



INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK



SPECIAL ISSUE FOR 2nd NATIONAL CONFERENCE ON "Recent Trends and Development in Civil Engineering"

A REVIEW PAPER OF STRATEGIC DEVELOPMENT FOR SUSTAINABLE SMART VILLAGE

JAYKUMAR SONI¹, PRIYANKA RAVAL², ROHAN GUNDALIYA², MEGHAL VARE², ANUJ PUROHIT², RAJESH GUJAR³

1. Civil Engineering Department, L.J. Institute of Engineering and Technology, Ahmedabad, Gujarat -382210
2. Civil Engineering Department, L.J. Institute of Engineering and Technology, Ahmedabad, Gujarat -382210
3. Department of Civil Engineering, School of Technology, Pandit Deendayal Petroleum University, Gandhinagar, Gujarat-382 007

Accepted Date: 22/12/2018; Published Date: 01/02/2019

Abstract: According to the Central Government of India, the region which has below 15,000 population is considered as 'Village.' In India, 21% of villages out of 6, 00, 000 villages are backward, so it is essential to develop the village as a 'Smart village.' People migrate from rural areas to urban areas due to the lack of facilities such as education, health care, recreation centers, unemployment, productive enterprise, clean water, sanitation. In order to stop habitats migrating from rural to urban areas, it is just not to develop the village, but it is also to create bonding between people. The idea of the smart village in the current scenario seems to be more critical because there's a limited growth of cities which are required in the development of urban area where the population ratio per km of land is higher than the given norms.

Keywords: Photovoltaic solar cell, Wind energy, RO water purifier, ALTAEROS



PAPER-QR CODE

Corresponding Author: JAYKUMAR SONI

Access Online On:

www.ijpret.com

How to Cite This Article:

Jaykumar Soni, IJPRET, 2019; Volume 7 (6): 243-249

INTRODUCTION

Development of villages was first proposed by Mahatma Gandhi as “Swaraj and Suraj Village,” but nowadays it is newly termed as “Smart Village.” In a smart village, the major thrust is given on the technology as a means for development, enabling education and agricultural opportunities, improving health and social welfare, enhancing democratic engagement and overall development of rural village dwellers. The concept of the smart village is to collect community efforts and strength of the individuals from various streams and integrate it with information technology to provide benefits to the agricultural community. According to Mahatma Gandhi’s philosophy and thoughts smart village projects provides, “Global means to the local needs”.

LITERATURE REVIEW

1. CONCEPT OF VILLAGE:

The rural area is defined as particularly area which is located outside the cities and towns, and these rural areas are also known as 'village' in India. In these villages, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery, etc[1]. According to 2011 census, rural area has a population of 68.84%, whereas urban area has a population of 31.16% only. It is a growing the fact that the rural population is suffering more consequences for livelihood as compared to urban areas[2].

As per the Erstwhile Planning Commission of India, a settlement with a maximum population of 15,000 is considered as “Village”. Along with this; most of India’s rural population lives in nucleated villages, which most commonly have a settlement form described as shapeless agglomerate. The number of rural units or villages in India have increased from 6, 38,588 to 6, 40,867 [3]. Around 65% of the Gujarat State's population is living in rural areas. People in rural areas should have the same quality of life as is enjoyed by people living in suburban and urban areas. Further, there are cascading effects of poverty, unemployment, poor and inadequate infrastructure in rural areas on urban centers causing slums and significant social and economic tensions manifesting in economic deprivation and urban poverty[4].

2. DIFFERENTIAL APPROACH TOWARDS SMART VILLAGE AND CITY:

As per the current scenario, there is an enormous interest in order for the development of Smart Cities. To construct a city “smart” is appear as an approach to reduce problems caused by urban population growth and fast urbanization[5]. Conditions in the rural area and urban area are distinct from each other. So, the “Smart City” concept cannot be implemented for villages. The efforts of rural development may not work on the same concept as of the smart city.[6]. Unbalanced growth between urban and rural landscapes may lead to rapid urbanization of the country, i.e. India, whose population is increasing enormously. The main effect of the

uncontrolled urbanization is lack of livelihoods, the standard of living and amenities in the villages of India[7].

Globally, the concept of 'Smart City' is a significant initiative that seeks to improve the quality of life of urban citizens. Smart Cities across the country have the potential to be a game-changer in the country's urban landscape and the lives of ordinary citizens. The smart city initiative is having good potential for urban development and India has also recognized this potential and is at the edge to start implementing this concept. This will facilitate better living for about 30% of the population, who live in urban area. However, more than half population will not be benefited from smart city development[6].

3. NEED FOR SMART VILLAGE

The non-rural growth to visible expanse is inescapable, as the economic tracks and aspirations of the population do alterations and progress. It requires to be store and sustainably controlled through stability between urban and non-urban life. The conception of "Smart Village" can address the multiple challenges two-faced for property development of rural India[2]. A "Smart Village" can give semipermanent social, economic, and environmental welfare activity for village community[8].

4. STRATEGIC FRAMEWORK FOR DEVELOPMENT OF SUSTAINABLE SMART VILLAGE

Fig.3. ALTAEROS AIR TURBINE



The alternative ways through which the sustainable development of a smart village can be done include the production of wind energy through ALTAEROS: Commercial Wind Air- Borne Turbines, Solar Photo voltaics and panels and Micro-hydro Power plant.

ALTAEROS: Financial power generation for the rural region and remote location remains a significant challenge. Currently, the primary focus is drawn towards the generation of diesel power or renewable energy, such as wind or solar. Diesel is fossil fuel which is expensive and needs regular refueling, and on the other-side, the renewable energy is not depleted when used, which makes renewable energy cheap.

Altaeros' autonomous tethered airborne platforms are designed to lift a lightweight wind turbine to 600m above ground, where winds are strong and consistent. At these heights, Altaeros can deliver the unprecedented value of generating power, efficient energy production, Increase of renewable energy credit.

MICROHYDROPOWERPLANT: Micro hydro Power plant is a type of Hydroelectric power that typically produced up to 100kW of electricity using the natural flow of water. These types of power plant can provide power to an isolated home or a small community. The micro-hydro system complements solar energy because in many areas in winter the water flow is maximum and solar energy is minimum.

SOLAR ENERGY:

National Solar Mission (NSM) received a thrust with the achievable target being increased from 20 GW to 100 GW of installed solar capacity by the year 2022. The target is of 40 GW of rooftop and 600 GW of large and medium scale grid-connected projects.

As per smart city guidelines, at least 10% of the smart city's energy requirement should be met by solar power.

5. PUNSARI: A MODEL INDIAN VILLAGE



Fig.4. RO Water System

The Punsari village is located in Sabarkantha district of Gujarat. Punsari is providing much more facilities than any ordinary village in India. This village provides 24X7 Wi-Fi connectivity, CCTV cameras, solar powered lamps, bus service which runs in village premises only, clean drinking water at an affordable rate of ₹4 for a 20 liter of drinking water.

Himanshu Patel was elected as a Sarpanch of Punsari in 2006. Initially, there was no sewerage connection, no street lights, no pucca roads and, of course, no source of income for the gram panchayat except the grants and funding from various states and Central government schemes. Six years later the village gets numerous amount of facilities like Wi-Fi, optical fibre broadband network, classrooms with CCTV cameras, its minibus transport system.

The Gram Panchayat had also provided loudspeakers covering the entire village, gutter project, clean primary health center, eight kinder garden schools, banking facilities, toll-free complain

receiving phone service among others. Villagers can buy a price ticket of Rs 1 to use the minibus service. For feminine students, the service is free. The villagers even have the accidental cover of Rs 1 lac and a media-claim cover of Rs. 25,000.

There are five primary schools in Punsari. All the five schools have CCTV cameras places to enable parents to check their wards' performance without interrupting the lectures and also to keep a watch on the teachers. The village was rates B+ during Ganotsav 2011 which is an annual educational campaign by the state government. Their success story is simple – optimal utilization of government schemes.

6. STEPS TAKEN BY GOVERNMENT FOR SMART VILLAGE DEVELOPMENT

The smart village corrects social oversight by providing accommodations for property family relationships while not worrisome the lifestyle of various generations. The perception of the smart village is that trendy energy access will act as a catalyst for development in clean water, health, productive enterprise, education, sanitation, environmental property and democratic democracy that helps to support any improvement in access to energy. Initially, the idea of the development of village is of Mohandas Karamchand Gandhi, i.e., Swaraj and Suraj village. However, today it is newly termed as a sensible village. We all know that India may be a developing nation, with the assistance of a good village we will create India as associate degree SS nation. Nowadays, our government conjointly offers powerful specialize in the smart village. Government implements such a lot of schemes fora smart village[9].

“E-Gram Yojana Government Scheme”: Mission ‘E Gram – Viswagram’ provides a facility for electronic issues of certificates which include certificates of birth, death, income, caste, domicile, property, residence proof, agriculture, Tax collection, marriage, family information, and land possession. A digitalized data-bank is in operation for the issuance of the abovementioned certificates at the village level, which is the lowest administrative body of Indian Governance. In the E-Gram Mission, all 13,693 village panchayats are in a position to provide necessary and essential services to their citizens in Gujarat vernacular language with the availability of VSAT connectivity. To leverage IT resource at the village level, E-Grams are being operated through Village Computer Entrepreneur (VCE) on revenue sharing basis under PPP model. This innovative mechanism is ensuring prompt services to the citizens; providing the opportunity of an additional income to the village panchayats and generation of the self-employment opportunities for rural youth.

“Nirmal Gujarat Mission 2012”: The purpose of this exercise is to assess the success rate of the Nirmal Gujarat programmer, a state wide campaign focused on sanitation and cleanliness, launched in 2007 by the Government of Gujarat. Given the broad stretch of the drive, the current study targeted on bound initiatives administered by the Nirmal Gujarat Mission; consequently, this study sets out to identify: (1) The impact of Nirmal Gujarat on sanitation standards in slums, including the effects of the drive on eradicating open defecation, (2) The

campaign' The impact of IEC (Information education communication) and EE (Environmental Education)

“Saansad Adarsh Gram Yojana (SAGY)”: It forecasts integrated development of the rural area over multiple areas like health, agriculture, sanitation, education, livelihood, environment. It seeks to not only offer physical infrastructure and access to essential amenities however additionally improve the quality of living, enrich social capital and build community spirit. These are the ingredients that will ensure long term positive change and sustainability of this change.

CONCLUSION

There are total 17 targets which are made by the central government of India in order to enhance the livelihood of Indians and to make India a grand and supreme country amongst the world. These 17 goals are termed as 'Sustainable Development Goals: SDG' having their focus towards various issues and challenges. Out of all these goals, the 7th goal is "Affordable and Clean Energy." This goal of NITI Ayog deals with energy and sustainable development and Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All. After performing through literature review and study area visits, it has been observed that there are several concepts which are being available in India regarding the energy and sustainable development which can accelerate the development of the country with high pace and a new scale. Various schemes and alternatives through which the sustainable development can be achieved and alternative ways include ALTAEROS: Commercial Wind Air Borne Turbines, Solar Photovoltaics, and solar panels and Micro-hydro Power Plant which can enable the development of a sustainable smart village.

REFERENCES

1. A. Srivastava, S. Gupta, and G. Tiwari, "Smart Villages : Progress of Indian Era – Today ' s," vol. 6, no. Iii, pp. 783–788, 2018.
2. P. Ranade, S. Londhe, and A. Mishra, "Smart Villages Through Information Technology – Need of Emerging India," Int. J. Inf. Technol., vol. 3, no. 7, pp. 1–6, 2015.
3. B. N. Patel and P. R. Shah, "Smart village a case study of kolavada village," pp. 907–911, 2017.
4. D. Mavalankar, K. V. Ramani, A. Patel, and P. Sankar, "Building Infrastructure to reach and care for the poor," p. 50, 2005.
5. E. P. Trindade, M. P. F. Hennig, E. M. da Costa, J. S. Marques, R. C. Bastos, and T. Yigitcanlar, "Sustainable development of smart cities: a systematic review of the literature," J. Open Innov. Technol. Mark. Complex., vol. 3, no. 1, p. 11, 2017.
6. S. Villages and S. Cities, "Smart Villages and Smart Cities," pp. 1–18, 2011.
7. N. A. Razak et al., "a Development of Smart Village Implementation Plan for Agriculture: a Pioneer Project in Malaysia," Comput. Informatics, 4Th Int. Conf. 2013, no. 024, pp. 495–502, 2013.

8. S. Darwin and H. Chesbrough, "Prototyping a Scalable Smart Village by Leveraging Open Innovation," *Harv. Bus. Rev.*, pp. 1–24, 2017.
9. R. Somwanshi, U. Shinde-Patil, D. Tule, and A. Mankar, "Study and development of village as a smart village," *Int. J. Sci. Eng. Res.*, vol. 7, no. 6, pp. 395–408, 2016.