Nord du Bénin. Elle est limitée au nord par les communes de Kouandé et de Pehunco, au sud par la commune de Bassila, à l'est par les communes de Sinendé, de N'dali et de Tchaourou, toutes dans le département du Borgou et à l'ouest par les communes de Ouaké et de Copargo. Djougou chef-lieu du département et de la commune est située à environ 450 km de Cotonou.

La commune de Djougou a un relief de plateau parsemé de collines de faibles dénivellations. Le climat est de type soudano-guinéen avec une saison de pluies (avril à octobre) et une saison sèche (octobre à avril). La moyenne annuelle de précipitation est comprise entre 1200 et 1300 mm ; elle varie entre 1000 et 1500 mm d'eau pour 75 à 140 jours effectifs de pluies. En début des saisons de pluies, la région connaît périodiquement le passage de vents fort soufflant de l'est vers l'ouest. Les sols sont de texture argilo-sableuse ou latéritique (gravillonnaire ou caillouteux) globalement favorables à l'agriculture. La superficie cultivée représente 35,7 % de la superficie de la commune. La végétation de la commune est dominée par des savanes arborées et arbustives dont 37182 ha de forêts classées sous aménagement. Néanmoins des poches non négligeables de forêts claires et de forêts denses s'observent par endroits. La commune est traversée et arrosée par quatre (04) cours d'eau sur une longueur totale de 21 km (PDC, 2003).

- **Projection des températures de la Commune de Djougou**

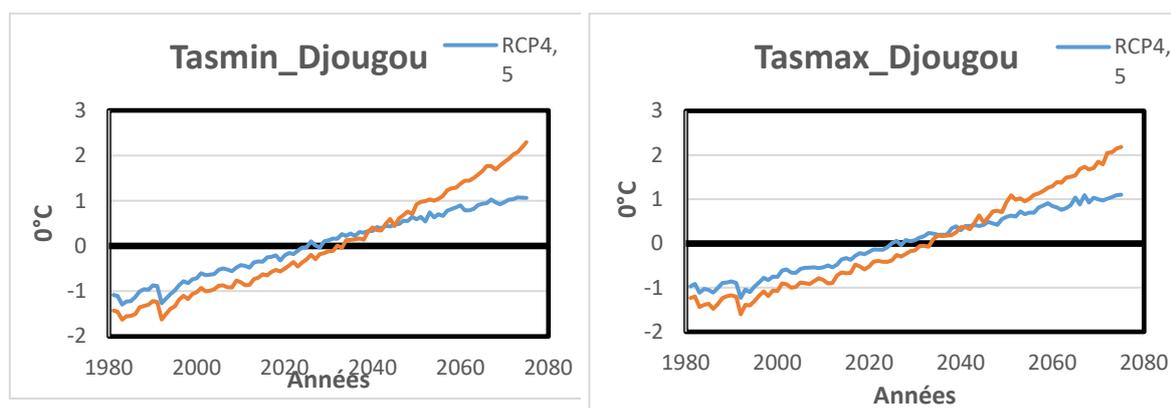


Figure 2 : Scénarii climatiques des températures dans la Commune de Djougou

Source: ASECNA, 2017 et travaux de terrain, 2020

Les températures minimales et maximales sont à la hausse. La variation au niveau de la température minimale actuelle (RCP8.5) est comprise entre -1,62°C en 1992 et 2,29°C en 2075. La température maximale quant à elle varie entre -1,40°C en 1994 à 2,18°C en 2075. C'est à partir de 2071 que l'augmentation de la température minimale va dépasser les 2°C et si rien n'est fait cette hausse

va s'accroître et devenir permanente. Ce qui n'aidera pas les producteurs. En effet, la hausse des températures (jusqu'à 37,8°C), consécutive à des sévères périodes d'harmattan va négativement impacter par exemple la production du maïs et du soja. Ces deux (02) spéculations, pendant leur cycle de croissance, exigent des températures n'excédant pas une moyenne de 36°C.

La même évolution s'observe au niveau des températures maximales. L'année 1992 reste la plus déficitaire avec une chute de -1,60°C et l'année la plus excédentaire sera l'année 2075 avec une hausse de 2,18°C par jour, sur la période 1992-2080.

- **Projection des précipitations et évaporation Commune de Djougou**

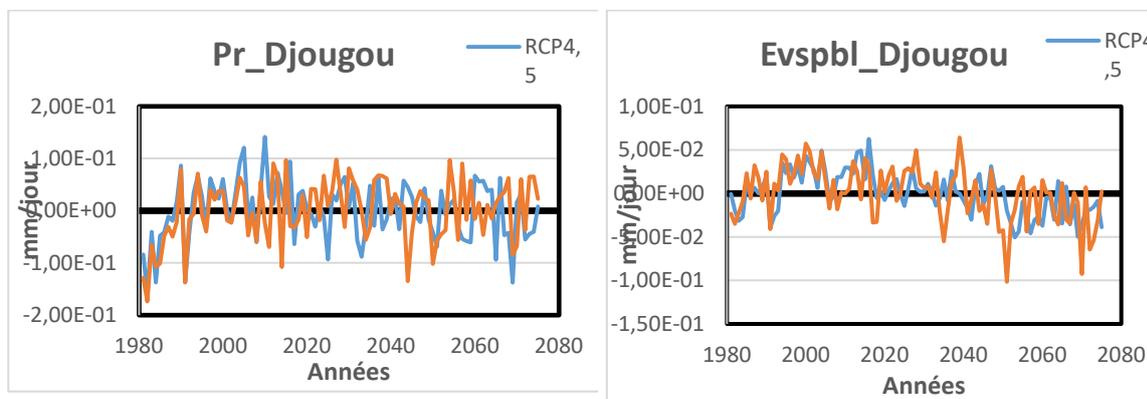


Figure 3 : Scénarii climatiques des précipitations et évaporation Commune de Djougou

Source: ASECNA, 2017 et travaux de terrain, 2020

Globalement, sur la période 1980-2080, les précipitations dans la Commune de Djougou sont à la hausse avec un pic de la trajectoire actuelle (RCP8.5) en 2027 et 2057, soit 1mm par jour. Quant au RCP4.5 qui est la trajectoire du climat souhaité, le pic était prévu pour 2010 avec une valeur de 1,41mm par jour. L'année la plus déficitaire est 1982 pour le RCP8.5 et pour le RCP4.5, ce sont les années 1981 et 2069. Ce qui suppose que dans la commune de Djougou des mesures doivent être prises pour faire face à la sécheresse en 2069.

Egalement, il faut noter que sur la période 1980-2080, il y a une baisse des épisodes de chaleurs. Pour le RCP8.5, l'année 2051 sera la moins chaude égale à -1,02 mm par jour tandis que l'année la plus chaude sera 2039 avec une valeur égale à 6,42 mm par jour.

En somme, les niveaux de précipitation dans la commune de Djougou restent globalement acceptables et favorables aux cultures ciblées, sous réserve d'une bonne répartition spatiale et temporaire. Toutefois, les niveaux élevés de chaleur envisagés pourraient entraîner des chutes de fleur, des stress hydriques temporaires et donc des baisses importantes de rendement.

### 3.2. Vulnérabilité des systèmes de productions agricoles dans Commune de Djidja

La commune de Djidja est la plus vaste des neuf (9) communes du Département du Zou. S'étendant sur une superficie de 41,66% de la superficie totale du département, elle est située dans sa partie nord-ouest et est limitée au sud par les communes d'Abomey et de Bohicon, au sud-ouest par le Département du Couffo (commune d'Aplahoué), à l'est par la commune de Za-Kpota et au nord par le Département des Collines (communes de Dassa et Savalou).

La commune de Djidja jouit d'un climat de type subéquatorial tendant vers le soudano-guinéen dans les parties septentrionales. Aussi remarque-t-on que dans ces parties les deux saisons pluvieuses deviennent pratiquement une seule (perturbation climatique).

Le relief est constitué de plateaux avec des dépressions, mais aussi des affleurements granitiques (Lô, Lalo...) atteignant 100 m d'altitude. Deux substrats géologiques portent les sols de la commune. Il s'agit du continental terminal qui porte les sols ferrallitiques du Sud et du socle cristallin du crétacé qui porte les sols ferrugineux.

La commune de Djidja dispose d'une variété de sols à savoir, les sols ferrallitiques, les sols ferrugineux tropicaux, les vertisols et les sols hydromorphes.

- **Projection des températures dans la Commune de Djidja**

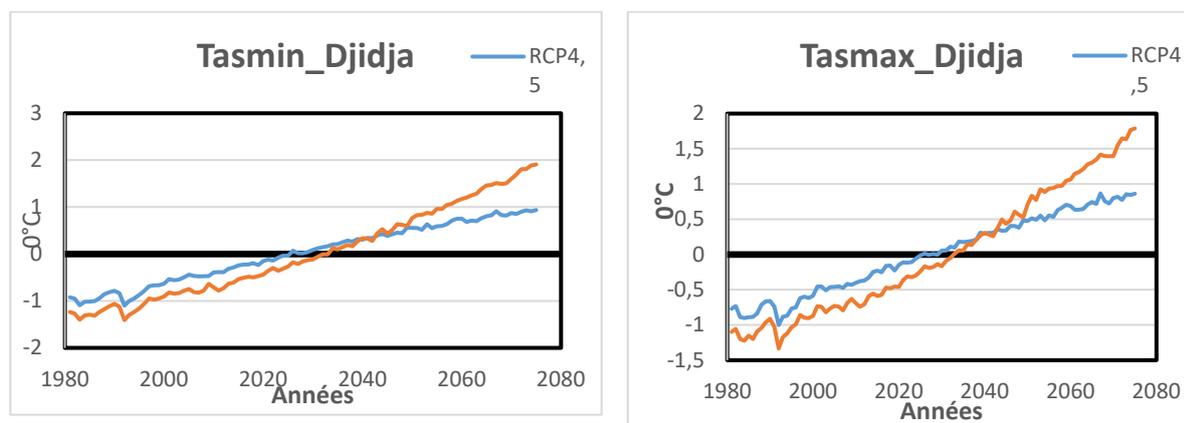


Figure 4 : Scénarii climatiques des températures dans la Commune de Djidja

Source: ASECNA, 2017 et travaux de terrain, 2020

La figure 4 montre une hausse croissante des températures sur la période 1980-2080. La température minimale la plus élevée est observée en 2075 avec des variations de 1 à 2°C pour les RCP4.5 et RCP8.5. Au niveau de la température maximale, l'année la moins chaude est 1992 (-1,33mm/jour) pour RCP8.5 et 1991 (-1,02mm/jour) pour RCP4.5. Les températures minimales sont en dessous de 2°C. Ce qui veut dire que les impacts des changements climatiques sur les cultures sont maîtrisables. Cependant, des mesures additionnelles sont nécessaires pour réduire leur vulnérabilité, notamment l'adoption du paillage et de l'agroforesterie.

La corrélation entre la trajectoire actuelle RCP8.5 et celle souhaitée RCP4.5 sera observée en 2041 avec une variation entre 0,28°C et 0,32°C. Cette légère hausse n'est pas susceptible d'influencer la production agricole au niveau des cultures cibles. Il y a donc un lien logique entre ces deux paramètres des scénarii climatiques.

- **Projection des précipitations et évaporations dans la Commune de Djidja**

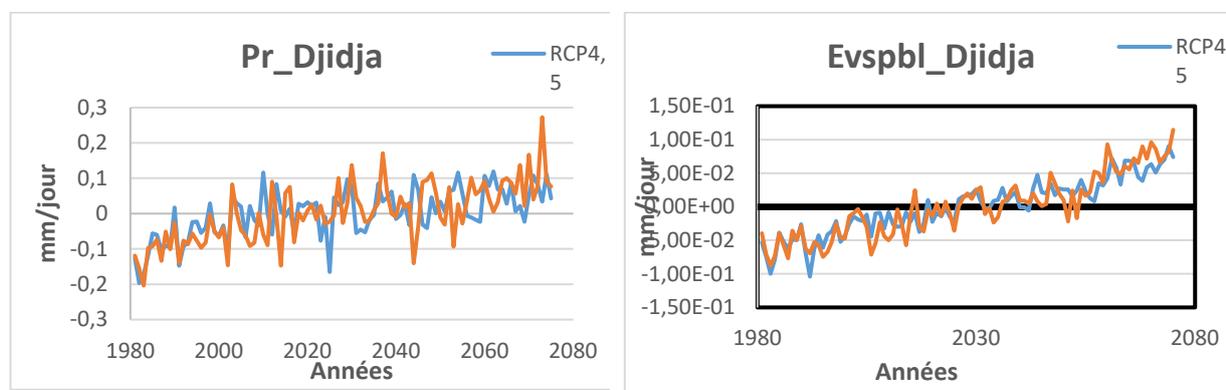


Figure 5 : Scénarii climatiques des précipitations et évaporations la Commune de Djidja

Source: ASECNA, 2017 et travaux de terrain, 2020

L'examen de la figure 5 révèle que les valeurs des paramètres climatiques à savoir précipitations et évaporation sont à la hausse sur la période 1980-2080 dans la commune de Djidja. Suivant la trajectoire actuelle, RCP8.5, les années les plus arrosées sont 2037, 2070 et 2073 avec respectivement des variations égales à 0,17mm et 0,27mm de pluie par jour. Cependant, cette hausse est en dessous de 1mm, donc non significative. C'est-à-dire qu'elle n'est pas susceptible d'impacter le cycle végétatif et des cultures cibles.

L'année la plus arrosée sera 2075 avec une valeur égale à 1,15mm mm de pluie par jour tandis que l'année la moins arrosée est 1983 avec une valeur égale à -0,83mm pour le RCP8.5.

Par contre, pour le RCP4.5, l'année la plus excédentaire sur la période 1980-2080 est 2010 (0,11mm de pluie par jour) et l'année la plus déficitaire et donc la moins arrosée sera 1982 avec une valeur égale à -0,19mm de pluie par jour.

Quant à la trajectoire de l'évaporation sur la période 1980-2080, elle est ascendante et l'année ayant de plus grands épisodes de chaleurs est 2075 (1,15mm/jour) avec une variation de 1,15mm de pluie par jour et l'année la moins chaude est 1983 avec une valeur égale à -0,87mm de pluie par jour pour le RCP8.5. Quant au RCP4.5, l'année la plus chaude sera 2074 avec une valeur relativement égale à 1mm de pluie par jour et la moins chaude sera 1992 avec une valeur égale à -1,04 mm de pluie par jour. Ce qui est susceptible d'impacter la production et les rendements des cultures ciblées. D'où la nécessité de développer et promouvoir des outils pour mieux gérer ces risques notamment d'agroforesterie, des variétés à cycle court et à haut rendement.

#### **IV. DISCUSSION**

Dans la Commune de Djougou, les températures minimales et maximales sont à la hausse. La variation au niveau de la température minimale actuelle (RCP8.5) est comprise entre -1,62°C en 1992 et 2,29°C en 2075. La température maximale quant à elle varie entre -1,40°C en 1994 à 2,18°C en 2075. C'est à partir de 2071 que l'augmentation de la température minimale va dépasser les 2°C et si rien n'est fait cette hausse va s'accroître et devenir permanente. Ce qui est un facteur défavorable pour les cultures. La corrélation entre les trajectoires actuelles et souhaitées sera observée en 2041 avec une hausse cumulative de 0,34mm de pluie par jour. De même, à Djidja, une hausse croissante des températures sur la période 1980-2080. La température minimale la plus élevée est observée en 2075 avec des variations de 1 à 2°C pour les RCP4.5 et RCP8.5. L'examen des résultats révèle que les valeurs des paramètres climatiques à savoir précipitations et évaporation sont à la hausse sur la période 1980-2080 dans la commune de Djidja. Suivant la trajectoire actuelle, RCP8.5, les années les plus arrosées sont 2037, 2070 et 2073 avec respectivement des variations égales à 0,17mm et 0,27mm de pluie par jour. Cependant, cette hausse est en dessous de 1mm, donc non significative. C'est-à-dire qu'elle n'est pas susceptible d'impacter le cycle végétatif et des cultures cibles.

Les résultats similaires ont été obtenus par G. Agbétou Essé en (2012, p. 7). Il ressort de ses analyses que, les populations de la commune de Dassa-Zoumé ont connu une augmentation des températures variant de 0,47 à 0,86 °C de mars en juillet (période de la grande saison agricole). Pendant cette même période, il est noté aussi une diminution de 3 % à 24 % des hauteurs pluviométriques et ceci pour ces trois dernières décennies par rapport aux valeurs de la période 1941-1970. Cette situation a affaibli les rendements agricoles qui engendrent parfois des insuffisances des produits alimentaires et la réduction du pouvoir d'achat. C'est-à-dire la baisse des revenus agricoles à près de 40 %. Face à ces difficultés, les populations de la commune adoptent des mesures pour contrer les contraintes climatiques. Aux nombre de ces mesures, il faut citer les stratégies utilisées pour améliorer les rendements agricoles (travaux de groupes, des semis répétés, semis étalés, le paillage, l'augmentation des emblavures, l'utilisation des engrais chimiques raisonnés) et les reconversions socio-professionnelles (M. BOKO, 1988, p. 13) et (C. G. Wokou, 2014, p. 14).

Globalement, sur la période 1980-2080, les précipitations dans la Commune de Djougou sont à la hausse avec un pic de la température actuelle (RCP8.5) en 2027 et 2057, soit 1mm par jour. Egalement, il faut noter que sur la période 1980-2080, il y a une baisse des épisodes de chaleurs. Pour le RCP8.5, l'année 2051 sera la moins chaude égale à -1,02mm par jour tandis que l'année la plus chaude sera 2039 avec une valeur égale à 6,42mm par jour. Ces résultats concordent avec ceux de Ogouwalé, (2001, p.) qui montre qu'au Bénin, le contexte climatique serait marqué par une réduction de 15 à 30 % de pluie entre 1990 et 2025, si l'augmentation de la température venait à être de 0,6 °C (notamment sous les latitudes comprises entre 5 ° et 10 ° nord. Allant dans le même sens, M. Issa, (2012, p. 34), GIEC (2007, p. 11) et I. F. Ouorou Barré (2014 p. 6) relèvent que la quantité d'eau précipitée diminuerait et le besoin en eau des cultures se trouveraient insatisfait. En effet, il existe une forte corrélation entre le rendement des cultures et la pluviométrie dans les différentes régions du pays. Cette situation accentue fortement la vulnérabilité des systèmes de production agricole.

#### **V. CONCLUSION**

Au terme de cette recherche qui porte sur vulnérabilité des systèmes de productions agricoles face aux changements climatiques dans la Commune de Djidja et de Djougou, il ressort globalement que les températures minimales et maximales sur l'ensemble des communes de Djidja et de Djougou du Pôle de Développement Agricole 4 sont à la hausse sur la période 1980-2080. Ce qui suppose

que si la tendance est maintenue, leur vulnérabilité par rapport aux changements climatiques sera limitée. Quant aux précipitations, la hausse est observée à Djidja et de Djougou; seulement qu'elle est plus prononcée dans les Communes de Djougou, avec une variation dépassant 1 mm de pluie par jour. Ce qui est suffisant pour impacter le cycle végétatif des cultures cibles depuis les semis jusqu'à la maturation et les récoltes. Il urge donc adopter des variétés à cycle court et à forts rendements sans oublier la mise en place d'une agriculture durable pour une conservation durable de la fertilité des sols et des eaux.

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# *Relationship between Work Capacity, Work Motivation and Opportunity to Participate in The Discretionary Behavior of Private Islamic Higher Education Lecturers in Lampung Province*

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**Abstract** – The aim of this study is to examine the relationship between work capacity, work motivation and the opportunity to participate, either partially or simultaneously, with the discretionary behavior of private Islamic higher education lecturers. This research is a quantitative survey study conducted at private Islamic universities in the province of Lampung. Population of 145 persons and samples using total sampling. Hypothesis testing uses the Pearson product moment correlation technique analysis and multiple regression, with a significance level of 5 per cent alpha ( $\alpha = 0.05$ ). This study resulted in four findings: 1) the work capacity variable has a relationship with the discretionary behavior of the lecturer; 2) the work motivation variable has a relationship with the discretionary behavior of the lecturer; 3) the opportunity to participate in the variable has a relationship with the discretionary behavior of the lecturer; 4) at the same time, work capacity, work motivation and opportunity.

**Keywords** – Work Ability, Work Motivation, Participation Opportunities and Discretionary Behavior.

## I. INTRODUCTION

The development of human resources in higher education is needed to anticipate as much as possible any change in the globalization of education. Quality human resources are more important than the wealth of natural resources, because the wealth of natural resources cannot guarantee the well-being and success of a nation (Asvio et al, 2019; Rahmadoni, 2018, Tobari et al, 2018).

Lecturers are one of the key components of human resources in the higher education system. The roles, duties and responsibilities of the lecturer are very important in achieving the objectives of national education, namely to educate the nation, to improve the quality of the Indonesian people, including the quality of faith or piety, noble character and mastery of science, technology and art, and to create an Indonesian society that is advanced, just, prosperous and civilized.

Law No. 14 of 2005 on lecturers states that lecturers are professional educators and scientists with the primary task of transforming, developing and disseminating science, technology and art through education, research and community service (RI Law No. 20 of 2003). Regulation of Permenpan-RB No. 17 of 2013 states that a lecturer always deepens and develops the knowledge he/she has mastered through research. The existence of this Regulation underlines that the teaching profession is not only a professional educator in higher education, but at the same time a lecturer is also a scientist and a pioneer in community service. Based on data from the Directorate-General for Research and Development Strengthening as of 31 July 2017, the number of internationally indexed Indonesian scientific publications has reached 9,349. Indonesia is third among ASEAN countries with 15,985 documents from Malaysia, 10,977 documents from Singapore, 9,349 documents from Indonesia and 8,204 documents from Thailand (Menristekdikti, 2018). In the meantime, Indonesia ranks second in ASEAN after Malaysia as of 6 April 2018.

The number of Indonesian international scientific publications indexed by Scopus as of 6 April 2018 was 5,125, while Singapore and Thailand were 4,948 and 3,741. In the meantime, Malaysia excels by successfully collecting 5,999 scientific publications. The

results of the above report show that there has been an increase in Indonesia's ranking at ASEAN level from 2017 to 2018. This is a good achievement for the world of education in Indonesia, although there is an increase in publications, but there is also a decrease in citations. More effort is therefore needed to improve the quality of all existing journals (<https://risbang.ristekdikti.go.id>).

Lecturers are a very important human resource to ensure the success of these goals, because they are creatures with certain feelings, thoughts, needs and expectations. This requires some attention or concern because these factors can affect the performance of work, dedication, love and loyalty to work. Therefore, tertiary institutions should be able to develop conditions that can encourage teachers or lecturers to always develop and improve their skills and abilities in the implementation of the tri-dharma of higher education.

The provisions related to the work of lecturers regarding work that must be carried out by a lecturer are confirmed in the Regulation of the Minister of Education and Culture Number 92 of 2014 concerning technical instructions for the implementation of lecturer's functional positions, including qualification criteria starting from expert assistants, lecturers, head lecturers to professors along with their duties, responsibilities and authority (Permendikbud No 92/2014). Increasing the functional position of a lecturer is an important career in the life of a lecturer. The functional positions of each lecturer are increased if they can achieve quality developments or advancements in the world of education, work and employment. This is because in each functional position there is a description of the different levels of work. It can therefore be said that there are differences in the specific characteristics of the job, namely the number of responsibilities, the types of tasks and the level of satisfaction of the job itself.

The work attitude of the lecturer is the behavior of the lecturer in order to fulfill his duties and responsibilities. There is an attitude or behavior that comes from within a lecturer that can later influence work attitudes. The different characteristics of each lecturer may have an impact on the different activities and activities that each lecturer undertakes. Often we don't pay close attention to the fact that there is actually a certain process going on in someone's mind to determine the steps to be able to complete the job. As stated by Fox, the characteristic of work is that there is an element of discretion. This choice element examines the extent of the behavior required in a job (Purcel et al, 2009).

The lecturers of private Islamic colleges in Indonesia are led by the Ministry of Religion of the Republic of Indonesia through Kopertais. Private Islamic colleges in the province of Lampung are under the leadership of Kopertais Region VII. Kopertais Region VII is home to private Islamic universities in several provinces, namely South Sumatra, Lampung and Bengkulu. Data from private Islamic colleges in Kopertais Region VII are 49 private Islamic colleges. Based on the above table, it is found that the province of Lampung has 24 private Islamic colleges. The selection of tertiary institutions in the province of Lampung as a research location used probability sampling techniques with stratified random sampling, namely the determination of a sample based on higher education institutional strata. The study population consisted of two strata, the Institute and the High School. The first group is an institute strata with a total of three colleges and a high school strata with 21 high schools. The selection of higher education institutions in the second group used probability sampling techniques with stratified random sampling, which is the determination of the sample based on the development and underdevelopment of higher education institutions based on the year in which the institution was founded.

Determination of the sample by simple random sampling with a lottery system in order to obtain the following research locations in this study: first, IAI Agus Salim Metro with 62 lecturers. Second, with 36 lecturers, STAI Ma'arif Kalirejo. Third, STIT Pringsewu has 33 lecturers. Fourth, STEBIS Nur Ilmi Ismailiyun has a total of 14 lecturers to obtain a 145-person lecturer sampling unit. Determination of the lecturer's sample using total sampling so that all lecturers become a sample in the study.

The following can be explained about the data on the functional positions of lecturers achieved by lecturers as a preliminary survey of research at four private Islamic religious colleges, namely IAI Agus Salim Metro, STIT Pringsewu, STAI Ma'arif Kalirejo and STEBIS Nur Ilmi Ismailiyun, which became research sites.

Table of Lecturer's Functional Positions 2018/2019

No	Islamic College	Grade					Total
		Expert Assistant (IIIb)	Lecture (IIIc)	Lecturer (IIId)	Lector Head (IVa)	Professor	
1	IAI Agus Salim	24	25	11	2	0	62
2	STIT Pringsewu	22	7	4	0	0	33
3	STAI Ma'arif Kalirejo	16	11	9	0	0	36

4	STEBIS Nur Ilmi	11	3	0	0	0	14
Total		73	46	24	2	0	145

Source: Processed data, 2018/2019

Based on the table, information on the status of the position of lecturers in the college research sample is obtained. In 2018/2019 IAI Agus Salim Metro as the chancellor was H. Ach. Chairy. The status of functional lecturers is at the level of expert assistants, with 24 lecturers, 25 IIIc lecturers, 11 IIId lecturers and 2 head lecturers. STIT Pringsewu was chaired by Dwi Rohmadi Mustofa in 2018/2019.

The status of the lecturers' functional positions is as high as 22 lecturers, 7 IIIc lecturers, 4 IIId lecturers and no head lecturer at the level of expert assistants. STAI Ma'arif Kalirejo was chaired by Sungkowo in 2018/2019. The status of the lecturers' functional positions is as high as 16 lecturers, 11 IIIc lecturers, 9 IIId lecturers and no head lecturer at the level of expert assistant. STEBIS Nur Ilmi Ismailiyun was chaired by S.E. in 2018/2019. Priyatna, man. There are 11 functional lecturers at the level of expert assistants, 3 IIIc lecturers, and no IIId or head lecturer. Thus, it can be concluded from Table 1.2 above that 73 expert assistant lecturers (50.34 per cent), 48 lecturers IIIC (31.72 per cent), 24 lecturers IIID (16.55 per cent) and 2 lecturers Head lecturers (1.38 percent).

Applying for functional positions for private lecturers is relatively more difficult than for lecturers in state universities, because there are still many on private campuses who do not understand the mechanism for submitting functional positions to LLDIKTI or Kopertais, resulting in difficulties in assessing the level of Kopertais. There are still lecturers who propose materials, do not attach proof of the requirements that must be met, such as the old position decree, the most recent diploma legalized by the competent official, the senate deliberation minutes, so that the Kopertais assessment process can be delayed. There are still lecturers proposing promotion documents, there are materials which are not organized on a per-activity basis and incomplete with supporting evidence of such activities, e.g. for lecture activities, the appointment of the lecturer must be accompanied by an appointment decree and a comprehensive lecture schedule. Issues such as teaching, requirements for writing in an accredited scientific journal as the main author and others. This often goes unnoticed to the effect that many proposals for Kopertais promotion are rejected or that their evaluation period is postponed.

How someone works is certainly not the same thing for every person. The existence of heredity or genetics, education, and the social environment that a person faces in his or her lifetime can shape a person's way of thinking and working. The emergence of action choices that are realized in work behavior is not necessarily the same for every lecturer, such as the extent to which a lecturer can schedule the completion time of his or her work and determine which procedures will be used on the basis of his or her skills and abilities. This was further explained by Appelbaum et.al in research in the steel, clothing and medical equipment industry in the United States, which found that the willingness of employees to engage in discretionary behavior depended on the creation of opportunities for participation, skills development and motivation and incentives (Purcel et al, 2009). The emergence of action choices that are realized in work behavior is not necessarily the same for every lecturer, such as the extent to which a lecturer can schedule the completion time of his or her work and determine which procedures will be used on the basis of his or her skills and abilities. This was further explained by Appelbaum et.al in research in the steel, clothing and medical equipment industry in the United States, which found that the willingness of employees to engage in discretionary behavior depended on the creation of opportunities for participation, skills development and motivation and incentives (Purcel et al, 2009).

The concept of how to act in carrying out the work is described in the Qur'an in the Surah at—Taubah verse 105, namely:

وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ وَسَتُرَدُّونَ إِلَىٰ عِلْمِ  
 الْغَيْبِ وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ﴿١٠٥﴾

Meaning: "Work you, then Allah and His Messenger and the believers will see your work, and you will be returned to (Allah) who knows what is unseen and what is real, then He will tell you what you have done. " (Surah at Taubah: 105) (Anonymous, 2014).

In Ibn Kathir's commentary, this verse is a threat from Allah to those who violate His commands. Namely, that their deeds will be shown to Allah, the Messenger of Allah, and to the believers. This is definitely going to happen on the Day of Resurrection. And

## Relationship between Work Capacity, Work Motivation and Opportunity to Participate in The Discretionary Behavior of Private Islamic Higher Education Lecturers in Lampung Province

sometimes Allah, the SWT, shows all this to mankind in the world. Imam al –Bukhori narrated 'Ayesha ra said, 'If you are amazed at the good deeds of someone, then say,' and 'Do good to you, Allah and His Messenger, and those who believe will see your work' (Muhammad, 2004).

On the basis of the above verse, it can be understood that all that humans do will be shown in the world to other people, and also in the hereafter, what work is done and how to do that work. Therefore, the choice of good working methods called *ihsan*, a professional called *Itqon*, and a thorough working in accordance with religious rules and regulations should be done seriously by someone doing work.

The results of the initial survey on the discretionary work behavior of lecturers at private Islamic colleges who were samples of research sites can be seen as follows.

Table of Results of the Distribution of Initial Survey Questionnaires for Discretionary Behavior Variables for STIT Pringsewu Lecturers

NO	INDICATOR	A	%	O	%	S	%	R	%	N	%	ITEM TOTAL	SCORE TOTAL	INF
1	Work Target	1	1.7	48	80.0	9	15.0	2	3.3	0	0.0	60	228	Good
2	Willingness to Work	2	3.3	37	61.7	17	28.3	4	6.7	0	0.0	60	217	Good
3	Needs of Knowledge and Skills	3	5.0	47	78.3	2	3.3	8	13.3	0	0.0	60	225	Good
4	Openness of Communication	12	24.0	33	66.0	4	8.0	1	2.0	0	0.0	50	206	Very Good
5	Availability of Rewards	9	18.0	36	72.0	4	8.0	1	2.0	0	0.0	50	203	Very Good
6	Never Give Up	1	2.0	29	58.0	18	36.0	2	4.0	0	0.0	50	179	Good
7	Work Involvement	0	0.0	35	70.0	14	28.0	1	2.0	0	0.0	50	184	Good
Discretionary Behavior Average Score													1442	Good

Table of Results of the Distribution of Initial Survey Questionnaires for Discretionary Behavior Variables STAI MA'ARIF Kalirejo, Central Lampung

NO	INDICATOR	A	%	O	%	S	%	R	%	N	%	ITEM TOTAL	SCORE TOTAL	INF
1	Work Target	4	6.7	47	78.3	6	10.0	3	5.0	0	0.0	60	232	Good
2	Willingness to Work	2	3.3	42	70.0	12	20.0	4	6.7	0	0.0	60	222	Good
3	Needs of Knowledge and Skills	3	5.0	47	78.3	1	1.7	9	15.0	0	0.0	60	224	Good
4	Openness of Communication	16	32.0	32	64.0	2	4.0	0	0.0	0	0.0	50	214	Very Good
5	Availability of Rewards	11	22.0	35	70.0	2	4.0	1	2.0	1	2.0	50	204	Very Good
6	Never Give Up	2	4.0	32	64.0	13	26.0	3	6.0	0	0.0	50	183	Good
7	Work Involvement	0	0.0	39	78.0	9	18.0	2	4.0	0	0.0	50	187	Good
Discretionary Behavior Average Score													1466	Good

Table of Results of the Distribution of Initial Survey Questionnaires for Discretionary Behavior Variables of IAI Lecturer Agus Salim Metro

NO	INDICATOR	A	%	O	%	S	%	R	%	N	%	ITEM TOTAL	SCORE TOTAL	INF
1	Work Target	7	11.7	45	75.0	8	13.3	0	0.0	0	0.0	60	239	Good
2	Willingness to Work	4	6.7	40	66.7	16	26.7	0	0.0	0	0.0	60	228	Good
3	Needs of Knowledge and Skills	15	30.0	33	66.0	2	4.0	0	0.0	0	0.0	50	213	Very Good
4	Openness of Communication	7	11.7	43	71.7	4	6.7	6	10.0	0	0.0	60	231	Good
5	Availability of Rewards	12	24.0	34	68.0	4	8.0	0	0.0	0	0.0	50	208	Very Good
6	Never Give Up	5	10.0	31	62.0	13	26.0	1	2.0	0	0.0	50	190	Good
7	Work Involvement	6	12.0	39	78.0	5	10.0	0	0.0	0	0.0	50	201	Very Good
Discretionary Behavior Average Score												<b>1510</b>	Good	

The results of preliminary research at the STIT Pringsewu, STAI Ma'arif Kalirejo and IAI Agus Salim Metro research sites show that the need for knowledge and skills is linked to the work behavior of the lecturers. This is confirmed by the research findings of Kelloway and Barling (2000), which state that knowledge influences one's discretionary behavior in organizations and work.

The results of preliminary research at the STIT Pringsewu, STAI Ma'arif Kalirejo and IAI Agus Salim Metro research sites show that the availability of rewards is linked to the work behavior of the lecturers. This is confirmed by the results of Baron and Kreps' research, which shows that total rewards, such as: competitive payments, perceived benefits, learning and development, have an impact on discretionary work behaviour (Pongah, 2016). In addition, researchers have seen discretionary behavior in the areas of work objectives, willingness to work, openness to unyielding communication and self-actualization of lecturers in order to continue working in higher education. With regard to the problems identified in the field, the researchers suspect that there are factors that influence the discretionary behavior of the lecturer, such as work capacity and work motivation.

Dosage discretionary behavior increases when dosage or educators are motivated, enthusiastic, and comfortable at work. Spirit and comfort can be created, one way is to receive a salary or an honorarium that is appropriate and appropriate and that can meet the needs of daily life. In addition to monthly salaries or teaching fees, the lecturer may still receive a variety of incentives, such as: certification for those who are certified, PPL assistant lecturers, KKN companion lecturers, thesis guides, thesis tests, comprehensive exams, semester exams, graduation committees and incentives when there are meetings bringing lecturers to campus. Permanent lecturers who have not received certification and have met the requirements will continue to be asked by the leadership of PTKIS to receive a professional lecturer allowance, the amount of which is in accordance with the functional position of the lecturer.

Several research results that have been published in journals or dissertations that are relevant to the subject of this research indicate that there is a difference between variables that are or are not related to other variables. This research study is very important to present because it is supported by a number of studies that discuss this issue as a current issue in private lecturers' circles.

Based on the general theory and the initial results of the survey described above, there are several factors that influence the discretionary behavior of lecturers in the performance of their duties and responsibilities in the performance of the Higher Education Tri-Dharma. This is what makes the issue of this research important to study, entitled The Relationship between Work Ability, Work Motivation and Opportunity to Participate in the Discretionary Behavior of Lecturers of Private Islamic Colleges in Lampung Province.

## II. METHODS

This research is a quantitative survey study conducted at private Islamic universities in the province of Lampung. Use relationship research in this study. Relationship research aims to test the hypothesis by measuring a number of variables and calculating the relationship coefficient between these variables in order to determine which variables are related (Noor, 2017). The Analysis Unit is a permanent lecturer at the Private Islamic College in Lampung Province.

Population of 145 persons and samples using total sampling. According to Gay in Mukhtar, the minimum acceptable sample size should be based on the design or method of research used. In general, the population view is more consistent for a study where the population is considered to be relatively homogeneous, with a population of at least 5% and a maximum of 30%. If a study has

## Relationship between Work Capacity, Work Motivation and Opportunity to Participate in The Discretionary Behavior of Private Islamic Higher Education Lecturers in Lampung Province

a population of less than 150 subjects, almost all research experts agree, it should be taken entirely or, in other words, the research can be said to be a population study. In other words, the population is also at the same time as a sample or research subject. Arikunto also explained that if the research subjects were less than 100, it would be better if they were all taken in such a way that the research was a population study (Rukajat, 2018). The determination of the lecturer sample is that the lecturers still use total sampling so that all lecturers remain in the research sample.

The data collection technique used in this study used methods such as: (a) questionnaires, (b) interviews and observations, and (c) documentation. The hypotheses in this study are: the ability to work, the motivation to work and the opportunity to participate are either partially or simultaneously related to the discretionary behavior of the lecturers. Hypothesis testing uses the Pearson product moment relationship technique analysis and multiple regression, with an alpha significance level of 5 percent ( $\alpha=0,05$ ).

### III. RESULT

The following shows the calculation data for the results of the research using the Microsoft Excel program and the SPSS 23.00 program as follows.

Table of Descriptive Statistics of Research Variables Processed from SPSS 23.00

		Statistics			
		Work Ability	Work Motivation	Participation Opportunities	Discretionary Behavior
N	Valid	115	115	115	115
	Missing	0	0	0	0
Mean		151.28	142.82	142.50	145.27
Median		151.00	142.00	142.00	146.00
Mode		151 <sup>a</sup>	140	142 <sup>a</sup>	146
Std. Deviation		10.191	9.185	10.187	11.982
Variance		103.852	84.361	103.778	143.567
Range		53	45	54	55
Minimum		124	118	115	116
Maximum		177	163	169	171
Sum		17397	16424	16388	16706

a. Multiple modes exist. The smallest value is shown

Source: Output SPSS 23.00

Table of Recapitulation of Normality Calculations

#### Research Variable Result Data

No	Variable	Chi-Square <sub>count</sub>	Chi-Square <sub>table</sub>	Conclusion
1	Discretionary Behavior (Y)	4,2170	14,0671	Normal Distribution
2	Work Ability (X <sub>1</sub> )	7,9069	14,0671	Normal Distribution
3	Work Motivation (X <sub>2</sub> )	5,5827	14,0671	Normal Distribution
4	Participation Opportunities (X <sub>3</sub> )	7,3065	14,0671	Normal Distribution
- Jika Chi <sub>hitung</sub> < Chi <sub>tabel</sub> maka Normal Distribution				
- Jika Chi <sub>hitung</sub> > Chi <sub>tabel</sub> maka Abnormal Distribution				

Hasil perhitungan uji homogenitas dapat dilihat secara keseluruhan dapat dilihat pada tabel berikut.

Table of Summary of Research Variable Homogeneity Test Results  
With a Probability Level of 0.05

No	Variable	dk	$X^2_{count}$	$X^2_{table}$	Information
1	X <sub>1</sub> toward Y	79	14,1555	100,7486	Homogen
2	X <sub>2</sub> toward Y	79	32,4664	100,7486	Homogen
3	X <sub>3</sub> toward Y	76	21,4872	98,4843	Homogen

Table of Summary of SPSS Output Correlation of X and Y Variables

**Correlations**

		Work Ability	Work Motivation	Participation Opportunities	Discretionary Behavior
Work Ability	Pearson Correlation	1	.200*	.982**	.578**
	Sig. (2-tailed)		.032	.000	.000
	N	115	115	115	115
Work Motivation	Pearson Correlation	.200*	1	.218*	.459**
	Sig. (2-tailed)	.032		.019	.000
	N	115	115	115	115
Participation Opportunities	Pearson Correlation	.982**	.218*	1	.577**
	Sig. (2-tailed)	.000	.019		.000
	N	115	115	115	115
Discretionary Behavior	Pearson Correlation	.578**	.459**	.577**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	115	115	115	115

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table of The Summary of The Results of The Relationship Test Between X and Y Variables

No	Variable	$r_{count}$	Coefficient of Determination	Decision
1	X <sub>1</sub> – Y	0,578	33,45%	Accepted
2	X <sub>2</sub> – Y	0,459	21,07%	Accepted
3	X <sub>3</sub> – Y	0,577	33,2%	Accepted
4	X <sub>1</sub> , X <sub>2</sub> , X <sub>3</sub> , – Y	0,6763	45,74%	Accepted

From the table above, it is concluded that all the correlation test variables in the study have a relationship. The results of the calculation of the research hypothesis test are shown below, namely:

Table of T Test and F Test Summary

No	Hypothesis	T <sub>count</sub>	T <sub>table</sub> 0,05%	F <sub>count</sub>	F <sub>table</sub> 0,05%	Decision	Information
1	H <sub>0</sub> : $r_{x_1y} = 0$	7,536	1,6585	-	-	H <sub>a</sub> accepted	There is a correlation
	H <sub>a</sub> : $r_{x_1y} \neq 0$						
2	H <sub>0</sub> : $r_{x_2y} = 0$	5,492	1,6585	-	-	H <sub>a</sub> accepted	There is a correlation
	H <sub>a</sub> : $r_{x_2y} \neq 0$						

3	$H_0 : r_{x_3y} = 0$ $H_a : r_{x_3y} \neq 0$	7,502	1,6585	-	-	$H_a$ accepted	There is a correlation
4	$H_0 : r_{x_{123}y} = 0$ $H_a : r_{x_{123}y} \neq 0$	-	-	31,186	2,68	$H_a$ accepted	There is a correlation
If $t_{count} < t_{table}$ , so $H_0$ accepted and $H_a$ rejected If $t_{count} > t_{table}$ , so $H_0$ rejected and $H_a$ accepted If $F_{count} < F_{table}$ , so $H_0$ accepted and $H_a$ rejected If $F_{count} > F_{table}$ , so $H_0$ rejected and $H_a$ accepted							

**a. Work Ability (X1) has a Correlation with Lecturer Discretionary Behavior (Y)**

The lecturer's work skills describe their physical abilities, thinking skills, mental abilities and attitudes in anticipation of work situations in such a way that they are closely linked to the professionalism of the way the lecturers work, the ability to master, understand and perform tasks according to their profession, the ability to work creatively and innovatively, efficiently and with high morals. For this purpose, the ability to work can foster a variety of choices of actions that will be used in work behavior to support the duties and functions of lecturers.

In this study, it is known that many factors affect the ability of the lecturer to work in relation to the discretionary work behavior of the lecturer, including knowledge and skills, so that he can be helped to complete work on time, to solve any work problems that arise, creativity and the power of innovation to complete the tasks that become the responsibility of the lecturer, the participation of lecturers in training, seminars or seminars. The ability of lecturers to use computer and internet technology to find information or references to complete their assignments and the ability to communicate and interact with others in order to find information solutions from those who are experienced so that they can provide ideas or behavioral alternatives in the completion of their work.

Robbins and Judge (2017) state ability, capacity is the current capacity of an individual to perform the various tasks in a job. Overall skills are essentially made up of two sets of factors: intellectual and physical, which refers to the individual's ability to perform different tasks in a job. The ability of an individual is essentially made up of two factors, namely intellectual ability, which relates to knowledge and mentality, as well as physical ability to carry out tasks that require stamina, dexterity and strength. Ability is a trait born or learned that allows a person to complete a job. The lecturer's ability to work is a description of the state of the lecturer's ability to complete his assignment. The intimate relationship between the discretionary behavior of the lecturer and the ability to work occurs because there is knowledge to understand the concept of assignment and good work skills.

The important value of building employability is always to increase knowledge and insight and improve skills. This has been described in Islam as well. Rasulullah Saw has directed mankind to have a work ethic based on the Koran and to know the work that has been done so as not to waste time. As the hadith narrated by Thabrani and Baihaqi, which means: from Aisyah r.a., actually Rasulullah s.a.w. said, "Surely Allah loves someone who when he works, he controls (his job)".

Based on the hadith above, it contains an interesting word, namely **يُقِنُّهُ** : "master it". The word master can be compared to the word "understand." Understanding the work being done at the same time in detail or in detail inspires us to become someone who is an expert or professional in a job. Therefore, in order to make this happen, lecturers should continue to build self-awareness in order to develop knowledge and self-skill dynamically, in order to encourage the discretionary behavior of lecturers to support and fulfill their professional responsibilities.

Each lecturer has the capacity to work that is created from the different learning, learning, training or work experience that has gone through. The ability of lecturers to work well is also inseparable from the role of interaction with the social environment, the work environment and higher education organizational systems. Thus, the above aspects shape the ability to work, which helps lecturers to shape and develop the discretionary behavior of lecturers in completing their assignments.

The suggestion to create a good employability and to produce better results with the knowledge and strength possessed has been taught in Islam. As Allah says in the letter to al-Baqarah, verse 30.

In Ibn Kathir's Tafseer book, Why do you want to make a person on this earth who will cause him harm and shed blood? "What this sentence means is that the angels mean that among these types of creatures there are people who will do this (It is as if the angels know about it on the basis of special knowledge, or they understand the word "Khalifah," that is, the person who decides cases between humans about the injustice that occurs between them, and prevents them from having prohibited acts and sins (Muhammad, 2004). The verse shows that Allah SWT has created man with perfect minds and physicalities so that he can be expected to become a leader and perform actions that will bring prosperity and prosperity to the earth.

Having a problem solving that occurs at work as part of the work capability indicator is a dominant element in building discretionary behavior in college lecturers. Work results can be achieved by completing tasks. Accepting every task given to the leader with the hope of providing new experiences and developing self-competence in work behaviour. Given the assignment, it may affect the knowledge and skills of the lecturers in the performance of their duties and responsibilities, which encourage the development of the discretionary work behavior of the lecturers.

The results of this study support a number of theories used as the basis for proposing research models. Among them, Ivancevich and Konopaske (2013) show that there is a relationship between work capability which is one of the factors that influences individual work behaviour. Purcel et al (2009) theory shows that the ability to work is related to the discretionary behavior of a person. Work capability contributes to the discretionary behavior that drives one's performance (Amstrong, 2008). Research findings also support Fishbein's theory in the Integrated Behavior model. Fishbein's theory shows that the behavior of a person is influenced by knowledge and skills (Glanz, 2008).

#### **b. Work Motivation (X2) Has Significant Correlation with Lecturer Discretionary Behavior (Y)**

An important driving factor that causes people to work is a need that needs to be met. Activities at work, produce something, and ultimately aim to meet their needs. But, behind this goal, people are also working to get compensation, wages or salaries from their work. So, in essence, people work not only to maintain their survival, but also to achieve a better standard of living.

The motivation for work in Islam is to earn a living that is part of worship. Thus, the motivation to work in Islam is not only the fulfillment of the living, but also the obligation to worship Allah after another fardlu worship. Working for a living is a special thing from an Islamic point of view. As Allah says in the Q.S. Al-Jumu'ah verses 10 and Q.S. Az-Zariyat verse 22, as the basis of thought.

In the interpretation of Ibn Kathir, الله فضل الارض وابتغوا من فضل الله “then scatter you on the face of the earth and seek the grace of Allah SWT”. When Allah the Almighty forbids them to buy and sell after hearing a call to prayer and orders them to gather together, Allah the Almighty allows them to be scattered upon the earth after they have finished their prayers and to seek the gift of Allah Ta'ala (Muhammad, 2004). From these verses it is shown that Allah SWT guarantees the sustenance of every human being on the condition that he tries or works and prays. This can be said to be the cause and effect of the process of how a person works and what the results will be. The results to be achieved are therefore reflected in the way the business processes or activities have been carried out.

The findings of this study support several theories used as a basis for proposing research models. Among them is the theory of Basic Motivation Process by Luthans (2010), namely motivation is a process that starts with a physiological or psychological deficiency or need that activates a behavior or a drive that is aimed at a goal or incentive. Motivation is a process that begins with a physiological or psychological deficiency that drives behaviors or drives aimed at goals or incentives. Someone does work based on the drive to fulfill the needs they have through the rewards that are achieved so that this contributes to driving behavior.

This study also supports Parrey's (2013) research on the Impact Assessment of Motivation on Discretionary Work Effort: An Empirical Study. The results of his research show that there is a relationship between the fulfillment of the motivational factors of the worker and the discretionary behavior of the worker.

#### **c. Opportunity to Participate (X3) has a Correlation with Lecturer Discretionary Behavior (Y)**

Jans and Backer (Grace and Grace, 2017) argue that when there is a dynamic balance between three dimensions, namely challenges, capacities and connections, people will participate actively. These challenges may include personal or organizational issues, interests, or things of interest, passion, and personal interest. Every job has a job challenge, the level of difficulty of completion or the amount of reward given, which gives rise to a desire to complete it. With the challenges of working in tertiary institutions, skills and knowledge will be updated to influence the discretionary work behavior of university lecturers.

Surah Ali-Imran verse 159 is one of the verses of the Koran that relates to the recommendation for participation and provides opportunities for all people. As Allah has said in the Qur'an, Verse 159 of Surah Ali-Imran. In the book of Tafsir Ibn Kathir, this verse explains that Allah SWT said (فا عف عنهم و استغفر لهم وشاورهم في الامر) “forgive them, ask forgiveness for them, and consult them in this matter. Rasulullah has always invited his companions to discuss a problem that has taken place in order to make their hearts happy and to make them more enthusiastic about the outcome of the discussions. As he once asked them to discuss the departure during the Battle of Badr to confront the army of the disbelievers. Thus the Prophet consulted his companions in both war and other matters (Muhammad, 2004).

The findings of this study support the theory used as the basis for the proposed research model. Among them is the Batch Performance Model by Purcel, which shows that there is a relationship between the opportunity to participate, which is one of the factors that influences individual discretionary behaviour.

The findings of this study are supported by research conducted by Butali and Njoroge (2018) entitled Effect of Employee Participation in Organizational Performance with Organizational Commitment as Moderator, which shows that employee involvement has a positive relationship with the results of work. The greater the involvement of workers, the greater the individual performance of work, which also has an impact on organizational progress.

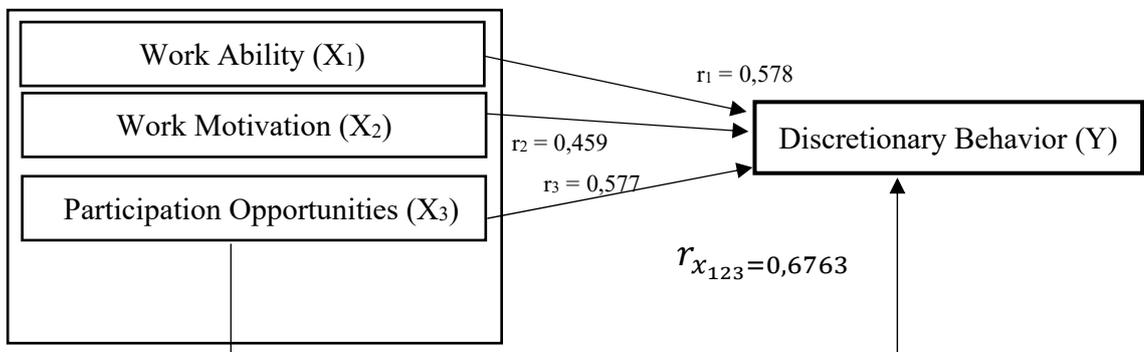
**d. Work Ability (X1), Work Motivation (X2), and Opportunity to Participate (X3) Have a Correlation with Lecturer Discretionary Behavior (Y)**

Lecturer's discretionary behavior is the behavior of a lecturer to identify ways and actions to carry out duties and responsibilities. In each individual, a lecturer or worker has discretionary work behavior based on the knowledge and skills they have. Other things that are no less important are internal motivation, appreciation received, support from colleagues and leaders, and a work environment that provides facilities and opportunities for workers. This is supported by Appelbaum (Purcel and Patrick, 2007), which argues that quality and innovation, improved individual and organizational performance, depend on the adoption of a coherent human resource system that gives employees skills, a structure of participation opportunities, and incentives to conduct their discretionary.

The concept of discretionary behavior is a choice of ways or actions that can be seen visually when doing so. Rasulullah Saw, has also advocated Muslims, as the Prophet Muhammad said, narrated by Muslims (1392 H). From the hadith, there's more than one way to slaughter the animals, the right way and the wrong way. A good method consists of a variety of ways, namely by sharpening knives and pleasing slaughter animals. This hadith also suggests planning ways and actions to carry out a job. Thus, the discretionary behavior of lecturers in tertiary institutions is understood as an embodiment of knowledge and skills with motivation and participation in obtaining a plan for their choice of work activities. These different options for action will make it easier for lecturers in higher education to achieve better results in their work.

The results of this study show that there are individual mechanisms and social factors related to work behavior in organizational mechanisms. The results of this study therefore support several theories used as the basis for proposing research models, including the Integrated Behavior Model by Fishbein, John Ivanchevic with Individual Differences Affected Workplace Behavior, which focuses on individual mechanisms, Purcel with the Bath Performance Model, which focuses on individual, social and organizational management factors. Some of these theories suggest a link between individual factors, social and organizational relationships, and the employee's work behavior in the performance of duties and responsibilities.

Testing of the four research hypotheses resulted in the following description of the research constellation.



**Final Image Research Constellation with Correlation Coefficient Value**

**IV. CONCLUSION**

Conclusions based on the results of the research: 1) the variable work capability has a relationship with the discretionary behavior of the lecturer; 2) the work motivation variable has a relationship with the discretionary behavior of the lecturer; 3) the opportunity to participate in the variable has a relationship with the discretionary behavior of the lecturer; 4) at the same time, work capacity, work motivation and opportunity.

**V. IMPLICATION**

The grand theory that was born on the basis of the results of this study, in the opinion of the researcher, is a model that can influence and improve the discretionary behavior of private Islamic university lecturers.

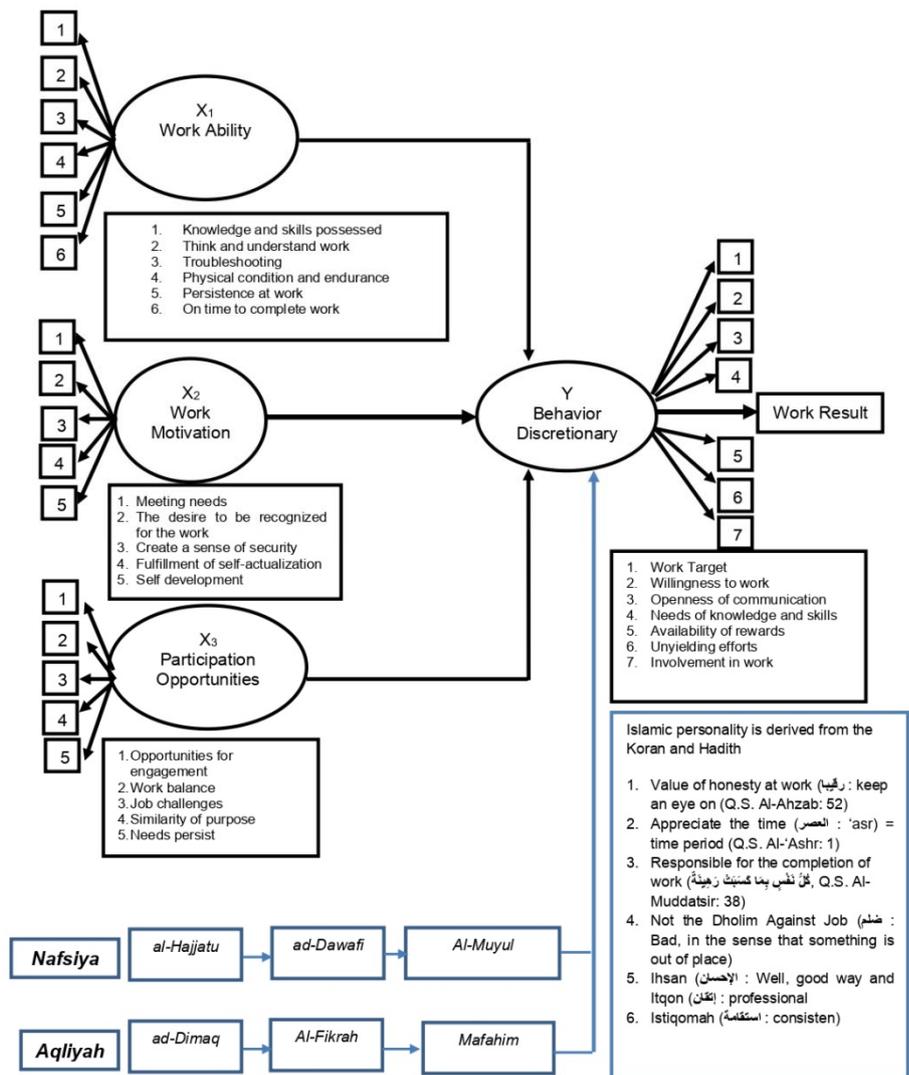


Figure PT AIS Lecturer Discretionary Behavior Research Model in Lampung Province

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# *Effect Of Mulching On Soil Physico-Chemical Properties Of Soil Under Semiarid Of Rain Fed Fersiallitic Soil Condition In Eastern Of Rwanda*

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**Abstract –** Mulches provide essential soil environment and economic benefits. Mulching is an agricultural and horticultural practice in which the use of organic is involved. This method is very convenient in protecting the roots of the plants from heat, cold. Mulch is used to cover soil surface around the plants to create congenial condition for the growth. This may include temperature moderation, reduce salinity and weed control. Unfortunately, this study has not been done much under different local conditions. This study was carried out to determine the effect of various mulches application on some soil physico-chemical properties of fersiallitic soil in semiarid ecosystem, eastern of Rwanda. A control (no mulch) factor was also included in the experiment. The findings for soil indicated the higher organic matter for rice straw than control, the highest pH of 7.6 for rice straw and 6.0 for control, there was a positive variation in EC across the depth from control to mulched land. The highest and the lowest values for soil moisture content obtained were 39.25% under rice straw and 25.01% for the control respectively and the obtained results showed that straws and grass conserved moisture at root zone level; there was a change in soil BD, porosity for mulched land from control. For moisture conservation rice and beans straw may be recommended.

**Keywords –** Mulches, *Phaseolus vulgaris*, pH, EC, OM, Porosity, BD, Soil moisture, yield.

## I. INTRODUCTION

Mulching is an agricultural technique widely used as soil management practice, they are used to cover bare soil especially in dry landscape with variable impact on the soil properties and plant growth, mulching have been widely used in agricultural lands, orchards, forests, and landscapes in many parts of the world (M A Kader, 2017). Mulch is any material that influences soil characteristics and sometimes plant growth (Bell, 2009). Today sub-Saharan countries are facing a big challenge of climate change which is resulting in water scarcity and large food deficiency (Green & Green, 2019). Several studies have showed that Overpopulation in sub-Saharan countries is resulting in food deficiency due to increased food demand under small land and less Agricultural technology. To improve how we produce food under small scale surface, mulching materials could be applied to improve soil health status this means that it improves soil structural properties directly and indirectly by promoting the biological activity (Ali, Islam, & Zaman, 2014) As the applied organic materials nourish the soil little by little while they decompose as after a long period in a farm or garden which promotes nutrient release from organic matter (Alharbi, 2017; Rees et al., 2002). Mulching

plays soil environment and economic benefits; the environment benefits include that it conserves soil water, reduces evaporation, regulates soil temperature and improves soil health status. The economic benefits include that increases water use efficiency, improves water holding capacity and profitable (Mohammad Abdul Kader, Singha, Begum, Jewel, & Khan, 2019). The application of organic mulches reduce evaporation especially in summer period as they retain the humidity of soil being accumulated during the spring rains that help to hydrate the plant, different production byproducts like rice straw increases water retention and prevents soil evaporation (Id et al., 2019) The previous research showed that mulching reduces quick infiltration of runoff, the presence of crop residue mulch at the soil-atmosphere interface has a direct influence on infiltration of rainwater and evaporation (Bhardwaj, 2013) and (Kwambe, Masarirambi, Wahome, & Oseni, 2015). This study was carried out to study about the effects of rice straw, beans straw and cut grass as mulches, on soil physical and chemical properties of soil in comparison with un-mulched land.

## **II. MATERIALS AND METHODS**

The study was carried out at Nyagatare dry valley near the town of Nyagatare district located in Eastern province, close to Rwanda's International borders with both Uganda and Tanzania. Its location lies about 168.7 kilometers by road North-East of Kigali the Rwanda's capital and largest city. The coordinates of the town are: 1° 18' 0.00"S, 30° 19' 30.00"E (Latitude:-1.3000; Longitude: 30.3250). The Nyagatare Soils are fersiallitic oxisol loams, pH of 5.8-6.5 with 30% clay, 3.2% organic matter; it experiences small quantity of rains around 827mm and hot temperatures (RAB, 2016). The temperature varies between 15°C to 30 °C depending on the location (REMA, 2011).

The study was set up as a Randomized complete Block design (RCBD), four (4) Treatments each with three (3) replicates were established for the study; Rice straw, beans straw, cut grass and un-mulched bare soil. Beans (*Phaseolus vulgaris*) were used as experimental crop during this experiment.

### **Soil sampling, data collection and analysis**

For each treatment, three random soil samples at depths 0–10, 10–20, and 20–30 cm were collected. Each sample were then placed in bags and transported to the laboratory. The soil sample was passed through a sieve of 2 mm and stored in a plastic bottle. The sample was then passed through a 2-mm sieve to remove all wastes, also a portion of approximately 20 grams of soil of 2 mm were passed through a sieve of 0.5 mm and also being stored in a plastic bottle. Both Fractions of soil were used for the various analyses according to their procedures. The soil samples for dry matter purposes were taken from the field using weighed cylindrical cores. The soil samples were oven-dried at 105°C for 8 hours and were used to analyze the physical and chemical properties of soil. The soil moisture was evaluated by taking the ration between the difference in weight before and after oven drying and the weight of the sample soil then percent. The bulk density of the sampled soil was measured by the ratio of oven dried soil excluding the mass of cores and the volume of core cylinders. The porosity was calculated by measuring the total water volume filled in the soil pores. To determine the organic matter and carbon, an approximate 0.5 grams of crashed and dried samples were weighed and put in a dry and weighed crucible where it was incinerated for 3 hours in a furnace at 550° C until obtaining ashes through a technique of loss Ignition method. The soil pH was determined using a pH meter by H-Selective electrode at a soil to water ratio of 2:5.

To attain the accurate information for this research study, some primary data by experiment and secondary (quantitative) data were collected and analyzed. Different literatures were collected by reviewing books, journals, etc. Based on how they are related and relevant to the topic of study. All the data analysis were done using SPSS software package (version 20.0) (IBM Corporation, Armonk, New York) and the data were subjected to Two-way of variance (ANOVA) with the least significant difference test at  $P < 0.05$ .

## **III. RESULTS AND DISCUSSIONS**

### **Physical properties**

There is a great significance difference between mulched and control treatments and of the top depth (0-20 cm) but it shows no change at the depth (20-30) compared to un-mulched bare soil.

Table 1: Soil physical properties at along treatments in Nyagatare dry valley treated with Rice straw, beans straw, cut grass and control.

Treatments	Stats	M.C (%)	Porosity (%)	B.D (gm/cm <sup>3</sup> )
T1 (Rice Straw)	Mean	32.233	49.933	1.755
	P50	32.440	50.500	1.378
	SD	5.447	2.839	0.674
	Min	25.010	45.100	1.219
	Max	39.250	54.000	2.650
	CV	0.169	0.057	0.384
	N	9	9	9
T2 (Beans straw)	Mean	29.580	48.667	1.804
	P50	28.940	49.800	1.458
	SD	2.994	3.258	0.639
	Min	25.700	41.600	1.283
	Max	34.100	51.600	2.650
	CV	0.101	0.067	0.354
	N	9	9	9
T3 (Cut grass)	Mean	31.500	51.167	1.749
	P50	31.330	50.900	1.333
	SD	3.649	1.378	0.677
	Min	26.570	49.600	1.224
	Max	36.600	53.800	2.650
	CV	0.116	0.027	0.387
	N	9	9	9
T0 (Bare soil)	Mean	31.473	47.000	1.834
	P50	30.520	47.100	1.442
	SD	4.240	2.204	0.614
	Min	26.300	42.700	1.336
	Max	37.600	49.600	2.650
	CV	0.135	0.047	0.334
	N	9	9	9
Total average of the experimental sites	Mean	31.197	49.192	1.786
	P50	30.930	49.700	1.418
	SD	4.120	2.875	0.624
	Min	25.010	41.600	1.219
	Max	39.250	54.000	2.650
	CV	0.132	0.058	0.349
	N	36	36	36

### Soil moisture contents, S.M.C (%)

Mulching has significantly affected the soil moisture content where the maximum moisture was observed to be 39.25% in a treatment mulched with rice straw and it is 1.3 times for rice straw, 1.25 times for beans straw and 1.24 times for cut grass than control in the top soil of the depth between (0-10) cm, the experiment shows no great significance in the lower depth (10-30) cm compared to mulched and un-mulched treatments. Mulching increased 11.05% of soil moisture compared to the initial soil moisture

status of 28.2%, some research shows that mulching has significant benefits on crops including an increase in soil moisture (4.70-12.50%). Thus similar findings were found by (Bhardwaj, 2013) who concluded that mulching can be effective change in increasing horticultural crop production in water scarcity regions.

Table 2: Analysis of Variance of moisture content records.

Physical property	Source	Partial SS	DF	MS	F	P>F
Moisture content	Model	574.5576	11	52.2325	64.22	0.000
	Treatments	34.7116	3	11.5705	14.23	<b>0.000<sup>a</sup></b>
	Depth	309.1451	2	154.5725	190.05	<b>0.000<sup>b</sup></b>
	Treatments X Depth	230.701	6	38.4502	47.27	<b>0.000<sup>c</sup></b>
	Residual	19.52	24	0.8133		
	Total	594.0776	35	16.9736		
Number of Obs	=	36		R <sup>2</sup>	=	<b>0.9671</b>
Root MSE	=	0.902		Adj R <sup>2</sup>	=	0.9521

*a, b, c correspond to statistical significance difference at 5% level of significance*

**Soil Bulk density, BD (gr/cm3) and Porosity (%)**

Both BD and porosity are good indicators for soil permeability and suitability for root growth refers to soil-plant-atmosphere system. The use of high density straws as mulches created the compactness at the upper depths (10-20) cm of the soil. The impact of mulching on bulk density may depend on soil properties, climate and type of mulch, whereas mulching had no effect on the bulk density(Ni, Song, Zhang, Yang, & Wang, 2016). The results showed that porosity and bulk density varied along the depths, therefore porosity and bulk density of the soil at lower depths is improved(Id et al., 2019). Due to rain water, mulches (Rice straw, beans straw, and cut grass) released organic matter which created the conditions favorable to microorganisms; these enhanced the improvement in porosity at lower depths. Much scientific researchers have shown that the use of surface mulch combined with minimum tillage showed significance increase in porosity (Science, 2019).

Table 3: Analysis of Variance of soil Bulk Density and porosity records

Physical property	Source	Partial SS	DF	MS	F	P>F
Porosity	Model	210.9275	11	19.1752	5.88	0.0001
	Treatments	85.7675	3	28.5892	8.76	<b>0.0004<sup>a</sup></b>
	Depth	4.655	2	2.3275	0.71	0.5001
	Treatments X Depth	120.505	6	20.0842	6.16	<b>0.0005<sup>c</sup></b>
	Residual	78.3	24	3.2625		
	Total	289.2275	35	8.2636		
Number of Obs	=	36		R <sup>2</sup>	=	<b>0.7293</b>
Root MSE	=	1.806		Adj R <sup>2</sup>	=	0.6052
Bulk Density	Model	0.104946	11	0.0095	0.02	1.0000
	Treatments	0.045198	3	0.0151	0.03	0.9939
	Depth	0.003046	2	0.0015	0.00	0.9973
	Treatments X Depth	0.056702	6	0.0095	0.02	1.0000
	Residual	13.51828	24	0.5633		
	Total	13.62323	35	0.3892		
	Number of Obs	=	36		R <sup>2</sup>	=
Root MSE	=	0.751		Adj R <sup>2</sup>	=	-0.4471

*a, b, c correspond to statistical significance difference at 5% level of significance*

**Soil chemical Properties**

The chemical properties of the soil during experiments after mulching have been represented in figure below:

Table 4. Soil chemical properties at along treatments in Nyagatare treated with various mulches and control

Treatments	Stats	pH of soil	E.C of soil	O.M of soil	O.C of soil
T1 (Rice Straw)	Mean	6.660	178.667	15.000	8.700
	P50	6.570	202.000	10.000	5.900
	Variance	0.315	1401.310	57.250	19.403
	SD	0.561	37.434	7.566	4.405
	Min	6.000	127.000	10.000	5.400
	Max	7.600	207.200	27.000	15.500
	CV	0.084	0.210	0.504	0.506
	N	9	9	9	9
T2 (Beans straw)	Mean	6.567	258.333	11.667	6.767
	P50	6.400	298.000	10.000	5.900
	Variance	0.190	5474.250	7.050	2.140
	SD	0.436	73.988	2.655	1.463
	Min	6.100	158.000	9.400	5.600
	Max	7.300	326.000	16.800	9.000
	CV	0.066	0.286	0.228	0.216
	N	9	9	9	9
T3 (Cut grass)	Mean	6.670	289.000	11.667	8.867
	P50	6.700	304.000	10.200	5.900
	Variance	0.162	2857.250	6.668	21.180
	SD	0.402	53.453	2.582	4.602
	Min	6.200	223.000	9.300	5.600
	Max	7.200	374.000	16.000	15.200
	CV	0.060	0.185	0.221	0.519
	N	9	9	9	9
T0 (Bare soil)	Mean	6.533	232.333	13.333	7.733
	P50	6.200	233.000	10.000	5.800
	Variance	0.285	2582.000	25.433	8.645
	SD	0.534	50.813	5.043	2.940
	Min	6.000	168.000	9.200	5.700
	Max	7.400	295.000	21.000	12.700
	CV	0.082	0.219	0.378	0.380
	N	9	9	9	9
Total of the site	Mean	6.608	239.583	12.917	8.017
	P50	6.500	227.500	10.000	5.900
	Variance	0.221	4500.892	23.999	12.469
	SD	0.470	67.089	4.899	3.531
	Min	6.000	127.000	9.200	5.400
	Max	7.600	374.000	27.000	15.500
	CV	0.071	0.280	0.379	0.440
	N	36	36	36	36

### Soil pH

Mulching highly affected the PH of the soil, the pH of the soil treated with mulches was significantly affected than un-mulched or control soil. There was a great significance between the treatments treated with mulches and control, the pH is 1.2 times than that of control, much research reported that the application of straw mulch has shown a slight improvement in the pH rise(Khan et al., 2002). In facts, under organic farming pH is a result of two processes namely ammonification and nitrification, by applying mulches it increases soil moisture contents which decreases soil air percentages so ammonification process increases which also increases soil reaction or pH, the PH in the top depth 0-10 cm was higher than in deep layer, the pH of soil at depths 0–10 and 10–20 cm were 7.8% and 6.6% higher than that of CK. Hence these findings agree with the research conducted by (Id et al., 2019)

Table 5. Analysis of Variance of Soil acidity (pH) records

Chemical property	Source	Partial SS	DF	MS	F	P>F
Soil pH	Model	6.665475	11	0.6060	13.61	0.0000
	Treatments	0.124475	3	0.0415	0.93	0.4406
	Depth	2.40855	2	1.2043	27.04	<b>0.0000<sup>b</sup></b>
	Treatments X Depth	4.13245	6	0.6887	15.47	<b>0.0000<sup>c</sup></b>
	Residual	1.0688	24	0.0445		
	Total	7.734275	35	0.2210		
Number of Observation		36		R <sup>2</sup>		<b>0.8618</b>
Root MSE		0.211		Adj R <sup>2</sup>		0.7985

a, b, c correspond to statistical significance difference at 5% level of significance

### Soil electric conductivity (mS/m)

The highest electric conductivity in plots treated with rice straw was 374 milliSiemens per meter. The present research has shown that rice straw mulches improved the soil electric conductivity, the same findings were reported that the application of straw improved soil electric conductivity(Khan et al., 2002) the electric conductivity of soil surface layer was lower than subsurface in mulched treatments. In contrast, the electric conductivity in soil treated with beans straw and cut grass were reduced than of control. According to Pakdel et al. (2013) reported that mulches can reduce the soil electric conductivity in two ways 1. Mulching reduce soil water evaporation which also might reduce the accumulation in the soils. 2. Water soluble salts might be absorbed by mulch layer and water reaches soil layer with reduced EC, the fact that the straw mulches increased the soil electric conductivity were due to decomposing of applied organic mulch to suitable nutrients, released to the soil lead to increased accumulation of soluble salts in soil surface so the soil electric conductivity increased. These results are similar to(Sadek, Youssef, Solieman, Abdul, & Alyafei, 2019)

Table 6. Analysis of Variance (ANOVA) of electric conductivity (EC) records.

Chemical property	Source	Partial SS	DF	MS	F	P>F
EC (Soil Salinity)	Model	154556.8	11	14050.6136	113.37	0.0000
	Treatments	59012.75	3	19670.9167	158.72	<b>0.0000<sup>a</sup></b>
	Depth	5946.5	2	2973.2500	23.99	<b>0.0000<sup>b</sup></b>
	Treatments X Depth	89597.5	6	14932.9167	120.49	<b>0.0000<sup>c</sup></b>
	Residual	2974.48	24	123.9367		
	Total	157531.2	35	4500.8923		
Number of Obs	=	36		R <sup>2</sup>	=	<b>0.9811</b>
Root MSE	=	11.133		Adj R <sup>2</sup>	=	0.9725

a, b, c correspond to statistical significance difference at 5% level of significance

**Soil organic matter and carbon (%)**

The organic matter in plots treated by mulches was higher at the depths 0-10 and 10-20 cm than deeper layer. The organic matter in plots treated with mulches was highly significant than in control, the earlier studies have shown that mulches increase organic matter (Id et al., 2019), the research has shown that the application of straw mulch improved organic matter (Khan et al., 2002), Similar results were observed in the present study. The addition of organic mulches has increased the accumulation of organic carbon in the soil, an increased soil organic carbon was obtained in plots treated with beans straw and cut grass due quick decomposition, soil organic carbon in plots mulched with rice straw was higher than in un-mulched plots. The results from other studies confirmed that the application of organic mulches positively influences the amount of soil Organic carbon (Bajorien, Jodaugien, Pupalien, & Sinkevi, 2013)

Table 7: Analysis of Variance of soil organic Matter (SOM) and organic carbon (SOC) records.

Chemical property	Source	Partial SS	DF	MS	F	P>F
SOM	Model	818.75	11	74.4318	84.26	0.0000
	Treatments	68.75	3	22.9167	25.94	<b>0.0000<sup>a</sup></b>
	Depth	387.5	2	193.7500	219.34	<b>0.0000<sup>b</sup></b>
	Treatments X Depth	362.5	6	60.4167	68.4	<b>0.0000<sup>c</sup></b>
	Residual	21.2	24	0.8833		
	Total	839.95	35	23.9986		
Number of Obs	=	36		R <sup>2</sup>	=	<b>0.9748</b>
Root MSE	=	0.940		Adj R <sup>2</sup>	=	0.9632
SOC	Model	430.25	11	39.1136	151.9	0.0000
	Treatments	25.49	3	8.4967	33	0.0000a
	Depth	250.685	2	125.3425	486.77	0.0000b
	Treatments X Depth	154.075	6	25.6792	99.72	0.0000c
	Residual	6.18	24	0.2575		
	Total	436.43	35	12.4694		
Number of Obs	=	36		R <sup>2</sup>	=	<b>0.9858</b>
Root MSE	=	0.507		Adj R <sup>2</sup>	=	0.9793

a, b, c correspond to statistical significance difference at 5% level of significance

**IV. CONCLUSIONS AND RECOMMENDATIONS**

Our findings suggests that organic mulches of straw of rice, beans, and cut grass exhibited positive effect by improving porosity, bulk density, moisture, pH, Electrical conductivity (EC), organic carbon and organic matter as soil physico-chemical properties comparatively to control (bare soil) in our study area. Mulching had no significant difference on bulk density. However soil organic matter and moisture content increased along the depths. Considering the effect of mulching on soil properties, straw mulches like rice and cut grass created a healthy environment than that of beans straw and can be recommended to be used by farmers in Eastern region of Rwanda.

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**CONFLICT OF INTEREST**

The author of this article declare that there is no conflict of interest related to this publication manuscript

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# *The Carbon Footprint Of Smallholder Dairy Farming In Sub-Saharan Africa: A Review*

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**Abstract** – Agriculture sector is one of major sources of income and livelihood to many populations of Sub-Saharan Africa (SSA). Over the past years animal production has been playing a vital role not only in generating revenues to farmers but also as a source of high qualitative proteins and essential micronutrients (i.e iron, zinc and vitamins) and boosting the agricultural productivity due to its importance in farmyards organic fertilization (i.e manure). Livestock production and Milk market in SSA are dominated by smallholder dairy farming (SDF) which employ nearly 70% of all livestock farmers. Despite its positive impact on people and SSA countries' economy, SDF has been the major fastest growing agricultural contributors of GHG emissions such as CH<sub>4</sub>, N<sub>2</sub>O and CO<sub>2</sub> (i.e 9t CO<sub>2</sub>e per tonne of milk; the highest in the world compared to other regions) thus accelerating global warming effect.

Although several articles have investigated the impacts of livestock production on climate change, to the best of our knowledge the existing literature doesn't contain any studies that provide insight review of smallholder dairy farming's carbon footprint (CF) in SSA. This review paper is therefore aimed at critical analysis of current knowledge in terms of CF of smallholder dairy farming in SSA and effective mitigation strategies (dietary, manure and animal management) recently proposed to reduce CH<sub>4</sub> and N<sub>2</sub>O emissions from ruminants. SSA was selected because of rapid rise of SDF in the region therefore it is expected to rapidly increase its GHG emissions in future if no sustainable measures are taken.

The critical analysis, what is known and gaps in SDF from this review will help to inform the farmers, researchers, decision and policy makers interested in GHG emissions thus to provide the next direction in research and improvement of the sector for sustainability. Capacity building for raising awareness among farmers was identified as paramount to better understand the issue and the options to mitigate emissions on-farm. As longer as adaptation and mitigation strategies become paramount on national and regional agenda, SDF will make significant contribution to economies, improved livelihood and become sustainable livestock production systems in SSA at large.

**Keywords** – Smallholder farming, Sub-Saharan Africa, Carbon footprint, Greenhouse Gases, GHG, Global warming, Climate change, Enteric fermentation.

## INTRODUCTION

The global population has been increasing dramatically over the last decades and it is projected to reach 8.5 billion by 2030 and accelerates further to 9.7 billion by 2050 [1]. Africa alone is expected to have more than half of global population growth in 2050. Recent statistics show that Sub-Saharan Africa (SSA) region (**Fig. 4**) accounts around 1.1 billion people (13.8% of global population) [2] and it is expected to double by 2050 [3]. This population growth is expected to increase with urbanization, food demand and diet changes in developing countries of Africa [4], [5]. With various eating habits there will be a tremendous demand for agricultural production in general and livestock products (e.g. beef and dairy products) (**Fig. 2**) specifically [6], [7]. Nowadays the globe's millions of poorest people mainly depend on smallholder farming systems to survive [8]. Being the major economic activity that most of the growing SSA's population rely on for living [9], [10],[11] much pressure is expected to be put on agriculture

hence impacting natural resource such as land and water resources for crop production and livestock farming. Globally agriculture, forestry and other land use activities are responsible of 24% of anthropogenic greenhouse gases (GHGs) emissions (Fig. 7). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are gases found in atmosphere originating naturally on one hand and from anthropogenic activities on the other hand. These gases absorb and re-emit radiation as heat causing the rise in global average temperatures.

SSA's agricultural sector is the biggest contributor of GHGs emissions accounting 27% of the total continental emissions [12]. Deforestation for expanding cropland and pasture, emissions from agricultural soils, nutrients and livestock management (e.g. manure and digestive processes) have been mentioned by many (Table 7, Fig. 3 and Fig. 8) as major GHGs sources [12], [13].

Over the past years smallholder farming has provided livelihoods to many people in SSA (Table 4), and it will continue to play its significant role in boosting their future income [14]. In SSA, 80% of agricultural production comes from smallholder farming and employs around 175 million people [10], [15]. Although small farms provides employment to many people and produce agricultural crops and livestock, at the same time they are characterized by high emissions of GHGs emission [8], [16]. The SSA's smallholder dairy farming has been attracting various farmers and different governments and international agencies which keep on supporting this sector for eradicating malnutrition and poverty [17].

Currently smallholder dairy farmers provide more than 80% of SSA milk production. Due to rapid growth of African population milk and meat products are projected to double over the coming 20 years in Africa [18]. However livestock in general and dairy farming in particularly has significantly contributed to global warming through the emission of three major GHGs which are: Methane gas (CH<sub>4</sub>), Nitrous oxide (N<sub>2</sub>O) and Carbon dioxide (CO<sub>2</sub>) [19]. These gases are also known as the carbon footprint<sup>1</sup> (CF) of dairy products [20]. However in this manuscript, sources of CO<sub>2</sub> from smallholder dairy farming (SDF) were not discussed due to the fact that emissions from CO<sub>2</sub> are in association of cycles of carbon fixation and oxidation through photosynthesis [21] and its Direct global warming potential (GWP) is less harmful compared to CH<sub>4</sub> and N<sub>2</sub>O as shown in Table 1 below.

Table 1: Idea on agricultural GHG emissions

Sources	Gases		
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Atmosphere lifetime (year)	120	14.5	120
Direct global warming potential (GWP)	1	24.5	320
Preindustrial concentration	280ppmv	0.8ppmv	288ppmv
Current annual increase (%)	0.5	0.9	0.25
Major agricultural source	Deforestation	Ruminants Wetland rice Biomass burning	Synthetic N fertilizers Animal excreta Biological N fixation

Source: [22] ppmv: parts per million volume

According to FAO and GDP (2018) GHG emissions from dairy sector have dramatically risen by 18% between 2005 and 2015 due to the increased consumption demand globally. During this period 4% of all global anthropogenic GHG emissions have been contributed by dairy sector. In 2015 the dairy sector in developing regions such as SSA, South Asia, West Asia and North Africa were found to have higher emission ranging between 4.1 to 6.7 kg CO<sub>2</sub>e/kg fat-and-protein corrected milk (FPCM).

In terms of research a lot of work has been done to better understand GHGs emissions from agricultural sector and smallholder dairy farms in SSA [12], [24], assessing and managing smallholder ruminants and dairy systems for food security in SSA [17], [25], Climate change impacts, adaptation and mitigation in smallholder agricultural systems in SSA [10], [16], [26]. Furthermore Wilkes et al, (2020) [27] conducted a study for analysing carbon footprint of milk production on smallholder dairy farms in central Kenya. The results showed that CF was ranging between 2.2 and 3.13 kg CO<sub>2</sub>e/kg fat and protein corrected milk (FPCM).

<sup>1</sup> Carbon footprint (CF) is defined as the total GHGs emissions that come from production, consumption/use and end of life of a product expressed in carbon dioxide equivalents (CO<sub>2</sub>-eq) [20]

From the above background, there is a need of reviewing “what is already known” (current knowledge) and ‘what is not known’ (knowledge gap) in SDF of SSA so that the next research direction can be enhanced and avoid repetitions on what has been previously done in this sub-sector. Hence, this article is aimed at:

- (i) Reviewing the importance of smallholder dairy farming in SSA based on previous studies,
- (ii) Analysing the contribution of SSA's smallholder dairy farming to GHGs emissions and impacts on global warming/climate change
- (iii) Investigating the SSA' smallholder farmers’ knowledge of the issues raised in (ii)
- (iv) Proposing strategies that smallholder dairy farmers can adopt to reduce emissions of GHGs

This paper will help to understand the role of SDF in climate change and proposed strategies will facilitate the reduction of livestock related carbon footprint thus improving and promoting a more sustainable SDF (green farming) in dairy sector of SSA.

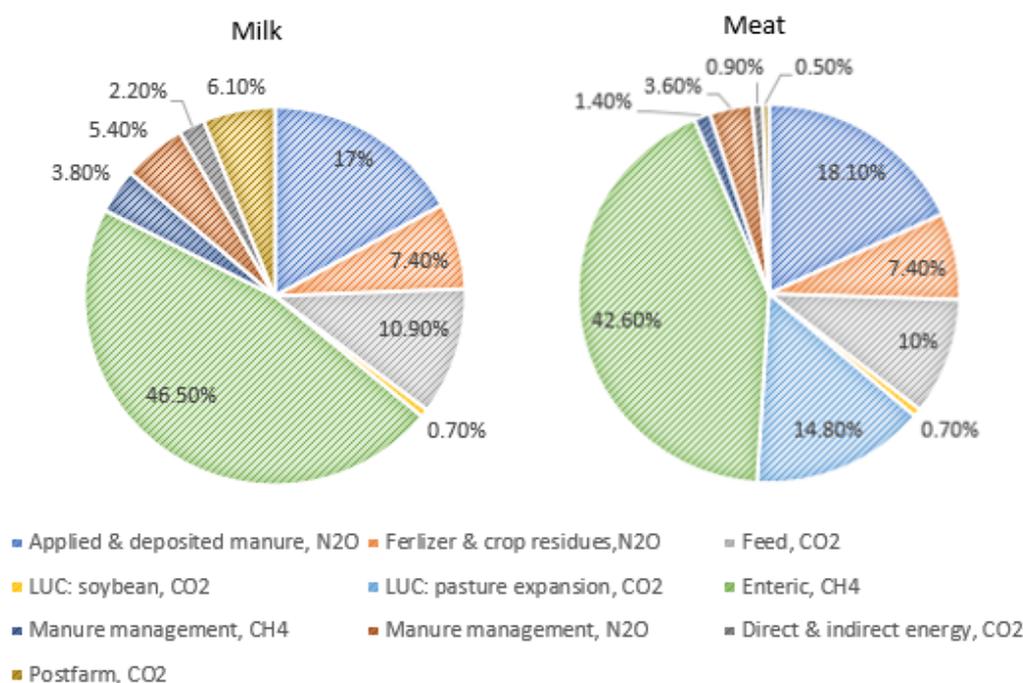


Fig. 1: Global GHG emissions from cattle milk and beef supply chains (by emissions category)

Source: GLEAM (Global Livestock Environmental Assessment Model)

Table 2: Number of dairy cows, milk production and milk yield per cow and increase in % for different regions (between 1961 and 2009)

Year	Number of dairy cows (million)			Milk production (million tonnes)			Milk yield (tonnes per cow)		
	1961	2009	Increase	1961	2009	Increase	1961	2009	Increase
Africa	17	60	255%	8	29	270%	0.5	0.5	4%
Asia	34	94	173%	21	151	613%	0.6	1.6	161%
Europe	83	40	-52%	190	208	10%	2.3	5.2	130%
North America	20	10	-50%	65	94	44%	3.2	9.2	186%

Oceania	5	6	24%	12	25	116%	2.3	3.9	74%
Latin America	17	42	145%	18	77	322%	1.1	1.8	72%
<b>World</b>	<b>177</b>	<b>253</b>	<b>42%</b>	<b>314</b>	<b>583</b>	<b>86%</b>	<b>1.8</b>	<b>2.3</b>	<b>31%</b>

Source: [28]

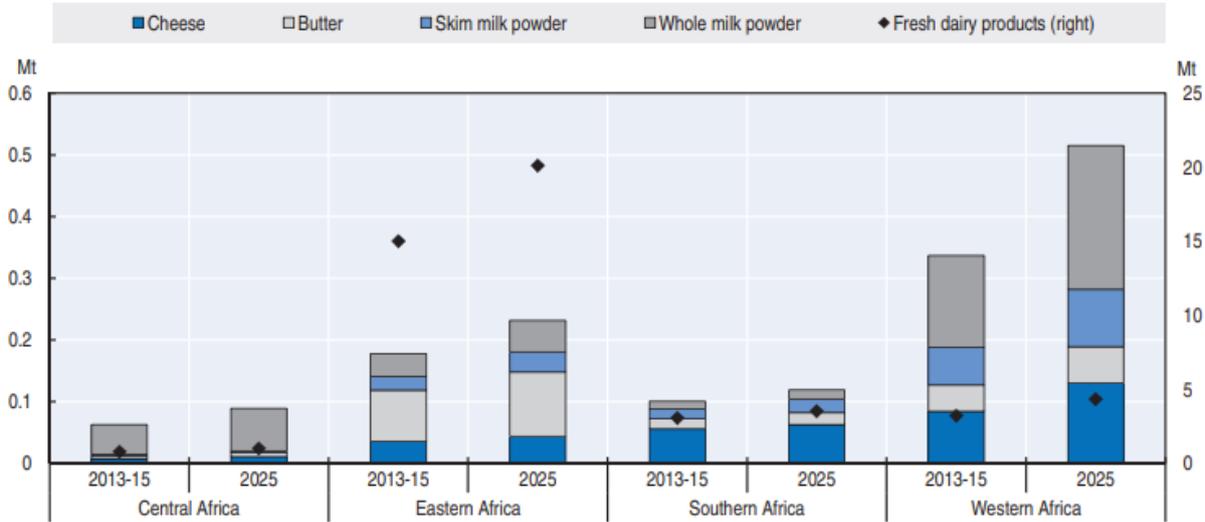


Fig. 2: Consumption trends of dairy products in SSA

Source: [29]

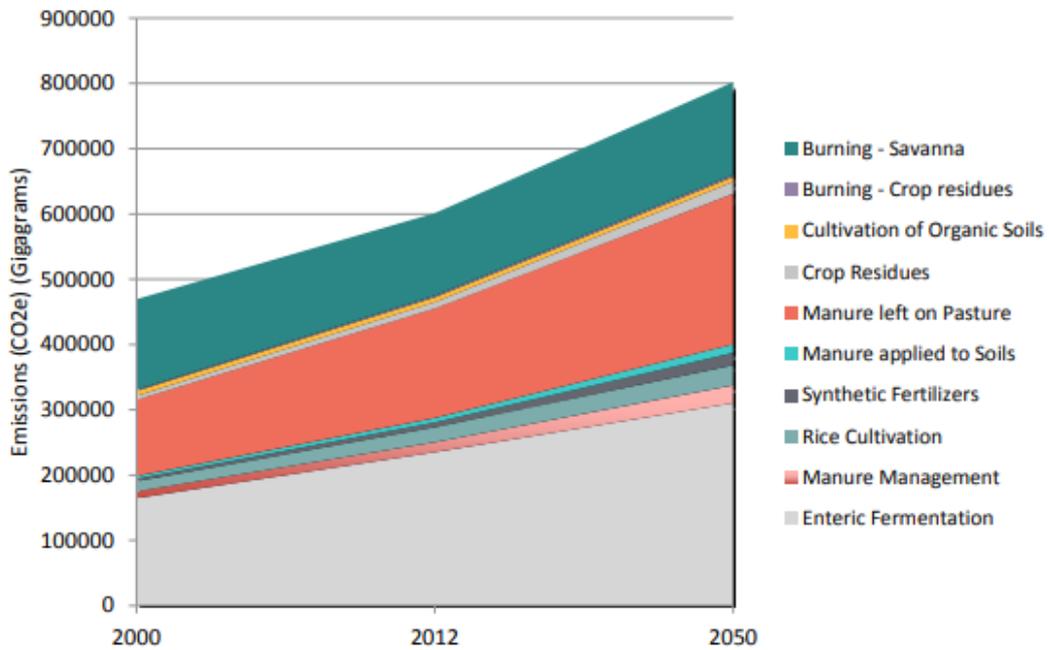


Fig. 3: Projected emissions from SSA's agricultural sector (excl. RSA), 2000-2050

Source: [30]

I. IMPORTANCE OF SMALLHOLDER DAIRY FARMING IN SUB-SAHARAN AFRICA

Globally, livestock production has increased tremendously over the past decades (Table 2) mainly for animal protein food [31]. In animal production sector dairy farming plays a significant role globally as a way of achieving food security, improving farmer incomes and impacting economic growth [32]. Generally, there is no standard or universal definition of smallholder dairy farming. Many authors/researchers have provided various definitions regarding Smallholder dairy farming. Gizaw et al. (2016) [33] defined it as production, on-farm processing and marketing of milk and milk products. On the other hand Mbilu (2015) [34] defined smallholder dairy farming to be the one which has 1-10 dairy cows with a purpose of income generation through commercial milk production.

The dominating terms in provided definitions by various authors are : small herds (2-3 milking cows) with the majority located in developing countries; usually on small plots [33], [35]. Smallholder farming systems contribute around 80% of all African continent milk production [18]. In these systems producers rear less than 10 head of cattle with land sizes varying from 0.2 to 4 hectares [8], [30], [36]. Taking one example of Eastern African country (e.g. Rwanda) smallholder crop-livestock mixed farming system dominates livestock production with average land holding of 0.76 ha for the majority of farmers with Smallholder farmers keep one to three cows [37]. Other examples are Kenya, Mozambique, Malawi and Zimbabwe where the average size of smallholder farms ranges between 0.8 and 4.65 hectares [38]–[41].



Fig. 4: Regions of Sub-Saharan Africa and corresponding countries

Source: <https://www.quotemaster.org/Sub-Saharan+Africa>

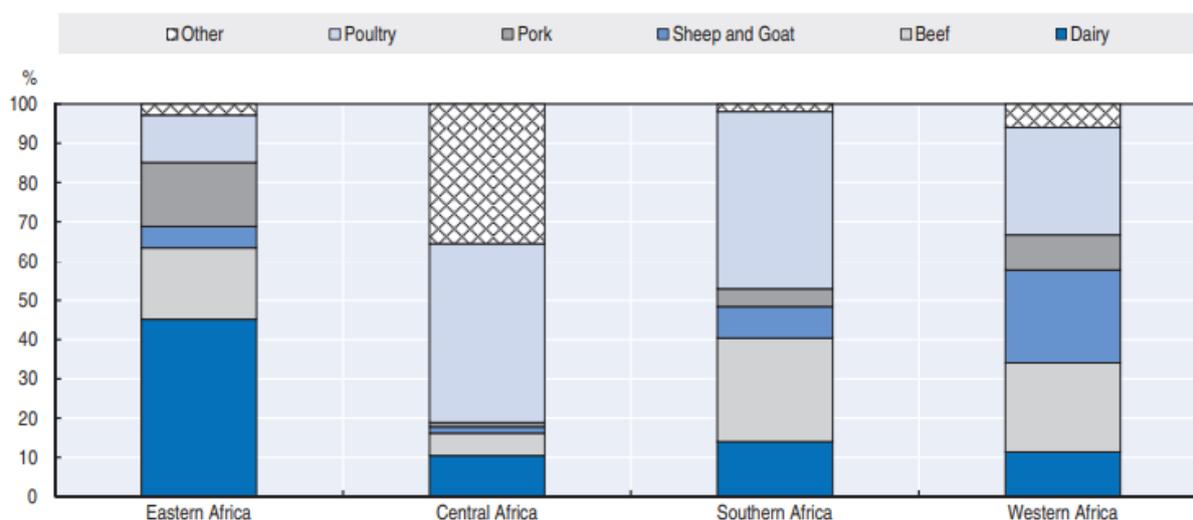


Fig. 5: Livestock mix across the Sub-Saharan African region

(Based on average value of production 2011-13)

Source: [42] FAO, <http://faostat3.fao.org/>

Table 3: Dairy production in Eastern Africa in 2011

Country	Milk (million t)	Milk (% growth rate between 200-2011)	Butter (1000 t)	Cheese (1000 t)
Ethiopia	4.4	14.2	17.6	5.8
Kenya	4.3	5.5	14.7	0.3
Rwanda	0.2	5.3	0.7	n/a
Tanzania	1.8	7.8	31.5	13.0
Uganda	1.2	8.0	n/a	n/a

Source: [43]

### 1.1 Nutrition, source of income and employment opportunity

In SSA smallholder farming counts approximately 80% of all agricultural farming and employs more than 175 million people directly [10], [29], [44] and a source of livelihoods for women in particular [45]. In this region, milk production is among top important agricultural sub sectors which contributes to food security and provides regular income which reduces poverty hence improving farmers’ living standards [29]. Cow milk production is predominant specifically in Eastern Africa (**Table 2**), followed by goat milk, sheep milk and camel milk. Being the leading first milk-producing region in Africa, Eastern African milk production represents 68% of the continent’s milk output. The dairy sector is one of the fastest growing agricultural sub-sectors in Eastern African countries, which has generated significant economic returns and employment opportunities along dairy value chains [43]. Dairy farming which includes livestock rearing, forage, feeding, milk production, distribution and sale (**Fig. 6**) employs and generates income to millions of smallholder farmers in SSA[18]. Smallholder dairy products improve household nutritional status as a result of higher milk consumption [46], [47].

### 1.2 Impact on national economy growth

Agricultural sector contributes significantly to the GDP of most SSA’countries and taken as priority in their development agenda. Over the past decades smallholder dairy farming made important contribution to the increase of 37% in milk yield and is projected to rise at an annual average growth rate of 2.5% [29]. The livestock subsector accounts for about 5% of the total gross domestic product (GDP) in sub-Saharan Africa. **Table 4** below is an example of how this sector contributes:

Table 4: Contribution of the dairy sector to GDP and employment [43]

Country	% share of agricultural GDP	% share of GDP	Smallholder dairy farmers (millions)
Ethiopia	40	12-16	
Kenya	50	3	2
Rwanda	15	6	0.1
Tanzania	n/a	1.8	
Uganda	50	7-9	0.7



(a) Smallholder farmer feeding her milk cow, (b,c) Milk collection and transport and (d) Manure management for biogas production

Fig. 6: Some activities of Smallholder dairy production in SSA (e.g Rwanda)

II. SMALLHOLDER DAIRY FARMING GHGs EMISSIONS

Over the past decades anthropogenic activities have been increasing GHGs emissions in the atmosphere which caused global warming [48]. This phenomenon is actually happening and no longer a prediction [49]. It is estimated that human activities globally increased temperature between 0.8 °C and 1.2°C above pre-industrial levels. If emissions continue at the current rate the global warming is expected to rise up to 1.5 °C between 2030 and 2052 [50].

In fact when the sunlight reaches the earth's surface and oceans a portion of that light (around 30%) is sent back into the space and the remaining portion is absorbed by land, water bodies (e.g oceans, lakes, etc) and air [51]. As the atmosphere is made of various gases including water vapours, ozone (O<sub>3</sub>), methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>) and other gases they make a kind of blanket which retain part of reflected radiations from the earth [19], [26]. These gases are commonly known as greenhouse gases (GHGs) due to their capacity of trapping heat. Once reflected back into the atmosphere the heat is trapped by the above mentioned gases hence contributing to the increase of average surface temperature higher than it would be [52]. Anthropogenic activities such as burning of fossil fuels (coal, oil, and natural gas) and deforestation are major contributor (Table 1) of GHGs emissions in the atmosphere [49].

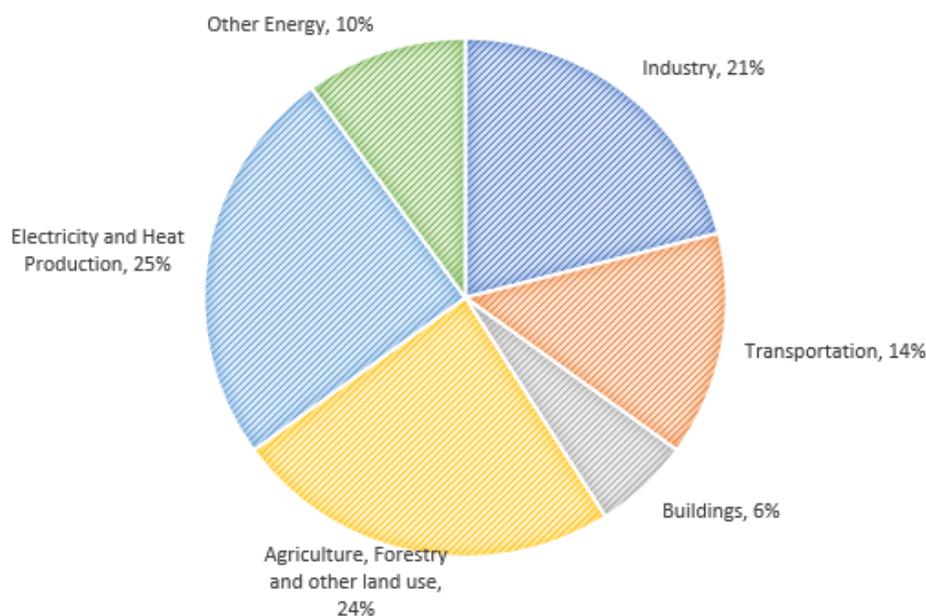


Fig. 7: Global GHGs emissions by economic sector

Source: [52]

Agricultural activities which employ 65-70% of Africa's workforce (mostly as smallholder famers) [30], [53], [54] have been put among the quickest growing GHGs emitters in the world as a result of increasing food demand due to rapid population growth [55]. A mean annual increase between 2.9% and 3.1% of GHGs emissions from agricultural sector was observed during the period 1994-2014 with enteric fermentation alone contributing more than half of the total GHGs emissions on the African continent; which points out the role of livestock (ruminants) in global warming [55] and climate change [19].

The CF of milk produced by smallholder farmers in African is high and projected to increase rapidly in the years to come [27]. Compared to other parts of the world, Africa emits highest GHGs per unit of milk and meat production. SSA alone emits 9tCO<sub>2</sub>e per tonne of milk; the highest in the world while North America and Europe emit only 1.9tCO<sub>2</sub>e and 1.6tCO<sub>2</sub>e per tonne of milk respectively. It is a result of inadequate livestock's feed and low productivity [56].

The annual increase in agricultural GHG emissions (dominated by enteric fermentation emissions from smallholder farmers) makes Africa to be a suspicious continent in the future climate change due to its growing emissions (Table 7) [21].

Table 5: Carbon footprint of smallholder dairy farming in some countries of Sub-Saharan African

Country	FPCM emissions (kg CO <sub>2</sub> e/kg)	% contribution of enteric fermentation	% contribution of feed production and transport	% contribution of manure management	Source/reference
Kenya	2.19-3.13	55.5	31.6	12.6	[27]
Ethiopia	2.07-4.71	80	-	-	[57]
Malawi		44% (CH <sub>4</sub> )	21% (CO <sub>2</sub> )	35% (N <sub>2</sub> O)	[24]
SSA	7.5				[7]

Table 6: SSA regional emission levels in GgCO<sub>2</sub>e

Region	CH <sub>4</sub>	N <sub>2</sub> O	Total agricultural emissions
West Africa	116,959	93,600	210,560
East Africa	204,275	172,238	376,512
Central Africa	51,418	55,937	107,355
Southern Africa	22,984	24,268	47,251
<b>Total</b>	<b>395,636</b>	<b>346,042</b>	<b>741,677</b>

Source: [58]

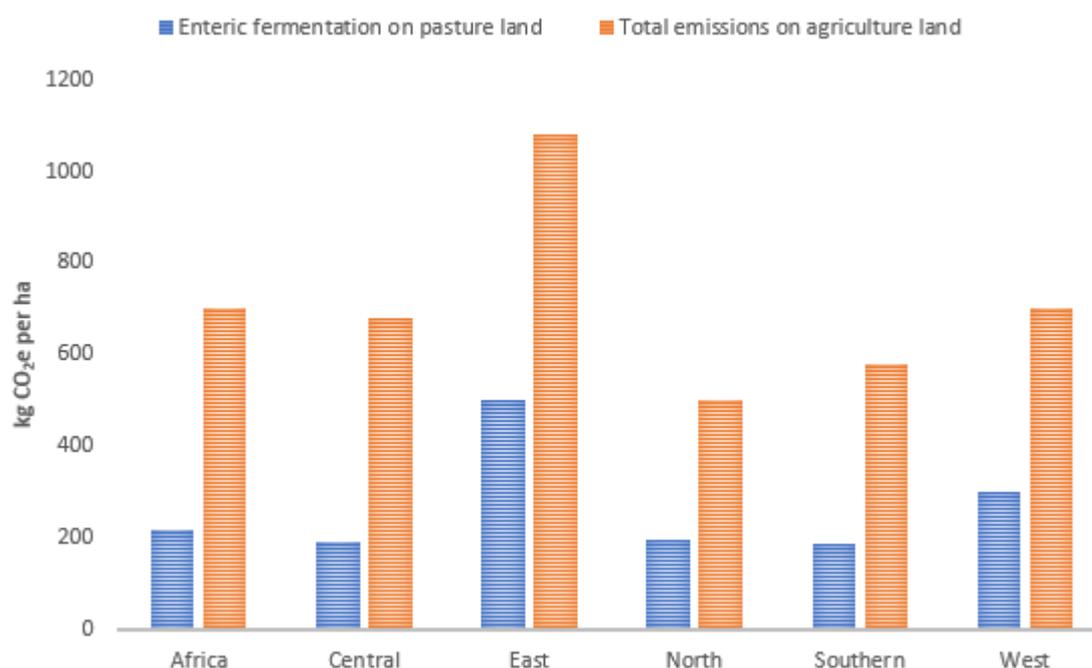


Fig. 8: GHG emission intensities per agricultural land and regions of Africa in 2010

Source: [55]

In 2013 global emissions from livestock sector were estimated at 7.1 gigatonnes CO<sub>2</sub>-eq per year. This value represents 14.5% of anthropogenic GHG emissions; explaining the role of the sector in global warming and climate change. Beef and cattle milk production contributed the majority with 41 and 20% of the sector’s emissions respectively [19], [59]. Due to rapid population growth the global demand of milk and dairy products is projected to sharply rise in the coming decades with increased emissions of GHG specifically in developing countries [60]. The growing of dairy production in many SSA countries is not only connected to rising consumer demand but also to many governments’ goals to reduce poverty, expand milk production for domestic self-sufficiency hence reducing dependency on imports, improve crop production by using manure, increase income and nutrition at the household level. As reported by Tadesse & Dereje (2018) [26] raw milk (also known as unpasteurized milk) at farm level in SSA is responsible of about 70-90% GHG emissions from smallholder dairy farming products.

In East Africa, despite its intended goals of reducing poverty through smallholder dairy cattle farming among others; Rwanda’s Girinka program (which is also known as one cow per poor family program) launched in 2006; is responsible of increasing national GHG emissions by 1174 kg CO<sub>2</sub>e hh<sup>-1</sup> yr<sup>-1</sup> [61], [62]. As the program goes on, it is reported that most of distributed cows in this program have given birth between 1 to 4 calves; an indicator of animal population increases which will have a future rapid rise of emitted GHGs too if current management practices are not improved.

Livestock systems in Africa (SSA particularly) emit higher rates per kg of animal product compared to other parts of the world [16]. Large emissions of enteric methane ( $\text{CH}_4$ ), carbon dioxide ( $\text{CO}_2$ ) and Nitrous oxide ( $\text{N}_2\text{O}$ ) in livestock are provided by smallholder farming systems due to the use of fodder of lower digestibility, poor management of manure, low milk yield and milking cows at ageing stage [20], [26], [63]. While the global mean is 46 and 2.8 kg  $\text{CO}_2$  equivalent per kg of dressed weight and fat- and protein-corrected milk (FPCM) respectively, It is estimated that African beef and dairy systems emit 70 and 9 kg  $\text{CO}_2$  equivalent per kg of dressed weight and FPCM respectively [63]. Livestock GHGs emissions can be direct or indirect. Direct emissions include enteric fermentation, urine excretion and microbial decomposition of manures. Indirect emissions describe those which are related to manure applications for crop production, fertilizers applications for growing fodder (forage), processing and transportation of refrigerated livestock products, deforestation and release of carbons from cultivated soils for expanding livestock farming (Fig. 9&14) [12], [19].

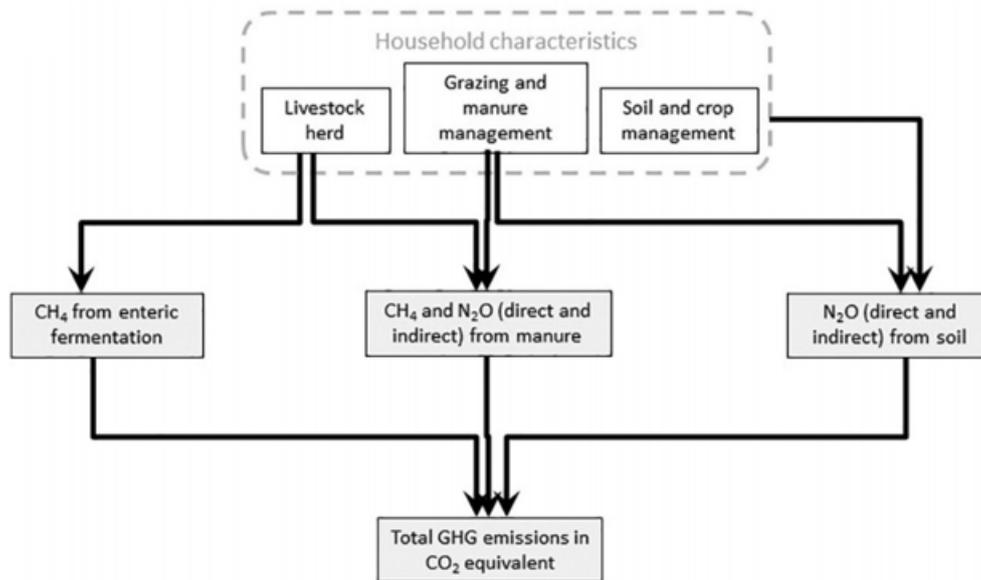


Fig. 9: Diagram indicating sources of GHG emissions ( $\text{CH}_4$  and  $\text{N}_2\text{O}$ ) from smallholder dairy farming and used approach to convert their totals into  $\text{CO}_2\text{e}$   
Source: [61]

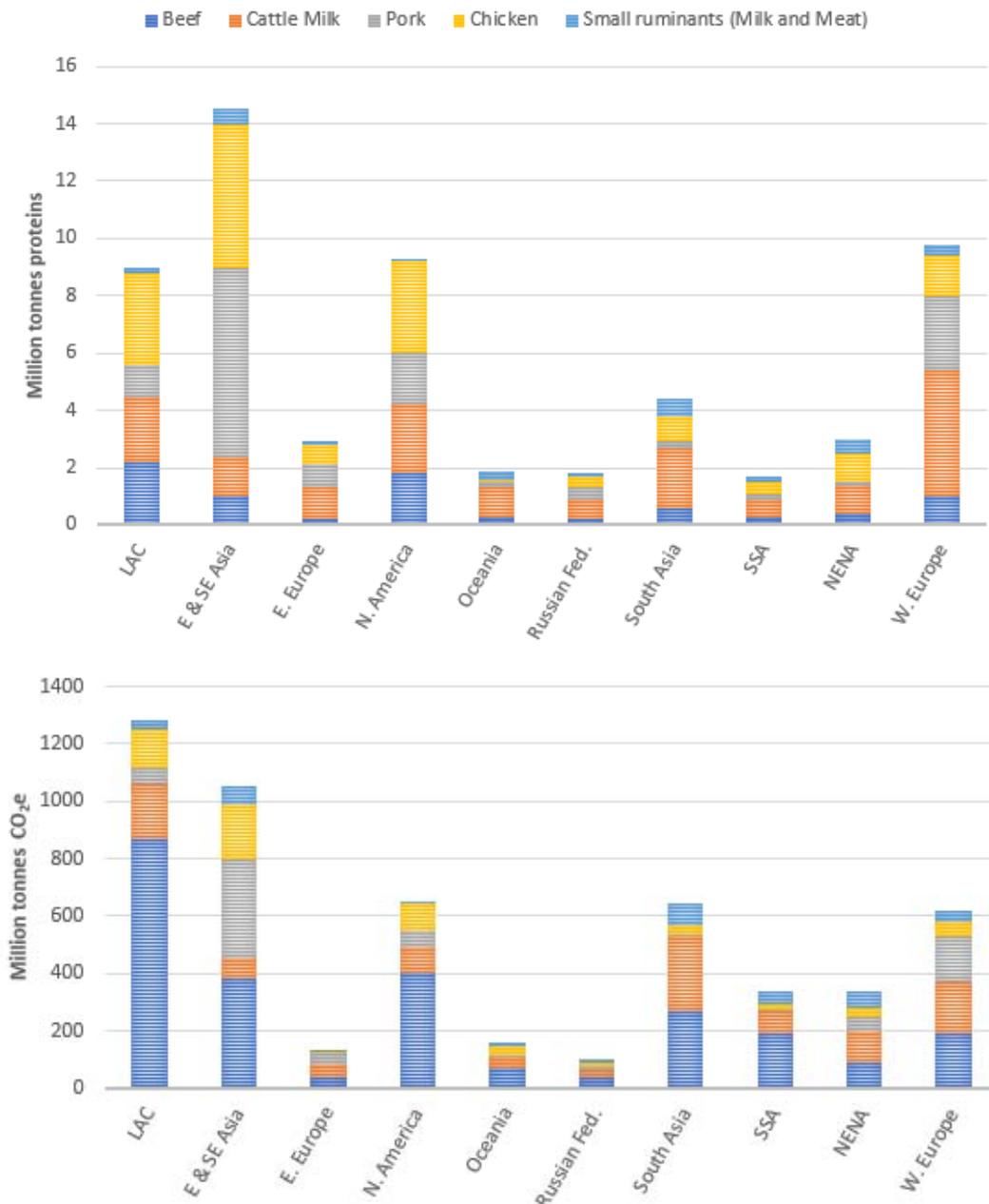


Fig. 10: Global livestock production and GHG emissions from livestock (by commodity and regions) adopted from [59]

Despite lower output in proteins and in other dairy nutrients, GHG emissions of livestock farming in SSA are on a rise [59]. CF of dairy farming which is estimated to 7.5 kg CO<sub>2</sub> eq per kg milk; is the highest by counting all emissions from livestock sector in SSA [20]. The CF of this sub-sector in SSA countries is projected to continue rising in the coming decades (Fig. 3) as a result of high number of smallholder dairy farmers which dominate this sub-sector characterized by poor farm management and inadequate livestock feeding [27], [32]. Smallholder dairy systems in SSA are generally characterized by mixed systems whose main output is milk for sale. Livestock production is integrated with the growing of subsistence crops (e.g maize, beans, potatoes, etc) [25].

Livestock GHG emissions in regions of SSA mainly come from three major sources: enteric fermentation from ruminants (CH<sub>4</sub>), manure management (N<sub>2</sub>O) and changes in land use (CO<sub>2</sub>) [26], [64]:

Table 7: GHG emissions in Gigatons (Gt) CO<sub>2</sub>eq sources in Sub-Sahara African regions

	1994		2000		2005		2010	
	CH <sub>4</sub>	N <sub>2</sub> O	CH <sub>4</sub>	N <sub>2</sub> O	CH <sub>4</sub>	N <sub>2</sub> O	CH <sub>4</sub>	N <sub>2</sub> O
<b>Total</b>	<b>0.360</b>		<b>0.417</b>		<b>0.469</b>		<b>0.541</b>	
<b>Sub-Saharan Africa</b>	<b>0.236</b>	<b>0.124</b>	<b>0.273</b>	<b>0.144</b>	<b>0.307</b>	<b>0.162</b>	<b>0.354</b>	<b>0.187</b>
Enteric fermentation	0.226		0.262		0.295		0.340	
Manure management	0.009	0.002	0.010	0.003	0.011	0.003	0.013	0.004
Direct soil		0.014		0.016		0.018		0.020
Pasture, range and paddock		0.099		0.114		0.129		0.149
Indirect soil		0.009		0.011		0.012		0.014
Burning agricultural waste	0.001	0.000	0.001	0.000	0.001		0.001	0.000
<b>Sub-Total</b>	<b>0.026</b>		<b>0.030</b>		<b>0.033</b>		<b>0.036</b>	
<b>Central Africa</b>	<b>0.017</b>	<b>0.009</b>	<b>0.020</b>	<b>0.010</b>	<b>0.022</b>	<b>0.011</b>	<b>0.023</b>	<b>0.013</b>
Enteric fermentation	0.016		0.019		0.021		0.022	
Manure management	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001
Direct soil		0.001		0.001		0.001		0.001
Pasture, range and paddock		0.007		0.008		0.009		0.010
Indirect soil		0.001		0.001		0.001		0.001
Burning agricultural waste		0.000		0.000		0.000		0.000
<b>Sub-Total</b>	<b>0.150</b>		<b>0.174</b>		<b>0.203</b>		<b>0.248</b>	
<b>East Africa</b>	<b>0.103</b>	<b>0.047</b>	<b>0.118</b>	<b>0.056</b>	<b>0.138</b>	<b>0.065</b>	<b>0.169</b>	<b>0.079</b>
Enteric fermentation	0.099		0.114		0.133		0.163	
Manure management	0.004	0.000	0.004	0.001	0.005	0.001	0.006	0.001
Direct soil		0.002		0.003		0.004		0.004
Pasture, range and paddock		0.042		0.048		0.056		0.069
Indirect soil		0.003		0.004		0.004		0.005
Burning agricultural waste		0.000		0.000		0.000		0.000
<b>Sub-Total</b>	<b>0.104</b>		<b>0.117</b>		<b>0.122</b>		<b>0.127</b>	
<b>Southern Africa</b>	<b>0.064</b>	<b>0.040</b>	<b>0.073</b>	<b>0.044</b>	<b>0.075</b>	<b>0.047</b>	<b>0.078</b>	<b>0.049</b>
Enteric fermentation	0.062		0.071		0.073		0.076	
Manure management	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001
Direct soil		0.008		0.008		0.009		0.010
Pasture, range and paddock		0.028		0.032		0.033		0.034
Indirect soil		0.003		0.003		0.004		0.004
Burning agricultural waste		0.000		0.000		0.000		0.000
<b>Sub-Total</b>	<b>0.080</b>		<b>0.096</b>		<b>0.111</b>		<b>0.130</b>	
<b>West Africa</b>	<b>0.052</b>	<b>0.028</b>	<b>0.062</b>	<b>0.034</b>	<b>0.072</b>	<b>0.039</b>	<b>0.084</b>	<b>0.046</b>
Enteric fermentation	0.049		0.058		0.068		0.079	
Manure management	0.002	0.001	0.003	0.001	0.003	0.001	0.004	0.001
Direct soil		0.003		0.004		0.004		0.005
Pasture, range and paddock		0.022		0.026		0.031		0.036
Indirect soil		0.002		0.003		0.003		0.004
Burning agricultural waste	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000

Source: Data to create this table was obtained from [55]

## 2.1 Enteric fermentation

Enteric fermentation is a digestive process by which microbes decompose and ferment plant materials such as celluloses, fibre, starches and sugars in their digestive tract or rumen. This anaerobic fermentation process produces hydrogen (H<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). In normal feeding conditions, methane (CH<sub>4</sub>) produced by enteric fermentation process ranges between 15-30% of the total ruminal gas [65], [66]. Methane gas (CH<sub>4</sub>) is the major source of ruminants' GHGs emissions with 90% resulting from enteric fermentation and 10% from manure [7]. Globally methane gas has a warming potential 25 times greater than CO<sub>2</sub> over a 100-year time horizon [67]–[69]. Enteric methane represents from one to two thirds (1/3 to 2/3) of milk CF at farm level [70].

The production of enteric methane (CH<sub>4</sub>) (i.e approximately 8% of ingested food) which is expelled by the animal through burping is directly related to amount, type and quality of feed, animal weight, production level and environment (e.g temperature, etc). Enteric methane emissions change significantly from one region to another globally and in developing countries emissions are very high due to lower productivity and output (e.g milk and meat) is growing fast to meet demand [71]. For example in 2010 according to [72] 75% of total emitted enteric methane globally (1.0–1.5 GtCO<sub>2</sub> eq/yr) was from developing countries with an average annual emission increase of 2.4% in Africa. These emissions are projected to rise resulting from extension of smallholder dairy production in Sub-Saharan Africa for meeting high demand of milk (**Table 2**) and meat of rapid growing population. Most of this growth in livestock population is expected to occur in East and Western Africa worsening their CF [73]. **Fig. 11** shows that East Africa and West Africa are major contributors of Enteric fermentation emissions in SSA.

Recent studies showed that South Africa; one of SSA countries had enteric methane emission factors for dairy cattle of 76 kg CH<sub>4</sub>/head/year and 72 kg CH<sub>4</sub>/head/year for concentrate fed and pasture-based production systems, respectively; emissions rates which are higher than those reported by other developing countries, as well as the IPCC default value of 46 kg CH<sub>4</sub>/head/year for developing countries [74], [75]. On the other hand Kenya whose one of the most developed dairy sub-sector in SSA; contributes around 12 million tonnes CO<sub>2</sub> eq. 88% of these emissions come from cow's enteric fermentation and 11% from manure management. On average at national level the milk production sector emits 3.8 kg CO<sub>2</sub> eq./kg of fat and protein corrected milk (FPCM). On the other hand Tezera & VHL (2018) [57] in their study on CF of milk at smallholder dairy production in Ethiopia concluded that enteric fermentation contributed 80% of all GHG emissions in smallholder dairy farming. This sector is currently dominated by smallholder farming and contributes to the livelihoods of many through income generation, food and employment [76].

Furthermore the study conducted by Kouazounde et al.,(2015) [77] on enteric fermentation emission factors (EF) of cattle from Benin (a west African country) revealed the national EF of 39.5 kg CH<sub>4</sub>/head/year. This estimated EF value was 27% higher than the African cattle default EF recommended by IPCC. Generally ruminant livestock in SSA emits 16% of all GHG emissions [30].

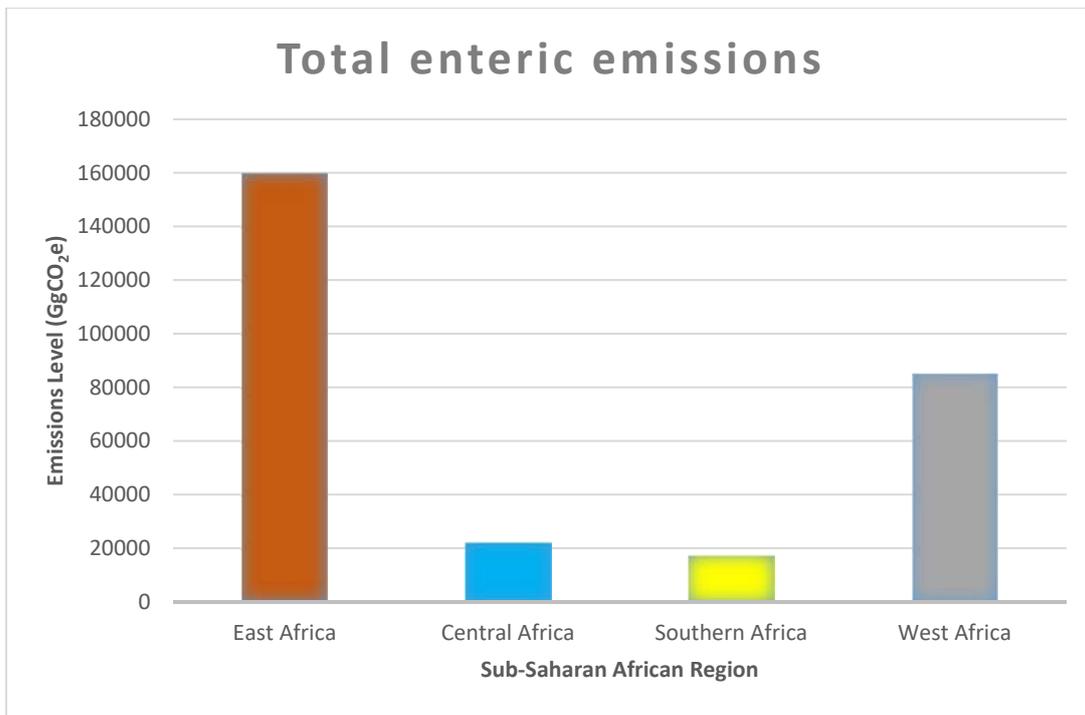


Fig. 11: 2016 Emissions from livestock's enteric methane

Source: [12]

## 2.2 Manure management practices

Livestock manure is an asset and source of nutrients for increasing crop production for many smallholder farmers of SSA. Most of them depend mainly on cattle manure for improving the soil fertility because they cannot afford synthesized fertilizers [78], [79]. Unfortunately the mismanagement of manure is leading to increased environmental contamination and GHG emissions in smallholder agriculture [78]. In fact, large emissions are from manure deposited on pasture compared to the one applied agricultural soil as organic fertilizer (Fig.s 3&12). For example, 80% of GHG emissions (mainly N<sub>2</sub>O and small portion of CH<sub>4</sub>) were from developing countries between 1961 and 2010. During this period Africa had a large average emission rate of 2.5%/year followed by Asia with 2.3%/year. Two-thirds of these emissions came from grazing cattle with small portion from small ruminants such as goats and sheep [72], [80].

Manure is the 3<sup>rd</sup> largest GHG contributor from agricultural emissions on the African continent with accounting 6.5% of total sectoral emissions [55]. Livestock manure includes dung and urine [81]. Globally manure is responsible for around 7% of agricultural emissions GHGs (e.g CH<sub>4</sub> and N<sub>2</sub>O) emissions [82], [83]. It is the second source of farm GHG emissions after enteric fermentation process which emits methane (CH<sub>4</sub>) [83]. NH<sub>3</sub> emitted from livestock manure can travels multiple distances, contaminates the environment [84] and could transform into Nitrous oxide (N<sub>2</sub>O). Manure storage emissions depend mainly on animal species, storage type and storage temperature [85]. Livestock manure in solid state emits less methane gas compared to its liquid state. However, the dry anaerobic manure systems create favourable environment for Nitrous oxide production. This gas (N<sub>2</sub>O) has a relative global warming potential 320 times that of CO<sub>2</sub> (or around 16 times more potent than CH<sub>4</sub>) at a 100-year period. Manure systems in liquid sate are suitable environment for microbes multiplication, which in turn enhances the production of methane gas (CH<sub>4</sub>) [81]. The major components of dairy livestock manure are: Nitrogen (N), Phosphorous (P) and and Potassium (K). These nutrients are important for plant growth but have negative impacts on the environment (e.g eutrophication and contamination of water resources) if applied in excessive quantity [84], [86]. Storing manure for long time without processing it can also lead to significant contribution of GHG emissions [83]. Livestock manure contains organic matter and nitrogen which influence methane and nitrous oxide emissions respectively [87].

The increase in methane gas emitted by manure mainly depends on the quantity of stored manure, temperature rises of manure, long time storage of manure, chemical composition and the amount of organic matter [88]. On the other hand, N<sub>2</sub>O emissions from livestock manure mainly depend on nitrogen (N) and carbon (C) contained in the manure, manure storage time and treatment method in place. When the manure is stored its oxygen, content slows down; at the same time affecting nitrification and denitrification processes. N<sub>2</sub>O can be formed as a by-product (as a second product), particularly if the oxygen concentration is low. Generally the insufficiency of oxygen reduces nitrification process in slurry manure (liquid) causing it to emit less N<sub>2</sub>O in comparison with solid manure (dung) [89].

Smallholder dairy farming (cattle farming) dominates livestock sector in East Africa (e.g in Kenya it accounts 80% of all milk production) and it is characterized by variation in farming conditions and manure management (e.g collection and storage) with dominating cattle manure type. Most of smallholder farmers rely on manure nutrients for improving their agricultural soils hence increase the crop production [79], [90]. As shown on Fig. 12 current and projected GHG emission levels from manure applied to soil and manure left on field have East Africa leading in emissions followed by West Africa [12]. The manure storage in smallholder farming is mainly characterized by solid manure storage (dung) without collection facility of urine. The most common livestock keeping fences in SSA are Kraal where animals deposit much of the manure and pile up before collection. Some farmers also collect dung and store it in heaps on uncover floor in most cases. Only few number of small farmers collect liquid manure in silos, pits or lagoons in connection of anaerobic biogas for producing biogas [78]. However most of liquid manure storing facilities in smallholder farms are not well managed and store the manure in liquid state for long of time without processing it; which contributes to significant GHG emissions (CH<sub>4</sub>) [78], [83].

Open manure collection systems like kraal and heaps accelerate the Nitrogen (N) and nutrients loss contained in manure as a result of weather (e.g rainfall&tempeartures cause leaching and volatility of Nutrients) therefore reducing the effect of manure during its application in soil for raising fertility [91].

Livestock manure GHG emissions should be taken into account from animal excretion to the final destination (e.g incorporation of manure to soil, etc) [92]. These emissions are allocated through the following processes: Emissions related to manure storage, Emission from manure applied on land for feed and crops production and Emissions from manure discharged into the environment [19].

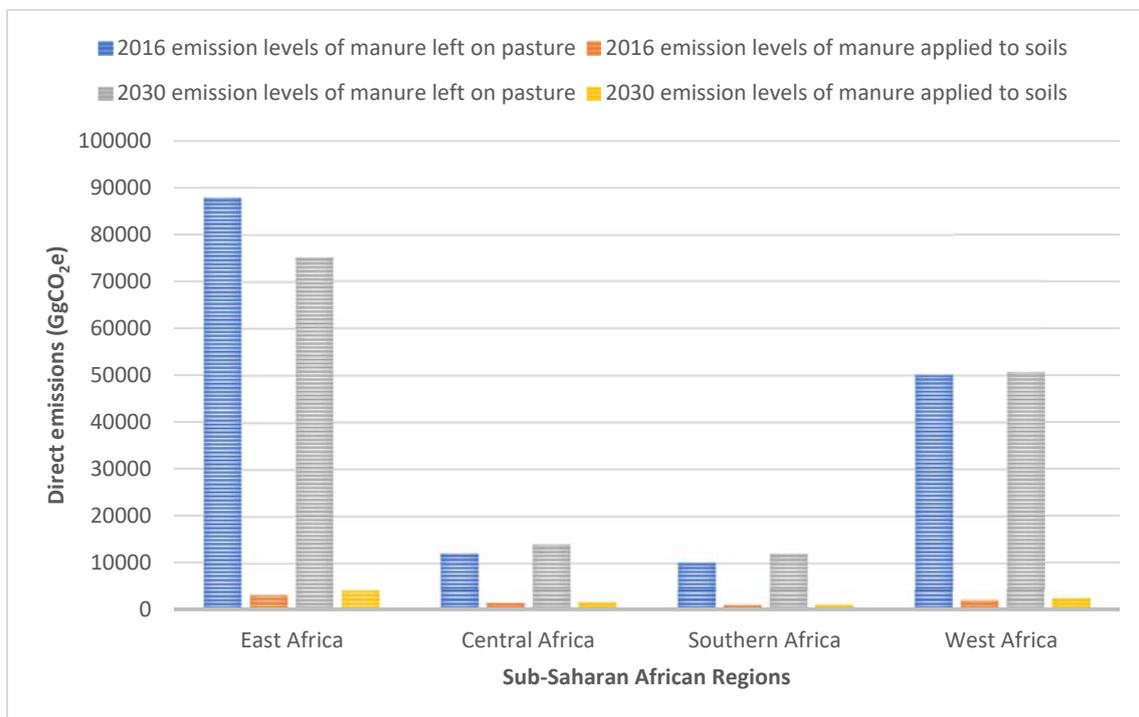


Fig. 12: Current and projected manure emission levels in SSA

Source: [12]

Table 8: Summary of advantages and disadvantages of major manure management options in SSA [78]

Manure treatment	Brief description	Advantages	Disadvantages
<b>Fresh application (solid and liquid manure)</b>	Direct application of either solid or liquid fresh manure to pastures or crops	<ul style="list-style-type: none"> <li>• Fresh manure, like any other form of organic manure improves the structure of the soil which allows better aeration of the soil, improves drainage, and reduces erosion.</li> <li>• Manure nutrients become slowly available as plant food and can have effects on crops for several years.</li> <li>• Good crops can be obtained with reduced need for extra chemical inputs</li> </ul>	<ul style="list-style-type: none"> <li>• Minerals from manure may not be immediately available to plants; mainly for ruminant manure.</li> <li>• There can be a mismatch in time between nutrient release and plant uptake;</li> <li>• Risks associated with transmission of zoonotic diseases if crops are consumed;</li> <li>• Seeds of weed can be transferred to the field through fresh manure.</li> </ul>
<b>Drying</b>	When manure is left in heaps on natural earth for a long periods till it dries up. Manure is also actively molded and dried for fuel in some countries like Ethiopia	<ul style="list-style-type: none"> <li>• Drying makes manure less bulky and easier to transport.</li> <li>• Dried manure contains organic matter that provides similar advantages of using organic fertilizer as in fresh manure.</li> </ul>	<ul style="list-style-type: none"> <li>• During drying, nitrogen is lost from manure through volatilization of NH<sub>3</sub>.</li> <li>• Also, if dried manure is not protected from rain, rewetting events can lead to GHG emissions. These N losses will also result in a poorer quality fertilizer.</li> <li>• Nitrogen and organic matter are lost when manure is used as fuel</li> </ul>
		<ul style="list-style-type: none"> <li>• Provides energy and fertilizer value is maintained or even enhanced.</li> <li>• It provides the same advantages of organic fertilizers to the soil as manure and in</li> </ul>	

**Anaerobic Digestion  
(with use of bio-slurry  
as fertilizer)**

This is the conversion of manure by anaerobic bacteria into biogas and digestate. The digestate which is also called bio-slurry is a mixture of digested dung and water having a dry matter content of ~7%

addition:

- Reduce labor especially of women and girls who spend many hours searching for fuel wood.
- Reduce cost on purchase of synthetic fertilizers, which will be (partly) replaced by the bio slurry
- Lower risk of infection due to the hygenization during digestion affordable lighting in rural (for learning and doing house chores in the evenings)
- Reduce risk of respiratory diseases linked to the use of fuel wood, dung cakes, and charcoal.
- Reduced greenhouse gas emissions as the produced CH<sub>4</sub> is captured and used for cooking.
- Bio-slurry is odorless as compared to manure

- This requires a very high initial investment, often not affordable to smallholder farmers, except though subsidies.
- It requires continuous availability of water.
- Requires frequent feeding of manure
- Liquid digestate is more difficult to manage than dried manure due to high water content

### 2.3 Land use change for feed production

Land-use change has an impact on amount of GHG emissions due to changes in vegetation, soil physical/chemical properties, hydrology and soil nutrient management [93]. Soil organic matter can be progressively oxidized and resulting in emission of CO<sub>2</sub> and N<sub>2</sub>O as a result of land use change [6].

In livestock production land use change occurs in expansion of grazing lands for forage production (feed crops) which increase the number of cut trees (deforestation); the second major global anthropogenic sources of carbon dioxide (CO<sub>2</sub>) from agricultural sector [10], [19]. Carbon dioxide emissions from agriculture and livestock production are highly associated with energy use (for milking, grain drying, etc) , production and transport of inputs, transport of production, processing of dairy products and land use and land use change [23], [81].

Furthermore around 60% of the global biomass harvested enters the livestock subsystem as feed or bedding material. In dairy farming large sources of carbon dioxide (CO<sub>2</sub>) emissions are plants, animal microbial respiration [92], aerobic digestion of manure organic matter by micro-organisms and combustion of materials rich in carbon (e.g fossil fuels and organic waste) [31]. In this sector milk and beef emit 35–45% of the overall feed production GHG emissions. Manure application to agricultural fields as fertilizer for feed crops also represent significant GHG emissions [87].

In SSA burning of crop residues and savannah are commonly practiced by smallholder farmers for the development of agricultural and pasture lands. This practice is for nutrient mobilization and pest control of agricultural fields but also it is responsible of emitting GHG such as CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O [12]. However CO<sub>2</sub> emissions are considered as neutral due to annual cycles of carbon fixation and oxidation through photosynthesis [94]. **Fig. 13** below indicates GHG emissions from burning of savannah in SSA where central and East Africa have the highest emissions:

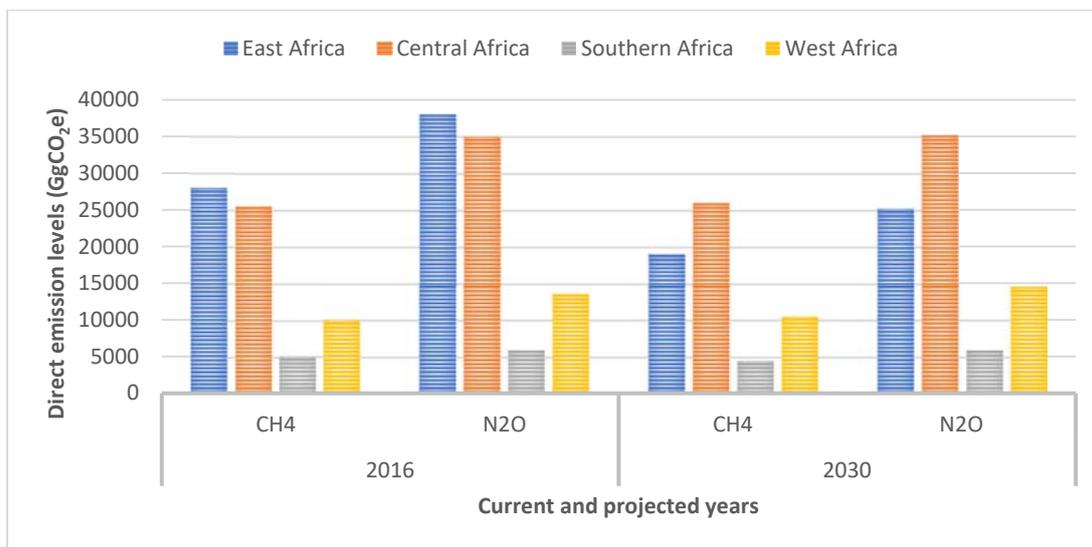


Fig. 13: 2016 and 2030 emission levels from SSA savannah burning [12]

### III. SMALLHOLDER FARMERS’ KNOWLEDGE ON DAIRY FARMING GHGs EMISSIONS IN SSA

Although different African governments including Rwanda have put an emphasis on setting up strategic development policies that facilitate the mitigation of agricultural GHG emissions among other polluting sectors, supporting smallholder dairy farmers to implement these mitigation measures will require interventions at several levels in feed supply chains [95]. Wu et al., (2018) [96] stipulates that farmers’ perception of climate change is positively correlated with adaptive behaviour. Farmers need to know what climate change is and how their activities contribute to increase greenhouse gases emissions. The understanding of the farmers’ perception of climate change and its influencing factors is a prerequisite for the formulation of climate change mitigation and adaptation policies [97].

Using Bayesian hierarchical techniques, Ng'ombe et al., (2020) [98] highlighted the drivers of awareness of climate change and its risks to agriculture among smallholder farmers in Zambia. The findings from this study concluded that 77% of smallholder farmers are aware of climate change and its impacts on agriculture. Radio, Televisions and access to extension services were the major paths of knowledge sharing. However, it is unclear whether the farmers who were involved in the study are aware specifically on how their respective farming activities contribute to Global warming and strategies in place for mitigation.

In Botswana, Mogomotsi et al., (2020) [99] used empirical data gathered from farming households to analyse the perceptions of smallholder farmers regarding climate change. The study revealed that there was a direct relationship between the farmers' adaptation strategies and education. The major constraints that most farmers were facing are: insufficient financial resources and lack of adequate skills to cope with climate change. Government subsidies and continuous trainings were proposed as remedials for sustainable farming activities.

Other similar studies were conducted in Ethiopia [100]–[103], Nigeria [104]–[106], South Africa [107], [108], etc. The common denominator of these studies is that many smallholder farmers are aware of climate change but its adaptability is hindered by lack of information, insufficient funds, among others.

Therefore, the farmers' capacity to implement climate change measures may be stifled due to lack of understanding of how exactly emissions are generated from livestock farming [109], [110]. Successful implementation of mitigation and adaptation measures is determined through farmers' awareness of the issue and their perceptions of risks that it may bring. While knowledge is seen as an important first step in the adoption process [111] on one hand, Niles et al., (2016) [112] found that education is a positive predictor for the likelihood of mitigation measures on the other hand.

Most of farmers recognize climate change through factors such as droughts, frost, floods, extreme temperatures and seasons' variations frequently occurring nowadays in most of SSA countries. However, the level of farmers' knowledge on the causes of their occurrences is still uncertain since only few researches on smallholder farmers' perceptions regarding climate change have been conducted [113]–[115]. Therefore, Farmers' capacity to implement mitigation and adaptation measures needs both personal cognitive motivation and societal support such as subsidies, trainings, etc [26], [116], [117]. Access to extensions services, fields visit and other forms of training and information sharing (radio, TV, etc) have demonstrated positive impacts for raising climate change awareness among farmers such as in Ethiopia [118], Zambia [98] and other regions of the world. Lack of appropriate information regarding interaction between farmers activities and climate change is not only in SSA's smallholder farming but also in other parts of the worlds as witnessed by some Germany's farmers [117], Brazil [119], etc.

The livelihood of many people in developing countries depends on smallholder farming systems [8]. Lack of knowledge and limited access to technology are major concerns raised by many researchers on the cause of increase in GHG emissions in smallholder farmers of SSA [78], [120]. Smallholder farmers in Sub-Sahara Africa depend upon inorganic farm inputs. As a consequence of increase in inorganic farm inputs consumption, vast quantities of gases and effluents are discharged that may change the climate composition of the atmosphere. Unfortunately, many livestock farmers in Africa are unaware of their contribution to climate change. For example the majority of smallholder dairy farmers (around 62%) in Ethiopia think that livestock do not contribute to global warming while 16% of them had no idea at all about animal GHG emissions [57]. This is a common issue which is found in many farmers of agricultural sector. Recent study conducted by Jantke et al., (2020) [117] and Ndambi et al., (2019) [78] revealed that farmers in livestock keeping and crop-cultivating farms were lacking sufficient information on GHG emissions in order to plan mitigation measures. Agricultural magazines were proposed as tool for disseminating knowledge on GHG emission and mitigation measures.

Smallholder farmers in Africa could take advantage of carbon markets and other climate change mitigation financing mechanisms to get training and support for managing agricultural land more sustainably, which would improve the yield and resilience of their agricultural systems. Carbon projects that reduce emissions of greenhouse gases such as carbon dioxide and methane can earn farmers 'carbon credits' for sale in the global carbon market [121]. Producing food for community consumption is the major duty for smallholder farmers but also, they should ensure that the environment is preserved by adopting waste recycling, reduce air, soil and water pollution. However limited access to financial assistance (credit, etc) may affect the successful implementation of good agricultural practices [122], [123]. Weakness is transferring feed technologies and too many top-down approaches are also highlighted as barriers to sustainable smallholder farming systems [124].

IV. STRATEGIES TO REDUCE GHGs EMISSIONS IN SMALLHOLDER DAIRY FARMING

Currently GHG emissions in smallholder farming of SSA are on a rise and are expected to grow rapidly due to agricultural expansion resulting from increased food demand of growing population (both livestock and crop production) and use of fossil fuel [27], [30]. As the demand of dairy products expected to be tripled by 2050 in SSA [27], significant GHG emissions which will impact the climate are unavoidable in case the livestock management practices are kept as they are today. For sustaining smallholder dairy farming and minimizing GHG emissions of livestock production for global warming control, strategies to reduce the CF of smallholder dairy products in SSA are necessary. In most of smallholder dairy farms of SSA, significant GHGs production is resulted from feed production, enteric methane (also known as enteric fermentation) and manure management. That is why proposed strategies to be adopted by smallholder farmers will mainly focus on the aforementioned three GHGs sources.

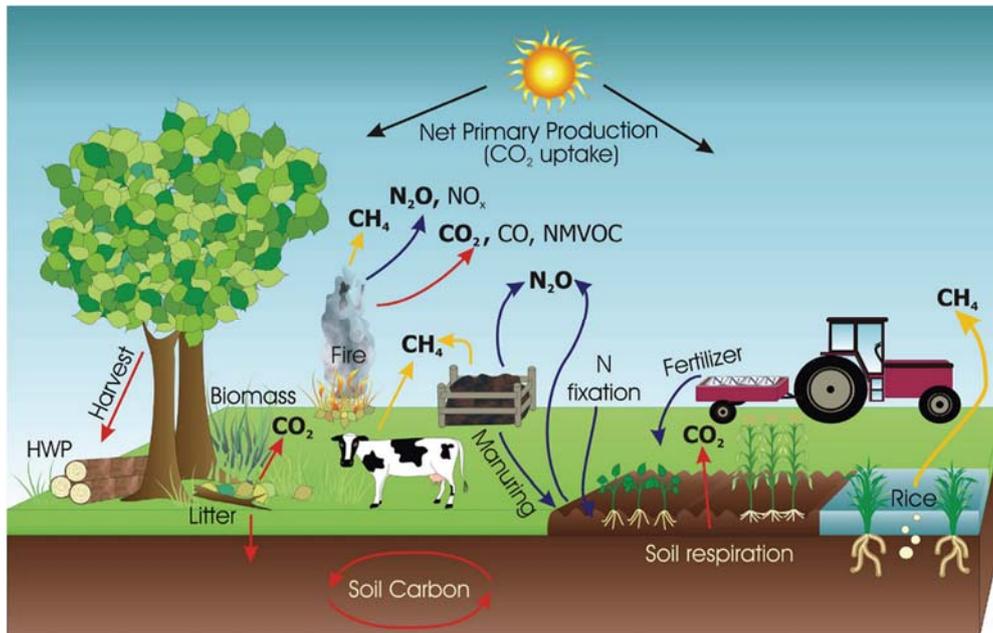


Fig. 14: The major GHGs emission sources, removals and processes in agriculture

Source: [125]

Literature shows that methane and nitrous oxide loss do not only accelerate the climate change but also exacerbates the livestock productivity [63]. Enteric fermentation and manure GHG emissions (dominated by CH<sub>4</sub> and N<sub>2</sub>O) can be reduced significantly if there is change in livestock feeds types, selection of livestock that produces fewer emissions and biotechnological solutions such as vaccinations or the introduction of microorganisms to the animals that reduce enteric fermentation [30]. By providing animals with greener, more nutritious forage, enteric fermentation can be lowered relative to weight gain, reducing methane emissions [126]. Feeds of high quality pass the rumen faster, which reduces anaerobic fermentation and methanogenesis due to post ruminal digestion and, thus, results in lower production of CH<sub>4</sub> [127]. However, increased protein content in diets may cause higher N excretion leading to potential trade-offs between CH<sub>4</sub> and N<sub>2</sub>O emissions.

The study conducted by Brandt et al., (2018) [128] focusing on the contribution of sectoral (dairy production) climate change mitigation options to Kenya national targets revealed that improving forage quality by increasing the use of Napier grass and supplementing dairy concentrates, reduced emission intensities by 26%–31%. Furthermore, the above authors concluded that covering manure heaps may reduce emissions from manure management by 68%. Emission of methane gas from livestock do not only harm the atmosphere but also is a form of feed energy loss which would have been used by the animal in milk and meat production.

On the other hand, milk production sector of Tanzania which is 97% dominated by traditional/small scale dairy farmers; produce 70% of the national milk. In this country 97% of the total GHG emissions come from traditional dairy systems with improved

systems contributing only 3% of all dairy emissions. Average emissions from traditional systems range between 20.3 to 28.8 kg CO<sub>2</sub> eq./kg FPCM while in improved systems they range from 1.9 to 2.2 kg CO<sub>2</sub> eq./kg FPCM [129].

On the other side most of GHG emissions from livestock manure are emitted in storage and in anaerobic treatment. Generally most of strategies to reduce GHG emissions in manure involve the use of anaerobic digesters (biogas production), covering manure storage facility (pit, etc), shortening storage duration, improving timing and application of manure, using a solids separator, and changing the animal diets [26]. Anaerobic digestion is a biochemical process which take place under anaerobic conditions (without oxygen) using bacterial action to convert organic waste (manure in this case) into combustible gas known as biogas [130]. Biogas is composed of CH<sub>4</sub> (60%) and CO<sub>2</sub> (35–40%) [131]. This gas is used as fuel for cooking (as it generates heat) and generating electricity for home use. It is helpful in reducing GHG emissions and reduction of deforestation in SSA [132]. However, the production of this gas has a higher initial investment; a challenge of many smallholder dairy farmers in SSA. This is why governments should put in place subsidies for encouraging such farmers to adopt biogas production. Summarized mitigation strategies are summarized in the **Table 9** below:

Table 9: Summary of selected strategies that smallholder dairy farmers can adopt to mitigate GHG emissions in SSA

Strategy	Practice	Procedure/Aim	Potential for CH <sub>4</sub> and/or N <sub>2</sub> O reduction	Technology availability/feasibility for smallholder dairying	References
Feed production		Avoid applying fertilizers (manure) during wet periods (seasons) or before major rainfall events for allowing nitrogen to reach the targeted crop efficiently	This practice optimizes biomass production and reduces GHG emissions from soil	Feasible and practical	[87]
		Improvement of forage digestibility (Grinding/milling and pelleting of forages)	20-40% reduction in CH <sub>4</sub> per unit of diet	Feasible but may require high initial investment for pelleting equipment	[63], [68], [133]–[135]
Feeding (nutrition)	Forage selection and processing	Improving pasture quality by adopting forages with lower fibre and rich in soluble carbohydrates (increasing to more than 50% /adopting legumes or grain forage such as corn, wheat, etc). In other words, adoption of concentrate diets	8-25% reduction in CH <sub>4</sub>	Despite the challenge of land holding sizes this strategy is feasible and practical for farmers with pasture land.	[68], [133], [134]
		Cassava products such as roots (chopped), leaves and peels are used by several livestock farmers in developing countries such as Mozambique as an alternative source of carbohydrate and protein. This can be used as livestock feed where grains such as maize is limited	When cassava feed is mixed with biochar and nitrate, the reduction in enteric methane is by 22% and 29%, respectively	Feasible and practical	[136]–[138]

<p>Feed additives/supplements</p>	<p>Dietary oils (lipid addition to feeds)</p>	<p>Studies have indicated that for every 1% of oil mixed with the diet (6% maximum), there will be a reduction in CH<sub>4</sub> between 3.6-25%. Introduce lipids/oils rich in medium chain fatty acids (such as sun flower oil ) in feeds when fat contained in pasture is lower (i.e dry/summer periods)</p>	<p>Feasible and practical but may require subsidies from government for availing such oils</p>	<p>[139]–[141]</p>
	<p>Additives (such as ionophores, tannins, etc)</p>	<p>24-30% reduction in CH<sub>4</sub> when 33 ppm ionophore such as monensin is included in forage diets. One the other hand when used as forage diets or feed additives; plants which contain tannins can reduce enteric methane up to 20%. Feeds containing tannins also reduces N excretion, increases N retention, and shifts N excretion from urine to faeces.</p>	<p>Feasible and practical but may require external subsidies as motivation</p>	<p>[26], [133], [142]–[145]</p>
	<p>Regular removal of manure/slurry to an outside storage facility</p>	<p>This practice can reduce emissions from CH<sub>4</sub> and N<sub>2</sub>O by 55% and 41% respectively</p>	<p>Feasible and do not require high initial investment</p>	<p>[146]</p>

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<b>Manure management</b>	Manure collection, storage and use	Separation of solids from liquid manure (use of solids separator)	This practice has a potential of reducing GHG emissions up to 30%	Feasible but may require moderate initial investment for gravity or mechanical separation system (e.g filters, centrifuges, etc)	[6], [87]
		Anaerobic digestion (Biogas production)	This process mainly produces CH <sub>4</sub> and CO <sub>2</sub> which are collected for generating heat for cooking and/or power for lighting. Biogas production is reported to reduce up to 30% of GHGs emissions associated with inadequate manure storage	Feasible but may require high initial investment for installing digestors and accessories. This is why local governments are encouraged to subsidise this equipment to poor smallholder farmers	[23], [147]
<b>Animal management</b>	Improved fertility in dairy animals (Animal breeding/ Artificial insemination)	Genetic selection of efficient and productive breeds (cattle, goats, other milky livestock) with low emissions and high productivity. Dairy cattle such as Bos taurus and crossbreeding have shown improved performance and reduction in CH <sub>4</sub> emissions specifically in tropical production systems	This practice can reduce emissions from CH <sub>4</sub> and N <sub>2</sub> O by 10-24% and 9-17% respectively	Feasible in the long term but currently not practical in most countries in Sub-Saharan Africa because of lack of genetic selection programmes	[26], [87], [134], [148], [149]
		Adopting nitrification inhibitors & vaccination	This practice can reduce nitrous oxide losses by up to 40%	Feasible and practical with the support of stakeholders	[150]

## **V. GAPS IN EXISTING LITERATURE AND NEW RESEARCH DIRECTIONS**

Despite its significant contribution to SSA's milk market (i.e more than 70% of milk production), researches concerning the SDF sector need to be increased mainly focusing on how it can reduce its GHG emissions as one of main agricultural contributors on the continent in particular. The current knowledge is only limited to the effects of climate change/variability on smallholder dairy farmers and farmers' adaptation, Farmers' perceptions of climate change and adaptation. The smallholder farmers' knowledge on dairy farming GHGs emissions in SSA need further researches to better get a clear picture on the level of understanding among farmers and their willingness of reducing their emissions.

Research works on dissemination of best practices information in mitigating GHG emissions to farmers on regular and timely basis, field study (visiting role model farmers/ Establish partnership between farms) towards improved awareness in SDF need further investigations.

Another gap is the lack of updated data on the development situation of smallholder dairy farming systems. An extensive review revealed that more data are needed to better quantify GHG emissions from smallholder farmers in SSA's dairy sector. Most of countries in this region implement agricultural development policies and strategies in isolation without taking into account climate change mitigation objectives. The role of public private partnership is not clear concerning this matter.

Furthermore, the role of private stakeholders in bringing the cost-effective technologies supporting GHG mitigations (such as biogas digestors, grass cutting machine, devices for monitoring the levels of CH<sub>4</sub> emissions, etc) is not clear as well.

## **VI. CONCLUSION**

The rapidly increase of smallholder dairy farming activities in SSA need priority and more attention as far as the world in general and Africa particularly seeks to mitigate agricultural GHG emissions hence addresses climate change issues. Between 1994-2014 a mean GHGs emissions annual increase ranging from 2.9% to 3.1% was observed from Africa's agricultural sector; with enteric fermentation alone contributing more than half of the total GHGs emissions. Compared to other parts of the world, Africa emits highest GHGs per unit of milk and meat production. SSA alone emits 9tCO<sub>2</sub>e per ton of milk; the highest in the world while North America and Europe emit only 1.9tCO<sub>2</sub>e and 1.6tCO<sub>2</sub>e per ton of milk respectively. It is a result of inadequate livestock's feed and low productivity from Smallholder farming systems.

Several best practices have been developed over the years for mitigating GHG emissions in SSA. These strategies differ in cost, practicability, level of reducing emissions and acceptability level by farmers. Therefore, their adoption will depend on the desired animal performance and affordability to implement the strategy. Among them three of the most promising strategies in curving the carbon footprint of SDF: livestock diet manipulation (additives such as lipids, cereals, grass grinding, etc), breeding (genetic selection) and anaerobic manure storage for biogas production. These practices are considered as the most effective approaches of directly reducing enteric methane and nitrous oxide emissions in ruminants. Despite their significant role in addressing GHG emissions and improving farm efficiency some strategies in place are costly to implement (such as digesters for biogas production); therefore, governments should avail incentives and subsidies for their adaption. The support from governments and various stakeholders is also highly needed in terms of capacity building (training) and extension services so that SDF addresses its increasing GHG emissions for sustainability. Furthermore, communication between dairy farmers and researchers should be enhanced so that findings are implemented timely and feedback provided adequately.

In addition to that, to better understand past, present and future trends in GHG emissions of smallholder dairy farming in SSA region, governments, research institutions and other stakeholders need to integrate their collaboration in publishing, reporting and making available updated data concerning the development situation of smallholder dairy farming in respective countries and design development policies of this sub sector for achieving food security without significant increase in GHG emissions.

This study also recommends the use of hand-held laser methane detectors (LMD) by group of smallholder farmers (for sharing its cost) for checking the level CH<sub>4</sub> emissions once the proposed mitigations strategies have been implemented. This technological practice can help farmers as well environmentalists to better evaluate their progress towards reduction of GHG emissions. More research work is required to better understand the smallholder dairy farmers' awareness towards GHG emissions and existing cost-effective mitigating strategies. By taking into account the highlighted mitigating strategies, smallholder dairy farmers in SSA can simultaneously contribute to a reduction in GHGs and improve the farm efficiency.

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# *Internal and External Environmental Strategy Analysis Using SWOT Matrix and QSPM*

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**Abstract** – The aim of the research to develop Internal and External Environmental Strategies that can be applied for Primary Naval Cooperative Institutions company (PNCI). By using the SWOT matrix and Quantitative Strategic Planning Matrix (QSPM), alternative strategies in getting that maintains the image of PNCI company, facilities PNCI, maintaining the quality and service of products to attract consumers, increase the ability of management and cooperation for the purpose PNCI, service delivery order for consumers, utilizing technological advances to Environmental, serving the lower middle market segment by providing a package and a special portion, and maintaining good relationships with suppliers or the surrounding area.

**Keywords** – Environmental Strategy, SWOT, QSPM.

## I. INTRODUCTION

In the digital era, the cooperative must be transformed, especially the digital transformation of the team to stay afloat. However, it should be in the know, the transformation of cooperatives should not be done simply by applying the latest software, but also have to make changes to the business model, management, and service (Ahmadi, 2019).

Primary Cooperative is a legal entity that was established based on the principle of kinship. Adheres to the principle of a democratic economy in the form of a cooperative aimed at the welfare of its members (Bandono, 2019). So the whole profit made by the cooperative will be managed for the betterment of the performance of cooperatives and distributed to active members. PNCI Company abbreviation of Primary Cooperative of Navy kinship and cooperation (Bhandari, 2013). PNCI Company aimed at improving the welfare of members in particular and the region's development work in general life cooperative in the Navy, especially in STTAL region, and mobilize the implementation of a just and prosperous society.

To achieve the objectives, the PNCI company business activities include:

- a. Liabilities and activate members to save money in a certain amount as savings regularly and continue PNCI company include principal savings, mandatory and voluntary (Browning, 2007).
- b. Organize a business - a business that is fair and commercial.
  - 1). Ideal businesses include counseling, coaching, and wellness.
  - 2). Commercial businesses include field - the field of services production, distribution, and trade (Dewi, 2012).
  - 3). Receivables - other legitimate businesses for the welfare of members.

In the conduct of business - a business that is commercial either by trade or business (Kustina, 2008). In business needs a Environmental strategy, the Environmental mindset that will be using by the business unit to achieve its objectives. The

Environmental strategy also sets a target market and related Environmental assimilation (Ginting, 2006). It is a bigger picture of what the enterprise will do in a few markets. The method used to prioritize Environmental strategies that AHP and QSPM (Quantitative Strategic Planning Matric). The advantage of using a matrix QSPM is a strategy - a strategy can be examined sequentially and simultaneously, and there is no limit to the number of strategies that can be evaluated simultaneously (Reza, 2019). QSPM evaluates the relative attractiveness of the alternative selection strategies of some objectively.

## II. MATERIAL AND METHODS

This research was conducted in PNCI company Surabaya on 26-31 March 2020. The data analysis was conducted in the S2 class Asro, building STTAL Nipa island. Limitation of problems just studies only discusses the factors - internal and external factors that can PNCI Company through interviews with the manager PNCI Company.

### II.1. Requirements and Limitations of Research

Some of the requirements, limitations, and materials in this study are as follows:

- a. PNCI Company internal environment that includes management (Planning, Organizing, actuating controlling), Enviromental (product, price, place, promotion, process, person, physical evidence, productivity, and quality) research and development and information system.
- b. PNCI Company's external environment includes the microenvironment (suppliers, customers, competitors), the industry environment (threat of substitute products, competition among companies, the threat of new entrants), and the macro-environment (demographic, economic, social, political and technological).

### II.2. Procedure of Research

The procedure is performed as follows:

- a. Preliminary survey  
The preliminary survey was used to determine the condition of the company, so we can know describing PNCI Company.
- b. Identification of problems  
The problem is identified through a direct interview with PNCI Company
- c. Study of literature

The study of literature in use to search for information and the theoretical basis supporting the research. The study of literature comes from books, journals, magazines, and others.

- d. Identification of study variables

Identification of research variables steamy environment variable external and internal variables. Identification of factors - internal factors were obtained through interviews with company management. The company's internal variables consist of the management (planning, organizing, actuating, controlling), Enviromental (product, price, place, promotion, process, person, physical evidence, productivity, and quality) research and development, and information systems (Suharjo, 2019). External Variable consists of the microenvironment (distributors, customers, competitors), the industry environment (threat of substitute products, competition among companies, the threat of new entrants), and the macro-environment (demographic, economic, social, political, and technological).

- e. Respondent

Respondents were selected namely the head of PNCI company and Enviromental members, of which only t6ersebut respondents who know information about factors - internal and external factors strategy and was instrumental in formulating Enviromental strategy and market the product and determine the condition of the company at this point thoroughly.

- f. Validity test

Test the validity of this research using face validity. Face validity is the satisfaction to ask whether the instrument is measuring the desired concept (Suharyo, 2017). The decision - the decision about the face validity of subjective well and usually involves a process in which experts in the field of construction and field test instrument assessing interest to see if in their opinion, the

instrument measure what is meant to be measured. Face validity refers to people's opinion about the credibility of the test. Irrelevant questions will make the test participants questioned the validity of the test and produce less credible answers (Nugroho, 2019).

g. Analysis of the data preparation

Preparation of Enviromental strategies using the SWOT method and Quantitative Strategic Planning Matrix (QSPM) using a three-stage implementation of the data analysis (Setiadji, 2019).

### II.3. Data Analysis

#### a. Phase Entry (The Input Stage)

The matrix used in this phase is the Internal Factor Evaluation (IFE) and Factor External Evaluation (EFE). Stages of the stages in the preparation of the IFE and EFE matrix are:

1. Identification of Internal and External factors Company

Phase identification of internal factors, namely by registering all the strengths and weaknesses of the company. Presentation of data by a factor that is positive (power) is written before negative factors (weaknesses). Similarly, the identification phase of external factors (Susilo, 2020).

2. Assigning weights to each factor

Weighting on the internal and external analysis done by asking questions to respondents using the paired comparison method (pairwise comparisons).

3. Giving rating/ranking

Ratings or rankings illustrate how big the company's effective strategy at this time in response to the existing strategic factor (Umar, 2001). Scoring ratings are based on the following information:

- (a). Grades 4, If the company has an excellent ability to achieve these opportunities by a factor of factors such threats provide a very weak influence on the company.
- (b). Grades 3, If the company has good ability to seize the chance factor and threat factors provide a weak influence on the company.
- (c). A value of 2, If you have a pretty good compared to seize the chance factor and threat factors provide a strong influence on the company.
- (d). A value of 1, If the company can do well in grabbing the chance factor and threat factors provide a strong influence on the company.

4. Multiplicative weights and rating

Determining the weighted value of each factor obtained by multiplying the weight by the rating (ratings) for each factor. The weighted value of each factor and then summed to obtain the total value weighted (Zulkarnain, 2013).

#### b. Phase Matching (The Matching Stage).

Matrix IE (Internal External).

This matrix is useful to position the company into a matrix consisting of 9 cells. IE matrix consists of two dimensions, namely the total score matrix IFE on the X-axis and Y-axis EFE Matrix in this matrix are grouped into three main strategies (Nugroho, 2020):

1. *Grow and Build* (Growth and Development) located in the cell I, II, or IV. The appropriate strategy is intensive (market penetration, market development, and product development) or integration (backward integration, forward integration, and horizontal integration).
2. *Hold and Maintain* (Preserve and Maintain) cell covers III, V, or VII cells. A common strategy used is market penetration, product development, and market development.
3. *Harvest and Devest* (Harvest or Divestment) cell covers VI, VIII, or IX. The strategy adopted is divested conglomerate diversification strategy, and the strategy of liquidation (Sumantri, 2019).

SWOT matrix

SWOT matrix is a decision-making tool to determine the formulation of the strategy pursued by the logic to max strengths and opportunities, but simultaneously to minimize the weaknesses and threats of the company. Stages in preparing the SWOT matrix is as follows:

1. And list opportunities and external threats as well as the company and the company's internal strengths and weaknesses of the company
2. Develop strategies SO (Strength - Opportunity) by matching the internal forces and external opportunities
3. Develop strategies WO (Weakness - Opportunity) by way internal weaknesses and opportunities for external.
4. Develop strategies ST (Strength - Threat) by matching the internal forces and external threats.

**c. Phase Decision (The Decision Stage)**

The matrix used in this decision is QSPM. QSPM analysis was used to evaluate objectively strategy based on factors - internal primary success factors - external have been identified in the previous stage. QSPM matrix preparation steps as follows:

1. Make a list of opportunities / external threats and strengths/weaknesses in the company's key left in QSPM. This information was obtained from EFE and IFE matrix.
2. Give weight to each of the internal and external factors (weight equal to the weight given to the EFE matrix and IFE).
3. Matrix evaluation phase 2 (matching) and native The alternative identification strategies should be developed by organizations to implement.
4. Determine the Value Fascination (Attractiveness Scores-AS), as the numbers the relative attractiveness of each strategy in a certain alternative set.
  - a. Value 1 = unappealing
  - b. Value 2 = somewhat interesting
  - c. Value 3 = quite interesting
  - d. Value 4 = very interesting

Attractiveness Attractive Value Total Score - TAS) was obtained by weighting attractiveness scores.

**III. RESULT AND DISCUSSION**

**Internal Environmental Analysis**

The internal environment discusses the strengths and weaknesses of the company. Factors - internal factors used in the study are based on the state of the company consists of management, Enviromental, research and development, and information systems. Variable strengths and weaknesses of each - each factor can be seen in Table 1.

**External Environment Analysis**

External environmental factors lead to opportunities and threats. Opportunities may direct the activities of the organization, while the threat, hinders the movement of the organization. External factors are discussed in this study is the microenvironment, industry environment, and the macro environment. Variables opportunities and threats in each of these factors can be seen in Table 2

**Matrix IFE (Internal Factor Evaluation)**

Analysis of the internal environment is done through the identification of internal factors to determine the strengths and weaknesses of the company. Once identified, it is weighted and awarding ratings on each variable. Based on the results of the rating using weighting and the IFE matrix can be in the know that the total score Matrix IFE is 3.181. IFE matrix results table is shown in Table 3. The total score showed a strong position.

Table 1. Identify the Strengths and Weaknesses factors

Internal factors	Strengths	Weakness
1. Management		
- <i>Planning</i>	Meetings are conducted periodically	The long-distance
- <i>Organizing</i>	Each office doing a good job	-
- <i>actuating</i>	Their direction and motivation before starting work	-
- <i>controlling</i>	Managers routinely control	-
2. Enviromental		
- <i>product</i>	- The menu is varied - The recognition of the brand - Good taste	Products less enjoyable when taken cold
- <i>Price</i>		Prices were less affordable
- <i>Place</i>	strategically place	The less extensive parking area
- <i>Promotion</i>		Promotions that are less than the maximum
- <i>Process</i>	Good service to consumers	-
- <i>person</i>	Good cooperation among workers	-
- <i>Physical evidence</i>		Placeless comfortable
- <i>Productivity and Quality</i>	- Using the list of stocks for the control of raw materials - Is certified kosher	-
3. Research and Development	Is performed continuously by the team	-
		-
4. Information Systems	Using email and broadcast by the employee	

Table 2. Identification of Opportunities and Threats factors

External factors	Opportunity	Threat
1. Micro Environment		
- Suppliers	A good relationship with supplier	-
- Customer	-	The shift of customers in similar competitors
- Competitor		The entry of new competitors that are not similar
2. Environment of Industry		
- Threat Product substitution	-	The number of substitute products in the area mentioned
- Competition inter- Company	-	The facilities were more interesting in another restaurant
- Threat Comer New	-	More innovative products



Table 4. Results of Matrix EFE

Chance	On average Rating	Average weight	Total score
1. A good relationship with suppliers	3	0088	0267
2. Surabaya as the city of education	2:33	0071	0165
3. Lifestyle people tend to fancy	2:33	0:07	0163
4. Development of technology (internet)	2.67	0084	0224
5. Changes in production technology	3	0:09	0:27
Threat	On average Rating	Average weight	Total score
6. shift of customers in similar competitors	3:33	0088	0293
7. The entry of new competitors	2.67	0:09	0:24
8. The number of substitute products	2:33	0079	0184
9. facility a more attractive	2.67	0081	0216
10. products more innovative	3	0072	0216
11. Rising prices of raw materials and support	3:33	0095	0316
12. The existence of the restaurant tax	2.67	0045	0:12
13. existence of policies oneway	2.67	0047	0125
<b>Total</b>			<b>2,798</b>

Table 5. Results of QSPM

No	Alternative Strategies	Total	Ranked
1	Maintaining the quality and service of products to attract consumers	6.443	III
2	Improving the ability of management and cooperation for the company	6393	IV
3	Utilizing advances in technology for Enviromental	5916	VI
4	Maintaining good relations with suppliers and the area around the restaurant	5795	VIII
5	Maintaining an image or image company	6906	I
6	Providing service delivery order for consumers	6015	V
7	Serving the lower middle market segment by providing a package or Special portions	5825	VII
8	Improving facilities company	6,468	II

### Matrix EFE (External Factor Evaluation)

EFE matrix analysis is the result of the identification of external factors such as opportunities and threats that affect Waroeng Steak & Shake (WS) Branch Soekarno Hatta Malang. The multiplication of the average weighting and assessment rating will produce a total score. The main opportunities in this company are based on the highest score that a good relationship with suppliers. A good relationship with suppliers will help us to find information on pricing, other than that suppliers can also provide shuttle service and provide special discounts for large purchases (Kustina, 2008). Based on the results of the rating using weighting and the IFE matrix can be seen that the total score matrix IFE is 2,798. EFE matrix results table is shown in Table 4.

### Matrix IE

Based on the results of the matrix IFE and EFE matrix furthermore, it can be arranged in a matrix IE. The average value of 3.181 IFE and the EFE average of 2.798. The average value of IFE and EFE is derived as the sum of scores for each factor, where the score is obtained by multiplying the average rating and average weight to each factor. This value indicates the position of the quadrant IV of demonstrating the necessary strategies for the company now is grow and build strategy. Grow and build strategy shows that companies require a technology strategy to grow better and can develop into a better company. Strategies that can be implemented by companies today is the intensive strategy, integrative strategy, and the strategy of concentration.

### SWOT Matrix

SWOT produces several alternative strategies derived from internal and external variables following the company's position in the IE matrix that is Grow and build strategy. Alternatives strategy obtained as follows:

1. SO strategy,
  - a. Maintaining the quality and service of products to attract consumers
  - b. Improving the ability of management and cooperation for the company
2. WO strategy
  - a. Utilizing advances in technology for Enviromental
  - b. Maintaining good relations with suppliers and surrounding area
3. ST Strategy
  - a. Maintaining the company's image or image
  - b. Providing service delivery order for consumers
4. WT strategy
  - a. Serving medium market share by providing a package or special servings
  - b. Improving facility
  - c. Quantitative Strategy Planning Matrix.

### Quantitative Strategy Planning Matrix (QSPM)

The final stage of the analysis of the strategy is the selection of appropriate strategies and can be run by the company. The selection of a suitable strategy is by using analytical tools QSPM. Alternative strategy derived from the SWOT matrix in which the matrix produces several alternative strategies through internal and external factors.

The results showed that the highest value on the TAS is an alternative strategy for maintaining the image or the image of the company. The three experts have to pull towards an alternative strategy because it considers that the role of the image or the image of the company would affect the company's long-term plan. GET strategy company image or image is important because a positive image that has been built should be maintained. After all, it is closely related to the company's reputation. The strategy is to get the highest score is 6906, experts believe that the main factors that influence enhancing the good image of the company are its human resources. The role of employees in serving customers is a major factor. Previous studies had similar results with this strategy found that a strategy of maintaining the company's image by maintaining the quality and quality and innovation and product development to perfect the product (Dewi, Andri, Yonaldi, 2012). QSPM The results are shown in Table 5.

## IV. CONCLUSION

Alternative strategies obtained from the results of data processing using QSPM (Quantitative Strategy Planning Matrix), namely to maintain the image or the image of the company, increased the restaurant, retain the quality and service of products to attract consumers, increase the ability of management and cooperation for the company, providing services delivery order for consumer, utilizing technological advances to Enviromental, serving the lower middle market segment by providing a package or a special portion, and maintaining good relationships with suppliers or territories around the restaurant.

Results The main priority of this analysis is to maintain the image or the image of the company with TAS 6906. The results of the study can be utilized by PNCI Company in strategic planning to assist the development of the company, especially in the field of Enviromental. Subsequent research can make customers as respondents to consider Enviromental strategies and develop strategies for savings and loan cooperatives.

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# *Communication Practices of Single Mothers in Carrying Out Their Dual Roles*

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**Abstract** – The research aims to analyze the communication practices of single mothers in carrying out their dual roles. This research approach is a critical qualitative case study method. The research data were collected through in-depth interviews with a number of informants and participatory observation. The research results show that there are five interaction arenas of single mothers in carrying out their dual roles, i.e. with their household, fellow single mothers, women, men, and with the environment / community. Communication practices that they are carrying out are interpersonal, avoiding conflict when interacting with men, and messages that tend to be emphatic when interacting with the community. Therefore, communicating their dual roles is a necessity because single mothers are frequently confused when they have to choose between housewife and modest public / productive role or they try to balance both roles if they have a larger productive role.

**Keywords** – Single Mother, Dual Roles, Interpersonal Communication.

## I. INTRODUCTION

Dual roles are something that adult women usually do [1] [2] [3]. However, the dual roles are most clearly seen in women single parent [4] [5]. The position of women who carries out the dual roles leaves a number of problems ranging from the difficulty of sharing roles proportionally [6], stress and vulnerability at work [7], to the skewed viewpoints of society [8].

The facts show that the number of single parents in Indonesia has been increasing. The data on the percentage of households by province, residence area and gender of heads of household in the period of 2009-2019 [9] show that 84.54% are headed by men, both complete families (father, mother, children), or incomplete family (father and children). The remaining of 15.46% are families headed by women (an increase if compared to the previous year (2018) by 15.17%).

Putri et al., [10] argue that there are a number of reasons why women become heads of households while they are simultaneously carrying out the dual roles, i.e. 1) Women who are divorced / dead by their husbands, namely women are required to work hard to earn a living themselves and to support their households, replacing the role of their husbands, 2) A married woman, but the income is not sufficient for family needs because her husband is unemployed / has no income, is also disabled, 3) The woman is alone, but has to earn a living to replace her parents' position.

Setiawan [11] states that the problems that women experience as single parents are very complex. Firstly, women have to raise their children alone. This is very difficult, at a time when children are growing, and looking for self-identity, they really need a

father figure. Secondly, women who become single parents also experience economic problems, particularly if they do not work when they get married and they only rely on income from their husbands. When suddenly she loses a husband who has been supporting the economy of the single parent family and she does not have a fixed income nowadays, as a single parent she frequently faces economic difficulties.

The existence of a single mother who carrying out the dual roles will have an impact on the imbalance of family functions. Family life feels bland, full of stress, minimal interaction, lonely dialogue, discussion and exchange of ideas in the family [12]. This condition will lead to distant relationships among household members.

From the description at above, it is necessary to establish or create a model of communication practices that are harmonious and in harmony in household, single mothers and children and other household members. This harmonious communication will determine the closeness of the relationship between household members [13]. According to Wahidah [14], communication in the household is defined as openness to convey everything in the household, in terms of good and bad matters, and also preparing to solve every problem in the household in a patient, honest and open way. Furthermore, Kusuma [15] states that healthy communication is also open in which it is very necessary in maintaining a harmonious relationship between parents and children.

Communication in the households of single mother has a strategic position in maintaining bonds with children [16]. With open communication, children will see and assess their relationship with their parents. Yarosh et al. [17] argue that the main problem in the households of single mother is maintaining communication, related to children's activities and finding topics in conversation.

It occurs when the position of men as fathers in the households is vacant. Furthermore, mother take over the function of the head of household, so all domains in the household become the authority of the mother, including in terms of communication with children. Not only in the aspect of communication, the loss of the father's role in the household causes unbalanced parenting and shifts in the obligations of the father that a mother must bear. This means that as a single parent the mother has dual obligations in her household.

The difficult situation is seen in the households of single mother. Not only single mothers, but children also experience shocks and shifting relationships with their household due to the separation of their parents [18]. Children who are cared for by single mothers encounter more problems than those with complete parents due to the presence of a father and mother who are accompanying them [19]. Parenting for single mothers, both those who suffer and who die, also affects the psychological life of the children [20].

Based on the background at above, this research will investigate how communication practices of single mothers in carrying out their dual roles. The research objective was to analyze the communication practices carried out by single mothers.

## II. METHOD

This research applies a critical qualitative approach. According to Liliweri [21], the critical paradigm departs from critical theories which aim to defend ideas that are ready to criticize and resolve social inequalities in the domination of power / in this matter, the power of the majority of society, i.e. men called patriarchal culture. Guba and Lincoln [22] state that in qualitative research, the focus of attention is at the general level with a variety of methods, interpretive and naturalist approaches to a research subject. Moreover, Moleong [23], the qualitative research intends to understand the phenomenon of research subjects by describing words and language in a special and natural scope through the use of natural methods.

The research method here is a single descriptive case study [24]. Furthermore, Yin mentions five important components that must be present in a case study, i.e.: 1) Research questions, 2) Proposition, 3) Unit of analysis, 4) Logic linking data and propositions, 5) Criteria for interpreting the findings. Finally, Stake [25] also states that case studies are used for specific case research, and it is expected that it can present a useful viewpoint on a problem for theoretical improvement. it means that if a case is examined deeply, investigated in detail, then the daily activities are solved. The selection of research informants was carried out purposively and snowball. The data collection techniques used here were in-depth interviews and participatory observation.

## III. RESULT

This research will analyze how communication practices of single mothers when they are carrying out dual roles. The informants in this research have identified a number of issues relevant to their experience of communicating their dual roles (Table 1).

Table 1. Communication Practices in Carrying Out Dual Roles

Interaction Arena	Communication Practices
Interaction with household members	Interpersonal
Interaction with other single mothers	Interpersonal
Interaction with other women	Interpersonal
Interaction with men	Emphatic messages and avoidance in interpersonal conflict
Interaction with environment and public	Emphatic messages tend to focus on problems and do not "patronize"

When communicating dual roles to their household members, fellow single mothers or fellow women, the informants practiced interpersonal communication. This interpersonal communication aims to familiarize the interaction and therefore, it creates a positive impression of the status of single mothers who are carrying out dual roles without neglecting their status as mothers, for example in child care. The informant Wn stated:

"At least if we want to go sleep, we take the time to tell stories. It is definitely really a good mother ... It likes that. After telling stories, we feed the food when children eat like that. It is definitely the tasks of a real mother. Otherwise, if about the function of father he teaches us more about how to get out. It is like that."

Wn also said that 'establishing communication with household members is an important aspect in carrying out dual roles'. This is because, she said, as a mother, she still prioritizes communication with her children as part of "an effort to provide understanding to the household members about the position currently held by the mother".

However, not all informants felt the need to clearly communicate dual roles to their families. The informant Im has pointed out that when carrying out dual roles, the oint we have to have is honesty to acknowledge the status which for some people is stigmatic. She said:

"Yes, it is like that the honesty means that what we must do anything honestly. What I mean that we try to be honest not to do such things (negative things) firstly to ourselves. We must be honest with ourselves, for example ... 'with the status of widow', we know the meaning of 'widow' word'."

Therefore, for the informant Im, because she is not an extrovert woman, communicating her dual roles is best 'exemplified through deeds' rather than through words which actually stimulate misunderstanding in her household, among the household members and outside her household. For their households, interpersonal communication is the best choice with "more polite messages" while for outside of their households, the choice is interpersonal communication with "emphatic messages". Hy said:

"Yes, for externals, we only see what the the case is ... if it is formal, if some ask me whether I am married or not, I will say it formally. It depends on the asking person I will definitely say that I am a single parent, a single mother."

The informant Wd said the message she wants to convey regarding the status of single mother and her dual roles is that the position of a single mother is something that she must be carried out at this time, so complaining is not a way out. She said:

"The message is more that I have to carry out it. That the point ... Enjoy it. Live with it. Be grateful with it. So the point is that we do not make any complaint. At the time ... the message was already that. This is what we have to live with it at this time. So don't make any complaint ... because there is a time for everything."

The informant Wn also states the same thing. According to the informant, currently the stigma against single mothers is so strong. Therefore, it is necessary to prove that this stigma is unusual. Wn stated:

"Well, what we needs is to prove it, my sister. The proof is how we behave, how we can be accepted among them ... It is the point. So it's okay ... for example in the social regular gathering of heads of household, I will say that there is no head of household in my household, but I live in the community. I am a member of the community, I have to know the activities in my environment. It also prevails for my children."

Based on the findings of the communication practice, interpersonal communication is a choice to reveal the dual role of single mothers to outsiders, both households and friends. This is in line with the conception of interpersonal communication in the family as stated by Supratman (2017) that households, particularly children, need complete parents to create healthy family communication. This is because children will find it difficult to build an identity without the help of the whole family. Single parent support in establishing good interpersonal communication and it makes children learn to be brave by accepting new family structure situations. Without good interpersonal communication, children will be confused to interpret their identity.

To more clearly understand interpersonal communication patterns as a practice in communicating dual roles, the communication practice model of a single mother can be built in carrying out multiple roles, as presented in Figure 1 below:

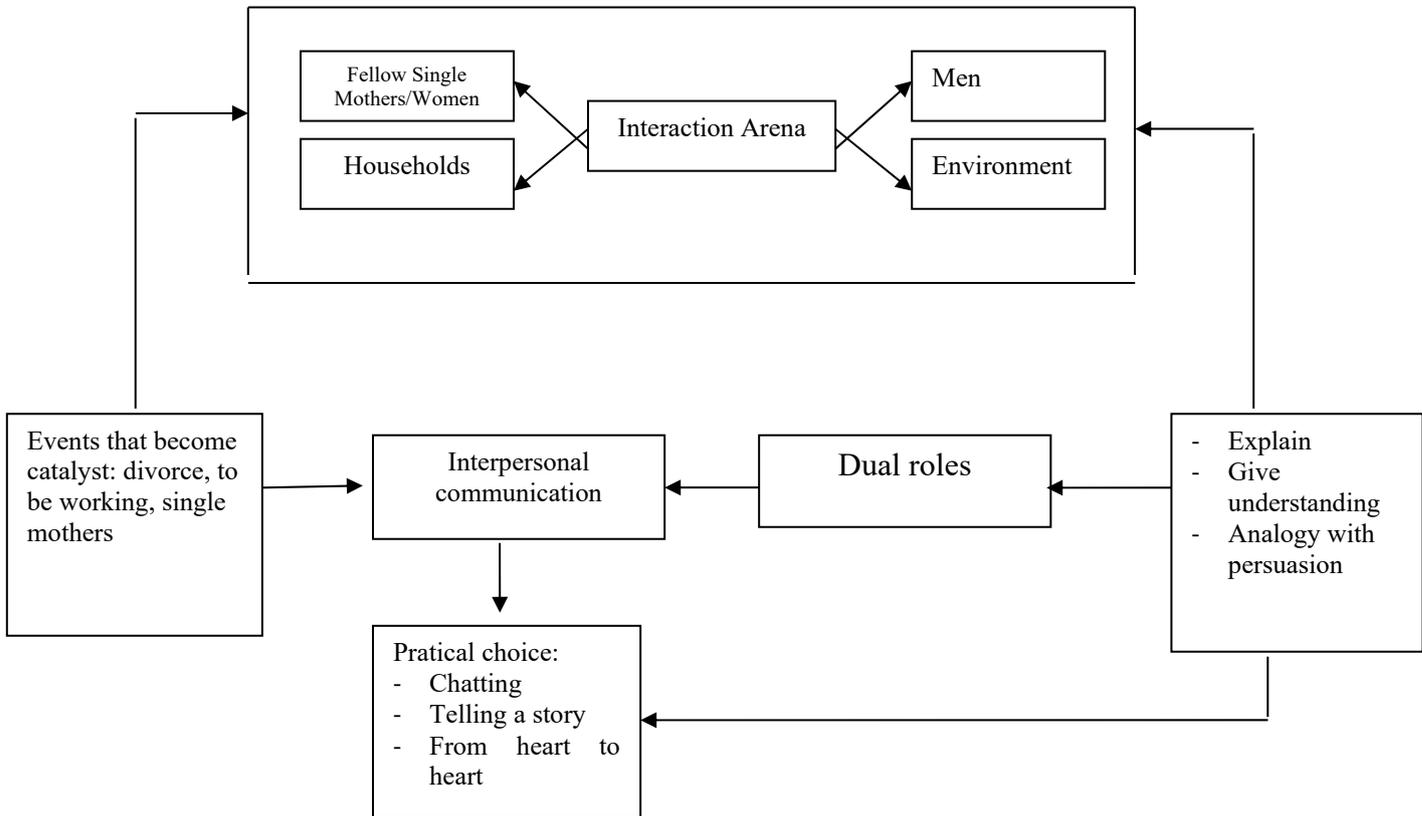


Figure 1. Model of interpersonal communication of single mother

As in the above model strengthened by the researches of Suryadinata [26], Supratman [27] concerning interpersonal communication and Retnowati et al., [28] Sari [29], concerning family communication in households with single mothers and Cools [30] concerning the communication of multicultural single mothers that without communication within households or particularly good interpersonal communication, children can take negative actions as a way to require for more attention as well as their nonverbal symbols for disapproval of the divorce of their parents. Therefore, single mothers must play a dual role. Moreover, children will observe how their parents respond to the divorce.

Caughlin et al., [31] have stated that importance of interpersonal communication in families where carrying out multiple roles. According to Caughlin, communication is the way in which family relationships are built and maintained, attachments and intimacy are created, children are socialized, gender roles and expectations are formed, decisions are made, problems and conflicts are resolved, social support is provided, and the physical and mental well-being of others is affected. Therefore, family communication is an important outcome variable because understanding how families communicate is likely to appreciate how other factors further affect the household and individual household members. There is an overall negative effect of divorce on children, for example, but the 'divorce effect depends on the nature of communication' between divorce or divorcing parents.

#### IV. CONCLUSION

Communicating dual roles is a necessity because single mothers are frequently confused when they have to choose between housewife and modest public / productive role or they try to balance both roles if they have a larger productive role. This is because when women become more and busy in their careers, they are sometimes seen negatively. Moreover, due to gender issues many single mothers cannot get high positions in companies. Definitely no one enforces that a single mother is supposed to be what and how. One thing that needs to be underlined is that Indonesian women should be able to become figures who are not only reproductive figures but also productive and social ones.

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# *The Denotative And Figurative Meaning Relations Of The Components Of Word Combinations*

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**Abstract** – This article explores the structure of word combinations of Uzbek and English languages. It reports the denotative and figurative meaning relations of the components of word combinations.

**Keywords** – Word Combination, Structure Of Word Combinations, Denotative Meaning, Figurative Meaning, Semantic Feature.

## I. INTRODUCTION

We know that according to their structure the word combinations are of two types, first, the word combinations consisting of two constituents, for instance, a *red apple* (first word *red*, the second *apple*), second type, the word combinations consisting of more than two constituent parts as in the syntactic connotation of *red apples with sweet flavor* (1-sweet,2-flavor, 3-red,4-with,5-apple) made from words accompanying side by side.

Interestingly, so far this phenomenon (side by side accompanying of words) of language is named as a word combination, and has been interpreted and defined in different ways by the linguists. The interpretations of word combination focus on and defines their order of consistency (consequence, successiveness) the nature of code and subordination (according to the position in syntactic relations), governance and dependence (in relation to the status in expression of thought), expressing and being expressed with the interrelated words, the relations of clarification and being elucidated, their power of expression (independent and auxiliary function), reflection or being reasoned (abstract or real) and harmony of words to mean the interrelationship of meaning of words in a message or information conveyed by a word.

## II. MATERIALS AND METHODS

By this article, we try to offer some thoughts and ideas about the denotative and figurative meaning relations of the components of word combinations.

When words are two, of course, they have a mutual meaning relation. In this case, the relationship can base on denotative or connotative meaning of the word. In this article, we have approached the phenomenon of combinations in their denotative and connotative meaning from a semantic and stylistic point of view. In this approach, we have used the epithet. An epithet expresses the general or specific sign of a word or a group of words. of the components of the word combinations are classified into the following groups in terms of defining the semantic features:<sup>1</sup>

1. Concrete (aniq), it expresses mainly the observation of the five senses of a human
2. Evaluative. It expresses the speaker's personal attitude and opinion about the real world.

<sup>1</sup> Drozdowski G. Duden, Deutsches Universalwörterbuch. Mannheim.Dudenverlag.1989.

3. It is distinguished with the adjacent use of the attribute and modified word.
4. Unexpected qualitative combinations are the combinations that are newly coined by some speakers and even difficult to imagine as a word combination.
5. Favorite word combinations that are welcomed by common public.
6. In tautological combinations the meaning of the defined word is repeated emphasizing the attributive component.

Before analyzing the word combination, we tried to study their components in terms of their denotative and figurative semantic relations. In order to ensure that our examples are not approximate or divine, we have excerpted from the book "Selected Works"(2<sup>nd</sup> volume) by M. Abdulkhikim (Tashkent-2017) in this article.

### III. RESULTS

#### The denotative meaning relations of the components in word combinations:

##### 1. "sayyod malika"- "A hunter princess"

*Lekin meni hech vaqt shikorga olib*

*Chiqolmaysan, sayyod malikam.* <sup>2</sup>(M.Abdulkhikim. "Erk qo'shig'i" 12-bet)

The word *Sayyod* is an old Uzbek word from Persian that means a hunter, trap-holder.

Tog'larda irg'ishlab o'ynasin ohu, Ularning poyiga tushmasin **sayyod**. (By X.Saloh)

(In English: Let gazelle leap in the mountains, and let the **hunter** not stalk her trail)

1. The word *Malika* means a title formerly used for various woman rulers, a princess
2. a woman of chief governor's dynasty.

Shahanshoh o'zingni padar, qizingni malika qilmoqchi. (By Uyg'un)<sup>3</sup>

(The king intends to make your daughter a queen and accept you as his father)

##### 1. Morphological analysis according to the type of the part of speech –

The Noun- (*hunter*)*Sayyod*- Who?

The Noun- (Princess)*Malika*-Who?

**Semantic analysis** – The hunter princess aimed at the target, her beloved and invited him to the date as the queen. Perhaps, the poet meant the wealthy background of the girl inviting a man to the date, as it is not normal for an ordinary woman to do it or as in case of old fairy-tales "og'zi qiyshiq bo'lsa ham boy bolasi gapirsin"(let the rich's son speak even if his mouth is crooked) yoki "boylar aytsa toshbaqa ham ucha oladi"(a tortoise can fly if the rich order). Thus the princess can do anything on her will and has any opportunity to realize it. It is known from the works that from ancient times the girls of the royal family were thoroughly taught the arts of horseback riding, archery, multilingualism, wrestling, kopkaribozlik, and wire-dancing. Certainly, there are such princesses who, when they reach the age of puberty and choose a partner, give the candidates the same tests as above and agree to get married after passing all the conditions in the world epics. (the Uzbek epic "Alpomish"). From the above lines, it is clear that the princess invited the young man to the hunt at any time, but she did not come out herself. An in-depth analysis of the meaning of the word in the context shows that the hunter here is in the sense of a hunter of the soul or a thief of the heart. The image of a princess in young man's mind is described as a thief who hunts his heart.

In addition the following lines can explain the semantic meaning of the word *sayyod* in Uzbek:

*Rabbi maskun ichra sayyod, o'zim sayd,*

*Ortiq madorim yo'q, voqifsan ahir.*

*Manglayda yozilgan farmoningni ayt,*

*Da'vat qil, gunohkor bandangni chaqir.*(by R.Parfi)

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<sup>2</sup> Matnazar A. Tanlangan asarlar-Toshkent-2017.B-12.

<sup>3</sup> O'zbek tilining izohli lug'ati.

**Literal translation:**

Lord is the hunter on the Earth and I'm the prey

Oh, Lord! You know, I'm out of strength,

Say the decree written on my forehead,

Call me, call your sinful servant.

The words *sayd* and *sayyod* are used to create 'ishtiyoq' rhyme in this verse. The word *sayd* is an Arabic borrowing which means to hunt belonging to the verb category of the part of speech. The word *sayyod* is an Arabic borrowing which means a hunter, a noun denoting a human activity. The lexical units *sayd* and *sayyod* are derived from the same root, the ishtiyoq rhyme serves as the mean of enriching the literary nature of the poem. The word *sayyod* originally denotes the meaning a man hunter who hunts under the open sky or roaming through the woods or in the open-air.

**The Figurative Meaning Relations of the Components of Word Combinations :**

**"makkor davra"- "a sly circle"**

**In Uzbek:** Eng makkor davra ham u gap boshlasa,

Farqlab ololmaydi ne yolg'on, ne rost. (M.Abdulhakim. "Do'st" 9-bet)

Literal translation in English: When he begins his speech even the sliest group (circle) of people cannot decide if it is the truth or a lie.

1. The word *makkor* means cunning, sly (person). 2. The word *makr* – trick, dodgery. Dushmanning makkor niyatini (*The cunning intent of the enemy*)... by Oybek "Quyosh qoraymas"(The Sun Never Darkens)

The next component of the word combination is the word *davra* – a row in circle, a group of people sitting in a circle or at a round-table.

E.g. *Yaxshi yigit- davraning boshi.*(A nice guy is the heart and soul of the party.(Uzbek proverb)

**1. The morphological analysis according to the type of parts of speech:**

*Makkor*(cunning, sly)- Which? What kind of?-The adjective

*Davra*(circle, group)- what? The Noun

**2. The semantic analysis of the components:** the word *makkor* is derived from Arabic *faalun* cadence of the word *makr* that means someone's tricky or sly act or cheating somebody while the word *davra* means a group of people. The meaning of the word combination is a surrounding group of sly and cunning people. Nobody can guess the lie of the person meant by the poet even if only the whole talk is a lie told by this cunning group of people surrounding him. Thus, it means that the person is the sliest of all the cunning.

E.g. "Valloho xoyrul *makirin*"(Arabic )-Alloh bilib ularga *makr* qildi (Allah deliberately used *trick* on them). In addition, we can say that, although the sly plays tricks on all without disclosure, Allah sends the tricks to him.

**IV. DISCUSSION**

Some of researchers' interpretation of the word combination should be approached from philosophical point of view. However, the definition of a word combination as a unique phenomenon of language must be interpreted from the point of view of linguistics. Or else not only the language phenomenon in our view is related to the notion or thought but it should be related to call the language unit with appropriate name to its nature and essence. In this sense, the "word combination" is in terms of the spelling and the meaning of the words, it is noteworthy that the compound is not always named, in its constituent parts being independent, it is worth noting that the name does not suit to the substance. The name "word combination" is used to name not combined words. Such antinomy phenomena are common in the language. At the same time, they need to be understood symbolically. Then there is no need to rename the word combination. In fact, under this term, "two or more words" are lexically and grammatically intertwined, suggesting exactly the same thing (represented by a ruler) and its symbols (represented by subordinate words). It should be noted that it provides, gives some information about it, and that the common meanings of the related words are in general.

**V. CONCLUSION**

We would propose that, based on the above interpretations of our linguists, and all of those who are interested in our definition are: "Two or more independent words that are interconnected in terms of lexical and grammatical meanings are called word

combination." In the context of the word "lexical meaning" it is possible to understand the meaning of naming, displaying and interpreting a particular word, and "the grammatical meaning" of the words in the word combinations, conflict resolution in their relation, as the components are envisaged to change the forms and their categories and features specific to the word categories.

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# *Philosophical And Methodological Aspects Of The Scientific Picture Of The World And The Humanization Of Science*

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**Abstract** – In the modern intellectual question analysis of the humanitarian fields of scientific knowledge is indicated as an important philosophical problem. The fundamental intentions of the cultural development of the 21st century intersect at this point: on the one hand, there is an awareness of the loss of spirituality, and on the other, the indication of science as the highest human value. Science, entering into the mysteries of space, living matter and the human body, creates rise to acute social, ideological, methodological and humanistic problems concerning the individual and social aspects of man. The large amounts of scientific knowledge development should be combined with humanistic ideals, otherwise it is sure to give rise to further discord to the human condition and the world of culture. Next natural question arises in the problem of humanizing science context: "What should be the peak of scientific knowledge in order to avoid further mismatch between man and nature, society, science and humanitarian ideals?" As a result, the task arose to supplement the analysis of scientific aspects of cognition with an analysis of its synergetic, existential, axiological components. It is necessary to consider cognition not only as discovering the objective truth apart from man or from mankind, and also as part of the human-species, containing valuables that act to determine the human genuineness. With this in view, we will consider how the ideal of science is changing, leading from principle ontology when the most significant value for the cognizing subject is the world in itself, to taking into account the subjective conditions under which principles of new knowledge are gained. The evolution of the paradigm of science and the scientific picture of the world is shown. This evolution goes through three stages: classical, non-classical and post-non-classical.

**Keywords** – Science, Culture, World Picture, Scientific Picture Of The World, Humanistic Ideal, Ethics, Synergistic Paradigm, Classical Picture Of The World, Nonclassical, Post-Nonclassical.

## I. INTRODUCTION

Throughout the life span of humanity not only knowledge which was of practical value had a great significance, but also knowledge that which reflected common ideas about nature, society and man himself. It was this knowledge, which was integrated into a single whole of the spiritual world of people. This integration was the basis for emerging, shaping and developing traditions in all spheres of human activity. No less important a role was played by how man conceived of the world structure. The human self-consciousness has the tendency of conceiving the surrounding world, or in other words to see with insight the Universe. Man seeks to find his own place among the surrounding objects material and spiritual, to determine his own place in the cosmos and natural hierarchy. Modern science is oriented toward building-up an unified integrated picture of the world, depicting it as an interrelated "net of the being". The "scientific picture of world" (SPW) is a term that points to the integrated system of knowledge, not only a part or fragment of knowledge. In social consciousness different PW are historically formed and changed. The human species generally accepts and distinguishes ordinary, religious, scientific, esoteric, and philosophical PW, we will consider only the SPW.

Traditionally the combination of the concept of "scientific picture of the world" is the wide panorama of knowledge of the nature, including the most important theories, hypotheses and facts. In the scientific picture of the world, a central theoretical core and particular theoretical models are distinguished, which are constantly being refined. The scientific picture of the world is not just a quantity or a set of separate knowledge, but the result of their mutual consistency and organization into a new integrity, i.e. into the system. The scientific picture of the world is paradigmatic in nature, since it sets a system of attitudes and principles of mastering the universe. The content of the scientific picture of the world determines the method of seeing the world. This affects the socio-cultural, ethical and methodological foundations of science. At present, the humanization of science is acquiring an imperative character. Science simply needs a humanistic paradigm. It must fully address the person, his existence, survival and prospects for further development. [ 1, p.81].

Within the notion SPW the scientific community associates the well-grounded concrete-historical knowledge of the world, which determines the style and method of scientific thinking. The structure of the SPW includes an array of theory postulates, conceptions about methods of interaction, genesis and development. The SPW drives new thought movements, poses the constraints placed on the characteristics of assumptions accepted as new "reasonable" hypotheses. The SPW organizes the system of directives and principles of exploration of the Universe in accordance with characteristics of what its paradigmatic character reveals. The essence of the SPW stipulates the manner of how scientific world vision is to be approached. It influences the forming of logic, methodological processes, and social and cultural and ethical norms of scientific exploration.

## **II. TRANSFORMATION OF THE SCIENTIFIC PICTURE OF THE WORLD AND HUMANISTIC IDEALS OF SCIENCE**

Let us consider how the evolution of SPW, from classic through non-classic and including post-classic views, evolutionality influences humanistic ideals and ideals of science. Historically the flourishing of scientific knowledge was connected to advancements of classic mechanics of the 17 - 18 centuries. Classic mechanics elaborated specific concepts of matter, motion, space, and causation. Absolutisation of mechanics laws gave rise to the creation of the PW where the Universe is a closed mechanical system consisting of unchanging elements, the motion of which is subjected to the laws of mechanics. These laws are considered universal and applied over all matters' motion. In such a world there was no place for chance, and irreversibility and probability were usually connected with incompleteness of knowledge. That meant predetermination of all occurring world processes. Scientific knowledge as well became dominated by such a world-outlook and methodological principles of determinism, rationalism, mechanicism and reductionism. Within the frameworks of classical SPW man had been brought out of the limits of nature and represented as a subject cognizing it as well as constructing and spiritualizing it. Developing science and engineering man ensured domination over the nature aimed at meeting his own needs [2, pp.125-126].

Under the impact of forming non-classic (quantum mechanic) PW serious shifts in philosophical foundations of science, expressed in recognition of various types of explanation for one and the same fragment of physical reality, which were only a partial reflections of truth. Such types that had pronounced references became acceptable to the means and procedures related not only to the object but also to the subject of cognition. To the picture of world created by quantum physics, due to the principle impossibility to eliminate the measurement instruments impact on the parameters of investigated phenomena alongside with the object of cognition there were introduced the means and the very act of measurement. The physical PW in this case was becoming the picture of interacting objects under study and their instruments of measurement. Coming into being of the new PW means the transition from thinking of reality only in the form of an object to the thinking about it as about human sensitive activity and practice.

The decisive changes in gnosiological comprehension of scientific knowledge took place when into the sphere of science were introduced objects such as historically developing systems, and interrelationship and intertransitions between them. These systems comprise not only a biosphere, Metagalaxy and the Earth being the system of geological, biological and technological processes in which the human species is also included (biotechnology, nanotechnology, artificial intelligence, ecology, noosphere, informatics, sociocultural sphere, etc). Hence, one could define the changes in understanding of the object of scientific knowledge as one of the ways of humanization of scientific knowledge. As a result of this the objective sphere of science has broadened and will continue to become more sophisticated due to the new objects evolving into it, the considerable part of which is itself the outcome of the scientific and technological development ("artificial intellect" and bioelectronics). Thus it is the question to represent not only the simple broadening of objective world but its radical "humanizing", new systematization of natural characteristics, in the result of which man enters the PW not as a thing besides other things, and not as an active participant of natural processes, but as a system forming principle, as the beginning of all the coordinates and initial point of any knowledge about the world. The essence lies in the "prism" of the humanistic values and aims through which the cognizing subject looks at the "environment", the world in which

he has to live" [3, p.290]. The thinking of such processes is indissolubly related to the characteristics of a cognizing human, by which the very process of cognition is oriented. Researcher V.K. Sergeev examines the humanization of science through the prism of the acmeological approach. According to his point of view, "in general to science in all types of its rationality, this aspect is essential, since science has always strived for the heights of the human spirit. From this perspective, those results that affect the co-evolution of society, nature and man, striving to harmonize their relations, can also be considered real positive achievements of science. A scientist can reach the heights of the human spirit if he measures his spiritual path with the needs of society and nature." [4, p.53].

### **III. POST-NONCLASSICAL - SYNERGETIC PARADIGM OF SCIENCE**

In the second half of the 20 century the transition of most fundamental scientific disciplines to the studying of new types of objects — self-organizing and self-developing systems became complete. The study is able to self-organizing had led to a radical transformation of mechanistic concepts of nature. Non-classical and thermo-dynamical approaches essentially changed the SPW. I. Prigozhin stated that "the world is neither an automatic machine nor the chaos" [5, pp.4-8]. Following this the erroneous views of opposing self-organizing to organizing and self-governing and governing arose. These forces most probably however are subject to the principle of supplementation, order and chaos most probably are mutually supplementing rather than excluding each other. In the framework of this new concept, chaos is not only destructive but also creative, if it is regarded in the limits of "order - chaos" [5, pp.4-8]. According to synergetics most systems existing in nature are those of the open type. Between them there is a constant exchange of energy, substance and information, and, thus, constant changeableness and stochasticity [6, pp.4-8]. With the notion of stochasticity the phenomena of fluctuation and bifurcation are closely related. At times, the fluctuations become so strong that the organization which existed before fails to stand up to damage. In this critical moment (point of bifurcation) it is impossible to predict in which direction further development will go: whether the condition of the system will be more chaotic or it transfers to the new, higher levels of organization.

At present, the development of self-organization theory is related to the philosophical comprehension of results of investigations into irreversible and open thermo-dynamic processes and expanding on this basis transformation of world-outlook and methodological principles of understanding the world, what in its turn leads to the change of ideal of scientific knowledge. Today the tough determinism and reductionism, being the basis of mechanistic world-outlook, can not be viewed as universal principles of scientific cognition, as a broad class of phenomena and processes as they exceed the limits of linear, equilibrium and reversible schemes. Reversibility and tough determinism can be applied only in simple limited cases. Irreversibility and chance henceforth are viewed not as exceptions but as a rule.

The processes of self-organization correspond to the subtle interrelationship between chance and necessity, and fluctuations in deterministic laws. In the vicinity of bifurcations fluctuations play the major role, whereas in the intervals between bifurcations the deterministic links dominate. Hence, the functions of self-organizing systems' development have not been predetermined. The future stops being the given matter, it reaches no further than the present time. This means that the end of the classical ideal of omniscience making it necessary to review the mechanistic rationalism as the dominating principle of scientific explanation. In the open and irreversible world where the future cannot be accurately predetermined and the present has several potential lines of development man is in the situation of constant choice and in search of optimal solutions in accordance with changing conditions. The existing classical ideal of scientific knowledge is not adequate to the actual state of the world. This ideal postulates that science is morally and emotionally neutral and rational and that logical principles and argument dominate in within the world [7, P.159].

According to M. Abdullaev, scientific knowledge represents an open dynamic system of the fluctuation, i.e., the spontaneous deviations from the equilibrium state, which emerge as a result of getting outside information consisting from empirical data as well as information, gained from the vast "world of knowledge" as well as the world of moral and humanistic values. Interaction of "the world of knowledge" and "the world of human values" are clearly seen on the example of integration of scientific disciplines, extrapolation of scientific methods, and world-outlook approaches through the higher paradigm level [8, pp.22 - 23].

The modern scientific picture of the world is formed on the basis of the synergistic doctrine of complex self-organizing systems, holism (a holistic approach to the world), global evolutionism, ecology, theories of the Big Bang and the expanding Universe, based on the anthropic principle. Thus, a fundamentally new picture of the world is created, which is fundamentally different from the mechanistic, electromagnetic and quantum field pictures of the world [9, p.12]. Using the paradigm of complexity (synergetic paradigm), it is possible to build a certain picture of the world in which a person is fixed in nature, the world and human existence

are proportional, and therefore the construction of artificial nature and social institutions is carried out in a single network of interactions [10, p.94].

The point of bifurcation, which is revolutionary as to its essence, bears in itself the pluralism of opportunities for new development of the ideal of scientific knowledge. As an alternative to the classical ideal, science can become a science having the following characteristic: differentiation of material and ideal as relative. Man as an immanent part of nature not so much stands against nature. The human species should not govern nature but should be culture relationships having dialogue form rather than expecting mathematical knowledge to be a universal language and standard of science. "Understanding" methods are significant; because science should not be ethically and politically neutral, it could be subjected to humanistic values and be responsible to the society [7, p.159]. Taking the etymology of the word "synergetics" it is derived from the word "synergy" - co-energetics, joining of various energies: heavenly and mundane, divine and human, gnosiological and axiological, truth and good, scientific and valuable, - of two plans of Being. Thinking that mankind that is apt to recognize single things, for example Heavens or Earth, or knowledge or valuables, neglected is the unity of these two plans, as a rule. Not many wise men, as the history of philosophical thought testifies, have become aware that the unity of this and that, the nature of the Whole, and unitary as a unity coexist [11, p.90].

The novelty of future situations are that the systems of total confrontation, and dualism have become completely obsolete. Humanism and morals are becoming integral properties of scientific methods. This testifies to overcoming of the metaphysical mode of thinking, broadening consciousness, connecting of the odd, existence of a principally new attitude of integral man making no attempts on the integrity of one another. Everything should come to one formula: "One in all and all in one" [11, p.97].

Synergetics as a science is open to new ideas and theories. Synergetics fosters the establishment of new scientific knowledge, a new vision of our understanding of the world, and meets the requirements common to mankind [12, p.5]. It has a large adaptive resource base. The appearance of synergetics responded to the need to solve the problems of modern humanity. Synergetics has a powerful methodological potential, is characterized by a clearly expressed desire for interdisciplinary synthesis and the creation of a model of a unified science. Its arsenal can be used not only in the natural sciences, but also in the sciences of the social and humanitarian profile, thereby providing a dialogue between two cultures through synergy [13, p.64].

Synergetics is characterized by clearly expressed aspirations of inter-disciplinary synthesis and creation of a model of unified science. Estimates of truth and lie should be replaced by a broad spectrum of scales including the notions of beauty and goodness, that is they should enter the system of culture and science. I. Prigozhin, and I. Stengers wrote "At present we experience deep changes in the scientific conception of nature as well as in the structure of human society resulting from demographic booms, and this coincidence is rather significant. These changes raise the necessity of new relationships between human and nature as well as between human being as a social species. The old, a priori difference between scientific and ethical values is no more valid" [5, p.383].

Moral and humanistic norms of science. The objective of modern post-non-classic science is not the cognitive value of scientific knowledge about the external world, as the determining of priorities of economic, socio-political and cultural character. A new orientation of science that leads to "the objectively true explanation and description applicable to "man-sized" objects not only assumes but also supposes inclusion of axiological factors into the set of explaining concepts" [14, p. 186]. Insertion of valuable factors increases ethicism of scientific knowledge, its orientation to humanistic ideals and values. Ethical aspects of science, engineering and technology, genetic engineering, bioethics and nanoethics have been actualized in the modern sociocultural and research space [9, p. 13]. This process is due to the fact that the whole world is dynamically developing, forming new values. New landmarks generated by the information and digital age are based on such discoveries as: a) nanotechnology; b) artificial intelligence; c) virtual and additional reality; d) biotechnology; e) neurotechnology; f) robotics; g) energy technologies. The artificial world is actively replacing the natural, and in this world the key figure is a person [15]. The humanization of post-non-classical science and the modern scientific picture of the world are indicated in the fact that it is a person who is increasingly considered the main value and goal of social development, becomes an object of interdisciplinary, comprehensive research.

"The standard concept of science" coming from the classical idealism of rationality proceeds from the idea that nature is in constant motion and at its base there are unchangeable uniformities which can be expressed in universal laws. The priorities here are objective criteria, being personally unprejudiced and emotional neutrality. It appears that theoretical knowledge is built into the structure of the world of nature. Truth is the main norm of scientific knowledge cognition. Such an ethos of thought is found in

expressions of positivism. K. Mangeim, and E. Durhaim paid attention to social constructing of scientific knowledge and facts they derived are theoretically loaded and socio-culturally stipulated. Everything depends on the cultural background, where specialists and scientists work [16, pp.93-94]. With increasing impact of historicism in science philosophy a complicated problem revealed: how in explanation of scientific phenomena to coordinate socio-cultural, humanistic values and cognitive and logical factors? A solution to perspective of this problem is contained in the concept of on-apparent knowledge by M. Polani who drew attention to the concrete-and-personal character of cognition and thinking. He makes attempts to rethink the understanding of objectivity's characteristics of positivism as pure empirical actuality proceeding from opposing objects of cognition to their subjects. He claims that it is characteristic for humans to use abstract thought and representations for penetrating into the essence of things within themselves but to correlate reality with the human world. Thus, any attempt to eliminate the human perspective from our picture of the world, the author states, leads not to objectivity but to the absurd [ 17, p.7] . On the other hand, the refusal from the ideal of scientific impartiality is hardly ever legitimate based on the fact that cognition contains the element of evaluation, that the "sense" of theory assumes the choice of formal and logical structures. The humanization of science is a way of overcoming the one-sidedness of the rational-experimental way of understanding the world, ensuring its harmonious unity, complementarity with the spiritual, moral, emotional and aesthetic comprehension of objective reality. Conversion of knowledge of scientific truths, goodness, beauty and faith in the ideals and principles of humanism as necessary guidelines in the life of a person and society.

#### **IV. CONCLUSION**

The reality requires development of new type of scientific thinking which is aimed both at production of an innovation, and at an assessment of its consequences of negative character. New turn in development of science that its creative power concentrated on tasks of the forecast, safety, counteractions to destructive tendencies, saving and consolidations of resilience of the earth self-organizing system is necessary. The modern paradigm of a scientific pattern of the world and science in general assumes new type of innovative thinking in which the main dominants will be feeling of civil and ethical liability, valuable and humanistic reference points of the higher order. The search for truth in science is also a search for good and beauty. Thus, at the junction of cultural spheres and life spheres unspoken codes and rules for minds are formed - ethos of thinking, which is common for all forms of culture - science, art and morals.

The humanization of science in the 21st century acquires an important methodological significance in the process of integrating various branches of knowledge around the comprehensive study of nature and man, his spirituality, in the search for the meaning of the historical process, its human conditioning. In connection with the development of complex self-organizing systems, points of growth of new moral and humanistic values, a scientific picture of the world and worldview orientations arise, which open up prospects for a dialogue of cultures. This dialogue is necessary to develop an innovative strategy for human life in a globalized world, to get out of the global crises generated by modern technogenic civilization.

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# *Prise En Charge Sanitaire Des Malades Du VIH/SIDA Au Centre Vivre Dans L'Esperance De Dapaong (Région Des Savanes Au Togo)*

## *[Health Care For HIV / AIDS Patients At The Living Center In The Hope Of Dapaong (Savanes Region In Togo)]*

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**Résumé** – L'apparition de la maladie du VIH/sida dans le monde a contraint les pays à prendre en charge les personnes infectées. C'est ainsi qu'au Togo, la prise en charge médicale de ces malades au « Centre vivre dans l'espérance MAGUY » de Dapaong a connu des fortunes diverses où l'engagement des Religieuses a permis aux malades du VIH/sida, d'avoir un niveau d'accès judicieux aux soins de santé. Cet article vise à analyser le mécanisme de prise en charge sanitaire des malades du VIH/sida dans ledit centre.

Une méthodologie quantitative et qualitative a été utilisée. Au total, 260 personnes ont été enquêtées et les données collectées ont été traitées à partir des logiciels Cspro 7.4 et Nudist 1.71. Des cartes ont été réalisées grâce au logiciel Arc GIS 3.2.

Il résulte de cette étude qu'il y a une bonne prise en charge de ces malades depuis 2000 avec 46% des enquêtés qui ont vu leur état de santé s'améliorer. Cela est dû essentiellement au coût moins élevé des médicaments, aux activités organisationnelles de prise en charge. Plus de 75% des personnes infectées interrogées ont déclaré que l'administration et la disponibilité des structures de prises en charge sont des facteurs non négligeables dans l'amélioration de leur état de santé.

**Mots clés** – Personnes Infectées, Prise En Charge, Santé, Vivre Dans L'espérance, VIH/Sida, Dapaong.

**Abstract** – The emergence of the disease of HIV / AIDS in the world has forced countries to take care of those infected. Thus in Togo, the medical care of these patients at the "Center to live in hope MAGUY" in Dapaong has experienced varying degrees of success where the commitment of the Religious has enabled HIV / AIDS patients to have a judicious level of access to health care. This article aims to analyze the mechanism of health care for HIV / AIDS patients in the said center.

A quantitative and qualitative methodology was used. A total of 260 people were surveyed and the data collected was processed using Cspro 7.4 and Nudist 1.71 software. Maps were produced using Arc GIS 3.2 software.

The results of this study show that there has been good care for these patients since 2000, with 46% of respondents having seen their state of health improve. This is mainly due to the lower cost of drugs, to organizational support activities. More than 75% of the infected people questioned declared that the administration and availability of care structures are significant factors in improving their state of health.

**Keywords** – Infected people, care, health, living with hope, HIV / AIDS, Dapaong.

### INTRODUCTION

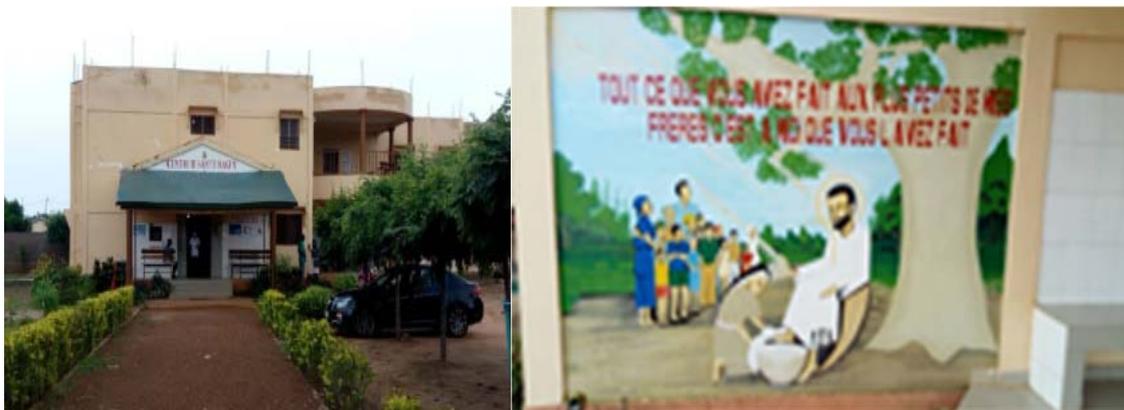
Depuis l'apparition, en 1987, des premiers cas de sida au Togo, le gouvernement a fait de la lutte contre le VIH/sida une priorité nationale. Cet engagement au plus haut niveau de l'État s'est matérialisé par la mise en place en 2001 d'un Conseil National de

Lutte contre le Sida et les Infections Sexuellement Transmissibles (CNLS-IST) afin de mieux organiser la riposte multisectorielle et assurer une meilleure coordination. Par ailleurs, trois plans stratégiques nationaux ont été élaborés sur la période 2001 à 2019 et ont permis d'améliorer le niveau de connaissance des populations en matière de VIH/sida.

Le Plan Stratégique de lutte contre le VIH élaboré en 2012 pour la période 2012-2018 s'est fixé de grandes orientations et des principes d'actions qui se concrétisent conformément à la vision du gouvernement par rapport aux différentes stratégies sectorielles en matière de lutte contre le VIH/sida. Aussi, s'inscrit-il dans le cadre de la réalisation des engagements internationaux pris par le Togo, notamment l'atteinte des Objectifs du Millénaire pour le Développement (OMD). Ce plan envisage le renforcement de la prévention de l'infection au VIH et des IST, l'intensification de la prise en charge globale et le renforcement de la gouvernance et gestion de la riposte contre cette maladie [1].

Dans le cas des pays à «épidémie généralisée » comme le Togo, le système de surveillance a mis l'accent sur le suivi de l'infection de VIH et des comportements à hauts risques au sein de la population générale et de groupes spécifiques. En effet, l'efficacité des mesures de prévention dépend non seulement de la connaissance de l'ampleur et du rythme de propagation de l'épidémie mais aussi de l'identification des comportements, des attitudes et des pesanteurs socioculturelles.

Au Togo, les actions menées par le gouvernement contre la propagation du VIH, ont permis aux populations les plus démunies d'accéder aux centres de santé [2]. Ainsi la crise sanitaire déclenchée depuis 2000, a poussé plusieurs patients à chercher de l'aide dans les centres d'accueil. Une proportion importante (plus de 50%) des personnes infectées du VIH/sida de la Région des Savanes, a rejoint le centre « Vivre dans l'Espérance MAGUY » de Dapaong, construit (Photo n° 1) à cet effet par les Religieuses de la Congrégation des Sœurs Hospitalières (symbole n° 1) avec l'appui du gouvernement, pour des raisons de proximité géographique et surtout linguistique.



**Photo n°1: centre de santé vivre dans l'Espérance      symbole 1 : une religieuse donnant des actions**

**Source : Paki Wonibangue, septembre 2020      Source : Paki Wonibangue, septembre 2020**

La photo 1 montre le centre « vivre dans l'Espérance MAGUY » de Dapaong. Ce centre accueille les malades infectés du VIH/sida tandis que le symbole 1 est une illustration de prise en charge des malades infectés du VIH/sida par une des religieuses de la congrégation responsable du centre.

Selon le Plan National de Développement Sanitaire [3], le taux de fréquentation des structures de santé s'élevait à 28 % sur le plan national et de 23 % dans la région des savanes.

A partir de 2000, les Religieuses, avec l'aide des partenaires externes, se sont engagées progressivement dans une opération humanitaire pour soutenir les personnes infectées du VIH/sida. Le centre « vivre dans l'Espérance MAGUY », avec l'appui financier du Programme National de Lutte contre le Sida (PNLS), assurent une prise en charge gratuite de ces malades en matière d'alimentation et de soins médicaux. Les autres besoins vitaux fondamentaux à savoir le logement et l'habillement sont aussi pris en compte avec des distributions régulières de vivres et non vivres. Ces religieuses interviennent dans la santé, l'éducation, l'insertion sociale et professionnelle des jeunes orphelins, victimes du sida. Dans la foulée, les personnes infectées sont encouragées à trouver des solutions durables comme l'intégration socioéconomique à partir des activités génératrices de revenus.

Il est question de s'interroger sur le processus de prise en charge sanitaire des malades au centre « vivre dans l'Espérance MAGUY » et de demander comment se fait l'insertion sociale des personnes infectées du VIH/sida après leur prise en charge ? Cet article a pour but d'étudier le mécanisme d'insertion sociale des malades du VIH/sida et d'analyser le processus de prise en charge sanitaire au sein du centre « vivre dans l'Espérance MAGUY », de Dapaong.

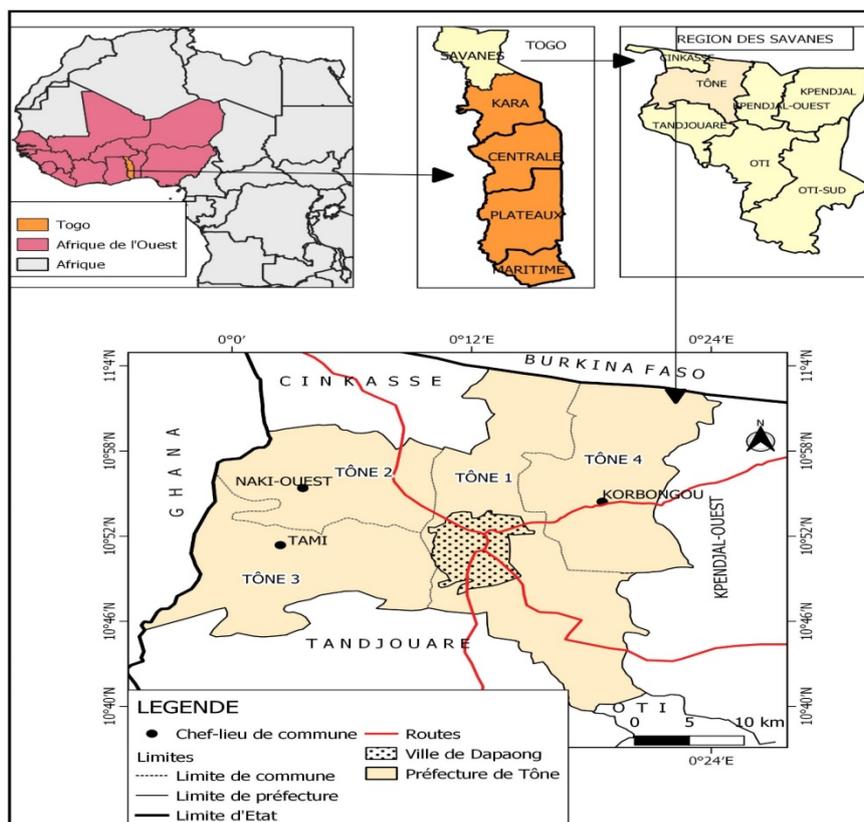
### I. MÉTHODES ET MATÉRIELS

Pour atteindre l'objectif fixé, une méthodologie de collecte de données en trois étapes a été adoptée: La documentation, les observations et la collecte des données primaires

#### 1.1. Site de l'étude

La ville de Dapaong est le chef-lieu de la préfecture de Tône, l'une des 5 préfectures que compte la région des Savanes au nord-Togo. Elle s'étend sur une superficie de 5500 km<sup>2</sup> à environ 630 km de Lomé [4]. Géographiquement, la ville de Dapaong est comprise entre 10°51 et 10°44.1 de latitude nord et entre 0°12 et 0°27.4 de longitude est. Elle se localise dans la préfecture de Tône qui est limitée au nord-ouest par la préfecture de Cinkassé, au nord-est par le Burkina Faso au sud par la préfecture de Tandjouaré, à l'est par la préfecture de Kpendjal-ouest et à l'ouest par le Ghana.

La ville de Dapaong, qui abrite le centre « vivre dans l'Espérance MAGUY », comptait, en 2010, environ 94535 habitants [5]. Elle est également le chef-lieu de la Région des savanes du Togo (carte n°1).



Carte n°1: Carte de localisation de la ville de Dapaong

Source : INSEED, 2010 ; carte actualisée par SAMBIANI S, 2021

La carte n°1 situe la ville de Dapaong qui abrite le centre «vivre dans l'Espérance MAGUY » Cette ville a été choisie pour la construction de ce centre à la suite des flux massifs des personnes infectées du VIH/sida à la pédiatrie de Tantigou. Entre 2012 et 2019, l'on dénombrait 1469 personnes infectées dont 199 enfants dans le centre.

## 1.2. Population de l'étude

La collecte des données constitue la charpente de toute recherche. Pour la présente étude, les sources de données secondaires et primaires ont été utilisées. Ce travail s'est appuyé sur une approche méthodologique basée sur la revue documentaire et la collecte des données. Les documents utilisés sont les rapports d'activités du Programme de Lutte contre le Sida (PNLS) partenaire de mise en œuvre du projet de protection et des personnes infectées du VIH/sida, des rapports des statistiques de dénombrement annuel des personnes infectées du VIH/sida de l'Organisation des Nations Unies pour le sida (ONU sida-Togo), des textes juridiques nationaux et internationaux en matière de protection internationale et de lutte contre la stigmatisation des personnes infectées. D'autres ouvrages ayant trait au sujet d'étude comme des thèses ont été aussi consultés. Cette documentation a permis de cerner davantage les contours du sujet et a servi à choisir, de façon judicieuse, les concepts clés afin de mieux comprendre la problématique développée.

Les données primaires sont celles issues des enquêtes de terrains constituées des observations, de l'administration des questionnaires et des entretiens.

Une grille d'observation a été mise au point. Cette phase a permis d'observer l'état actuel du centre « vivre dans l'Espérance MAGUY », les voies d'accès à ce centre, les équipements sanitaires, le comportement du personnel soignant vis-à-vis des personnes infectées, l'attitude de ces patients par rapport aux personnels de santé, le temps qu'ils mettent avant d'être reçus, l'accueil qui leur est réservé.

Pour obtenir les données qualitatives, des entretiens semi-directs qui ont permis d'avoir des informations détaillées et d'approfondir les investigations sur le sujet de recherche, ont été menés auprès de sept professionnels de soins de santé dans différents services du centre (Tableau n°1).

Tableau n°1: Agents de santé interviewés

Centre sanitaire	Agents de santé interviewés
service d'accueil	1
service enregistrement	1
service entretien avec les patients	1
service de prise en charge	1
service soins	1
service de logement	1
service de suivi et d'insertion	1

Source : *Enquêtes de terrain, novembre 2018*

Comme l'indique le tableau n°1, les entretiens ont été menés avec les agents de santé dans différents services du centre et avec des personnes ressources des institutions impliquées. La prise en compte des agents de santé a permis d'avoir des informations sur le degré de fréquentation. Les entretiens ont été complétés par des questionnaires. Ces questionnaires ont été élaborés puis adressés aux personnes infectées.

La phase des enquêtes proprement dites a été le point saillant de la collecte des données. L'enquête s'est déroulée du 15 Octobre 2019 au 12 février 2020 et la population cible concerne les personnes infectées. Elle a été réalisée sur la base d'un questionnaire qui a pris en compte le processus de prise en charge des personnes infectées, les renseignements sur le personnel soignant,

l'importance des activités sanitaires, les aspects liés aux soins de santé, et pour le questionnaire des personnes infectées, la collecte s'est faite en prenant en compte 260 personnes infectées dans le centre. Ces personnes infectées constituent la population cible pour l'administration du questionnaire. Un échantillon comptant 260 personnes infectées a été tiré au hasard. Des entretiens ont été effectués avec des personnes ressources impliquées à l'instar de la Coordination Nationale d'Assistance aux malades du VIH/sida (CNA-VIH/sida), les agents du Programme National de Lutte contre le Sida (PNLS).

### **1.3. Méthode de traitement des données collectées**

Une fois les données collectées, il est procédé à leur dépouillement à partir des logiciels appropriés. Les données quantitatives ont été saisies à partir du logiciel Csp7.4 puis transférées dans le logiciel SPSS 26.0 pour leur traitement et leur analyse.

Les données qualitatives ont été traitées avec la technique de l'analyse de contenu. Elles ont été traitées dans le logiciel Nudiste 1.71 pour une analyse approfondie à partir des idées fortes issues des entretiens et qui sont jugées importantes. Les principaux tableaux et graphiques de l'étude ont été produits dans Excel. Des cartes ont été réalisées à partir du logiciel Arc GIS 3.2a.

Les résultats de cette étude se rapportent au processus de prise en charge sanitaire des personnes infectées au centre « vivre dans l'Espérance MAGUY » et le processus de leur insertion sociale après leur prise en charge

## **II. RÉSULTATS**

Les résultats sont axés sur l'évolution de l'effectif des malades du VIH/sida 2000 à 2019, le circuit de prise en charge de ces malades, les difficultés liées à la prise en charge et l'insertion socioprofessionnel de ces patients.

### **2.1. Evolution du nombre des malades du VIH /sida**

#### **2.1.1. Nombre de personnes vivant avec le VIH et tendance évolutive dans la Région des savanes**

La prise en charge des malades infectés du VIH/sida au centre "vivre dans l'Espérance MAGUY ", a connu diverses variations entre 2000 et 2019.

Une première marquée par une progression du nombre de Personnes Vivant avec le VIH (PVVIH) de 127 050 en 2000 à 140 714 en 2008 soit une augmentation d'environ 10%. La 2<sup>ème</sup> phase est celle de la régression entre 2008 et 2012 où le nombre de PVVIH passe de 140 714 à 123 185 soit une baisse de 14%. Cette tendance à la régression montre toujours un effectif élevé de PVVIH avec pour conséquence un nombre important de ces personnes qui sont sous antirétroviraux (ARV). La mortalité liée au VIH/sida reste élevée malgré l'augmentation des ressources financières de 21,5% allouées aux soins de ces personnes infectées. De 2003 à 2009, le nombre de décès lié au VIH/sida est resté quasi constant avec parfois des pics de progression. Nous sommes passés de 1150 à 1510 décès entre 2003 et 2009. Cependant, les décès ont légèrement baissé entre 2009 et 2012 et sont passés de 1510 à 780. Cette baisse est le fait des soins et traitements apportés aux malades pris en charge par le centre vivre dans l'Espérance MAGUY.

#### **2.1.2. Accueil des malades du VIH/sida au centre vivre dans l'Espérance**

D'après les enquêtes de terrain, l'on dénombre 206 malades au centre vivre dans l'Espérance MAGUY soit un taux moyen de 7%. Les malades accueillis et gardés au centre n'ont pas les moyens de se procurer des antirétroviraux. Le taux de mortalité au sein du centre est plus bas (2%) que dans les formations sanitaires de la ville (11%), parce que le suivi est beaucoup plus renforcé. Ce qui leur permet aussi de prendre conscience de leur état de santé par rapport à ceux qui sont à l'externe du centre. Selon les responsables du centre d'accueil, les malades du VIH/sida, qui ont été accueillis depuis 15 ans, estiment que leur état de santé s'est amélioré. 17 malades enquêtés ont affirmé n'avoir pas eu d'aide quelque part avant d'arriver au centre. Ils seraient venus directement au centre dans l'intention d'être satisfaits par leur prise en charge. 66% des malades interrogés ont reconnu avoir tenté de demander de charge gratuite car étant sous le coup de la pauvreté.

Avec un taux important (48%) des malades avérés, 46% des enquêtés lient leur maladie à leur statut de pauvreté. Ils estiment que du fait que la famille soit pauvre, le manque de moyens de support, les conditions de vie sanitaire (promiscuité, misère..) ont contribué d'une manière ou d'une autre à la contraction de la maladie.

Selon le personnel soignant du centre vivre dans l'Espérance MAGUY, au moins 29% des infectés ayant été victimes des troubles mentaux, ont été pris en charge par le psychologue du centre.

## 2.2. Circuit de prise en charge des malades infectés

Le circuit de prise en charge des malades du VIH/sida au centre vivre dans l'Espérance MAGUY su un processus qu'il convient de détailler.

### 2.2.1. Processus de prise en charge sanitaire des malades du VIH/sida

La prise en charge médicale des malades du VIH/sida sans distinction a été gratuite depuis 2000 au centre. Elle est offerte à tous sans distinction. Du personnel soignant (assistants, infirmiers et des sages-femmes), avec un plateau technique qualifié est recruté et déployé au centre vivre dans l'Espérance MAGUY. La prise en charge de ces personnes infectées a été renforcée par l'appui du Programme National de Lutte contre le sida (PNLS) et celui des partenaires externes. Leurs actions sont conçues et mises en œuvre avec les personnes concernées afin de répondre à leurs demandes et à leurs besoins. Elles prennent la forme d'accompagnement individuel où ils sont reliés dans un cadre collectif (groupe de parole, activités conviviales, ateliers d'information...). Le but de ces actions de la part des responsables du centre, vise l'amélioration de l'état de santé et le renforcement des capacités des personnes infectées notamment par l'échange de savoir et de soutien entre pairs.

A cet effet, le PNLS a été chargé de suivre les structures sanitaires dans la prise en charge des malades du VIH/sida. Il a pris en compte les volets financier, médical et social avec l'appui du gouvernement et du Fonds Mondial. En 2017, les partenaires avaient mobilisé 50% du financement. Tous les autres frais additionnels sont pris en charge par le centre vivre dans l'Espérance MAGGY. Pour l'année 2018, les partenaires identifiées pour appuyer le centre dans la prise en charge des malades infectés étaient, entre autres, l'Association Maminou, l'Association Yendouboame, l'Association l'ARCH, les Apprentis d'Auteuil, l'Association Simba, le Petit pont vers le Togo, et les Rires du soleil (**Photo 3**).



**Photo 3: l'association « les rires du soleil » avec les enfants infectés du VIH/sida**

**Source : LARE, vue prise en novembre 2019**

La photo 3 montre une séance de jeux avec les enfants malades du VIH/sida internés au centre pour leur suivi. Le processus d'enregistrement des malades du VIH/sida au centre vivre dans l'Espérance MAGUY se fait d'une façon informatisée par le service d'accueil. Chaque patient a un dossier dans lequel, on note toutes les visites réalisées, les bilans et d'autres problèmes de santé en dehors de celui du VIH/sida. Le dossier constitué est remis à l'assistant médical du centre qui le soumet à un comité de référence. Lorsque le malade identifié est accepté, il peut bénéficier des prestations de prise en charge à 80% contrairement à ce qui se passait dans les années antérieures.

Avant 2000, une personne infectée se faisait consulter dans une formation sanitaire de sa localité ou dans d'autres centres de formations sanitaires réparties dans la préfecture de Tône. Mais, à partir de l'année 2000, avec des séances de sensibilisations (Photo 4), lorsque le malade est identifié infecté, il est référé au centre vivre dans l'Espérance de Dapaong pour le suivi.



**Photo 4 : séance de sensibilisation à Konkouré**

**Source : LARE, vue prise en novembre 2019**

La photo 4 montre une séance de sensibilisation par une religieuse avec la communauté de Konkouré à Dapaong. Les responsables du centre se chargent des soins et du suivi des malades à domicile comme le montre la Photo 5.



**Photo 5 : Visite d'une Religieuse à une patiente infectée à domicile**

**Source : LARE, vue prise en novembre 2019**

La photo 5 présente une religieuse qui a rendu visite à une malade infectée. Elle se charge du suivi de cette personne dans la prise régulière des antirétroviraux. Elle apporte également un soutien moral et de l'affection. Ce qui la reconforte dans l'espoir de vivre avec le virus ; ceci à travers l'accompagnement spirituel et un appui psychologique. Cette attention apportée aux personnes infectées entraîne un afflux vers le centre de prise en charge vivre dans l'Espérance MAGUY.

Le nombre de consultations annuelles n'est pas limité pour les malades. Ce qui a entraîné des excès dans la consommation des médicaments et, par conséquent, la recherche d'autres partenaires pour soutenir le centre financièrement. Ce qui évitera des interruptions de prise en charge des personnes infectées dans le centre.

Au regard de ce processus et des différents mécanismes de prise en charge, les malades du VIH /sida estiment qu'ils sont mieux pris en charge dans ce centre. Tous les services de santé leur sont offerts et certaines analyses médicales comme la numérisation des lymphocytes CD4 (CD4+) et la charge virale du VIH sont prises en charge par le partenaire PNLIS. Une majorité (90%) des personnes infectées continue d'apprécier les efforts des Religieuses en charge, du gouvernement et des partenaires. De plus en plus, ces personnes infectées sont conscients de la pertinence des nouvelles orientations en matière de santé et aussi de l'amélioration de

leur situation socio sanitaire. Aussi, 81% des malades provenant des localités à savoir Korbongou, Naki-ouest, Namoudjoga, Nano, Bombouaka, Gando, Barkoissi, Mango, Cinkanssé, des régions, Centrale, Kara, et d'autres pays comme le Burkina Faso, le Bénin, jugent-ils la prise en charge efficace pour plusieurs raisons. Ils expliquent ce fait à travers l'accueil qui leur est réservé dans le centre et le suivi des malades à domicile.

Les personnes infectées à domicile cherchent à améliorer leur condition de vie en s'installant dans l'artisanat et autres activités. Ce qui leur permet de subvenir à leurs besoins quotidiens. Des opportunités d'insertion socioéconomique à travers des activités d'auto assistance et des facilités sont offertes pour que la personne infectée ou un membre de sa famille puisse exercer une activité génératrice de revenu. Ces personnes infectées optent aussi pour le commerce.

Mais, force est de constater que plus de 4 malades sur 5 pensent que ce sont les acteurs humanitaires qui doivent continuer à assurer l'intégralité de leurs besoins quotidiens, sanitaires et autres (alimentation, logement, santé, éducation...).

L'enquête a prouvé que 67% des malades internés au centre n'ont pas un attachement pour des activités génératrices de revenus alors que 33 % déclarent vouloir s'adonner à ces activités génératrices pour subvenir à leurs propres besoins.

### **2.2.2 Mécanisme du circuit de prise en charge et ses conséquences sur les personnes infectées du VIH /sida**

Le mécanisme de prise en charge des personnes infectées du VIH /sida est confronté à un certain nombre de difficultés dont l'épuisement des ressources, le coût élevé des de certains médicaments en pharmacie, la mauvaise observance des indications thérapeutiques et les difficultés organisationnelles de prise en charge.

#### **2.2.2.1. Coût des consultations spécialisées et des médicaments de prise en charge des maladies**

Les molécules des médicaments de soins de cette pathologie relèvent le plus souvent de la gamme des spécialités. Leur coût est généralement plus élevé que les médicaments génériques. De ce fait, bien que 80% des soins soient couverts par les partenaires, les 20% constituent une charge considérable pour le centre. Ce qui les amène à faire recours à la représentation du programme de PNLS pour bénéficier des soins totalement subventionnés.

#### **2.2.2.2. Mécanisme organisationnel de prise de décision de prise en charge**

Les personnes infectées du VIH/sida du centre « Vivre dans l'Espérance MAGUY » sont gérées par de multiples structures notamment la confession religieuse appuyées par des partenaires européens et le PNLS. La personne infectée du VIH/sida a le devoir de se déplacer vers le centre car, les autres centres de santé de la ville n'ont pas souvent la même approche de la prise en charge de ces personnes infectées. Des cas d'urgences se soldent habituellement par des décès avant que les autorisations de soins ne soient obtenues. Le personnel soignant sur le terrain n'a pas souvent les moyens nécessaires d'intervention. Bien plus, dans ces centres, le personnel soignant n'a pas les moyens nécessaires ou de mécanisme approprié de prise en charge en leur sein. Les difficultés de prise en charge de ces personnes infectées sont plus graves particulièrement pendant les jours fériés et les week-ends. D'ailleurs, plus de 75% des enquêtés ont déclaré que l'absence du personnel le weekend et l'éloignement des localités sont l'un des facteurs non négligeables des décès.

Il existe des difficultés liées aux déplacements des malades. En effet, les malades des localités enclavées éprouvent de grandes difficultés de transport et financières pour accéder au centre de prise en charge. Cette étude partage les avis des auteurs sur les conditions d'accessibilité des centres de santé par les populations rurales. Ainsi, les personnes infectées vivant dans les zones enclavées sont en marge des soins de santé de qualité du centre.

#### **2.2.2.3. Incapacité des patients à payer les analyses**

Le plus souvent, les personnes infectées du VIH/sida présentent une situation économique très vulnérable et n'arrivent pas à honorer les frais de certaines analyses médicales. Du coup, ils se retrouvent dans l'incapacité de faire ces analyses avant de recevoir les soins appropriés (48% se trouvaient dans ce cas lors des enquêtes). Par conséquent, on assiste parfois à des situations inévitables sanctionnées par des décès.

#### **2.2.2.4. Prise en charge tardive de certains malades infectés au centre vivre dans l'espérance**

L'une des difficultés majeures réside dans le fait que certains malades infectés ne veulent pas se rendre tôt dans le centre de prise en charge et lorsque la maladie rentre dans la phase active, le processus de prise en charge est très difficile. Selon les

orientations du PNLIS, aucune assistance ne devrait plus être portée à des personnes infectées n'ayant pas signalé à temps leur état de santé. Dans ces conditions, pour des raisons humanitaires à titre exceptionnel, des appuis ponctuels se font parfois mais pas de façon prompte. L'assistant médical est dans l'obligation de solliciter des autorisations de tous ordres avant d'engager un quelconque appui. En conséquence, les personnes infectées très fragiles succombent le plus.

#### **2.2.2.5. Renouvellement annuel de la prise en charge des malades infectés**

Une proportion importante (83%) des malades infectés estiment que, quel que soit leur état physique, mental ou psychologique, ils doivent bénéficier d'une continuité des soins. Cette continuité de la prise en charge constitue un facteur de suivi et d'amélioration de l'état de santé de ces malades infectés.

### **III. DISCUSSION**

L'analyse de la présente contribution a permis de présenter le processus de prise en charge des personnes infectées du VIH/ sida au centre « vivre dans l'Esperance MAGUY » de Dapaong dont le nombre de personnes vivant avec le VIH (PVVIH) au Togo plus précisément dans la Région des savanes a connu des variations entre 2000 et 2012 selon les estimations de [6].

Cette étude présente des éléments qui rentrent dans l'organisation des services de la prise en charge des personnes infectées du VIH/ sida. C'est ainsi que la référence, [7] trouve que 10 à 40 % des personnes infectées par le VIH au Canada victimes de la maladie mentale sont pris en charge par des psychologues. Des éléments qui sont, entre autres, le niveau de performance du personnel soignant, l'accueil et le niveau de satisfaction des malades, constituent la base du fonctionnement des structures d'accueil qui combent, dans l'ensemble, les attentes des malades. Le travail des responsables du centre de prise en charge, permet de recueillir des informations relatives aux difficultés d'application des « droits des malades », aux formes de discriminations, aux enjeux du maintien ou de l'amélioration de certains services hospitaliers [8].

Des facteurs liés aux services rendus, à l'accessibilité géographique et financière dans le centre, ont été analysés. En ce qui concerne l'accessibilité des centres de santé, [9] trouve que les problèmes de la qualité des soins de santé sont dus à l'inégale répartition des structures sanitaires et surtout à leurs problèmes d'accès.

A cet effet, ce sont les principaux bénéficiaires de prise en charge qui expriment le plus souvent leur opinion sur la qualité de ces différents services [10]. Des résultats présentent des difficultés de prise en charge des malades, qui sont entre autres l'incapacité des patients de payer les analyses, la prise en charge tardive des malades infectés au centre vivre dans l'espérance. Selon la référence. [11], «la rupture de la prise en charge par moment constitue des facteurs de rechute et des circonstances d'aggravation de la maladie permanente». Ce qui entraîne des décès dans les familles. La référence [12], constate que «le taux de morbidité du VIH/sida était élevé entre 2008 et 2012». L'état infectieux des malades conduit à un amenuisement des ressources des familles démunies engendrant beaucoup de problèmes. Les décès des personnes infectées laissent de nombreux problèmes aux enfants, aux femmes et aux vieillards qui sont sans soutien [13],

Le soutien des associations et leur implication dans la mise en œuvre des programmes de financement ont beaucoup aidé les responsables du centre vivre dans l'Esperance MAGUY à mener à bien la prise en charge. Ces programmes de financement intègrent également de nouveaux contenus comme des activités génératrices de revenus afin de soutenir l'autonomie des personnes malades du VIH/sida. Il est important, comme l'a souligné [14], que «les gouvernements allouent des fonds qui permettront de rapprocher les unités sanitaires aux populations enclavées ».

L'efficacité des interventions de ces associations pour soutenir les personnes malades du VIH /sida dans l'appropriation et l'utilisation des informations, a permis à ces personnes de surmonter les difficultés de la vie affective et de favoriser leur participation à la vie active [15]

Cette étude partage les avis de ces auteurs sur les conditions de prise en charge des personnes infectées du VIH sida et leurs difficultés d'accès aux centres de prise en charge. Ainsi, dans la zone d'étude, les personnes infectées du VIH /sida des zones enclavées, sont en marge de la prise en charge pour des soins de qualité. L'amélioration de l'état de santé des populations a été toujours et continue d'être au cœur du projet global de développement au plan mondial en particulier des pays africains. Selon la référence [16] « On ne peut plus considérer de nos jours qu'il suffit de développer, mais de traiter, de vacciner pour améliorer mécaniquement l'état de santé de la population ». L'OMS rapporte que les maladies transmissibles représentent plus de 63% de tous les décès annuels à travers le monde, dont 80 % dans les pays à revenu bas et intermédiaire [17].

#### **IV. CONCLUSION**

Au regard des résultats obtenus, il ressort que la prise en charge des personnes infectées du VIH/sida au centre vivre dans l'Esperance MAGUY de Dapaong, constitue une solution majeure qui leur permet d'accéder aux soins adéquats dans cette structure de santé. Cette étude n'a pas pris en compte les aspects institutionnels relatifs à la politique de santé dans le milieu d'étude et leur influence sur la distribution des offres de santé mais plutôt elle s'appuie sur la disponibilité du personnel soignant et les processus de prise en charge des patients pour assurer des meilleurs soins de santé. La prise en charge des malades du VIH/sida fait office de centre d'intérêt de cette approche. Au Togo, l'incidence de pauvreté reste toujours un frein au développement malgré les efforts consentis par le gouvernement. Au cours des dix dernières années, le gouvernement a mis l'accent sur les réformes dans les secteurs sociaux tels que l'éducation, la santé, la nutrition et la lutte contre le VIH/Sida.

La prise en compte de ces suggestions permettra au niveau de l'Etat d'améliorer l'accès aux soins de santé des plus démunis. Il convient aussi aux partenaires techniques et financiers de faire un suivi au niveau des communautés pour vérifier la concrétisation des aides apportées aux associations et aux centres de prise en charges des personnes infectées.

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# *The Application of E-learning in English Teaching at Dong Nai Technology University*

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**Abstract** – Many colleges and universities in Vietnam have employed e-learning platforms in teaching English with the hope to better students' English proficiency. Recently, e-learning programs such as DNTU-LMS and Canvas have been implemented at Dong Nai Technology University. With their features of flexibility and efficiency, they have been being used as crucial tools for teaching and learning in various faculties in the university especially during the widespread of Covid-19 pandemic. The present study aimed at identifying the views of the EFL learners from Faculty of Foreign Languages on the application of e-learning platform. A group of 100 EFL students was chosen randomly to participate in this study. Data was collected using questionnaire. After analyzing student's responses, the results proved that the introduction of e-learning was effective. E-learning also stimulates students to learn English and brings them comfort and joy.

**Keywords** – English language, teaching and learning, E-learning, EFL setting, learners' views.

## I. INTRODUCTION

In a world of rapid change, students are required to prepare themselves to keep track with the fast development of technology that helps them live, study and work more effectively. Needless to say, technology has been making education much closer to every students than ever before. Due to the advantages of using modern technology in education, most universities in Vietnam have deployed teaching and learning via computer and Internet. After a long time conducting research, Dong Nai Technology University has started applying e-learning program since the beginning of 2018 in Faculty of Foreign Languages as well as other faculties in the university.

Many language teachers have recommended using e-learning systems to teach English thanks to the benefits they bring. According to [1], e-learning is one of the modern methods which contributes in expanding educational opportunities and makes the teaching and learning process more effective. Obviously, e-learning is flexible because students are able to manage their study depending on their own schedules. The increasing application of e-learning is also based on findings of some studies that indicate the effectiveness of e-learning comparing to traditional methods. Studying through e-learning, students can increase high level of learning achievement and higher-order thinking abilities because they engage to the learning process actively anytime and anywhere [2]. In addition, [3] stated that e-learning supports both teachers and learners with useful and available resources to gain knowledge easily.

To keep up with the trend of teaching via e-learning, Dong Nai Technology has applied two versions of e-learning platforms for students. The first one is DNTU-LMS which has been established and implemented successfully since 2018 for online teaching. Later, students are taught through a modern e-learning platform called Canvas. From the researcher's experience of using e-learning

programs mentioned above in teaching English, he believe that the learners can take advantages of lectures through e-learning system. Therefore, the research was conducted to explore how students majoring in English react to e-learning program at Dong Nai Technology University. This study examines the following research question: What are students' views on the application of e-learning?

### II. LITERATURE REVIEW

Referring to innovation in education, it would be a mistake not to mention the utilization of e-learning programs to English teaching in particular and other subjects in general. The application of e-learning has received a lot of attention due to the advances of technology and computer science. It has been presented as an effective aid in the learning process in many universities around the world. Undeniably, e-learning has proved its superior characteristics of convenience and easy accessibility which makes most schools invest financially and intellectually to adopt e-learning in teaching.

Many researchers have defined the term e-learning in their studies. First of all, [4] considered it as “the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration”. Equivalently, [5] defined it as a medium of computer technology that could be utilized to develop the application of learning and teaching. Similarly, e-learning was defined by [6] as “any learning that involves using internet or intranet.” Besides, [7] pointed out that “the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance” was e-learning. It is apparent that the growth of e-learning is associated with the advance in technology, computer science, and internet.

According to [8] “e” in e-learning should not stand for electronic; it should be an abbreviation for “evolving, enhanced, everywhere, every time and everybody.” Obviously, these qualities are considered as the advantages of e-learning. The positive effects of e-learning in education were also mentioned in many studies. [9] claimed that using e-learning is advantageous in terms of cost effectiveness; cost efficiency, easiness of learning; long life education; saving on the part of the student and teacher; less geographical barriers; greater flexibility; and better administration. Likewise, [10] classified several usefulness of e-learning including sharing ideas easily, promoting learner-centred teaching approaches, enhancing the availability of learning materials, and being helpful for instructors. On the evidence of mentioned insights, the application of e-learning results in numerous effectiveness.

In English teaching and learning, a number of researches have been done to investigate how e-learning platforms develop student's English competences. [11] looked into the effect of e-learning on EFL learners' writing achievement. It is revealed that the use of multiple technologies in teaching writing skill assisted students with diverse studying styles, abilities and interests. Students also had opportunities to practice more types writing at the same time. Moreover, [12] created a helpful pattern that encourage teachers to implement the e-learning mode. He also evaluated the effectiveness of e-learning in teaching English in Thailand. The results illustrated that in light of e-learning, English courses meet the diversity of both teachers and students. A year later, [13] studied the use and value of exploiting e-learning to teach English. He found that the distinctions of e-learning were accessing to information easily, improving learners' comprehension skills, and encouraging students to master English. Similar findings were reported in English teaching context. [3] demonstrated the effectiveness of e-learning. He stated that e-learning provides students suitable materials to enhance basic English skills (reading, writing, speaking, listening) and its components (grammar and vocabulary).

Despite the positive outcomes of applying e-learning in education, many researchers also concern about its negative impacts. One of the barriers of e-learning were the limitation of face to face interaction [14]. Other disadvantages were categorized by [15] like high production cost; demanding skills; expense condition; and negligible social interaction. The most important problem in e-learning is the low level of students' participation. According to [16] high dropout ratio is one of the difficulties that teachers face while teaching. Also, [17] revealed that the distance between instructors and learners limits the communication and discourages students from participating persistently and continuously in online learning. Additionally, [18] claimed that students distance reduces the interaction between learners and teachers, so students tend to enroll less in e-learning courses. Furthermore, instructors cope with the learners autonomy problems. While many language teachers argue that students become less dependent on teachers and more involved in different kinds of learning opportunities, others believe that many students do not take enough responsible for their own learning. Clearly, there are still unavoidable shortcomings when applying e-learning in teaching.

### III. METHODOLOGY

#### Data collection tool

The present study used questionnaire to collect quantitative data from the participants. In this study, questionnaire which consists of 8 closed-ended Likert scale statements was designed and delivered to all participants in the third semester in the academic year 2019-2020. This questionnaire had the partakers respond to each items in a five point Likert scale which descend the meaning respectively from strongly agree, agree, neutral, disagree to strongly disagree. This design is helpful to figure out students' reaction, attitude, and ideas towards the application of e-learning in previous terms.

#### Participants

The questionnaire was sent via email to 100 sophomore English majored students from Faculty of Foreign Languages at Dong Nai Technology University. Totally, there are 90 questionnaires were completed by participants and returned. Actually, 90% return rate was large enough to ensure the validity and reliability of the results of the study.

#### Data Analysis

After gathering and grouping information from questionnaire, all quantitative data was analyzed using Microsoft Excel Program in which the responses of participants were displayed by graphs and tables.

### IV. RESULTS AND DISCUSSION

Participants were asked to appraise whether they enjoy the utilization of e-learning in the first question. It can be seen clearly in the below pie chart that the majority of the students revealed their agreement including 38.9% of strong agreement and 45.5% of agreement. It is true that they are fond of the use of e-learning when learning English. On the other hand, only 6.7% of the students disagreed with this statement and 5.6% of the responses were strong disagreement. Although there was a small amount of neutral feedback (3.3%), these figures show that e-learning really attracts students in the learning process.

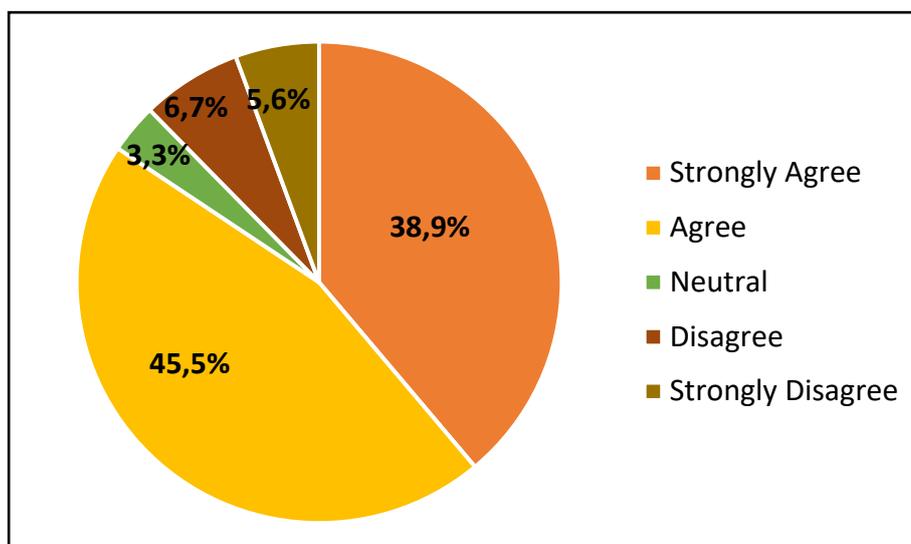


Figure 1. Student's interest about the application of e-learning

From the below bar graph, it is indicated that the high rate of the students agreed (40%) and strongly agreed (38.9%) with the idea "e-learning provides more learning experiences" in the second statement. This is no doubt that students have experienced a totally different type of learning environment in comparison to traditional teaching and learning approaches. In addition to appealing to English lessons as revealed in the above pie chart, students have countless new learning experiences with e-learning platform. Nevertheless, the total number of students expressed disagreement and strong disagreement was 10 out of 90 participants occupied 11.2%. Anyway, there are 9% of students showed their neutral opinion.

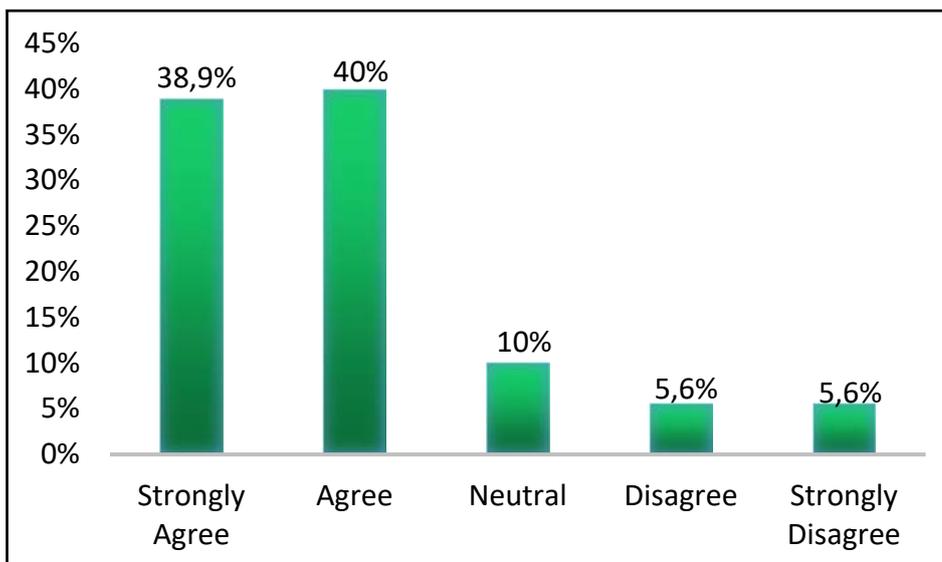


Figure 2. Students' learning experiences promotion

Moreover, the respondents showed their views about the enrollment in e-learning classes in the following semesters in the third questions. Overall, students had the tendency to take e-learning courses. This is understandable because most of the students agreed that they had many experiences while learning English via e-learning programs in question 2. While the percentage of students disagreed and strongly disagreed with the idea was low at 10% and 6.7% respectively, a relatively high proportion of responses were agreement including 42.1% of students agreed and 35.6% of students strongly agreed. This proves that the trend of teaching and learning through e-learning has met the learners' needs. In terms of neutral opinion, 5.6% of responses were collected.

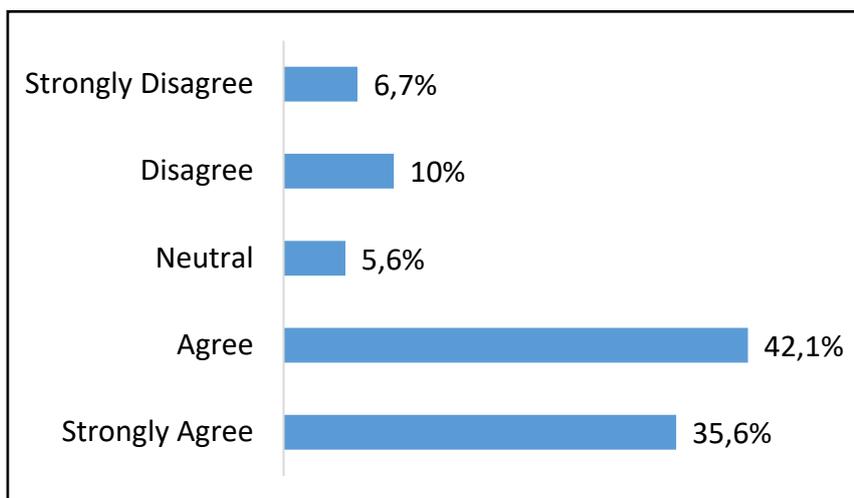


Figure 3. Students' views of enrollment in e-learning classes

The participants also rated their opinions about other features of e-learning. The following table demonstrates the findings of the students' responses.

Table 1. Students' opinions about other features of e-learning

E-learning makes English courses.....	SA	A	N	DA	SD
more effective	43.3%	35.6%	11.1%	5.6%	4.4%

less stressful and enjoyable	37.8%	45.5%	8.9%	7.8%	0%
a favorable option comparing to the classroom-based courses	30%	38.9%	15.6%	8.8%	6.7%

Table 1 presents students’ perspectives on applying e-learning in English teaching. It is clear that high percentage of students’ responses showed agreement. Nearly 80% of the students agreed (43.3% strongly agreed and 35.6 % agreed) that e-learning makes English courses more effective. Only 10% of them disagreed while 11.1% of the respondents were in the middle. Besides, 83.3% of students (37.8% strongly agreed and 45.5 % agreed) thought that e-learning made them more comfortable and enjoyable while learning. When we compare this figure with the number of students disagreed and disinterested, we see a huge gap (83.3%, 7.8% and 8.9% respectively). Consequently, most students (62 out of 90 responses) admitted that e-learning platform was a favorable choice for English teaching and learning. However, 15.6% of students didn’t take any sides, and totally 15.5% of students disagreed. Based on the percentages above, we can see that the students’ responses about applying e-learning are good. Therefore, the researcher believed that the application of e-learning can enhance students’ motivation and sense of achievement as well as opportunities to learn.

Furthermore, students were asked to compare e-learning and traditional learning methods in terms of efficiency. The plurality of the students did not think e-learning was not as efficient as long-established learning approaches. It can be seen from the chart that 75.5% of the respondents reacted disagreement with the idea while only 12.3% of students agreed. This indicated that from students’ point of view, e-learning brought the certain benefits to most students which impact their learning outcomes positively. Actually, there were 12.2% of students were unbiased.

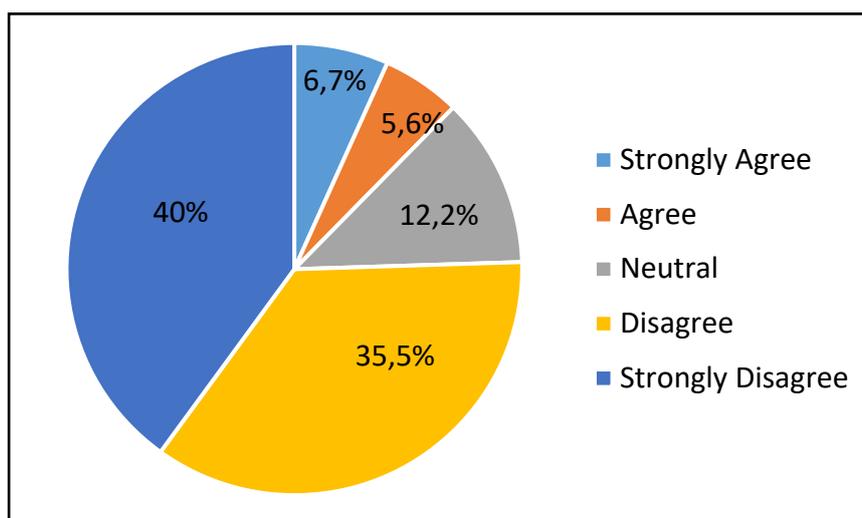


Figure 4. Students’ views about e-learning and traditional learning methods

Also, in the final question, students responded to the idea about whether applying e-learning was a waste of time. Generally, most of the students realized how advantageous e-learning were for their learning, it was not surprising that 76.5% of them disagreed that applying e-learning was not a waste of time. In fact, what you see as the advantages will bring your positive attitude. Obviously, if students have a favorable attitude towards e-learning, there will be greater possibility that more students will agree to take this new learning system.

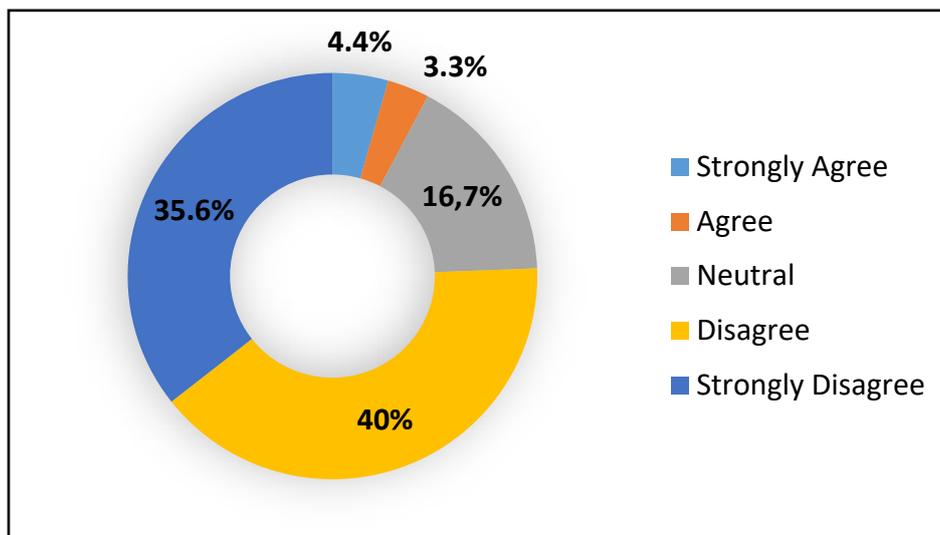


Figure 5. Students' view about e-learning is a waste of time

In a nutshell, integrating e-learning platform in English instruction was found to be a beneficial tool for EFL learners. Its results showed that e-learning can enhance students' inspiration and provide a less stressful educational atmosphere. The use of e-learning from home is strongly recommended. However, it can be difficult to maintain students' engagement to e-learning courses due to the lack of direct interaction between the students and instructors. Thus, teachers need to change pedagogical strategies to keep students motivated. Liu (2015) clarified that the greater students' motivation were, the higher level of autonomy students were able to achieve. Most importantly, instructors should be trained to develop and use e-learning programs more successfully. Besides, the school administrators have to regularly check and evaluate the efficiency of e-learning to promptly detect and resolve the obstacles. In addition, students need to be instructed under the direct supervision of the teachers so that students' ability can be assessed accurately. Simultaneously, teachers can give helpful guidance whenever students need. In short, it emphasizes the important role of teachers in students' progress.

## V. CONCLUSION

In 21<sup>st</sup> century, it is significant to use modern e-learning instruments to improve English language teaching methods. This research has described some essential findings of e-learning in EFL setting at Dong Nai Technology University. From the information obtained, e-learning is a powerful platform for teaching English for it is regarded by EFL learners as effective, comfortable, enjoyable and favorable tackle. However, to manipulate e-learning successfully and to maximize its effectiveness, teachers need better planning, flexibility as well as prompt feedback during teaching procedure.

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# *Application De La Démarche Expérimentale Dans L'apprentissage*

## *[Application Of The Experimental Approach In Learning]*

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**Résumé** – La réalisation des objectifs tracés dans une démarche expérimentale demande la mise en place d'une phase d'induction, qui consiste en un espace ouvert offrant l'occasion aux apprenants d'énoncer leurs hypothèses tout en choisissant collectivement une seule et quelques variables, une procédure déductive vient en second ordre. Cependant, l'adoption d'une telle démarche se trouve confrontée aux difficultés des apprenants à énoncer des hypothèses cohérentes avec des données théoriques. L'absence d'esprit critique chez les apprenants ainsi que leur incapacité à interpréter des résultats expérimentaux posent également problème dans cette pratique enseignante. Il est important de noter que la méthode expérimentale ne doit pas se limiter à des manipulations et à l'analyse des résultats par les apprenants.

**Mots clés** – Démarche scientifique, Enseignement SVT, Expérimentation en sciences.

**Abstract** – Achieving the objectives outlined in an experimental process requires the establishment of an induction phase, which consists of an open space offering the opportunity for learners to state their hypotheses while collectively choosing one and a few variables, a deductive procedure comes second. However, adopting such an approach faces difficulties for learners to formulate hypotheses consistent with theoretical data. Lack of critical thinking in learners as well as their inability to interpret experimental results is also a problem in this teaching practice. It is important to note that the experimental method should not be limited to manipulation and analysis of the results by the learners.

**Keywords** – Scientific approach, SVT education, Science experimentation.

### I. INTRODUCTION

Dans ce contexte, la démarche expérimentale occupe une place centrale dans l'enseignement des Sciences de la Vie et de la Terre (SVT) et elle est de plus en plus recommandée (Coquidé, 1998 ; Galiana, 1999 ; Coquidé, 2000 ; 2003). Cette pratique enseignante est caractérisée, au niveau méthodologique, par un ensemble d'étapes bien identifiées et ordonnées dans le temps ((Bachelard, 1938 ; Giordan, 1978 ; Lika, 1999). En effet, l'Observation, l'Hypothèse, l'Expérimentation, les Résultats, l'Interprétation et la Conclusion (OHERIC) constituent ensemble la démarche expérimentale.

Dans le courant actuel des recherches sur les apprentissages, les conceptions des apprenants commencent à faire l'objet d'une attention particulière. La présente étude s'inscrit dans cette perspective.

L'être humain naît, puis se développe jour après jour. Il acquiert des mouvements qui lui permettent de marcher, des sons qui

lui permettent de parler et de développer son intelligence.

De sa naissance jusqu'au dernier jour de sa vie, la personne utilisera ses capacités intellectuelles pour être fonctionnelle dans ses différentes activités. C'est par son développement intellectuel qu'elle pourra apprendre de nouvelles choses, mais apprendre, selon De Vecchi et Giordan, 1989, ce n'est pas seulement accumuler un ensemble de connaissances, mais bien mettre des concepts en relation pour construire son savoir.

Dans notre travail de recherche, nous avons dirigé notre travail vers les sciences que l'on enseigne au collège et, plus précisément, vers les sciences de la vie et de la terre (SVT). Notre expérience d'enseignement et les lectures que nous avons effectuées nous permettent d'affirmer avant même de débiter notre travail, que les élèves possèdent beaucoup de conceptions erronées par rapport aux disciplines scientifiques

Notre travail de recherche est porté sur le rôle de la démarche expérimentale dans l'apprentissage de la science expérimentale (sciences SVT dans notre cas), dont l'objectif spécifique de notre recherche est:

Le rôle de la démarche expérimentale dans l'apprentissage des sciences SVT.

Nous avons utilisé un questionnaire adressé aux professeurs de la science physique du collège (praticiens), et aux professeurs stagiaires de SVT au CRMEF de Rabat-Salé-Kénitra, qui nous servira à faire des tests statistiques pour démontrer l'importance et l'apport de la démarche expérimentale dans l'apprentissage des élèves.

### II. PROBLÉMATIQUE

Pour notre part, l'enseignement des sciences SVT est primordial, et nous avons alors posé plusieurs questions :

"De quelle manière doit-on utiliser la démarche scientifique expérimentale pour faire évoluer les conceptions des élèves?" "Comment les enseignants doivent-ils s'y prendre?" D'où ma problématique: La démarche expérimentale et les représentations des élèves en sciences SVT. Quels apports et quels liens.

### III. METHODOLOGIE

La méthodologie utilisée pour cette recherche s'inscrit dans le sens de la collecte de données par l'utilisation de questionnaire adressé aux professeurs exerçant en classe de lycée et du Collège de la ministère de l'éducation national-délégation Kénitra (2013-2014).

Voici donc, les cinq (05) questions telles que présentées dans le questionnaire.

1. La démarche expérimentale permet-elle aux élèves de confronter leurs connaissances à celles d'autres élèves?
2. La démarche expérimentale permet-elle de découvrir des connaissances ?
3. La démarche expérimentale facilite-elle l'apprentissage des leçons?
4. La démarche expérimentale permet-elle de mieux se souvenir des notions abordées ?
5. La démarche expérimentale permet-elle aux élèves d'être plus actifs dans le cours?

Les questions ci-dessus sont orientées vers les apports de l'application de la démarche expérimentale dans l'apprentissage.

#### Population choisie

Pour les fins de cette recherche, nous avons utilisé la population professeurs de la science SVT de lycée, du collège du ministère de l'éducation national-délégation Kénitra, pour l'année scolaire 2013-2014.

Cette population regroupe environ 70 professeurs. Pour notre échantillon, environ 50 questionnaires qui sont récupérés.

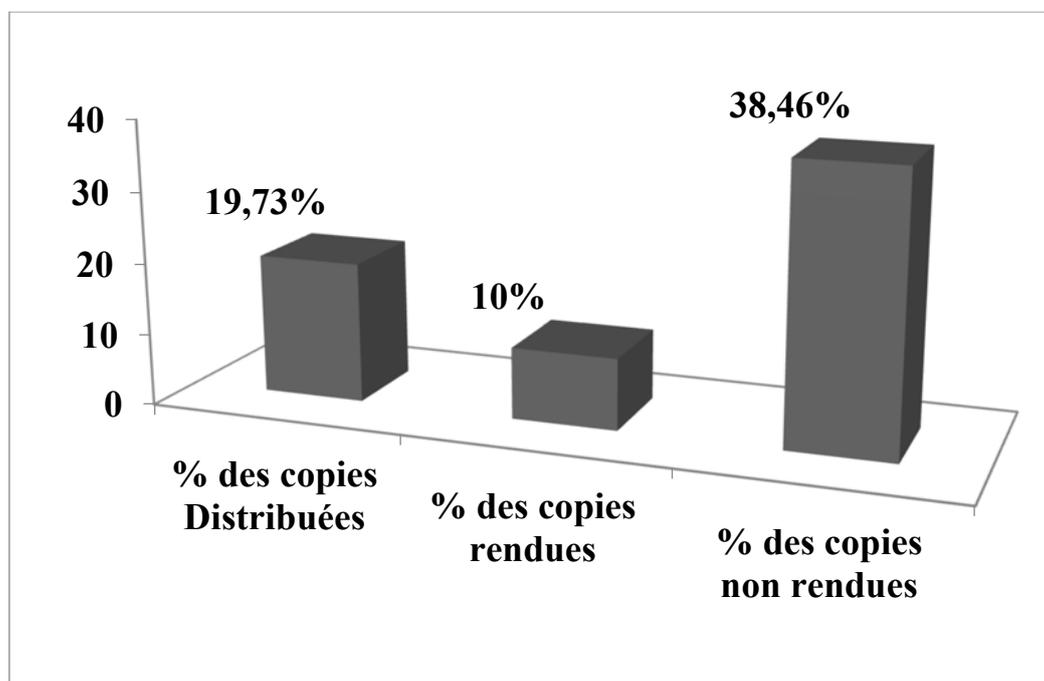


Fig.1 : Pourcentage des copies distribuées, rendues et non rendues des professeurs de lycée.

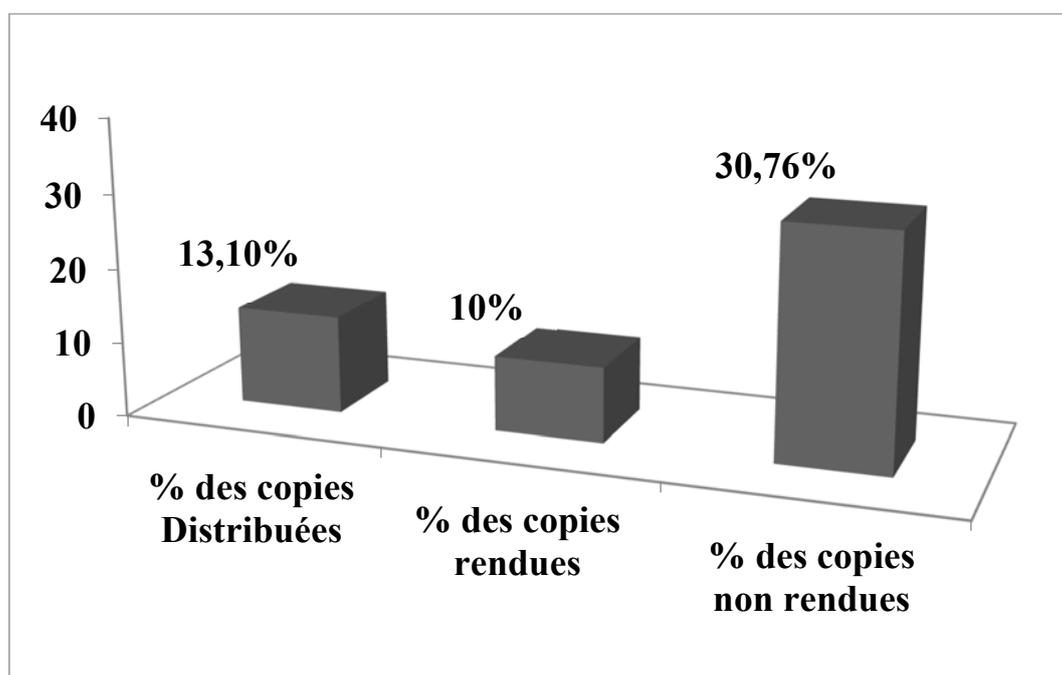


Fig.2 : Pourcentage des copies distribuées, rendues et non rendues des professeurs du collège.

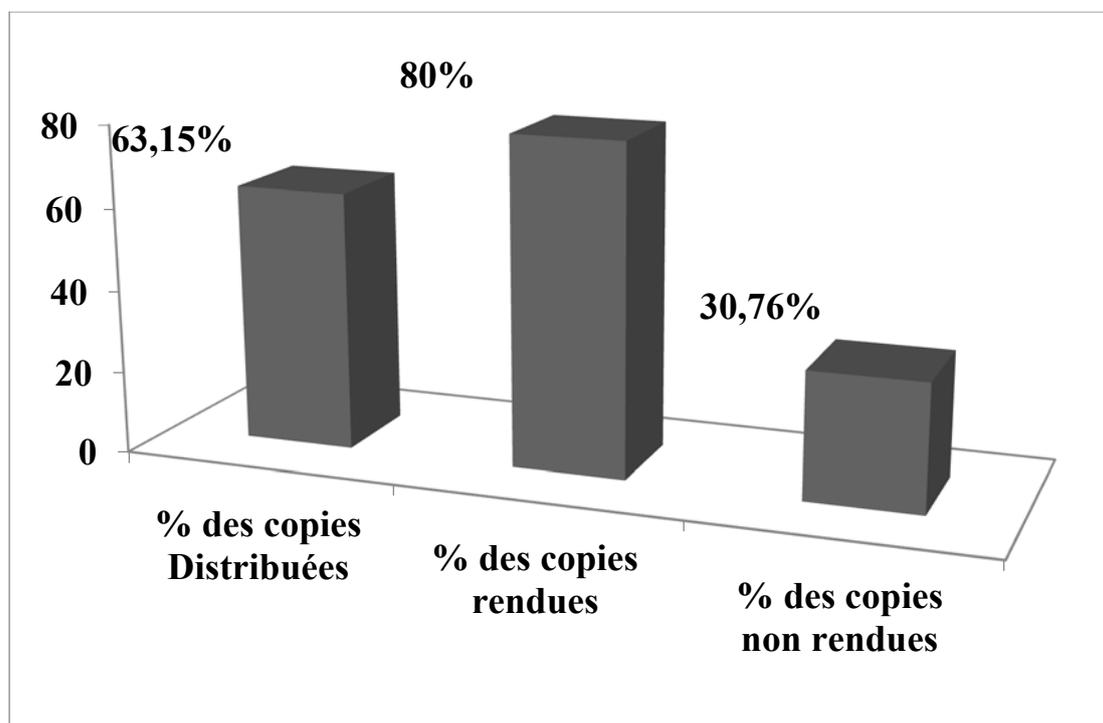


Fig.3 : Pourcentage des copies distribuées, rendues et non rendues des professeurs stagiaires.

#### IV. RESULTATS

❖ Réponses des professeurs exerçant en classe sur les questions:

1. La démarche expérimentale permet-elle aux élèves de confronter leurs connaissances à celles d'autres élèves?

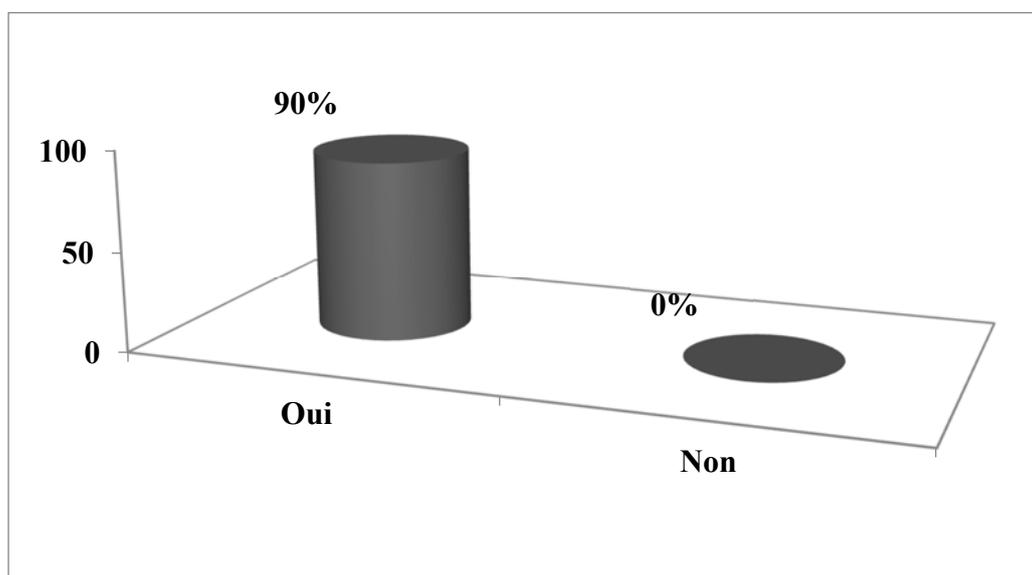


Fig.4 : Réponses des professeurs exerçant en classe sur la question N°1.

2. La démarche expérimentale permet-elle de découvrir des connaissances ?

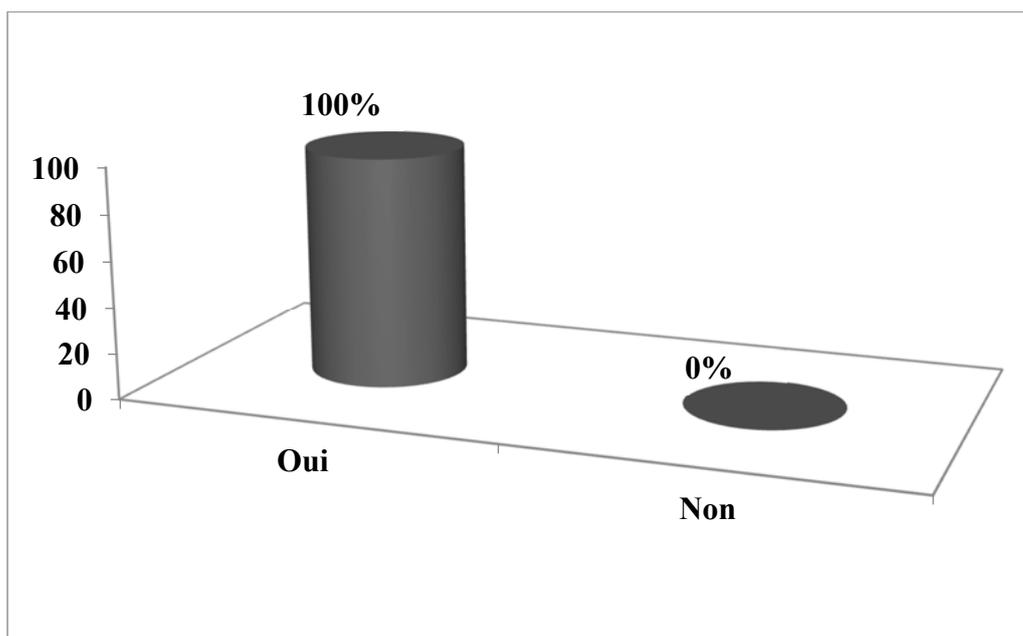


Fig.5 : Réponses des professeurs exerçant en classe sur la question N°2.

3. La démarche expérimentale facilite-elle l'apprentissage des leçons?

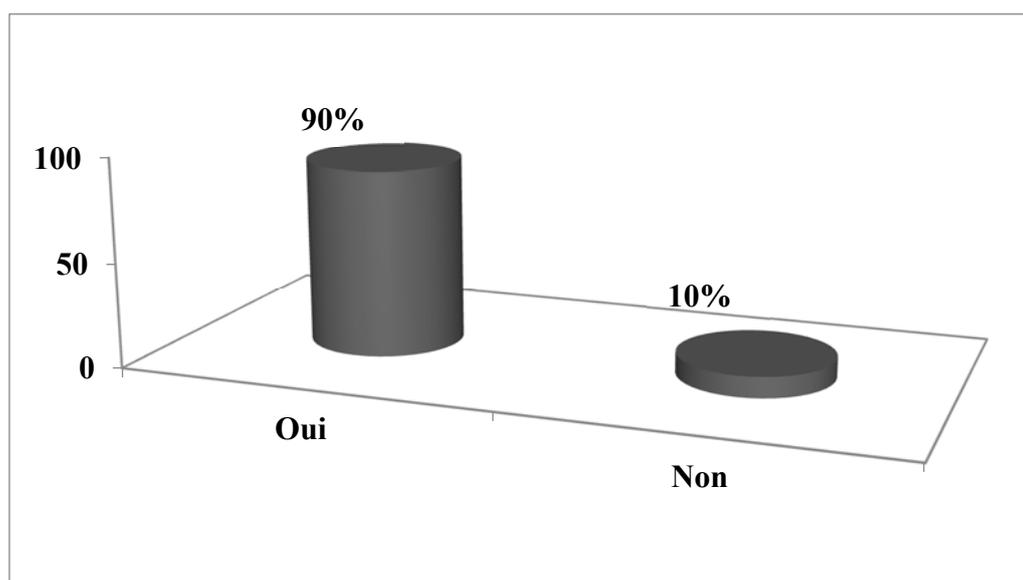


Fig.6 : Réponses des professeurs exerçant en classe sur la question N°3.

4. La démarche expérimentale permet-elle de mieux se souvenir des notions abordées ?

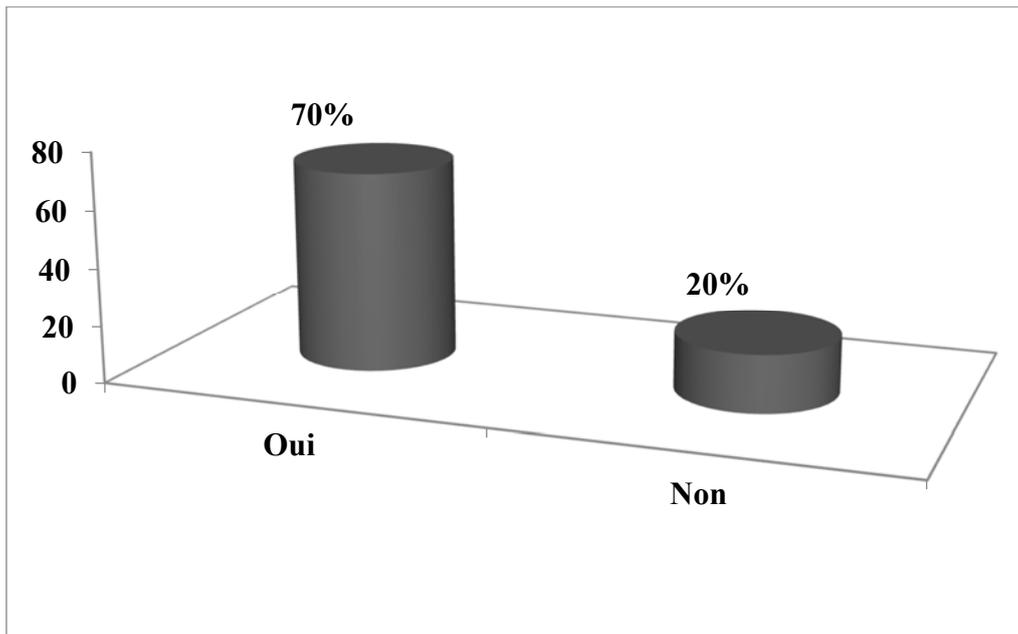


Fig.7 : Réponses des professeurs exerçant en classe sur la question N°4

5. La démarche expérimentale permet-elle aux élèves d'être plus actifs dans le cours?

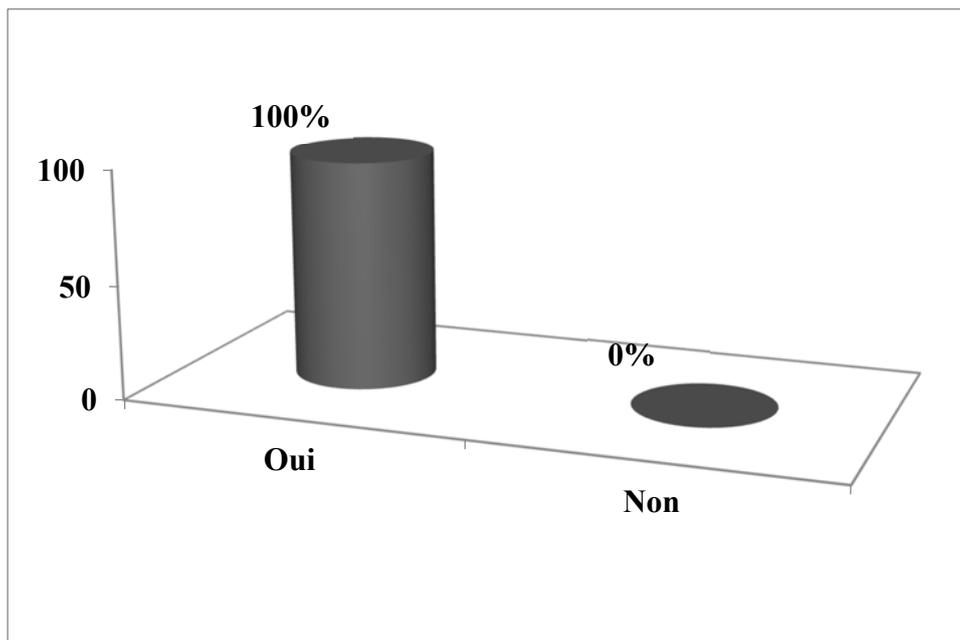


Fig.8 : Réponses des professeurs exerçant en classe sur la question N°5.

## V. DISCUSSION

En analysant les questions n°1 et n°2, on remarque qu'elles tournent autour du rôle de la démarche expérimentale dans la construction de l'apprentissage.

En traitant les résultats issus de mon questionnaire, après avoir calculer la moyenne des pourcentages des réponses (%Oui,

%Non) des professeurs exerçant en classe on trouve:

90% à 100% des professeurs exerçant en classe ont montré l'intérêt de la démarche expérimentale à faire émerger les conceptions des élèves, de les analyser puis de les utiliser en les confrontant pour les faire évoluer et construire chez les élèves un savoir scientifique.

Alors que la majorité des professeurs affirment que la démarche expérimentale permet de mettre à l'épreuve la construction des savoirs chez les apprenants.

D'après les résultats obtenus pour la question n°3, la majorité des professeurs exerçant en classe affirment que les élèves ressentent une plus grande facilité à apprendre un cours ainsi élaboré.

La raison la plus généralement invoquée est la « découpe » du cours : structuré, élaboré selon un processus d'investigation, il apparaît sur le cahier comme le compte-rendu du cheminement intellectuel et naturel effectué en classe. La leçon présente de ce fait une trame sans doute plus accessible, permettant à l'élève de mieux associer les différentes phases d'activité à la question initiale et à la conclusion à retenir.

Pour la question n°4, les professeurs estiment que pour les élèves la plus grande facilité à se souvenir du cours est le plus important bénéfice de la démarche expérimentale. L'explication qu'ils apportent est la même que précédemment : le découpage du cours, l'investigation, menée personnellement jusqu'au savoir. Les élèves s'approprient la construction de leurs connaissances et il est donc beaucoup plus aisé de se les remémorer par la suite.

En effet, ceux-ci disent avoir déjà réfléchi en cours et éprouvé leurs hypothèses, ce qui leur permet de se souvenir facilement des notions vues.

Finalement, s'ils se souviennent davantage, c'est sans aucun doute qu'ils se sont davantage investis dans le cours (et qu'ils ont à ce moment-là compris la plupart des notions traitées).

La trame hypothèse / protocole / mesures, observations/ conclusion est également toujours conservée et écrite, ce qui structure davantage le cours et facilite sa mémorisation.

La Totalité des professeurs dans la question n°4 pensent que cette forme d'enseignement permet d'être plus actif en cours. Ce résultat peut paraître surprenant car les élèves sont dans cette conception expérimentale du cours davantage acteurs, la connaissance n'étant plus assénée mais construite.

En fait sans doute la différence entre un cours de sciences plus « traditionnel », mais intégrant tout de même une part importante d'expérimentation, et un cours bâti selon une démarche expérimentale repose sur cette phase d'élaboration du raisonnement qui précède l'expérimental.

S'ils sont donc amenés à davantage réfléchir, les élèves n'ont toutefois pas la sensation d'être concrètement plus actifs.

## VI. CONCLUSION

Dans ce travail, Il est intéressant de poursuivre l'étude des apports à long terme de la pratique d'une démarche scientifique expérimentale : les élèves ont-ils assimilé le processus de raisonnement, sauront-ils s'en resservir, cela leur est-il apparu comme une méthode de travail nouvelle à utiliser ? Notamment est-ce que cet outil mis en place par tous les professeurs de sciences SVT ?

Les résultats de ce travail montrent que les enseignants des SVT sont conscients de l'importance de la démarche expérimentale dans le transfert de savoir aux apprenants. Toutefois, ces derniers résumant cette pratique enseignante essentiellement à l'expérimentation, tout en négligeant les autres étapes de l'OHÉRIC. Une simple méconnaissance du déroulement de la démarche expérimentale serait derrière ce résultat. Ceci étant, certains enseignants ont rapporté que la mise en œuvre d'une telle démarche dans l'enseignement des SVT pose problème. Un sur effectif des classes ou encore une surcharge des programmes seraient les raisons majeures.

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# *Représentations des Elèves et Elaboration d'une Démarche Expérimentale*

## *[Representations of Students and Development of an Experimental Approach]*

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**Résumé** – Ce travail présente les représentations des élèves et l'élaboration d'une démarche expérimentale par les enseignants des Sciences de la Vie et de la Terre (SVT) au collège. Les résultats que nous avons obtenus montrent que cette pratique enseignante est largement utilisée par ces derniers afin de résoudre un problème ou tester une hypothèse. Cependant, les enseignants résumant la démarche expérimentale essentiellement à l'expérimentation et ses liens avec les représentations des élèves, et sur son utilisation en tant qu'outil facilitant l'apprentissage. Nous nous sommes également intéressés aux difficultés qu'ils s'opposent de cette démarche.

**Mots-Clés** – Démarche scientifique, Enseignement SVT, Expérimentation en sciences, Représentations.

**Abstract** – This work presents the representations of the students and the development of an experimental approach by the teachers of Life and Earth Sciences (SVT) at the college. The results we obtained show that this teaching practice is widely used by them to solve a problem or test a hypothesis. However, the teachers summarize the experimental approach essentially to experimentation and its links with student representations, and its use as a tool to facilitate learning. We were also interested in the difficulties they oppose in this process.

**Keywords** – Scientific approach, SVT teaching, Science experimentation, Representations.

### I. INTRODUCTION

La pratique expérimentale a reçu beaucoup d'attention dans les recherches didactiques et a réellement évolué en biologie, vers une valorisation de la démarche de résolution de problèmes (Orlandi, 1991; Coquidé, 1998; Girault, 2012). Cette méthode scientifique correspond ainsi à mettre davantage l'accent sur l'élaboration d'une problématique avec essai de résolution (Lhoste, 2006, 2007).

Il a été démontré par Driver, Guesne et Tiberghien (1985) que même après avoir subi un enseignement de qualité, c'est-à-dire un enseignement qui permet à l'élève d'acquérir des objectifs spécifiques pour lui permettre de comprendre des concepts. L'élève revient à ses propres conceptions aussitôt l'examen passé. Cela veut donc dire que pour tenter de faire disparaître ces conceptions, l'enseignant doit savoir ce sur quoi elles portent....

Pour pouvoir savoir sur quoi les conceptions des élèves portent. Je dois confronter ces conceptions au savoir réel. Pour ce faire, il doit y avoir des échanges entre élèves, entre l'élève et l'enseignant ainsi qu'entre la classe et l'enseignant. Plus il y aura d'échanges, plus grandes seront les chances pour l'enseignant de retrouver les mêmes conceptions chez différents élèves et ainsi pouvoir créer des ruptures épistémologiques chez les élèves afin de réorganiser la pensée de l'élève pour qu'il acquière la conception qui lui permettra de poursuivre son apprentissage avec le moins de difficulté possible.

Notre travail de recherche est porté sur l'intérêt pédagogique de la prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale.

### II. METHODOLOGIE

La méthodologie utilisée pour cette recherche s'inscrit dans le sens de la collecte de données par l'utilisation de questionnaire adressé aux professeurs stagiaires du Centre Régional des Métiers de l'Education et de la Formation (CRMEF) de Rabat-Salé-Kénitra (2014-2015) du collège et lycée.

Voici donc, les six (06) questions telles que présentées dans le questionnaire.

1. La démarche expérimentale permet-elle de mettre à l'épreuve les représentations des élèves?
2. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, a-t-elle un intérêt pédagogique ?
3. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, est-elle facultative?
4. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, ne sert-elle à rien ?
5. Prenez-vous en compte les représentations initiales de vos élèves pour l'élaboration d'une démarche expérimentale ?
6. Préférez-vous utiliser la démarche expérimentale pour enseigner les sciences SVT?

les questions ci-dessus sont orientées vers l'intérêt pédagogique de la prise en compte des représentations des élèves lors de l'élaboration d'une démarche expérimentale.

#### La population choisie

Pour les fins de cette recherche, nous avons utilisé la population professeurs stagiaire de physique du CRMEF Kenitra pour l'année scolaire 2014-2015.

Cette population regroupe environ 80 professeurs. Pour notre échantillon, environ 60 questionnaires qui sont récupérés.

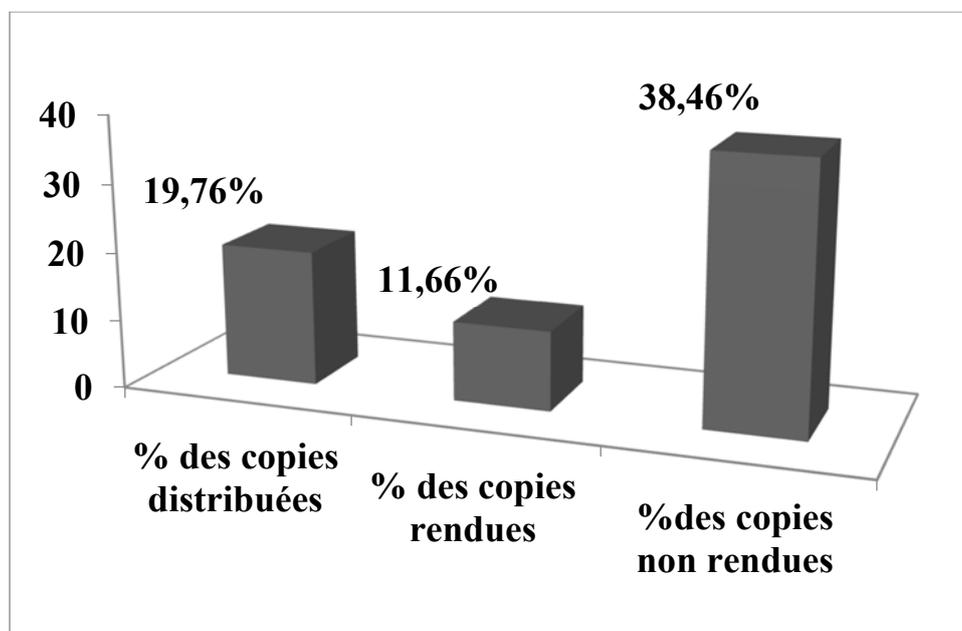


Fig.1 : Pourcentage des copies distribuées, rendues et non rendues des professeurs stagiaires de Lycée.

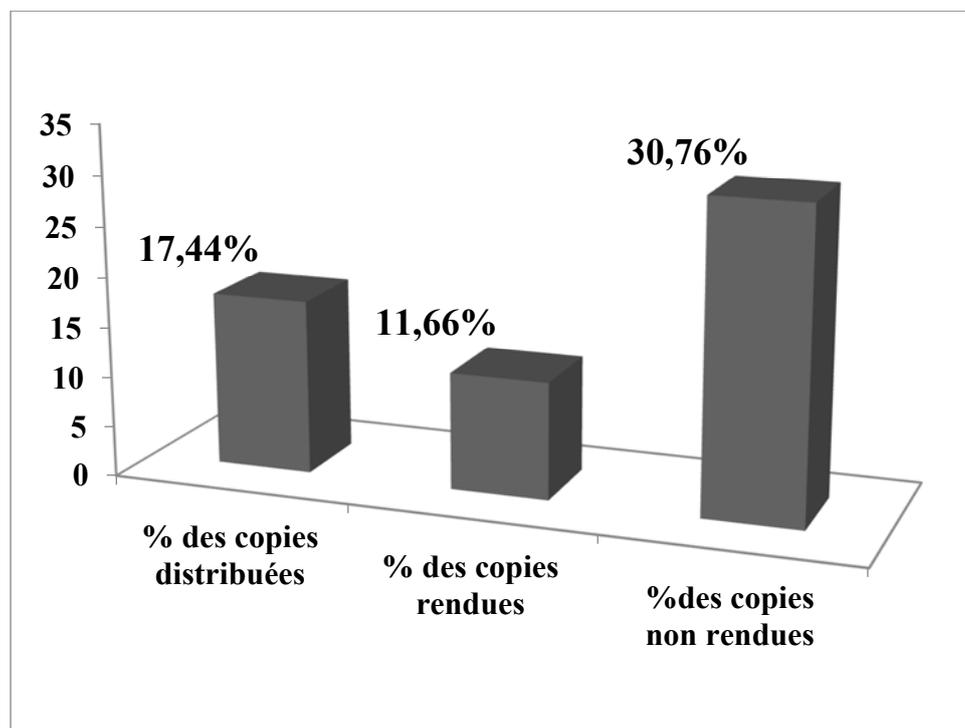


Fig.2 : Pourcentage des copies distribuées, rendues et non rendues des professeurs stagiaires de Collège.

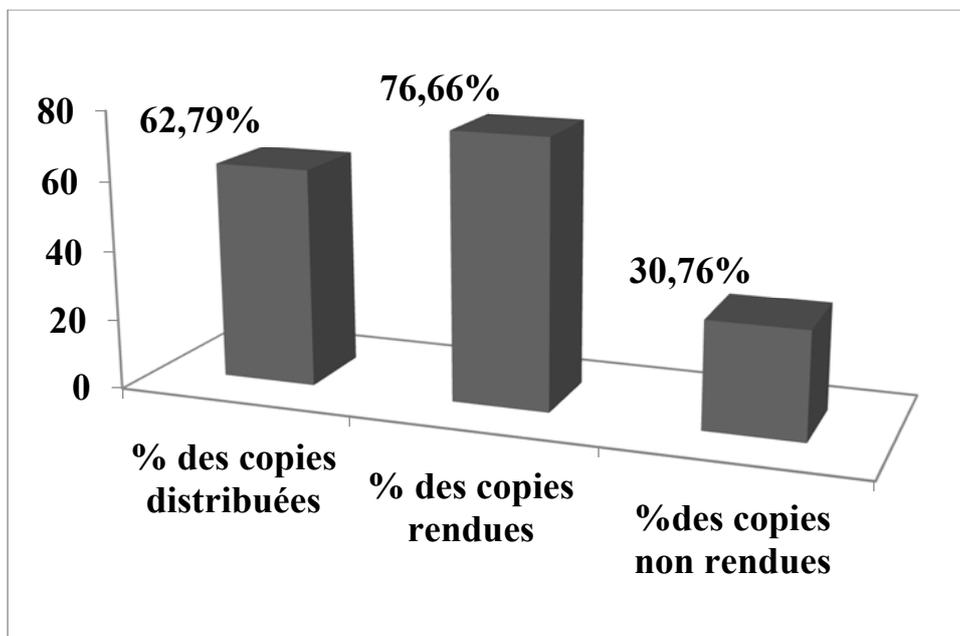


Fig.3 : Pourcentage des copies distribuées, rendues et non rendues des professeurs exerçants en classe.

### III. RESULTATS

❖ Réponses des professeurs stagiaires sur les questions :

1. La démarche expérimentale permet-elle de mettre à l'épreuve les représentations des élèves?

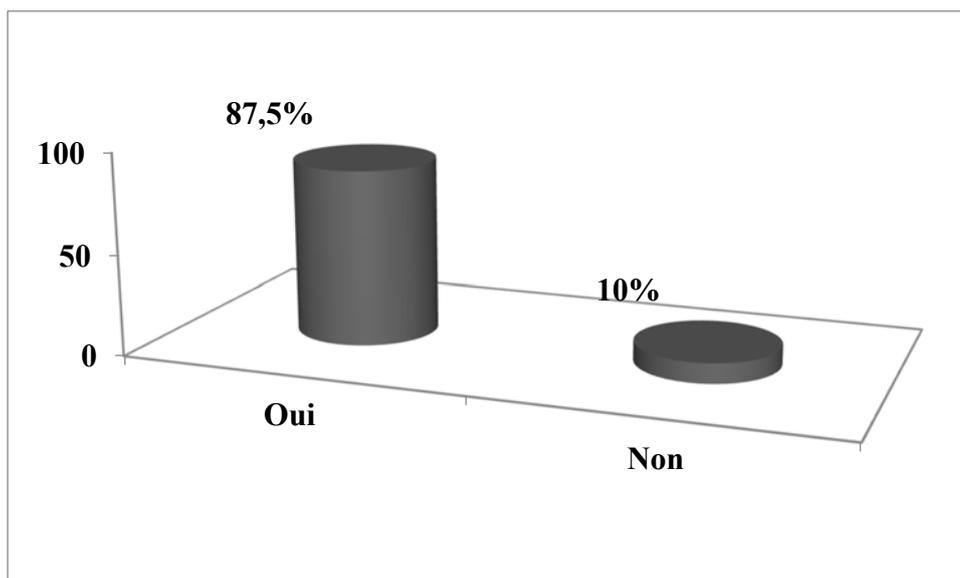


Fig.4 : Réponses des professeurs stagiaires sur la question N°1.

2. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, a-t-elle un intérêt pédagogique ?

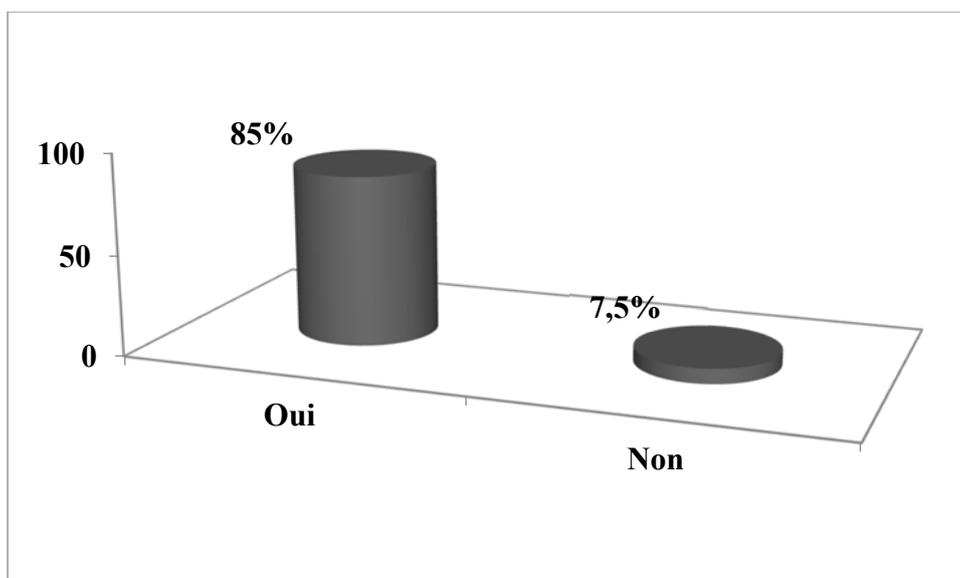


Fig.5 : Réponses des professeurs stagiaires sur la question N°2.

3. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, est-elle facultative?

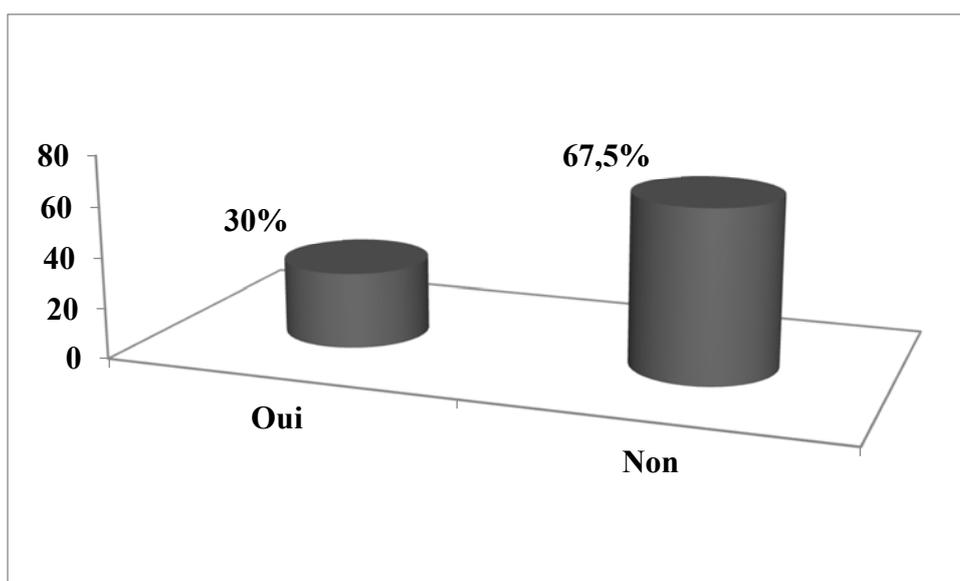


Fig.6 : Réponses des professeurs stagiaires sur la question N°3.

4. La prise en considération des représentations initiales des élèves lors de l'élaboration d'une démarche expérimentale, ne sert-elle à rien ?

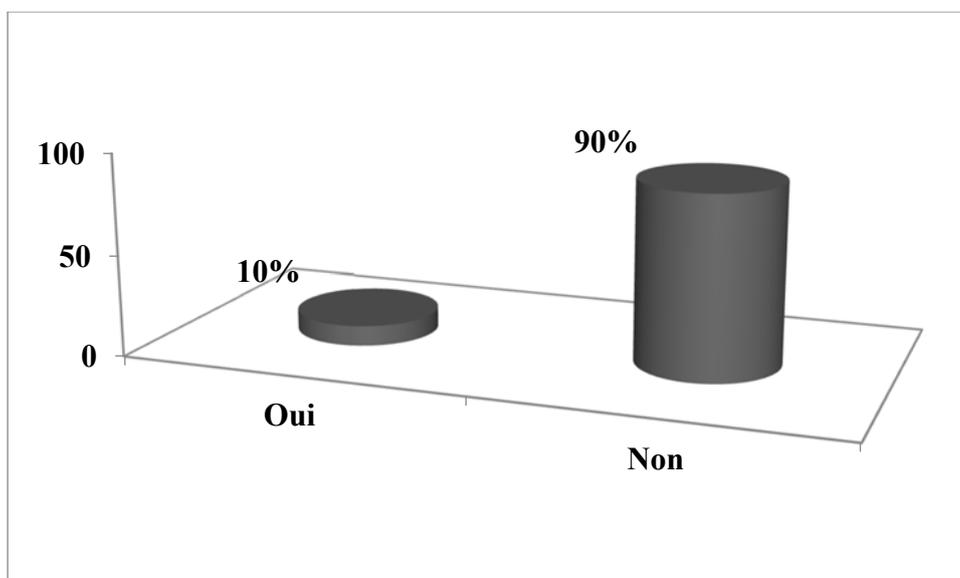


Fig.7 : Réponses des professeurs stagiaires sur la question N°4.

5. Prenez-vous en compte les représentations initiales de vos élèves pour l'élaboration d'une démarche expérimentale ?

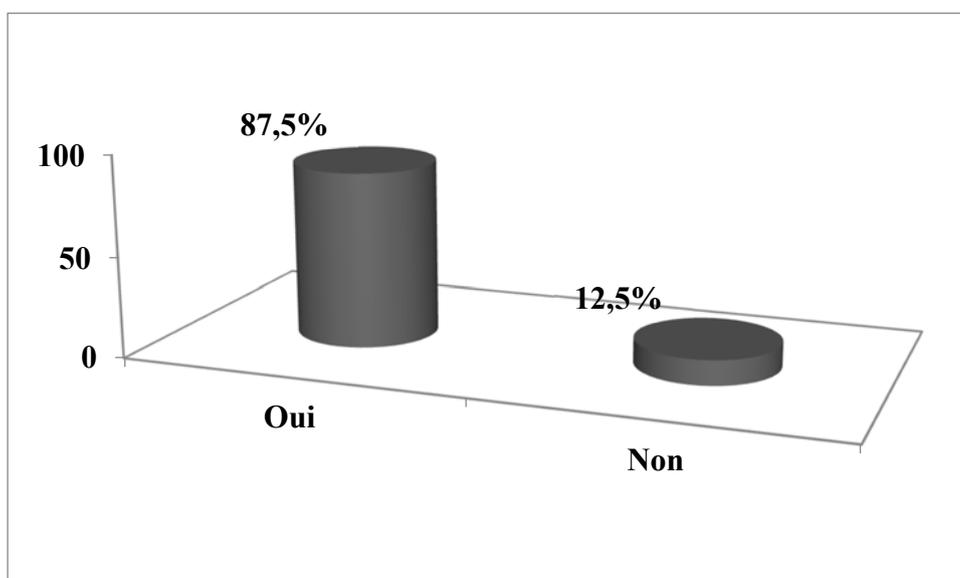


Fig.8 : Réponses des professeurs stagiaires sur la question N°5.

6. Préférez-vous utiliser la démarche expérimentale pour enseigner les sciences SVT?

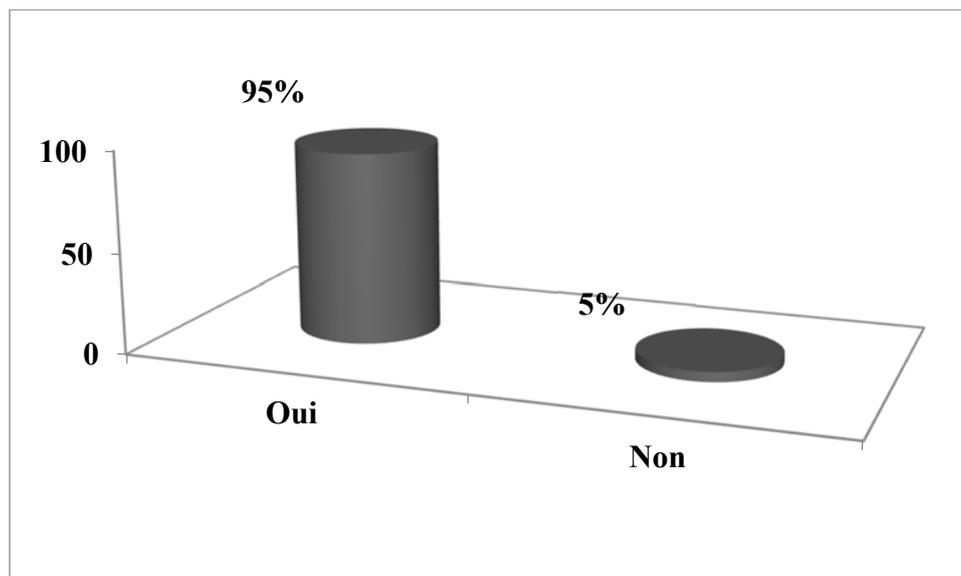


Fig.9 : Réponses des professeurs stagiaires sur la question N°6.

#### IV. DISCUSSION

En analysant la question n°1, on remarque qu'elle tourne autour du rôle de la démarche expérimentale dans la construction de l'apprentissage.

En traitant les résultats issus de mon questionnaire, après avoir calculer la moyenne des pourcentages des réponses (%Oui, %Non) des professeurs stagiaires on trouve :

85% à 95% de professeurs stagiaires PEC ont montré l'intérêt de la démarche expérimentale à faire émerger les conceptions des élèves, de les analyser puis de les utiliser en les confrontant pour les faire évoluer et construire chez les élèves un savoir scientifique. De revanche, on peut interpréter les 10% qu'ont répondu par « Non » à leurs expériences courtes dans le l'enseignement.

Alors que la majorité des professeurs stagiaires affirment que la démarche expérimentale permet de mettre à l'épreuve les représentations des élèves.

Les 3 questions n°2, 3 et 4 traitent l'importance pédagogique de la prise en compte des représentations initiales des élèves lors d'élaboration de la démarche expérimentale :

La réponse à la question n°2 était à 90% positive, alors environ 25% pensent que c'est facultative, en revanche 95% des professeurs stagiaires de notre échantillons, leurs réponses étaient négatives sur le non importance de prise de représentations des élèves.

**\*ce que je constate.**

L'analyse des conceptions de l'apprenant à propos des travaux pratiques de SVT pourra aider l'enseignant à connaître les élèves à qui il s'adresse.

L'enseignant pourra aussi prendre en compte les obstacles sous-jacents et des possibilités de compréhension des élèves pendant la préparation de leurs activités expérimentales. Il prendra conscience du chemin qui reste à parcourir entre les conceptions des apprenants et les objectifs qu'il doit élaborer pour l'enseignement. Il construira ainsi les objectifs-obstacles sur lesquels repose l'apprentissage des concepts.

D'après les résultats obtenus pour la question n°5, la majorité des professeurs stagiaires tiennent en considération les représentations de leurs élèves et ce pour la même raison que celle évoquée ci-dessus.

Pour la question n°6 et sans exception les professeurs stagiaires préfèrent utiliser la démarche expérimentale pour enseigner la science physique car cette dernière quand elle est proposée par le professeur elle implique les élèves dans le processus de construction de leur savoir, en les obligeant de ce fait à s'investir davantage dans la notion étudiée : l'appropriation en est d'autant facilitée.

Les résultats issus du questionnaire-professeurs montrent que les hypothèses de recherche citées au début de ce travail sont infirmées. J'ai constaté que professeurs ayant une longue expérience dans l'enseignement (exerçant en classe) et ceux qui vont commencer leur boulot à l'entrée scolaire 2014/2015 pensent que la prise en considération des représentations initiales des élèves a un rôle primordiale dans la construction des savoirs conceptuels et des savoirs procéduraux, ainsi elle met en évidence les relations entre les conceptions et les stratégies pédagogiques, ce qui permettra une tendance vers un apprentissage authentique.

### V. CONCLUSION

Cette étude des apports de la démarche expérimentale et ses liens avec les représentations des élèves sur les apprentissages ont permis de rendre compte davantage des réels bénéfices sur l'enseignement des sciences SVT: une adhésion plus grande et une meilleure implication.

Cela également permis de prendre du recul par rapport à l'enseignement en collège et d'en saisir mieux les objectifs pédagogiques.

En effet l'enseignant doit donc, dans la mesure du possible utilisé les conceptions des élèves pour faire avancer l'apprentissage en sciences SVT.

Pour l'élève, il y aurait des retombées puisque ses apprentissages se feraient avec un meilleur système explicatif ce qui lui permettrait d'avoir des conceptions beaucoup plus précises et scientifiques des diverses notions qu'il devra apprendre tout au long de sa vie.

Il serait pourtant sans aucun doute souhaitable, pour la qualité de l'enseignement et pour lutter contre la désaffection des filières scientifiques, de rendre plus aisée l'élaboration de cours de sciences SVT à caractère expérimental.

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# *The Influence Of Delivery Of Female Labor (TKW) On Family Social Economic Life In Way Jepara Sub-District, Lampung Timur District In 2014 - 2017*

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**Abstract** – The phenomenon of the large number of Indonesian workers (TKI) shows that the problem of poverty is so chronic, the limited work space for women in Indonesia makes them prefer to work abroad on the assumption that they just want to get a job and earn more than what they receive in the country. alone. The research method used in this research is quantitative research methods. The population in this study is Way Jepara Subdistrict which has sent 3045 workers abroad from 2013 to 2017. Indonesian workers, especially women, can improve family life. Female workers who have returned home can improve their skills so that they can become independent businesses in the creative household handicraft business sector and can process agricultural products so that they can support their families and no longer work as Indonesian workers (TKI).

**Keywords** – *Female Labor; Socio-Economic Life; Creative Enterprises.*

## I. INTRODUCTION

One of the causes of poverty is the large number of unemployed in a country. In terms of the factors that occurred, there were actually two things that caused the increase in unemployment. First, the new workforce cannot be fully absorbed by the business world. Second, it is about termination of employment. The strategy that is considered suitable by the government and most people in an effort to reduce the number of unemployed is the placement of Indonesian Workers (TKI) abroad. The government's efforts, in addition to reducing unemployment, the placement of Indonesian workers abroad is also a source of foreign exchange income for the country, so that it plays an important role in the country's economy.

East Lampung Regency is one of the districts in Lampung Province with 24 Districts. East Lampung Regency is the regency that is included in the top 25 districts or cities that send workers abroad. East Lampung district is included in serial number 16 out of a total of 25 districts with the number of workers sent that is 6641 workers. In 2017, East Lampung district became the largest contributor to Indonesian workers (TKI) from Lampung who worked abroad with a total of 3,810 people. The destination countries for Indonesian workers are Malaysia, Singapore, Hong Kong, Saudi Arabia, Taiwan, United Arab Emirates, and Brunei Darussalam. This number is followed by Central Lampung with 1,646 and West Lampung 51. West coast is the smallest sending TKI with six person. (source: BNP2TKI Lampung in 2017).

## **II. LITERATURE REVIEW**

### **Definition of Labor**

Law Number 13 of 2003 concerning Manpower also provides an understanding of labor as contained in Article 1 point 2 that labor is anyone who is able to do work to produce goods and / or services both to meet their own needs and for the community. The definition of labor in Law Number 13 of 2003 concerning Manpower has enhanced the definition of labor in Law No. 14 of 1969 concerning Basic Provisions of Employment.

According to Dumairy (1997) who are classified as workers are residents who have an age within the working age limit. The purpose of choosing the age limit is so that the definition given as far as possible describes the true reality. Each country chooses a different age limit because the labor situation in each country is also different, so that the working age limit between countries is not the same. In Indonesia, the minimum age limit for workers is 15 (fifteen) years without a maximum limit.

According to Simanjuntak (1998), the workforce includes residents who are already or currently working, who are looking for work and who are doing other activities such as going to school and taking care of the household. Job seekers, attending school, and taking care of the household even though they are not working, are physically able and can work at any time.

The definition of labor as stated by Dr. Payaman Simanjuntak has a broader definition of workers or laborers. The definition of labor here includes labor or laborers who are involved in an employment relationship and workers who have not worked. Meanwhile, the definition of worker or laborer is everyone who works and receives wages or other forms of remuneration. In other words, workers or laborers are workers who are in an employment relationship.

Mulyadi (2003) states that workers are residents of working age (aged 15-64 years) or the number of residents in a country that can produce goods and services if there is demand for their labor and if they are willing to participate in these activities. Sukirno (2005: 6) in terms of expertise and education, labor is divided into three groups, namely:

- a. Manpower is workers who have no education or lack of education and do not have expertise in a job.
- b. Skilled workers are workers who have expertise from training or work experience.
- c. Educated workers are workers who have a fairly high education and are experts in certain fields of knowledge.

Manpower is a term that is synonymous with the term personnel, which includes workers. The laborers in question are those who work for individual businesses and are provided with work benefits on a daily or piece basis in accordance with the agreement of both parties, usually the employee benefits are given daily (Siswanto, 1989: 9). In addition, the definition of labor according to BPS (Central Statistics Agency) is one of the modes for the wheels of development to move. The number and composition of the workforce always changes along with the ongoing dynamics of the population. The imbalance between the number of labor force and available job vacancies causes social problems.

### **Rights and Obligations of Labor**

Rights and Obligations of Workers in the Scope of Law of the Republic of Indonesia Number 13 of 2003 concerning Manpower Consists of:

- a. Labor Rights Article 5 Every worker has equal opportunity without discrimination to get a job.

Article 6 Every worker has the right to receive equal treatment without discrimination from the employer.

Article 18 paragraph (1) Workers have the right to obtain job competence recognition after attending job training organized by government job training institutions, private job training institutions or workplace training.

Article 82 Female workers have the right to get a break for 1.5 (one and a half) months before the time to give birth to a child and 1.5 (one and a half) months after giving birth according to the calculation of the obstetrician or midwife. Article 84 Every worker who uses the right to rest time as referred to in Article 79 paragraph (2) letters b, c and d, Article 80 and Article 82 has the right to receive full wages.

Article 85 paragraph (1) Workers are not obliged to work on official holidays.

### **Obligations of Workers**

Article 102 paragraph (2) In carrying out industrial relations, workers and trade unions have the function of carrying out work in accordance with their obligations, maintaining order for the continuity of production, channeling aspirations in a democratic manner, developing skills and expertise as well as participating in advancing companies and fighting for the welfare of members and their families.

Article 140 paragraph (1) At least 7 (seven) working days prior to the strike, workers and workers' unions are obliged to notify the employer and the agency responsible for local manpower affairs in writing.

### **Female workers**

There is a guarantee as outlined in the 1945 Constitution Article 27 paragraph (2) which reads as follows: "Every citizen has the right to work and protection that is decent for humanity." Providing opportunities for all citizens to participate in development without discrimination, both men and women have the right to get jobs and get protection. discrimination to get a job. " The provisions of Article 5 open Law Number 13 Year 2003 concerning Manpower which states that labor is "Everyone who is capable of doing work to produce goods or services to meet the needs of himself or the community."

### **Family Concept**

The family is the smallest unit in society which consists of husband and wife, wife and children and father and child. To create a prosperous family is not easy for every family. A family is said to be prosperous if each member of the family carries out his function as a family member.

According to Ritonga (Djamarah, 2004), That the function of the family is directly related to the following aspects:

1. Economic function, for the survival of a family, the economic role of the family is very important. This is intended so that the primary and secondary needs of the family can be fulfilled according to the family's ability.
2. The function of socialization, in a family the role of socialization is very important, because through this process each individual can learn to interact with other relatives. This includes values, norms and customs.
3. Protection function, the family as a place of refuge, creating peace and comfort for children. Reproductive function, the family is the smallest institution in society that has a reproductive function, namely to continue and continue the family's offspring.

## **III. RESEARCH METHODS**

The research method that I use is quantitative research methods. The population in this study is the Way Jepara District that has sent 3045 workers abroad from 2013 to 2017 according to what will be studied. In determining the number of samples for this study, researchers used the Slovin formula, namely:

$$n = \frac{N}{1 + N \cdot e^2}$$

Information :

n = number of samples

N = total population

e = the desired error tolerance, which is 10% with a confidence level of 90%

$$n = \frac{3045}{1 + (3.045 \times 0,01)}$$

$$n = \frac{3045}{1,3045}$$

n = 96.82 Written into 97 respondents

Based on the results of the determination of the sample above, the sample required is 97 people.

### **Method of collecting data**

The data processed in this research is using primary data and secondary data. Primary data and secondary data were obtained from 3 data collection techniques, namely:

#### **1. Questionnaire**

The questionnaire is an efficient data collection mechanism if the research knows clearly what is hinted at and how to measure the variables of interest. The questionnaire is in the form of a list of questions. The hope that is wanted through the preparation of the questionnaire is to be able to find out what variables the respondent thinks are important. The purpose of compiling the questionnaire is to correct the parts that are not appropriate to be applied in collecting data on respondents.

Respondents can easily provide answers because alternative answers have been provided, for example in the form of affixing a checklist in the column. In addition, the questionnaire also takes a short time to answer questions.

#### **2. Observation**

This observation technique is also carried out by researchers because this observation is useful for finding problems that may be uncomfortable to be addressed by informants directly (researchers did not find answers during direct interviews).

#### **3. Literature study**

This literature technique is used to obtain an overview of the process of sending female workers (TKW). Primary data and secondary data are not directly analyzed, but checked first. The goal is to test whether there is a deficiency or error.

### **Data analysis technique**

After obtaining the required data and determining the answer score, the next step is to analyze the data using the SPSS program. Data analysis using quantitative analysis and then described qualitatively.

SPSS is an application that is used to perform advanced statistical analysis, data analysis with machine learning algorithms, string analysis, and big data analysis that can be integrated to build a data analysis platform. SPSS is short for Statistical Package for the Social Sciences. SPSS is very popular with researchers and statisticians to help perform calculations related to data analysis. SPSS provides a library for statistical calculations with an interactive interface which makes it the most popular advanced data analysis software in universities, agencies and companies.

## **IV. RESEARCH RESULTS AND DISCUSSION**

### **Simple Linear Regression**

Regression aims to test the effect of variable one and variable. Variables that are influenced are called dependent or dependent variables, while variables that influence are called independent variables. Simple Linear Regression is a linear regression which has one dependent variable and one independent variable. This analysis is to determine the direction of the relationship between variables.

1. The value of R which is a symbol and coefficient. In the table above the correlation value is 0.882. This value can be interpreted that the influence of the two research variables is in the very strong correlation category. Through the table above, it is also obtained the value of R Squere or the coefficient of determination (KD) which shows how good the regression is formed by the interaction of the dependent variable and variable. The KD value obtained was 77.7%. So it can be interpreted that the free variable X has a contribution effect of 77.7% to variable Y.

2. The significance test table above can be determined using analysis of variance (F-test). The results obtained are F count = 331,222, while F (005) (1:20) is 3,939. It turns out that the calculation results show that  $F_h > F_t$  or  $331,222 > 3,939$ . It can be concluded that the regression equation model is significant.

3. The calculation result of the simple regression coefficient above shows that the constant coefficient value is 3,924, the coefficient of the independent variable (X) is 0.806. So that the regression equation  $Y = 3.924 + 0.806X$  is obtained. Based on this equation, it is known that the constant value is 3,924 and mathematically, the constant value states that the effect of sending female workers is 0, so the socio-economic life of the family has a value of 0.806.

A positive value of 0.806 is found in the regression coefficient of the free variable delivery of TKW, which illustrates that the influence on family economic life. This will affect any increase in the sending of TKW, so it will also increase the economic life of the family.

From the results of the analysis it is known that as many as 97 respondents resulted in a correlation value of 0.882. To determine the strength of interpretation and the strength of influence between two variables, it is done by looking at the correlation coefficient using the interpretation of the r value as follows:

**Data interpretation**

Interpretation	Information
0	There is no correlation between the two variables
>0 – 0,25	The correlation is very weak
>0,25 - 0,5	Sufficient Correlation
>0,5 – 0,75	Strong Correlation
>0,75 – 0,99	The correlation is very strong
1	Perfect correlation

From this information, it can be concluded that the variable influence of sending female workers (TKW) on the economic life of the family in Way Jepara District, East Lampung Regency, 2014 - 2017.

**Hypothesis testing**

From the results of the  $t_{test}$ , the value of the  $t_{table}$  for a significant level of 5% db = 95 (db = N - 2 for N = 97) is 1.661. The results of t count were obtained using SPSS 16.0, namely 18,200.

From the calculation process above, it can be seen that if  $t_{count} > t_{table}$  then  $H_a$  is accepted and  $H_o$  is rejected ( $18,200 > 1,661$ ) then  $H_a$  is accepted and  $H_o$  is rejected. So it can be concluded that "There is an influence of sending TKW to the economic life of families in Way Jepara sub-district, East Lampung regency in 2014 - 2017".

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882 <sup>a</sup>	.777	.775	1.362

- a. Predictors: (Constant), The Influence of Migrant Workers Sending on the Family's Socio-Economic Life in Way Jepara District, East Lampung Regency, 2014 - 2017.

**Coefficient of Determination (r<sup>2</sup>)**

After the r count is known to be 0.882, then to find out how much influence the variable X has on Y by using the determination for r<sup>2</sup> to know the percentage.

The results are as follows:

$$r^2 = (0.882)^2 \times 100\%$$

$$= 0.777924 \times 100\%$$
$$= 77,8\% \text{ makes } 78\%$$

From the results of the above calculations it can be concluded that there is an effect of variable X on Y by 78% and the rest is the influence of other factors.

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# *Structure Analysis Of Policy Needs For Sustainable Food Agricultural Land In Banjar Regency, South Kalimantan*

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**Abstract** – Agricultural land has an important role in life, especially in providing food for the community, therefore government policies, both central and regional are needed in maintaining its existence. The policy of protecting sustainable agricultural food land was one of the efforts, therefore it was necessary to carry out sustainable management of the land. This study aimed to obtain a policy needs structure model on sustainable food agriculture land in Banjar Regency, South Kalimantan. Requirement structure design was needed in the framework of sustainable management policies. Requirement structure modeling was done using Interpretative Structural Modeling. It was a strategic modeling technique that can map system conditions comprehensively. The results of the analysis showed that there was an element of need that can make the policy successful. There were also, the sub-element of supervision, control, coaching, development and research activities. Based on the driven power, the sub-elements that are the key factors in the elements of the need for sustainable food agriculture land in Banjar Regency were coaching and supervision.

**Keywords** – Interpretative Structural Modeling, Sustainable Agriculture, Agricultural Land, Policy.

## I. INTRODUCTION

Population growth needs attention, because along with the increase, the need for natural resources will also increase. Based on UN estimates by 2050, the world's population will reach more than nine billion people or about 9,725,148,000 inhabitants [1]. In Indonesia, the population has increased from year to year. In 2015, Indonesia's population reached 255,461,700 people with a growth rate of 1.5% and in 2050 Indonesia's population can reach 322,237,000 inhabitants ([2], [3]). One of the problems in population growth is food availability [4]. To maintain food availability in an area, policies that lead to food security are needed. Agricultural development policies of course need to be continuously developed in order to realize sustainable agricultural production.

Agricultural development is closely related to the provision of agricultural land. The problem is currently the use of agricultural land, continues to increase along with population growth [5]. Population growth has led to socio-economic development as well as environmental changes which have resulted in reduced agricultural land in some places ([6], [7], [8]). The reduction in agricultural land in some places is for infrastructure, housing, industrial facilities and other developments. 80% of urban development is carried out on agricultural land. Without policy intervention, housing and infrastructure are predicted to increase from 260 to 420 million ha in 2050 or cover 4-5% of the world's land area, but if there are strong policies, the increase can be reduced to only 90 million ha or an increase of around 3% only [9]. This has resulted in a land resource crisis marked by a decrease in land quality, a faster change

of agricultural land functions than the addition of new agricultural land, fragmented land per farmer which becomes narrower, more land tenure to a small group of owners ([10], [11]).

The decline in agricultural land area is one of the causes of local food supply that has not been able to meet national food demand. This has decreased national food production and productivity so that it cannot meet the increase in national food [12]. The conversion of agricultural land in Indonesia has been going on for a long time, estimated at 100,000 ha per year [13]. The conversion of this function has resulted in the narrowing of the area for food agriculture, especially rice fields. Rice fields in South Kalimantan, as the main food commodity producer for 15 years, show a decline. The use of land for rice fields in South Kalimantan in 2000 amounted to 427,495 ha while in 2015 the area was 401,217.25 ha and there was a land depreciation of 26,277.75 ha [2]. The decrease in the area of rice fields also occurred in Banjar Regency during the last five years covering an area of 11,634 ha [14].

The policy for the provision and management of agricultural land for food crops is a must to meet the food needs for the community, because it is an effort to implement the government's responsibilities and obligations ([15], [16]). The Indonesian government made a policy to solve the problem by making a policy in the form of Law (UU) No. 41/2009 concerning the protection of Sustainable Food Agricultural Land (SFAL). Based on Law No. 41/2009 the provincial government of South Kalimantan issued Regional Regulation No.2/2014 concerning the Protection of SFAL. In this regional regulation, South Kalimantan Province stipulates at least an area of 353,803 ha and 76,548.23 ha as reserves spreading across all districts/cities to be designated as sustainable food crop agricultural land. Likewise, the local government of Banjar Regency also issued Perda No.9/2012 on the protection of SFAL. All of these regulations are government efforts to maintain productive agricultural crop lands for food sustainability.

Implementation of land protection policies for SFAL still has many problems both in terms of planning and determining the land in the Regional Spatial Plan (RSP) [12]. It is unclear what land is protected; some areas only determine the extent of it [17]. According to [18], the implementation of the SFAL policy in the regions is still not effective because it appears that the conversion of agricultural land is increasingly happening. Policies on sustainable food crop agriculture already exist within the scope of Perda No.9/2012, however, research is still needed to determine the extent of the implementation of these policies. Based on this, it is necessary to analyze the structure of the policy needs in sustainable food agriculture. Analysis of the structure of policy needs using the Interpretative Structural Modeling (ISM) method which is an analysis to solve complex problems of policy needs [19]. This study aimed to obtain a structural model of demand in policies on SFAL in Banjar Regency.

## **II. METHODOLOGY**

Research was carried out in Banjar Regency, South Kalimantan, Indonesia on paddy field areas designated as SFAL or protected agricultural land. The respondent in the research were from six sub-districts in Banjar Regency. Meanwhile, the research locations were in 5 sub-districts, namely Gambut, Aluh-Aluh, Kertak Hanyar, Beruntung Baru, and Sungai Tabuk. The respondents of this study were determined to three groups of respondents. The first group of respondents were respondents from the farmer group, the second group were stakeholders, and the third group were expert respondents.

The number of respondents was determined to be 10% of each selected sub-district, so the total sample of farmer groups were 65 (sixty-five) farmer groups. The determination of the farmer groups was done randomly ([20], [21]). Stakeholder respondents were stakeholders of SFAL in Banjar Regency, namely the Food Crops and Horticulture Service (FCHS), the Development Planning and Research Service (DPRS), the Public Works and Spatial Planning Service (PWSPS), and National Land Service (NLS). Expert respondents were five experts, namely those related to policy makers (FCHS, DPRS and PWSPS), academics from Lambung Mangkurat University and researchers from the Swamp Land Research Institute. The determination of the number of expert respondents was based on the number of expert respondents who had high level of precisions between five and six experts [22].

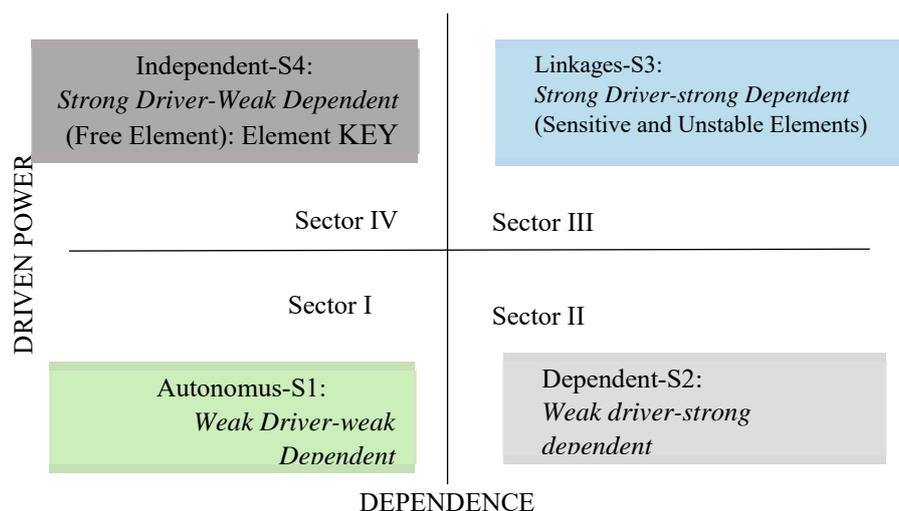


Figure 1. The dependence and driven power matrix

The method of descriptive analysis was conducted to evaluate policies in sustainable food crop agriculture and obtain the leverage factor which was the policy requirement. Analysis of the structure of policy requirements in sustainable food crop agricultural land using Interpretive Structural Modeling (ISM) analysis [19]. The first stage of the ISM analysis was to identify and list the system elements. The element in this research was the need for the SFAL policy program which was a leveraging factor in the SFAL policy. The second stage was the analysis stage which includes the tabulation stage of data from expert respondents. In ISM, compiling a Structural Self-Interaction Matrix (SSIM), converting SSIM to Reachability Matrix (RM). The SSIM arrangement was based on respondents' perceptions of the relationship of the intended elements using the following symbols:

V: the relation of the element  $E_i$  to  $E_j$ , not vice versa

A: the relationship of the elements  $E_j$  to  $E_i$ , not vice versa

X: the interrelation relationship between  $E_i$  and  $E_j$  (can be vice versa)

O: indicates that  $E_i$  and  $E_j$  are not related

Reachability Matrix (RM), namely converting the SSIM symbol into a binary matrix with the following rules:

If the relation  $E_i$  to  $E_j = V$  in SSIM, then the elements  $E_{ij} = 1$  and  $E_{ji} = 0$  in RM

If the relation  $E_i$  to  $E_j = A$  in SSIM, then the elements  $E_{ij} = 0$  and  $E_{ji} = 1$  in RM

If the relation  $E_i$  to  $E_j = X$  in SSIM, then the elements  $E_{ij} = 1$  and  $E_{ji} = 1$  in RM

If the relation  $E_i$  to  $E_j = O$  in SSIM, then the elements  $E_{ij} = 0$  and  $E_{ji} = 0$  in RM

Then the initial RM was modified into a final reachability matrix (Final RM). The final RM was a reachability matrix that has been corrected (checked) for consistency with the transitivity role method to show all direct and indirect reachability, i.e. if  $E_{ij} = 1$  and  $E_{jk} = 1$  then  $E_{ik} = 1$ .

The third stage of ISM was the determination of Driven Power and Dependence. The driven power value was obtained by summing the element values horizontally, while the dependence value was obtained by adding the element values vertically. Ranking was based on the highest to low scores, as well as for level determination. Next was the position formulation in the ISM quadrant. Element/sub-element positions was based on Dependence values as X-axis, and Driven Power values as Y-axis.

The dependence and driven power matrix show four sectors. Sector I Weak Driver-Weak Dependent Variables (Autonomous), which was a quadrant that shows elements that have low influence and dependence and have little or no relation to the system. Sector II Weak Driver-Strongly Dependent Variables (Dependent), which was a quadrant that shows elements that have low influence with high dependence, these elements are elements that are tied to the system (not free). Sector III Strong Driver-Strongly

Dependent Variables (Linkage), It was showing an element that has high influence and dependence, this element was unstable, so it must be studied carefully.

III. RESULTS AND DISCUSSION

The policy on SFAL was set forth in a regulation related to sustainable food agricultural land which has been promulgated since 2009 by the central government in the form of Law no. 41/2009 concerning Protection of Sustainable Agricultural Land (SFAL). Evaluation of the implementation of these laws and regulations in Banjar District is seen from the aspects contained in the Law and Perda on SFAL so that the stipulation of SFAL land management policies can be carried out more effectively. There are 11 aspects to evaluate the implementation of SFAL, namely the completeness of rules, planning, stipulation, development, research, utilization, control, transfer of functions of SFAL, supervision and administrative sanctions. Based on the law, the local government of Banjar Regency has stipulated a Regulation in the form of Perda Banjar Regency No. 9/2012. Paying attention to this showed that the aspect of completeness of the rules has been fulfilled (Table 1). Further evaluation of the SFAL policy can be seen in table 1.

Table 1. Evaluation of policies for the Protection of Sustainable Food Agricultural Land in Banjar District

No.	Aspect Assess	Variable	Result
1	Completeness of the rules	There were regulations or not	There has been a regional regulation, namely the Banjar Regency Perda No. 9 of 2012, but there are no implementation instructions and technical instructions.
2	Planning (whether there is an SFAL protection plan or not)	Formation of the SFAL Team	There was no special team for SFAL.
		Proposed SFAL plan - Preparation of proposals - Socialization of proposals - SFAL response	There was a coordinating team within the Regional Spatial Planning for the establishment of a sustainable food agriculture area. There was no socialization of the SFAL proposal at the community level. The response of SFAL at the local government level was quite good but at the community level, especially in the SFAL area, it still tends to be normal because there has been no socialization.
		Determination in the development plan	Nothing has been determined in the Long-Term Development Plan (LTDP) or the Regional Medium-Term Development Plan (MTDP)

No.	Aspect Assess	Variable	Result
3	Determination	Determination in the RSP	The sustainable food agriculture area as referred to in Article 34 paragraph (1) letter e in the Districts of Aluh-Aluh, Gambut, Kertak Hanyar, Beruntung Baru, Sungai Tabuk and Tatah Makmur in accordance with the potential and functional allocated for rice on wet and dry land is less over 15,828 ha; and (2) The land reserved for sustainable food agriculture was in the Districts of West Martapura, Sungai Tabuk, Astambul, Mataraman, and Simpang Empat and Karang Intan.
		In Detailed Spatial Planning (DSP)	The SFAL lands had not been specifically determined in the DSP, because DSP was still in the process of being drafted.
		SFAL area	The SFAL area was established in six sub-districts with an area of approximately 15,828 ha.
		SFAL	There was still no detailed data on the determination of SFAL
		Reserve Area SFAL	It had been established in six districts but the details of SFAL area were not yet known
4	Development	SFAL area intensification and extensification program	The intensification program was carried out continuously but it was a regular program. It was not specific to SFAL area.
5	Research	SFAL research was available or not	The research program in Banjar Regency was the responsibility of Bappedalitbang. There was no research program specifically for SFAL.
6	Utilization	Government obligations	Utilization programs related to the protection of land and water resources which are the responsibility of the government were implemented in general, not yet focused on SFAL land.
7	Coaching	Coordination	Coaching on SFAL related to coordination had been carried out within the scope of Regional Work Units (RWU), especially related to planning and land designation of P2B.

No.	Aspect Assess	Variable	Result
		socialization of statutory regulations	Socialization of legislation had been carried out but it had not been going well at the farmer level.
		providing guidance, supervision and consultation	Guidance, supervision and consultation at the farmer level are still generally not focused on SFAL
		education, training and counseling	Programs and activities related to education, training and counseling was still being implemented in general, not yet focused on SFAL
		dissemination of information on Sustainable Food Agriculture Areas and Sustainable Food Agricultural Lands	It had not been implemented optimally because there was still no data
8	Control	Incentives and disincentives	There was no form of incentive specifically for SFAL land, but general assistance according to central and regional government policies such as fertilizer subsidies, input production assistance, infrastructure improvements have been generally implemented.
9	Switching the function of SFAL		The transfer of function of SFAL can be carried out if it was for public facilities. Meanwhile, the transfer of functions for other uses was not allowed.
10	Supervision		Supervision activities including reporting, monitoring and evaluation was generally carried out not specifically for SFAL.
11	Administrative Sanctions	written warning	Administrative sanctions had been carried out in several violations, especially those that violate the RSP

Eleven evaluation variables indicated the extent to which the policy was implemented in Banjar Regency. Based on the descriptive analysis, it was found that eight sub-elements needed to find which elements had substantial influence on the success of the SFAL policy, namely: 1) technical implementation instructions; 2) planning and determining SFAL; 3) special incentives on SFAL; 4) research activities 5) development; 6) coaching; 7) control; and 8) supervision. The eight elements were elements of necessity in the SFAL management policy, described in Table 2.

Table 2. The need for sustainable agri-food land management policies

Code	Requirement Element	Description
C1	Supervision	Supervision activities include reporting, monitoring and evaluation.

C2	Control	Control in the form of disincentives was given if farmers violate the SFAL rules, and change the function of SFAL.
C3	Coaching	Coordination, dissemination of laws and regulations, providing guidance, supervision and education consultation, training and counseling, dissemination of information on Sustainable Food Agriculture Areas and Sustainable Food Agricultural Lands.
C4	Development	Intensification and extensification program in the SFAL area
C5	Research activities	The Sustainable Food Agriculture Land Policy was carried out with the support of research. Those related to agriculture on SFAL.
C6	Special incentives	Special incentives were incentives provided by the government to farmers whose land is included in the SFAL category. Incentives can take the form of improvements to agricultural infrastructure, financing research on superior seeds and varieties, easy access to information and technology, provision of production infrastructure and facilities, assistance in issuing land certificates, awards for outstanding farmers, and land and building tax relief.
C7	Planning and establishing	Planning includes the formation of the SFAL Team, proposals for SFAL plans, preparation of proposals, dissemination of proposals and SFAL responses. Designation of SFAL areas. The determination of sustainable agricultural areas must be stipulated in the district DSP while the determination of SFAL and sustainable agricultural food reserves was stipulated in the Detailed Spatial Planning of the district.
C8	Technical implementation instructions	Implementation instructions and technical instructions in the SFAL policy

Based on the results of the evaluation above (Table 1), Banjar Regency had made efforts to maintain food agricultural land. From this policy, what had been done well was the determination of the area of sustainable food agriculture, but this area still does not mention in detail the area of SFAL at the sub-district level or at the farmer level (Figure 2). This has resulted in not yet optimal implementation of other SFAL policies. The rice field area in 2018 was 61,113 ha, while the SFAL area was 15,737 ha or 26%. Based on Figure 2, it can also be seen that from 2012 - 2018 there was a decrease in land by 10,073 ha. If it allowed to decline in land area, it would continue to occur. Therefore, the SFAL policy should receive attention from the government.

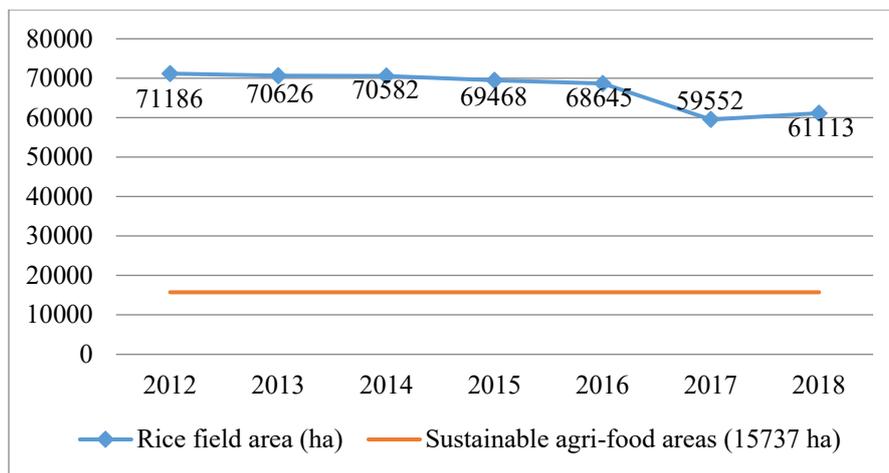


Figure 2. Graph of the area of paddy fields and sustainable food agricultural land

### 3.1. Analysis of the Structure of SFAL Policy Needs

The results of the respondent's assessment or opinion (expert judgment) regarding the contextual relationship of the eight policy sub-elements obtained the aggregate value of the expert's opinion which was then compiled in the form of a SSIM matrix (Table 3). The SSIM matrix and the results of the assessment were converted into RM matrix. This reachability matrix has not fulfilled the transitivity rules, or was an initial reachability matrix which was then corrected or consistency tests using the law or the transitivity rule of the transitivity role method to show all direct and indirect reachability, i.e. if  $E_{ij} = 1$  and  $E_{jk} = 1$  then  $E_{ik} = 1$ . The law of transitivity was related to the consistency of respondents' preferences in giving assessments, for example: respondents considered that "A-element" was more than "B-element" and "B-element" was more than "C-element", so the frequency consistency was "A-element" more than "C-element". The transitivity rule was the completeness of the causal loop [23]. Transitivity rules or transitivity laws are an attempt to assess the consistency of respondents' opinions/judgments (expert judgment) [24]. Examination with the transitivity rule was focused on cells whose value is 0 (zero). The results of the examination using the transitivity rule will obtain a final reachability matrix, which was the revised matrix of the RM matrix.

Table 3. Structural Self-Interaction Matrix

	C1	C2	C3	C4	C5	C6	C7	C8
C1		X	X	X	X	V	V	V
C2			X	X	V	A	V	V
C3				X	V	V	V	V
C4					X	A	V	V
C5						A	V	V
C6							V	V
C7								X
C8								

The final reachability matrix was a RM that had been checked with the law of transitivity, whose value was acceptable and meets consistent preferences. The final reachability matrix then became the basis for calculating the driven power and dependence of the elements studied (Table 4).

Table 4. Reachability Matrix which has cross checked the transitivity rule, driven power calculation and dependence

	C1	C2	C3	C4	C5	C6	C7	C8	Driven Power	Ranking
C1	1	1	1	1	1	1	1	1	8	1
C2	1	1	1	1	1	0	1	1	7	2
C3	1	1	1	1	1	1	1	1	8	1

	C1	C2	C3	C4	C5	C6	C7	C8	Driven Power	Ranking
C4	1	1	1	1	1	0	1	1	7	2
C5	1	0	0	1	1	0	1	1	5	4
C6	0	1	0	1	1	1	1	1	6	3
C7	0	0	0	0	0	0	1	1	2	5
C8	0	0	0	0	0	0	1	1	2	5
Dependence	5	5	4	6	6	3	8	8		
Hierarchy	3	3	4	2	2	5	1	1		

The value of driven power was obtained from the sum of the final reachability matrix values horizontally, and the dependence value was the sum of them vertically. Furthermore, the value of dependence and driven power becomes the ordination for determining the position of the elements in the ISM quadrant, where the dependence value becomes the value on the X-axis and the value of driven power becomes the value on the Y-axis. The ordination positions obtained were then represented in graphs and levels (Figures 3 and 4). Based on the ISM quadrant in Figure 3, it appeared that the sub-elements were scattered according to their ordinates in three sectors, namely Sector 2 dependent, Sector 3 linkage and Sector 4 independent. In the elements of the need for a sustainable agricultural land management policy in Banjar Regency, the sub-elements C1, C2, C3, C4 and C5 represent the sub-elements of supervision, control, coaching, development and research activities were in Sector 3 where the sector includes the linkages variable of the system. This shows that every policy on these sub-elements would lead to successful implementation of policies on sustainable food agriculture.

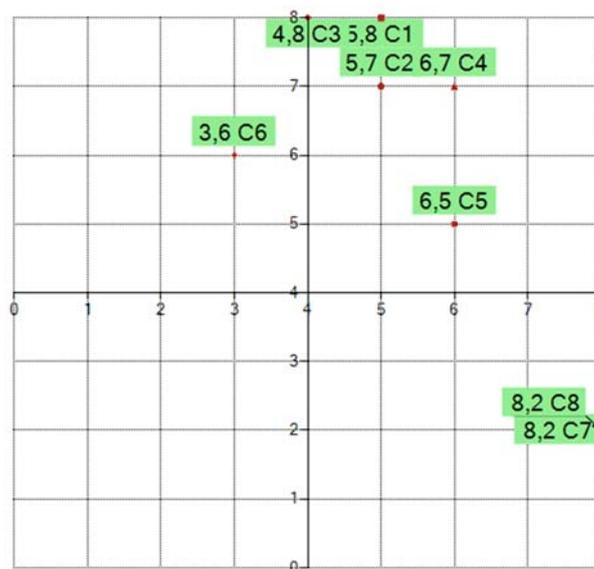


Figure 3. The driven power-dependence matrix for the requirement elements

Further structural analysis in Sector 4 (independent) was the C6 sub-element which represents the special incentive sub-element. In this independent sector, special incentives are included in the independent variable. The special incentives provided to farmers on sustainable food agriculture land have a large driven power, but have little dependence on the program. In Sector 2 there were sub elements C7 and C8 which represent implementation instructions and technical instructions as well as planning and stipulation. Sub-element in the dependent sector which means that the sub-element has low influence with high dependence, this element was an element that was bound to the system.

The form of analysis of the level diagram of the ISM which was determined by the separation of the RM results in the ranking of each sub-element (Figure 4). Based on the analysis results obtained five levels hierarchy. At Level 1 was coaching and supervision, Level 2 development and control, Level 3 special incentives, Level 4 research activities and Level 5 was the

implementation and technical guidance as well as planning and determination. The ranking designation which is based on driven power produces a key element, namely those at Level 1, in this case, coaching and supervision. Policies on sustainable food agriculture will be influenced by the success of coaching and supervision.

### 3.2. Coaching and supervision

Based on the results of the analysis, coaching is the key to SFAL policy. The coaching here includes coordination between stakeholders, socialization of laws and regulations, providing guidance to farmers, consultation, education, training and counseling and dissemination of information on Sustainable Food Agricultural Land. Coordination between stakeholders, which includes coordination between policy makers, academics, researchers and farmers, was very necessary to avoid conflict. This was in line with [25] which states that coordination between parties related to agricultural land needs to be done well. Based on interviews with respondents, coordination has been carried out between policy makers at the time of planning and determining the area of agricultural land which was designated as a sustainable food agriculture area. However, this coordination needs to be carried out regularly so that policy implementation runs well.

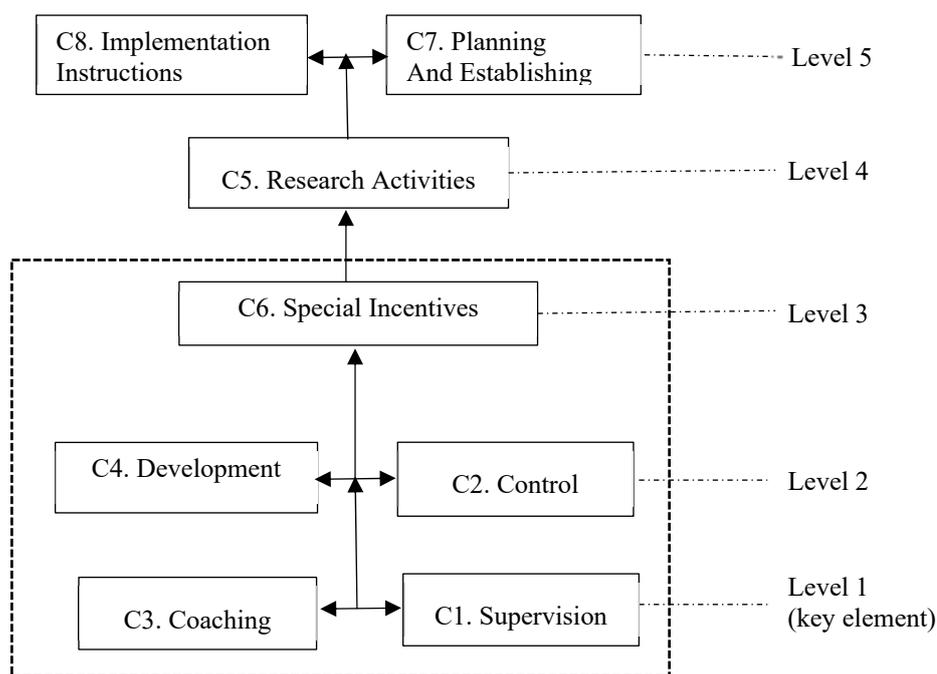


Figure 4. The structural model diagram of the policy program requirements

Socialization of regulations to farmers if their agricultural land was made into sustainable food agriculture has not yet been carried out. The results of this study also confirmed the policy implementation theory of Edward (1980) which states that one of the factors that influence policy implementation was the variable communication. The communication variable was intended as the socialization that policies must be conveyed to the implementer in a precise, clear, accurate and consistent manner ([26], [27]).

Providing guidance, consultation, education, training, and counseling carried out to farmers as a program has been carried out but was carried out in general in accordance with the main duties of the Food Crops and Horticulture Service (FCHS). The program of activities must be carried out in an intend to be given a larger portion to farmers whose land has become protected land (SFAL). This was done so that farmers were willing to defend their land for agricultural activities. Education had a key role in making policies to reduce fragmentation of agricultural land [28]. Coaching activities in the form of guidance, supervision and consultation, education, and training needed to be carried out in a larger portion to increase the knowledge and awareness of farmers so that the results in their rice farming can increase. Farmer’s knowledge and awareness had significant role in determining the level of unsustainability in rice farming ([29], [30], [31]).

Agricultural extension in agricultural policy is efforts to change the behavior of farmers and their families, so that farmers had the knowledge and willingness to increase their farming results so that they can improve their lives. In addition, with extension, it was hoped that farmers would be able to solve the problems faced in their agriculture. Based on the results of the research, it was found that extension services are still carried out as a routine program in general, not carried out with more portions or intensely in areas of sustainable food agriculture. The one who plays vital role in agricultural extension was agricultural extension. In general, according to [31] the level of performance of agricultural extension workers in Banjar Regency in empowering farmers and was 78.57% or classified as moderate. The problem faced was the difficulty of changing the culture and mindset in the application of modern technology and planting superior varieties of rice. An effective extension scheme was needed to be applied to farmers in sustainable food agriculture areas. According to [32] counseling can be done effectively and farmer-to-farmer extension programs for smallholders as a cost-effective alternative to conventional farmer training approaches. This can be done considering the limited number of extension agents, so that the success of extension objectives can be increased.

Supervisory activities including reporting, monitoring and evaluation were carried out on SFAL policies. It aimed to evaluate what was or had been implemented so that programs/activities that were or had been implemented can be repaired immediately. Based on the results, the supervision had not been implemented. Supervision is one aspect of management that was carried out by the implementor administratively. Weaknesses in the administrative system can result in low policy success rates [33]. According to [34] the success of policy implementation depends on the implementing element (implementor), either an organization (local government) or an individual (farmer business actor), who was responsible for the management, implementation, and supervision of the implementation process. According to [35] the limitations of monitoring, evaluation and policy analysis affect the success of agricultural development policies.

#### **IV. CONCLUSION**

Based on the results of the structural analysis, it can be concluded that the priority in policy on SFAL were supervision, control, coaching, development, research activities, and special incentives. These sub-elements were linkage factors in the system which indicates that any policy will lead to the success of policies on sustainable food agriculture. The sub-elements that were the key factors were coaching and supervision. All elements of policy needs were particularly important to implement so that the goal of protecting SFAL policies can be achieved.

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