

Management of Environmental Adult Education Programme for Control of Flooding in Higher Institutions in Bayelsa State, Nigeria

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Abstract – The study examined the management of environmental adult education programme for control of flooding in higher institutions in Bayelsa State, Nigeria. The issue of environmental protection has now become a global concern, since humanity cannot be separated from its environment for survival. The environment is the sum total of conditions in which an institution has to survive or maintain its life process, which influences the academic growth and development of the students and development of other living forms, with this reason it should be protected from flood. In Bayelsa State Niger Delta State University (N.D.U) and Federal University Otueke precisely, flood has been reported to affect and displace students, staff and other people than any other disaster. The purpose of this study was to investigate the extent to which environmental adult education programme designed for flood control is managed in higher institutions in Bayelsa State. Three research questions were formulated to guide the study. The study adopted descriptive survey design; the population of the study is 4,575. The population consists of 2,836 students and staff of Niger Delta Universities and 1,739 students and staff of Federal University Otueke. 848 staffs and students in environmental management related department in the two Universities were purposively selected due to their involvement in flood management. the researchers recommend that the management of environmental adult education programmes for flood preventing in the institutions need to consider stabilizing their flood prevention strategies to incorporate different non-structural measures for effectiveness of the programme.

Keywords – Adult education, flooding, Bayelsa, Nigeria, Higher institutions.

I. INTRODUCTION

Flooding is an overflowing of water onto land that is normally dry mostly during raining season. Flood occurs as a result of ocean waves, snow melting quickly, when dams or levees break. Flooding is an annual occurrence in most Nigerian states that are surrounded by coastal communities. Bayelsa state is one of the states faced with the issue of annual flooding due to its coastal nature. Flooding happens in many ways due to overflow of streams, rivers, lakes or oceans or as a result of excessive rain. In Bayelsa state during raining season, flood sacks many residents from their homes, leaving many of the residents homeless. The same applies to the students and staff living in the various higher institutions in the state; specifically, hostels and staff quarters of the various universities. Flooding negatively affects humans, animals and plants. Humans are displaced of their homes; animals are also displaced of their living habitats while plants are submerged and destroyed. In most cases, flooding destroys crops and wipes away trees and other important structures on land.

Bayelsa state has three universities which are the Federal University Otueke, Niger Delta University, and Bayelsa Medical University, but this study will be limited to the Federal University Otueke and Niger Delta University. Federal University, Otueke in 2020 witnessed a horrific experience of flooding of the school environment (Premium Times, 2020). Students and staff were

evicted from the school premises due to the high impact of flooding in the school environment, classrooms, laboratories, offices were all submerged with flood. Also, the school facility damaged too. According to Sahara Reporters (n.d.) during a tour to the offices, a huge python was seen and killed in the faculty. The presence of python can be attributed to the snake loss of habitat due to flood which move it from the bush where it lives to the school environment.

From oral interviews conducted by the researchers, Amasoma which is the home town of Niger Delta University have been witnessing high flood impact since 2012, 2018, 2019 and 2020 respectively. But despite the fact that the expectation of flooding in Amasoma was very high in 2021, the community did not witness flooding. During the years in which Amasoma was flooded, Niger Delta University was equally flooded sending students and staff packing, academic activities were put on hold, many students lost their personal belonging, the staffs were displaced too. Flood forced Niger Delta University to suspend academic activities for up to two months, it reduced dwellers as many students leave the community, seek refuge at home and this drastically affects the Amassoma local economy. The antecedent effect of annual flooding experienced by students, staffs and even people who live and do business within the higher institution (Federal University, Otuoke and Niger Delta University) prompted the Bayelsa State government Post Flood Management Committee (PFMC) in collaboration with the Flood Research Group of Federal University Otuoke designed plan for flood management in the state, in which education programme from the environment, for the environment and about the environment was used as a strategy. Education **from, for and about** the environment is called environmental adult education. Environmental adult education was used as educational strategy:

1. To create awareness of flood preparation;
2. Knowledge of flood response;
3. Re-orientate university residents on the need to value the environment and avoid different anthropogenic activities that contribute to flooding
4. Provide requisite skills for flood adaptation; and
5. Participating in actions for flood mitigation

Environmental adult education programme for flood management managed by the Flood Research Group of Federal Universities in collaboration with Bayelsa State Post Flood Management Committee (PFMC). Management of environmental adult education programmes involves different processes that start from planning, organizing, implementation, monitoring and evaluation of the programme. Management of environmental adult education programme is a means of addressing environmental problems such as flooding which affect teaching and learning and prevent both teachers and students from entering the school environment. According to Caribbean Environmental Investment Study, P A Government Services (CEISGS) (2001), management of environmental adult education programme is a systematic approach to finding practical ways for saving water, energy and materials, and reducing negative environmental impacts. The programme is created and implemented to meet the established objectives and target of reducing environmental flooding, like introducing the 3R's: reduce waste, refuse resources and recycle materials, and organizing and encouraging tree planting at schools and teaching the students why trees are important to the school environment. Management of environmental adult education programme is a system which integrates procedures and processes for training of personnel monitoring, summarizing and reporting of specialized environmental performance information against flooding to internal and external stakeholders of a school or institution (Ashford 2017). Environmental adult education programme is designed to avoid the occurrence of algal blooms in the school premises manage risks issues and changes pertaining to environmental flooding in schools.

Management in adult education can be viewed and researched on multiple levels: level of adult education system; level of the educational institution/organization as the structural element of that system; level of the adult education process (Alibabić, 2007). The subject of our research is the management in organizations (institutions) for adult education.

Environmental Management

Damages that occur in the environment during flooding indicate that generally, the damage is caused by human activities or due to natural factors; this leads to a decrease in environmental quality. The occurrence of environmental damage such as flooding which can threaten human life requires actions to improve environmental quality so that various kinds of actions and programs are offered by the government to minimize environmental damage activities. Environmental management is concerned with

understanding the structure and function of the terrestrial system, as well as how humans relate to their environment. It is concerned with identifying, observing and tracking environmental change, predicting potential changes and making an attempt to optimize human benefits and diminish environmental destruction which are caused by the behaviours and activities of men. The flooding which occurs annually in universities in Bayelsa State is an environmental damage that can be partly attributed to anthropogenic factors. Environmental management, a subject that combines science, policy, and socioeconomic applications is crucial to handle the issue of flooding according to the National Environment Commission (NEC). It primarily stresses on finding solution to practical problems that people face in cohabitation with nature, resource exploitation, and waste production. According to Kaushik and Kaushik (2010), environmental management facilitates socioeconomic developments on one hand and maintenance of environmental quality on other hand.

In a purely anthropocentric sense, environmental management is all about dealing with the fundamental issue of how to innovate technology to evolve continuously while limiting the degree to which this process alters natural environment. It is especially concerned with the decision-making process regarding the use of natural resources, pollution of habitats and ecosystem modification (Martín de Castro, Amores Salvadó & Navas López, 2016).

Barrow (2005), pointed out that objectives of environmental management include:

1. Identify the environmental problem and find its solution
2. Restrict and regulate the exploitation and utilization of natural resources;
3. Regenerate degraded environment and renew natural resources (renewable)
4. Control environmental pollution and degradation;
5. Reduce the impacts of extreme events and natural disaster;
6. Make optimum utilization of natural resources;
7. Assess the impacts of proposed projects and activities on environment;
8. Review and revise the existing technologies and make them eco-friendly; and
9. Formulate laws for the implementation of environmental protection and conservation programmes. (Ibrahim, 2019)

Environmental management is described as a process to minimize waste and maximize compliance. It is created to address the environmental issues that have a direct and indirect impact on the globe and is affecting it adversely. It deals in finding appropriate solutions to environmental crises and preventing ecological disasters.

According to Đukanović (1996), the principles and elements of environmental management strategies include the following:

1. Environmental policy
2. Planning
3. Implementation and implementation verification and corrective action
4. Review and improvement
5. Continuous improvement

Environmental management can be defined as a process that refers to the interaction between man and the environment that aims to identify:

1. What are the environmentally desirable outcomes?
2. What are the physical, economic, social, cultural, political and technological constraints to achieving these results?
3. What are the best options for achieving these results?

Environmental Adult Education Programme

It is a programme that is seen as a process of educating the learners about matters and issues that are affecting the school environment, homes, water supplies, forest, and human lives in general. Mbalisi (2016), says that environmental adult education programme is an application of theories, principles, programmes, methodologies, approaches and resources in educating the learners about the environment and its associated resources with conscious intention of inculcating in them knowledge, attitudes and skills required to generate a sense of responsibility and commitment towards resaving present environmental problems and preventing future ones. From the definition, it can be deduced that, the programme is concerned with inculcation of knowledge and skills to enable students live in harmony with the forces and factors of their environment. The programme aids in developing students attitudes to create sense of responsibility in avoiding and managing environmental flooding in the school environment. Since one has to learn about the environment before making it. Management of environmental adult education enables students to learn how to prevent and manage the environmental flooding in the school premises such as: debarring the students from not littering the school environment, clearing the existing drain, and so on.

The platform of this programme includes formal, non-formal and informal, it is seen as a product of the blend of the principles and goals of environmental adult education with those of adult education. Eheazu (2013) depicts it as a process of developing in students certain attitudes skills and knowledge that will enable them to successfully interact and live in harmony with the elements that surround them, as they engage in their school and daily activities for survival. Environmental adult education creates an overall perspective, which acknowledges the fact that, natural environment and man-made environment are interdependent. It is through this process of education that students can be sensitized about the environmental issues and problems that warrant flooding in the school environment. The programme teaches students how to address environmental issues in different perspective through critical thinking which enhances problem-solving and decision-making skills. Through the programme the students will be aware of the state of the environment. The environment refers to all parts of nature, living and non-living things.

Laurens (2020) ascertained the fact that students being aware of the environmental adult education programme is particularly important, given the increasing environmental challenges people are facing, such as: climate change, global warming, water scarcity, droughts, deforestation, floods and pollution. Being aware of these issues and making beneficial lifestyle changes to alleviate negative effects on the environment is what environmental awareness is about and is what the environmental adult education programme is all about. Students are encouraged to make life style changes that will benefit the environment and to guide against environmental flooding. The poor environmental problems in higher institutions include crowded classrooms, poor ventilation, lack of greenery in the school environment, location of schools close to swampy areas and air pollution impact on students' academic performance.

Management of Environmental Adult Education Programme

Environmental adult education programme can be managed effectively and efficiently to help mitigate flooding in higher institutions by infusing issues such as preservation, depiction of natural, resources, waste management, environmental values and human rights, pollution, energy crisis, water conservation, wild life conservation and sustainable use of resources; which should be introduced or embedded under the auspices of the course environmental adult education- especially in the institutions that have the department but do not have the programme. If these sub-courses are introduced and properly thought, the student will have proper knowledge of environmental awareness and environmental sustainability and this will guide the prevention of environmental flooding in schools. Most teachers find it difficult to convey complex environmental messages to the students in an effective manner due to the lack of expertise in the field and insufficient resources at their disposal (Ashar, 2017). If abused with drought, excessive rainfall, excessive pollution such as littering of papers, and exploitation of resources, immense environmental flooding can occur. Students can work towards restoring the damage done by constantly being inculcated with adequate and appropriate information and awareness concerning environmental management through environmental adult education programme.

The programme is the most efficient and cost-effective means to change students' thinking towards the school environment and this will produce the desired attitudinal change. Somanathan in Okorie (2016), attributed poor environment quality in schools to low levels of environmental regulations. He further pointed that, this sub-optional low regulation, which is caused by lack of knowledge of environmental education, is often caused by the low levels of students' awareness about the schools' environment.

Thus, providing students with knowledge about environmental hazards may increase welfare which includes safety, happiness, good health, academic prosperity and general well-being of the students, staff and the society in general. Floods have large social consequences on school community and the student as well. As most people are well aware the immediate impacts of flooding include loss of human life, damage to school property, destruction of school crops, loss of lives stock, and deterioration of health conditions owing to waterborne diseases. (Douglas, and Stuart and Daries 2015). Students are forced to leave the school environment and normal life is disrupted. Floods can also traumatize victims (Students and staff) displacement from one's hostels and offices, loss of property and disruption of business and economic and social affairs can prompt continuing stress, and for some students the psychological impacts can be long lasting.

Management of Environmental Flooding

The state of Bayelsa, Nigeria must improve their flood warning systems, giving people more time to take action during flooding, potentially saves life, because advance warning and pre-planning can significantly reduce the impact of environmental flooding in Bayelsa state. Beg (2014), observed that flood protection activities are essentially aimed at ensuring a sense of security for the population living in flood prone area. The people lose their jobs, business, become homeless, subject to threat from unsocial elements. In short, flood takes away what the people have or earned. The security of people against vandalism, rowdiness, robbery, thefts, cheatings, corruption and other insults during flood, should be ensured through education. In view of this Katie (2015) noted ten measures that must be taken to manage or prevent more flooding in the future, they are: introduction of better flood warning systems, modify homes and businesses to help them withstand floods, construction of buildings above flood levels, tackling climate change, increase spending on flood defences, protection of wetlands and introduction of plant trees strategies, restoring rivers to their natural courses, introduction of water storage areas, improvements of soil conditions and putting up more flood barriers. Conventional defences are to be supplemented with more innovative methods so as to lower the risk of futures disasters. Management of flood risk includes both the chance of an events taking place and its potential impact, land use planning informed by floodplain management plant can reduce risk for develop and developing areas because flood risk is difficult to manage in these areas, however, modification measures such as dams or levees can change the behaviour of flood waters, also proper modification measures can protect against harm caused by floods to individual buildings, and response modification measure can help institutions deal with floods. Douglas et al (2018) said that flood risk management is a partnership between government and the institutions using a range of measures to reduce but the risk to people, property and infrastructure. Decisions on managing flood risk should be made in consultation with the community that may be impacted by floods.

II. STATEMENT OF THE PROBLEM:

The issue of environmental protection has now become a global concern, since humanity cannot be separated from its environment for survival. The environment is the sum total of conditions in which an institution has to survive or maintain its life process, which influences the academic growth and development of the students and development of other living forms, with this reason it should be protected from flood. In Bayelsa State Niger Delta State University (N.D.U) and Federal University Otuoke precisely, flood has been reported to affect and displace students, staff and other people than any other disaster. Flood disaster has been perilous to these institutions and caused more damages to properties in the schools. It further disrupted academic and business activities. Many people living around the school experience serious economic and social impact as their various means of livelihood were cut shut due to flood and hardship was experienced subsequently.

Thus, the question is, considering the damaging effects of the constant environmental flooding in these universities, to what extent has environmental adult education programme designed for flooding been managed to control flooding in Niger Delta University (N. D. U) and Federal University Otuoke in Bayelsa State?

III. PURPOSE OF THE STUDY:

The purpose of this study was to investigate the extent to which environmental adult education programme designed for flood control is managed in higher institutions in Bayelsa State. Specially the study sought to:

1. Examine the level of management of improved drainage component of environmental adult education programme for flood prevention in higher institutions in Bayelsa state.
2. Examine the level of management of diversion canal, dikes and levees construction component of environmental adult education programme for flood prevention in higher institutions in Bayelsa state.

3. Examine the level of management of non-structural component of environmental adult education programme for flood prevention in higher institutions in Bayelsa state

Research questions:

The following research questions were formulated to guide the study:

1. To what level has improved drainage component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?
2. To what level have construction of diversion canals, dikes and levees component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?
3. To what level has non-structural component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?

IV. METHODOLOGY

The study adopted descriptive survey design; the population of the study is 4,575. The population consists of 2,836 students and staff of Niger Delta Universities and 1,739 students and staff of Federal University Otueke. 848 staffs and students in environmental management related department in the two Universities were purposively selected due to their involvement in flood management. Out of 848 copies of questionnaire distributed, 826 copies (340 from federal university Otueke and 486 copies from Niger Delta University) were recovered and were used for data analysis. The instrument used for data collection is a structured for point Likert- scale questionnaire rated as very high level (VHL), high level (HL), low level (LL), and very low level (VLL) designed with google form. The instrument was subjected to face and construct validity. It was also tested for reliability. Data was collected via electronic mailing (the designed google form-based questionnaire was sent to respondent emails and WhatsApp group chat platforms. Data collected was analysed with descriptive statistics (frequency, percentages, mean and standard deviation). Criterion mean of 2.5 was used for decisions on each of the responses, any mean scores lesser than 2.5 is taken to be negative while any mean score that is equal or greater than 2.5 is regarded as positive response.

V. RESULTS

Research Question One: To what level has improved drainage component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?

Table 1: Analysis of Level to Which Improve Drainage Component of Environmental Adult Education Programme for Control of Flooding Been Managed in Higher Institutions

S/N	Statements	UNI OTUEKE N= 340			NDU N=486		
		x	SD	Decision	x	SD	Decision
1	Drainage expert was invited to ascertain the cause of excessive amount of ground water presence in your school	2.9	0.99	High Level	3.2	0.67	High Level
2	CCTV drain survey was carried out to determine the cause of the inundation	2.0	0.95	Low Level	2.3	0.88	High Level
3	Collapsed drainage around your school environment were repaired with no-dig drainage solution	2.4	0.73	Low Level	2.2	0.84	High Level
4	Water Siphonic Regulator was installed in your school drainage to regulate water flow during raining season	2.3	0.90	Low Level	2.1	0.78	High Level
5	Permeable pavement was built along water	2.5	0.67	High Level	2.8	0.75	High Level

	ways surrounding your school						
6	French drain was built to direct surface run of water and groundwater away from your school compound.	3.0	0.91	High Level	2.9	0.72	High Level
7	Full gutter system was built to direct storm water management areas, ponds or collection system to remove from the affected areas	2.9	0.87	High Level	3.3	0.56	High Level
8	A small pump is installed in places such as the basement or crawlspace to collect excess water to prevent flooding	2.8	0.82	High Level	2.8	0.66	High Level
Grand Mean		2.6	0.86	High Level	2.7	0.73	High Level

In table 1, analysis shows that in Federal University Otueke and in Niger Delta University, drainage experts were invited to ascertain the cause of excessive amount of ground water presence in the schools. Permeable pavement, fresh drainage and full gutter system were built as part of strategies for preventing flood in the University premises. Also, a small pump is installed in places such as the basement or crawlspace to collect excess water to prevent flooding. But CCTV drain survey was not carried out to determine the cause of the inundation in the two universities; no-dig drainage solution was not used to repair collapsed drainage, neither was water Siphonic Regulator installed in the existing university drainage systems to regulate water flow during raining season in Federal University Otueke and in Niger Delta University respectively. With grand mean of 2.6 for Federal University Otueke and 2.7 for Niger Delta University, which are all greater than the criterion mean of 2.5, the result implies improve drainage component of environmental adult education programme for prevention of flooding in higher institutions in Bayelsa state has been managed to a high level. Improving upon the existing drainage facilities around flood plain area is one of the structural measures of flood management in Nigeria, these measures are not actually preventing the flood because despite the huge amount of money the spent on improve drainage facilities across flood plain areas in Bayelsa and Nigeria in extension, flooding continues to occur. Oladokun and Proverbs (2016) observed that: “in tackling flood risk in Nigeria, the main focus has been on” structural measures coupled with over dependence on imported expertise and technologies. The propensity to award contracts to build more structural flood defenses, canals, embankments, culverts and bridges without sufficient consideration for less costly and more sustainable, non-structural solutions is evident in the budgets of the nation, (Oladokun and Proverbs, 2016, p.490)

Research Question Two: To what level has construction of diversion canals, dikes and levees component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?

Table 2: Analysis of Level to Which Construction of Diversion Canals, Dikes and Levees Component of Environmental Adult Education Programme for Control of Flooding Been Managed in Higher Institutions

S/N	Statements	UNI OTUEKE N= 340			NDU N=486		
		X	SD	Decision	X	SD	Decision
9	Dikes were constructed to protect floodplains and control water in your school	2.1	0.93	Low Level	2.7	0.86	High Level
10	Levees were constructed to hold off water and to confine the water in its channel so that the floodplain is protected	2.2	0.88	Low Level	2.4	0.76	Low Level
11	Channels of water passages were enlarged and	2.9	0.72	High Level	2.5	0.83	High Level

	straightened due to anticipation of increase in water volume						
12	Channels of water passages were widened and deepened due to anticipation of increase in water volume	2.6	0.93	High Level	2.6	0.96	High Level
13	Provisions were made for escape or diversion of water from the main water channel to auxiliary or emergency channels of flood water in excess of the carrying capacity	2.4	0.73	Low Level	2.1	0.73	Low Level
14	Flood reservoirs were constructed in form of flood detention reservoir.	2.0	0.65	Low Level	2.0	0.81	Low Level
15	Embankments, were constructed to neutralize any excess Flood water.	2.4	0.67	Low Level	2.3	0.75	Low Level
16	Diversion canals were constructed to divert the flow of flood water to the sea	3.0	0.91	High Level	2.9	0.72	High Level
Grand Mean		2.5	0.80	Low Level	2.4	0.8	

Table 2 shows that dikes were not adequately constructed to protect floodplains and water control, levees were not constructed to hold off water and to confine the water in its channel; flood reservoirs were not provided; and embankments were scarcely constructed to neutralize any excess flood water. In the two University campuses. Whereas the existing channels of water passages were enlarged, straightened, widened and deepened in anticipation of increase in water volume and also to divert the flow of flood water. The result also shows that diversion canals to a high level were constructed to divert the flow of flood water to the sea in the two University campuses. According to Yan (2017) the economic and long-term benefits of building dikes is its ability to reduce the economic damage from river floods in the future to below today's levels. In support of this, dikes and dams need regular maintenance and strengthening to keep their protection capacities and meet safety requirements, (Climate-ADAPT, 2016) Dikes can also be re-enforced by heightening, broadening or by adding spatial components. Heightening is the usual way to re-enforce dikes, but other innovative approaches have recently been developed. Climate-ADAPT (2016). It will be noted that in Ugochukwu and Onyekwena (2014), they observed that structures that are constructed for flood management in most flooded communities including institutions are usually handled by foreign contractors and experts with limited understanding of the local situation. That these structures are usually copies of the solutions adopted in some distant countries with different socio-ecological settings different to the local (Nigeria) socio-ecological environment, this structures may not sufficiently adapt to the local environment and this will thus create other socio-technical problems.in support of this, Oladokun and Proverbs (2016) pointed out that based on their experience, that the capital intensive concrete structures and civil works that are constructed to prevent flood in most flooded communities, rarely offer adequate and sustainable defence against the threats of flood.

Research Question Three: To what level has non-structural component of environmental adult education programme for prevention of flooding been managed in higher institutions in Bayelsa state?

Table 3: Analysis of Level to Which Non-Structural Component of Environmental Adult Education Programme for Control of Flooding Been Managed in Higher Institutions

S/N	Statements	UNI. OTUEKE N= 340			NDU N=486		
		x	SD	Decision	x	SD	Decision
17	University management issued early warning notifications to staff and students on the possibility of flood in the school compound at beginning of the annual raining season	3.1	1.00	High Level	2.9	0.83	High Level
18	Staffs and students were prepared by the university management on ways to engage in environmentally friendly behaviour that will prevent water inundation of the school environment based on its volatile terrain to flooding	3.4	0.72	High Level	2.6	0.83	High Level
19	Staff and students were adequately informed or warned on the possibility of flood disrupting the academic calendar	3.3	0.63	High Level	2.8	0.85	High Level
20	University management provided relief funds to students and staff whose personal belongings were damaged by the flood in the school premises	2.0	1.06	Low Level	2.3	0.94	Low Level
21	University management in your institution utilizes flood forecasting opinion in planning appropriate measures to prevent environmental damage that may occur during flooding period	2.3	0.63	Low Level	2.2	0.77	Low Level
22	Your institution carries out flood proofing measure such as cleaning of primary and secondary drainage channels and clogged cross-drainage works before the onset of the flooding season	2.4	0.65	Low Level	2.1	0.53	Low Level
23	Students and staff awareness are raised and maintained, with a clear understanding of their roles in responding to flood emergency situations appropriately	2.1	0.66	Low Level	2.3	0.67	Low Level
24	Your university compound was landfilled after the initial flooding experience as a way of preventing future flooding	2.9	0.70	High Level	2.6	0.70	High Level
Grand Mean		2.7	0.76	High Level	2.5	0.77	High Level

In table 3, the result shows that non-structural component of environmental adult education programme for prevention of flooding have been managed to a high level in higher institutions in the area of study. But students and staff awareness were properly managed in area of adequate education on their roles in responding to flood emergency situations. Castillo-Rodriguez, Escuder-Bueno, Altarejos-Garcia and Serrano-Lombillo (2014) pointed out that much attention is been directed at structural measures in

flood management, that non-structural measures of public education and warning as well as social support systems, pre and post disaster need to be integrated in managing flood risks. Adelakun (2014) also observed that more attention should also be given to the enforcement of urban planning guidelines, development and building control as well as social participation of citizens to enable efficient and successful management of flood risk.

VI. CONCLUSION

Environmental adult education programme for preventing of flooding in higher institutions in Bayelsa State, Nigeria is more on structural measures (construction of diversion canals, drainage, dikes and levees). Little attention is being given to the non-structural measures. It is pertinent to observe that over-emphasis on structural measures could lead to sub-optimal development of the flood plan and may even invite greater losses when storms occur which exceed the design limits of the structures.

VII. RECOMMENDATION

In view of the conclusion, the researchers recommend that the management of environmental adult education programmes for flood preventing in the institutions need to consider stabilizing their flood prevention strategies to incorporate different non-structural measures for effectiveness of the programme.

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