

# *Smart Villages: Need For Future Sustainable Rural Development Of Emerging Bangladesh*

Marina Debnath<sup>1,2\*</sup>

<sup>1</sup>Assistant Commissioner (Land) and Executive Magistrate, Upazila Land Office, Fenchuganj, Sylhet, Bangladesh

<sup>2</sup>Ministry of Public Administration, Government of the People's Republic of Bangladesh

\*Corresponding email: [marina26nath@gmail.com](mailto:marina26nath@gmail.com)



**Abstract** – Over recent decades, people from urban and rural areas are passing various social and economic changes and challenges. Some of these challenges can overcome through the lenses of information technology (IT) and digitalization process. The current era is augmented using technology (information and communication). This technology has proved its potential in various segments of development in urban and rural areas. The objective of the present article is to present the concept and different cases of Smart Village to get an idea for the development of Smart Village in the context of rural areas in Bangladesh. The basic concept of Smart Village will be the key point for the sustainable development in rural areas in developing world like Bangladesh for the up-liftment of livelihood of the rural masses and to take a 'look ahead' at scientific developments and technologies that might be influential over the next decades to achieve sustainable development goals (SDGs) and vision 2041 of Bangladesh. The influential stimulant behind the concept on "Smart Village" is that the technology should acts as a stimulus for development, enabling education and local business opportunities, improving health and welfare, enhancing democratic engagement and overall enhancement of rural village dwellers. The concept of "Smart Village" model is not the uniform for all areas and must be applied based on regional opportunities and challenges. With sustainable development and smart techniques, all the components of rural areas (economic, environment and social) will be upgraded, so people enjoy a high standard living.

**Keywords** – Smart Village, Rural areas, Sustainable development, Information technology

## I. INTRODUCTION

About 50% of the world population is living in the villages. As per statistics, almost 62% people are currently living in the rural areas of Bangladesh [1]. Thus, the development of villages is the benchmark criteria for the development of a nation [2]. However, the expansion of urbanization in worldwide, people are migrating to the urban areas especially in big cities for different facilities such as education, employment, treatment, and better lifestyles etc. As a result, urban dwellers are facing different problems, including filthy housing, traffic jam, high crime rates, environmental pollution [3]. To solve these urban problems, many countries are focusing to build "smart city" through IT technology [4]. However, the concept of "Smart Village" has very recently gained propulsion, for example the idea of "Smart Village" establishment was promulgated by the European parliament together with European Commission in 2017 [5]. Furthermore, the concept of "Smart Village" was included in the European network for Rural Development (ERND) as a sub-theme to work on 'smart and competitive rural areas' between 2017 to 2018 [6].

In the modern era smart technologies are one of the leading directions of human development and current era known as "smart age" for social development. People are using smart phones, smart TVs, computer, and smart homes for living [7]. The concept of smartness is needed to respect and better to use in social development of rural and/or urban areas. When the concept of smartness is widely used, it is better to use this concept to develop Bangladesh. The introduce of "smartness" concept in social development can help accelerate to reach the agenda 2030 for Sustainable Development Goals (SDGs) and vision 2041 for Bangladesh. Like other developing countries, Bangladesh is a rural area dominated country. Thus, the focus on development of rural area can helps

to accelerate the SDGs and vision 2021 to make the country as “Developed Country”. The introduce of idea “Smart Village” build in rural areas will be an integral part to reach SDGs and vision 2041.

The aims of this paper are to focus on the existing initiative for “Smart Village” set up in worldwide, developed possible concepts, its importance and possible outcome in the context of Bangladesh.

## II. WHAT IS A SMART VILLAGE?

According to ENRD (2017) [6], “Smart Villages are communities in rural areas that use innovative solutions to improve their resilience, building on local strengths and opportunities. They rely on a participatory approach to develop and implement their strategy to improve their economic, social and/or environmental conditions, in particular by mobilizing solutions offered by digital technologies”. It is a holistic approach to develop the rural areas by which enhance the existing strengths and assets through creative solutions. In the Smart Village approach, individuals, and community group work together to overcome any local challenges by using smart technologies and with the support of smart manpower and by managing to be self-reliant [8]. The Smart Village concept will be considered availability of local infrastructure, resources, demand, and the potential capacity of this area. Fig. 1. gives the overall concept of a Smart Village framework for s self-sufficient village.

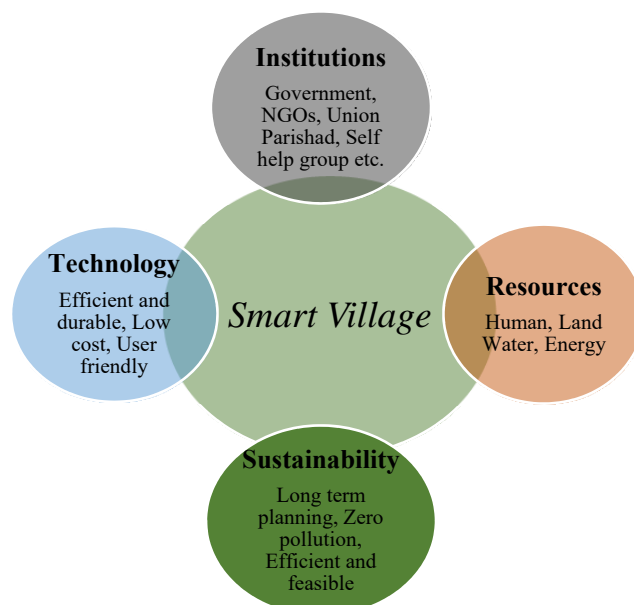


Fig. 1. Framework of Smart Village (Modified from Ramachandra et al., 2015 [9])

Villages are the heart of a nation. When build a Smart Village, primarily quantify the available natural resources present in the region such as land, water, energy, and human resources [10]. Not only the quantity but also the quality of the resource is important, for instance, educated and sensible human resources are needed because they constitute the ultimate users of all the natural resources. Besides, use of technology in competent way to achieve required outcome from the different sector such as agriculture and agro processing, healthcare service, and education to improve the life standard of rural people. Also, the application of the concept ‘sustainability’ in Smart Village, means use of resources without comprising the future generation use, and transferred the outcome to socio and economic development [11]. The term ‘sustainability’ in Smart Village concept means the strong agriculture, beautiful villages, and rich farmers who have the capacity to solve the problems faced in the rural areas [12]. In addition, institutional support plays a vital role in achieving sustainable development in rural areas to build a Smart Village. Government can play a key role for the implementation and supervision of the developmental activities and receive the feedback from the stakeholders. NGOs, Union parishad can help in motivating the people, create awareness and make a training on scientific technology introduction in rural areas.

In the context of Bangladesh, development of Smart Villages, different strategies need to consider based on the proposed framework of Smart Villages. Also, focus must the devoted to the sustainable use of resources and smarten the rural population using IT solutions. This ‘Smart Village’ concept may play a vital role to build a smart country by create a balance development

between the urban and rural areas, ultimately leads to reduce the migration of rural people to urban areas and people will acquire the same facilities living in rural or urban areas.

### **III. INITIATIVE CASE OF SMART VILLAGES IN WORLDWIDE**

There are several initiatives and projects promoting in the worldwide for using the concept of the “Smart Village”. In line with the context of increase using the concept of the “Smart Village”, European Union has taken a holistic and integrative approach to develop a smart and sustainable communities in Europe. To achieve SDGs goal 2030 and uprising the development in the 4<sup>th</sup> industrial revolution era, different countries in the world promoting the concept Smart City-Smart Village to solve the gap between city and village [4].

#### *3.1. Europe*

In 2016 Cork declaration 2.0 has been proposed firstly the concept of “Smart Village” under the name A Better Life in Rural Areas [13]. The declaration has very openly addressed some concerns about the conditions of the rural areas, especially rural migration and youth drain and thus way of solving these problems in future policies including Smart Village Agenda. Addressing ten points present in rural area, the conclusion remarks were rising the investment in rural areas, acknowledging their potential (economic) growth that will attract all ages of people to live and work at. Moreover, overcome the digital divide between rural and urban areas, provide emphasis on developing the digitalization in rural areas. In the next year, 2017, European Commission launched an action plan of Smart Village for the development rural areas in Europe [14].

By 2020, the government of French Republic invested 2 million euros to build a cooperation between urban and rural areas and improve the basic services (economic development, social inclusion, health culture, environment, and energy resources) in Bress and Bretton rural areas [15]. Bretton was selected as a local hub, where a hospital (Carhe Hospital) coordinated by remote service to control the disease and established a digitalized business model for the sustainable smart development.

The Fraunhof Institute, Germany, and Ministry of Interior jointly invested 4.5 million euros in a pilot project by 2019 to improve the digital services in local areas and expand the communications between communities and local government. This project was executed in three areas (Eisenberg, Heim Betzdorf and Gebbard Sign) to create a digital (smart) village. The services of digital village: develop a delivery based app service connect with local based product producer and volunteer delivery to the consumer and exhibit the local based product on online market place; people of these areas have access Mobile DorfFunk service of digital service, which delivers local news and exhibited the news of interested areas; Lastly, Hannah’s digital village service act as a two way communication with local residents with local governments for all these communications [15].

In 2016, Finland conducted different research projects on Smart Village to solve different social issues in rural areas by digitalization process. As a result, digitalized government project and broadband communication networks were established and used for research. The findings of these projects were, need to build a public platform, allow access, reduce digital information gap and to construct a digital promotion plan [15].

#### *3.2. Asia*

India has taken different projects to not only to build smart city but also Smart Villages in different areas where people will live well through IT technology. India has launched a PURA (Providing Urban Amenities in Rural Areas) scheme to reduce the exodus of rural people to the city by improving communication, internet, and employment opportunities. For example, Mori, a sleepy cashew exporting village was designated as a first Smart Village where internet and telephone banking are existed in all household [16].

In Japan, several projects are taking by the Japanese Ministry of Affairs to solve the different social problems by using digitalization. For example, autonomous public transportation service in some local cities to solve the traffic problem and accidents occurred due ton the elderly drivers by using IT technology. Japan is trying to reduce the medical expense and nursing problems for the elderly people in the future by establishing Smart Village instead of the concept of build big city [4].

In 2010, a project named Smart City Smart Village (SCSV) launched by the Malaysia Global Science and innovation Advisory council to build a digital Malaysia. The aim of SCSV is to improve everything from energy use to healthcare, education, traffic, and shopping by doing it ‘smart’ with the help of IT and green technology [17].

#### IV. IMPORTANCE OF SMART VILLAGES FOR BANGLADESH

The current increase rate of population and rapid expansion of urbanization is one of the major challenges in Bangladesh. Thus, needs to be a proper balance between rural and urban lifestyle. In general, people living in the village are little republics, having nearly almost everything for survive and almost independent of any foreign relations [18]. In the modernization process, people demand, and supply process have undergone many changes, as rural population also passing through the process this change. The concept of “Smart Village” will address the multiple challenges confronted for sustainable smart growth of rural Bangladesh. A “Smart Village” will provide long-term social, economic, and environmental welfare activity for village community [10], which will enable and empower enhanced participation in different institutions (Govt., NGOs etc.), promote entrepreneurship and build more resilient communities. Additionally, a “Smart Village” will ensure proper good food, education, better infrastructure, clean drinking water, health facilities, environment protection, resource use efficiency, waste management, renewable energy etc. Thus, it is an urgent necessity for develop the concept and designing “Smart Village”, which are independent in providing the services and employment and yet well connected to the rest of the world. Based on different programs undertaken by the government such as digital Bangladesh, Homeless shelter, green economy which can helps encourage to people live in rural areas mobile banking technology. Considering, a ‘Smart Village’ will incorporate a sustainable and inclusive development of all units of the village community, so as they enjoy a modern and high standard of living.

#### V. DEVELOPMENT OF SMART VILLAGES AND EXPECTED OUTCOME

The conditions and challenges are different for developing Smart Village due to differences of the opportunities and challenges in different regions. At first, researchers imagine that the developed smart city may be useful for the development of Smart Village concept [10]. Recently, some other researchers considered that the components and situations are totally different in urban and rural areas [7,10]. The components considered for Smart Village may vary from region to region, but the basic services and expected outcome will be the approximate comparable for each Smart Village.

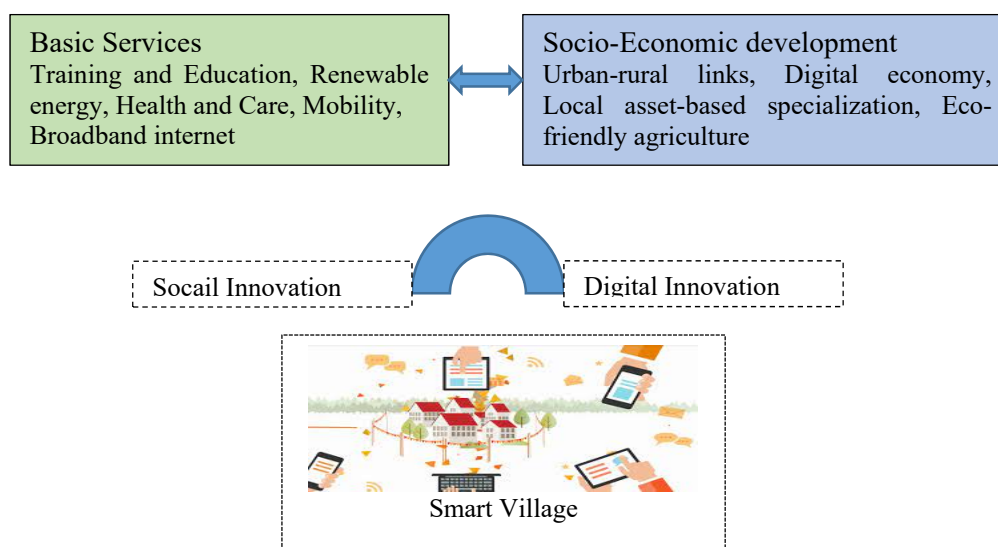


Fig.2. Development and sustain model for smart village

Several basic services need to provide such as training and educate the people, support for health care, internet, internet etc, expediently socio-economic development or rural areas will achieve (Fig. 2). This means that, develop the village in such a way that which is self dependant in providing the services, employment and well connected to the rest of the world. According to Sai [10], there are some generalized guidelines for the development of Smart Village. These guidelines comprise of three main components:

1. Economic Component: This section comprises by local administration and economic factors. It will cover governance models, bandwidth, health and care issue, mobility, cloud computing, digital innovation, entrepreneurship etc.
2. Environmental Component: This section includes the issues related to resources and infrastructures available at local level. It also covers the cleaner technologies, public and alternative transportation, green spaces, smart growth, climate change etc.

3. Social Component: This section addresses the issues related to training, community life, participatory democracy, social innovation, proximity services etc.

In the context of Bangladesh, the smart development in rural areas will help to achieve SDGs in 2030 and vision 2041 (to become a developed country). Also, rural development can contribute to eradicate poverty, hunger, scaling up their income and lifestyle. People will encourage rural in migration and return from urban to rural areas if smart development happens in every village. The problems relate with over population, urbanization, and urban slums area will reduce which can helps to improve the social and environmental conditions of a country. By adopting the use of renewable energy, eco-friendly agriculture will support the sustainable development of rural areas. The people live in the rural areas will get the appropriate health care service, clean water supply and with improved nutritious food. Also, people can share their problems, develop innovation solutions for these problems, progress their business by digital marketing. By Smart Village concept, rural areas in Bangladesh will be developed with improved the lifestyle by necessity access to employment, food, better house, and health care etc. and the country will be “Sonar Bangla” dreamed by the Father of the Bengali Nation named Bangabandhu Sheikh Mujibur Rahman.

## VI. CONCLUSIONS

The concept of Smart Village can help to achieve SDGs 2030 and vision 2041 of Bangladesh, where more than half of the population lives in rural areas. The guidelines and practice of Smart Village models in different countries will provide a basic concept for development of Smart Village in the context of Bangladesh, to achieve sustainable development. A smart village is a rural development model that makes full use of the solutions provided by IT to promote the sustainable development of rural areas on the basis of clarifying the characteristics and needs of rural development. Smart Villages will contribute to reduce the migration to urban areas, hence support to irrigate the population flow from urban to rural area. IT is the unbreakable pillar to support the whole process of Smart Village development. Smart village concept will have potential to improve the grass-root level of the country, hence adding feather in the overall development of Bangladesh. All the activities related to Smart Village need to be addressed based on the varying rural situations in different regions. A specially designed suitable framework for rural areas on the grounds of Science, Technology, Engineering, Regulations and Management will play vital role to build Smart Villages. Because each village is a distinctive character and having diverse set of problems and situations. Thus, the model for Smart Village will not be same for all the villages in Bangladesh. To address this complex problem, Public Private Partnership (PPP) may play key role for developing smart villages. The expected outcome of the smart village is prophesied to be remarkable. The conclusion that theoretical guidelines and necessity of Smart Village concept are discussed in this paper will provide a basic idea to policy makers to develop Smart Village in the context of developing countries like Bangladesh.

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