Suggestive measures for Infrastructure Development under Smart Village Project- A case study of Vadodara, Gujarat

Aibaz Rana[1], Gaurav Gohil[2],. Indrajit Patel[3], Jagruti Shah[4]*
[1]PG scholar, Infrastructure Engineering &Technology, B.V.M Engineering College
Vallabh Vidhyanagar, Anand, Gujarat, India.
[2]Assistant Professor, Civil Engineering Department, G. H. Patel Engineering College, Vallabh-Vidhyanagar, Anand, Gujarat, India.
[3]Professor, Structure Engineering Department, B.V.M Engineering College, Vallabh-Vidhyanagar, Anand, Gujarat, India.
[3]Assistant Professor, Structure Engineering Department, B.V.M Engineering College, Vallabh-Vidhyanagar, Anand, Gujarat, India.

_____

Abstract

Urbanization is taking place at a faster rate in India. Population residing in urban areas in India, according to 1901 census, was 11.4%. This count increased to 28.53% according to 2001 census, and crossing 30% as per 2011 census, standing at 31.16%.Gujarat is set to break all its previous records of urbanization. Gujarat's urban population is now 42.6 per cent, or 2.57 crore, of the state's total, according to the 2011 census figures. Due to rapid urbanization government more focus on developing village by various program and Projects like MGNREGA, Mission Antyodaya, National RurbanMission (NRuM), DeenDayalAntyodaya Yojana, Pradhan Mantri Awaas Yojana, Prime Minister's Rural Development Fellowship, Smart village project, Adarsh gram Yojana, etc. A village which has foresight for the development and proper planning to keep the village clean, healthy, green, pollution free and disease free with co-ordination of various community development and welfare schemes of government under smart village project.
This paper present analysis of the existing two villages which is selected under smart village project of Vadodara District

Keywords: Smart Village, Vadodara, Infrastructure, Rural area, Sustainable development.
_____

INTRODUCTION

As per Census of India statistics, the rural population in India stands at 833 million, constituting almost 68% of the total population. India has around 6, 00,000 villages out of them   1, 25,000 villages are backward so there is need for designing and build the village as a smart village. India is nation of villages, therefore for overall development of nation, development of villages is necessary. The main problem in Indian villages is less diversification of occupation. Mostly rural people depend on agriculture. Lack of infrastructure facilities in term of health, education, road transportation etc. Migration of people from rural to urban areas. Orthodox thinking of rural people. Lack of skill development and lack of cash crunch. Unemployment and Poverty in rural areas. Unplanned Development of village.

It is necessary to keep the soul of villages alive; by the provision of required infrastructure in villages like, Proper road network and connectivity. RO water supply system. Solid and liquid waste collection system in village. Proper drainage system. Rural electrification. Technical and Vocational Education for young generation. Women and Child Development.

ABOUT SMART VILLAGE

Gujarat Government has launched Smart Village program in 2016 to improve public facilities in the villages.

Aim of the project is to make village as the villages would become prosperous and smart, migration from villages toward cities would decrease. Under this programmed, 300 villages will be selected for Smart Village program. Village will be shortlisted by the state-level committee consisting of expert on the basis of Gram Panchayat's performance through a transparent process. It seeks to make villages 'smart' on the line of Smart Cities that will help them become self-reliant, clean and hygienic. Toilet's, cleanliness, drop-out rate in primary schools, malnutrition ratio, Anganwadi facilities, vaccination of children, ATVT services are some parameters on which village will be adjudged as 'Smart Village'.These selected villages will get financial assistance from the state government to improve public facilities in the villages.

OBJECTIVES OF STUDY
- To study parameters driven for the smart village development.
- To analyse the infrastructure facilities & its prevailing problem in the selected smart villages of Vadodara.

SCOPE OF THE STUDY
This study is focusing on Bajwa and Tundav villages of Vadodara which is selected under this project.

STUDY AREA PROFILE
Vadodara is the third largest city of Gujarat in terms of population as well as in area. The population of the city as per census 2011 is 16.70 lakhs. It is estimated that by 2041, it will be reaching around 37.12 lakhs.

In this study the two villages Tundav and Bajwa as shown in Fig.1

Source: Maps of India.com

Demographical detail of Bajwa and Tundav villages are shown in Table-1 and Table-2 respectively.

Table 1 Bajwa village

Particulars	Total	Male	Female
Total No. of Houses	1906	-	-
Population	9611	5093	4518
Child (0-6)	759	395	364
Schedule Caste	2479	1256	1120
Schedule Tribe	688	305	325
Literacy	72.29%	81.9%	64.1%
Total Workers	2980	1830	1440
Main Worker	1,914	0	0
Marginal Worker	383	235	148

Table 2 Tundav village

Particulars	Total	Male	Female
Total No. of Houses	1,116	-	-
Population	6,102	3,169	2,933
Child (0-6)	759	395	364
Schedule Caste	513	215	262
Schedule Tribe	360	183	177
Literacy	76.49%	85.9%	66.33%
Total Workers	2,297	1,830	467
Main Worker	1,745	0	0
Marginal Worker	310	186	214

DATA ANALYSIS
Data has been collected through Techno economic survey. Survey form has been design by considering all the parameters for the Infrastructure development & household level facilities.

Details of the entire Infrastructure available in both the villages as follow:

A. Drinking water
Main source of drinking water is Wells and tub wells to Elevated tanks to house which is available in adequate amount and utilize by both village peoples easily nearby their houses for drinking and domestic purpose. Both village has 100% Tap water connection.

B. Road network
Road network is providing up to village as WBM road which is in good condition in both villages. Internal Street are all most of R.C.C but not available in every faliya some of the streets road are very poor condition. Tundav village has also block paving system.

C. Electricity supply
Electricity is provided by government for 24hours domestic power use in both the villages. And these facilities are adequate for village. Power supply is provided 8 hours in agriculture purpose in both villages.

D. Sanitation Facilities
Public latrine Blocks, community toilet, solid and liquid waste disposal system and facility for waste collection from road is not available in both villages. The sanitation waste is not clean on time to time which may causes impact on environment.

E. Solid waste management
No proper solid waste disposal system in both villages.Bajwa village has his own system to collect garbage from every house. Tundav village has run vehicle in every morning through all street of village to collect garbage door to door.

F. Irrigation facilities
Main sources of irrigation are canal, tube well, hand pump in both villages. Bajwa village main source of irrigation is tube wells.

G. Housing condition
Housing condition is poor in all most both villages and the most of the houses are kutchha and some houses are pucca respectively 60% & 40%. The houses condition is critical as there is no proper roof for peoples who leave in houses.

H. Health Facilities
Village has Public health Centre (PHC) available in which various facility like medical room, maternity homes, child welfare, store room, 6 beds available with good condition in both villages.

I. Education Facilities
Anganwadi, Primary & Secondary education facilities available in both villages but some of the school rooms are in critical condition so that the student is uncomfortable to Study in that rooms because of that they are study in open space out of the school. Bajwa village has no government secondary high school building.

SWOT ANALYSIS

SWOT Analysis of Tundav Village

- **STRENGTH**
  - Crop Production is high
  - Literacy rate is good
  - Good milk collection center
  - 24 hours drinking water supply

- **WEAKNESS**
  - Poor Infrastructure facility
  - Unequal distribution of wealth
  - Migration rate is high

- **OPPORTUNITY**
  - Small scale bussiness
  - Agriculture market
  - Mobile Library

- **THREATS**
  - Safety and security issue
  - Traditional method for rural marketing

SWOT Analysis of Bajwa Village

STRENGTH
- Employment ratio is high
- Small scale bussiness is high
- Railway station available

WEAKNESS
- Poor Infrastructure facility
- Literacy rate is low
- Migration rate is high
High rate of pollution

OPPORTUNITY
- Hub for near by villages
- Huge commercial and agriculture market

THREATS
- Safety and security
- Sanitaion problem

SUGGESTIVES MEASURES

1. Door to door solid waste disposal in each are of village
2. To supply RO drinking water to all house of villages
3. Instead of RCC road we can make plastic road or make road with local available material
4. Agriculture waste can use in Bio-Gas plant and that gas supply to village people
5. Instead of normal street light use solar street light
6. Small scale business can improve at local level
7. Mobile library can place in village
8. Rain water harvesting system can adopted
9. There is a requirement to clean sanitation system onschedule.
10. Requirement to maintainhouses, School building and old structure.
11. Make village open defecation
12. Road side plantation in the village
13. Awareness toward modern farming and drip irrigation
14. Develop the public cum private dry compose toilet.

CONCLUSIONS

From this study it has been analysis that Tundav and Bajwa is having strength in basic infrastructure facility but if that infrastructure facility is improvised and if we can make it smart and sustainable then future of Tundav and Bajwa can been change due to that more employment can be generated and migration rate can reduce which is the main objective of smart village project.

REFERENCES

- International Journal of Applied Research, The Indian smart village: Foundation for growing India, Dr. Pritesh Y Shukla , The M. S. University of Baroda, Baroda. APRIL-2016
- International Journal of Advance Engineering and Research Development, "DREAM VILLAGE- A CASE STUDY OF BAKROL VILLAGE", Chauhan Darshak V. Assistant Professor, Civil Engineering, Sigma Institute of Engineering, Bakrol - Vadodara. APRIL-2017

- Tejas Bangera and Akshar Chauhan "IOT BASED SMART VILLAGE" (International Journal of Engineering Trends and Technology (IJETT)) Volume 32 Number 6- February 2016
- Pinak Ranade1, Sunil Londhe2 ,Asima Mishra3" SMART VILLAGES THROUGH INFORMATION TECHNOLOGY – NEED OF EMERGING INDIA" - IPASJ International Journal of Information Technology (IIJIT) Volume 3, Issue 7, July 2015 ISSN 2321-5976
- Karandeep Kaur "THE IDEA OF SMART VILLAGESBASED ON INTERNET OF THINGS"(International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 05 | May-2016
- Dr. S P Shahi,, Technology and Development: Rural Women in Focus, PG Dept of Political Science, A N College, Patna Magadh University, Bodh Gaya Bihar
- Esther W. Dungumaro, "Availability Of Domestic Water And Sanitation In Households", 2009, Committee for International Cooperation in National Research in Demography (CICRED), 107-125
- A.Chandra sekhara reddy, Dr. C. Anbalagan Effective Rural Development Strategies for the Improvement of Indian Economy, IRACST – Engineering Science and Technology: An International Journal (ESTIJ), ISSN: 2250-3498 Vol. 1, No.1, December 2011
- Albino V., Berardi U., Dangelico R., "Smart Cities: Definitions, Dimensions, Performance, and Initiatives", Journal of Urban Technology, Febuary 2015, 1-19
- Aoun C., "The Smart City Cornerstone: Urban Efficiency", Schneider Electric, ISBN: 998-2095-01-30-13, 2013, 1-13
- Azim A., AghaJani R., "Designing Smart Cities", Indian Journal of Fundamental and Applied Life Sciences, ISSN: 2231– 6345 (Online), Volume 4, 2014, 146-153
- Belani D., Makwana A. H., Pitroda J., "A Study of Evaluation Criterias for Renewable Energy Resources Using Frequency Analysis Through SPSS Software", Journal of International Academic Research for Multidisciplinary, ISSN: 2320-5083, Volume 1, Issue 10, November 2013, 350-366.
- Chavda Nihalsinh K. Patel Utsav C. Vaghela Raghuvirsinh P. Patel Dhavalkumar M.,Vishwakarma Yojana an Approach Towards Rurbanization PANSAR, IJIRST –International Journal for Innovative Research in Science & Technology| Volume 2 | Issue 11 | April 2016
- Cochran W. G. (1977),Sampling Techniques (3rd ed) new York,john wiley and sons
- David fresh water 2000, Direct and indirect rural development policy in a neo conservative, North America
- Debnath A, Chin H, Haque M, Yuen B., "A methodological framework for benchmarking smart transport cities", Cities-The International Journal of Urban Policy and Planning, ISSN: 0264-2751, Volume 37, 2014, 47-56
- Dr. Milind Kulkarni 2010, International Journal of Research in Engineering, Science & Technology
- Hogg R., Tannis E., "Probability and statistical inferences", 8th Edition, Prentice Hall, Upper Saddle River, NJ, 2009.
- Aditya A, Dhavan Gaurav R., Nikole Pritesh P., Ghutukade Manisha R., Jadhav Anil B., Sherkar Vitthal A., "Case Study And Planning Of Smart Village", 5th International Conference on Recent Trends in Science, Engineering and Management (ICRTSEM-16), ISBN: 978-93-86171-12-2, December 2016, 929-938
- Kendall M., Gibssons J.D., "Rank correlation methods", Oxford: Oxford University Press, 1990.
- Kothari C. R., "Research Methodology – Methods & Techniques", 2nd Revised Edition, New Age International Publishers, 2004.
- Madhusudan Ghosh, Infrastructure and Development in Rural India
- M.N.Mishra, "Modern Marketing Research", Himalaya Publishing Research
- Moulik T K & Mehta Swati, 1990. "**Migration: A Case of Gujarat**," IIMA Working PapersWP1990-09-01_00974, Indian Institute of Management Ahmedabad, Research and Publication Department.
- N. Viswanadham, Sowmya Vedula, "Design of Smart Villages", Indian School of Business, Hyderabad 500032, India, September-2010
- Noppawan Boontham , Chomchuan Boonrahong Sathaporn Sangsupoh2 and Surapol Dumronggittigule, SMART Village A Sustainable Model for Community Development, the International Conference on Gross National Happiness Paro, Bhutan, Nov. 4-6, 2015
- Rupapara Savan 2Khambhadiya Ronak 3Sheladiya Dharti 4Parmar Ashwini, Modernization of Villages Through Vishvakarma Yojana: A Case of Pipodara Village surat, GRD Journals, Recent Advances in Civil Engineering for Global Sustainability |, | March 2016 e-ISSN: 2455-5703