

An Approach towards Rurbanisation for PANSAR Village

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Abstract- The villages in Gujarat still not developed with respect to amenities required. The project will provide some recommendation and design of various infrastructure facilities for the Development of village. As per National survey organization defines 'Rural' as Follows: An area with a population density of up to 400 per square kilometer, villages with Clear surveyed boundaries but no municipal board, a minimum of 75% of male working Population involved in agriculture and allied activities. Aim of the project is to provide urban amenities in rural areas and maintaining the rural soul. This will help in developing villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. It consist also assessment of the infrastructure facilities (Water, Drainage, Road, Electricity, Solid, waste management, Storm water network, Telecommunication other), Social infrastructure facilities (Education, Health, Community Hall, Library, Recreation facilities & other) and Renewable energy (Rain water harvesting, Biogas plant, solar street light & other) for sustainable development. Project have to work at village PANSAR (Ta: KALOL, Dist: GANDHINAGAR), this study includes the data collection in all aspects and after the study of it, remedial measures can be suggested for further development of the same village as the level of urban requirement.

INTRODUCTION

About 70% of India's population, or 750 million, live in its 600,000 villages. More than 85% of these villages are in the plains or on the Deccan plateau. The Average village has 200-250 households, and occupies an area of 5 sq. km. Most of This is farmland, and it is typical to find all the houses in one or two clusters. Villages are thus spaced 2-3 km apart, and spread out in all directions from the market towns. The market centers are typically spaced 30-40 km apart. Each such centre serves a Catchment of around 250-300 villages in a radius of about 20 km.

As the population and the economy grow, several large villages are continually morphing into towns and market centers. Around 65% of the 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 sub urban and urban areas. Further there are cascading effects of poverty, Unemployment, poor and inadequate infrastructure in rural areas on urban centers Causing slums and consequential social and economic tensions manifesting in Economic deprivation and urban poverty. Hence Rural Development which is concerned with economic growth and social justice, improvement in the living Standard of the rural people by providing adequate and quality social services and a minimum basic need becomes essential. The present Project deals with the same.

- 1) Population of the village- 8438 (according to census data of year 2011)
 - (a) Male:-4467
 - (b) Female:-3971
- 2) Area of the village:-
 - (a) Total area: - 7850 hector
 - (b) Agricultural land: - 60% of Non-residential area
 - (c) Residential land: - 30% of All over area
- 3) Occupational detail:-
 - Name of three major occupational group
 - (a) Agriculture
 - (b) Industrial
 - (c) Labour work

OBJECTIVES OF THE STUDY

- (a) Promote integrated development of rural areas with provision of better connectivity and improving physical and social infrastructure.

- (b) Internal roads within village settlement, Public transportation facilities that need to be developed like bus stops, transport depot etc.
- (c) Refurbishing of village lakes, water tanks and Projecttlls, construction of rain water harvesting structures for sustainable Development.
- (d) To improve health and education condition etc. improvement of the people.

STUDY AREA LOCATIONS

- ❖ Time zone: IST (UTC+5:30)
- Latitude : 23.3098845
- Longitude : 72.4938607
- Pansar is a Vlage in Kalol Taluka in Gandhinagar District of Gujarat State, India. It is located 25 KM towards District Gandhinagar. Pansar Pin code is 382740 and postal head office is Pansar, Chhatral (5 KM), Isand (3 KM) , Dhamasan (5 KM) are the nearby Villages to Pansar.

The various surveys conducted by us are as follows:

- (a) Direct observation
- (b) Direct questions survey
- (c) Home interview survey
- (d) Primary survey

Data collected in project are,

- (a) Map of town
- (b) Data of site area survey
- (c) Population of village
- (d) Available facilities in village
- (e) Requirements of village
- (f) Government schemes in village
- (g) Project currently running in village

SUSTAINABLE DESIGN PROPOSALS

- Rain Water Harvesting System
 - Methods of Rainwater Harvesting
 - Surface runoff harvesting
 - Roof top rainwater harvesting

Rainwater harvesting is the collection and storage of rainwater for reuse on-site, rather than allowing it to run off. These stored waters are used for various purposes such as gardening, irrigation etc. Various methods of rainwater harvesting are described in this section.

1. Surface runoff harvesting

In urban area rainwater flows away as surface runoff. This runoff could be caught and used for recharging aquifers by adopting appropriate methods.

2. Rooftop rainwater harvesting

It is a system of catching rainwater where it falls. In rooftop harvesting, the roof becomes the catchments, and the rainwater is collected from the roof of the house/building. It can either be stored in a tank or diverted to artificial recharge system. This method is less expensive and very effective and if implemented properly helps in augmenting the groundwater level of the area.

Methods for storage of harvested rain water in tank;

Rapid depletion method (RDM):

In Rapid Depletion method, there is no restriction on the use of harvested rainwater by consumer. Consumer is alloProjectd to use the preserved rain water up to their maximum requirement, resulting in less number of days of utilization of preserved water. The rainwater tank in this method is considered to be only source of water for the consumer, and alternate source of water has to be used till next rains, if it runs dries.

For example if Project assume per capita water demand = 45 lit/day = 0.045m³/day.

Total amount of water consumption per day = 350 x 0.045= 15.75 m³/day.

Total no. of days, preserved water can be utilize = stored water/water demand = 759.22/15.75= 48 day

Hence, finally it is observed that, if the amount of water stored is equal to 583.52m³, then applying

Optimum dimension of the tank:

For area, total amount of water collected in one year = size of the tank = 759.22 m³

➤ Taking height of tank = 10m

➤ Area of the base =759.22/10 =75.92m²

➤ Project can take square base each of side=9×9m or rectangular base as per land availability.

➤ So our tank will be of dimensions 10m × 9m × 9m (taking square tank).

REPAIR & MAINTENANCE OF VILLAGE BUILDING

REPAIR AND MAINTENANCE OF EXISTING PUBLIC BUILDINGS

The bus stand of Pansar village is important means of transport for the villagers. Also the condition of the bus stand at present is not in good condition. Therefore Project have designed a very convenient design of a bus stand. The following are the details.

BIOGAS PLANT

Biogas (human waste) is one of the renewable energy sources which can be utilized as a backup in case of power interruption. For the waste collection; government provides backyard service to collect waste from the houses of village. But there is not any dump site available for dumping solid waste. So biogas plant is the solution for this situation. All solid waste has to dump at biogas plant site to convert the solid waste into the useful cooking gas and fertilizer. Also dump at low laying areas for land filling or for composting.

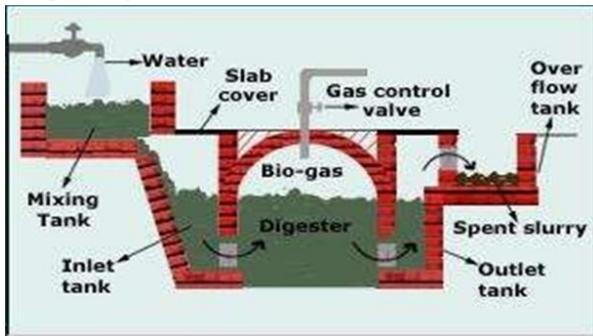


Figure :Components of biogas plant

Biogas-to-Energy system:

- Biogas-to-energy system has different parts reactor and its secondary systems, desulphurization and gas cleaning system, and the gas engines.
- Biomass is one of renewable energy resources. Biomass is a biological material derived from live or dead organisms, it can be used directly to get heat energy or indirectly by converting to bio fuel. Biogas is one of different types of bio fuel, which consist of liquid, gaseous, or solid fuels from biomass.
- The production of biogas happens through a biological process called anaerobic digestion. Biogas is principally composed of Methane (CH₄) and Carbon Dioxide (CO₂). After filtering and drying, the biogas produced will be utilized as fuel in gas engines to generate

electricity, as shown in figure. The gas engines and the peripherals making up the power plant system consist of standard equipment that is available in the market.

➤ Cost analysis of every section:

1. Digester
2. Hydraulic chamber and inlet recharge chamber
3. Overflow Tank
4. Pipe line and others (Local markets)
5. Generator

CONCLUSIONS

After the all data collections and surveys in the infrastructure facilities (Water, Drainage, Road, Electricity, Solid, waste management, Storm water network, Telecommunication other), Social infrastructure facilities (Education, Health, Community Hall, Library, Recreation facilities & other) and Renewable energy (Rain water harvesting, Biogas plant, solar street light & other) .Project will be provide Reimagine, Redesign and Rejuvenate of Village's infrastructure in sustainable and economical manner with the benifite of including government schemes.

REFERENCES

- [1] Akil Amiraly, Nathalie Prime, Joginder P. singh, 2004, "Rainwater Harvesting, Alternative to the Water supply in Indian Urban Areas" The Case Study of Ahmedabad" CRG-628.
- [2] Chris Donnges,2001, "Rural Transport and Local Government Units: How to Improve Rural Transport for the Rural Poor?" Transport and Communication Bulletin for Asia and the Pacific.
- [3] C.Manikanda Prabhu, R.Saranya, R.Lakhsmanan, R.Muralidharan, K.Kandasamy, "Proposed Rural Water Supply and Sanitation System for Nedungundram Village" e-ISSN:2278-1684,p-ISSN:2320-334X.
- [4] Debolina Ghosh, Udaybhanu Bhattacharya, February2015, "Solid Waste Hazards and Strategies for Better Management in India" Vol.2, Issue, 02, 420-425.
- [5] Dilip Saikia, July2014, "Health Care Infrastructure in the Rural Areas of North-East India: Current Status and Future Challenges".
- [6] Dr.Pradeep Kumar Samanta, February2015," A Study of Rural Electrification Infrastructure in

- India" e-ISSN:2278-487X, p-ISSN:2319-7668, Vol 17, Issue 2, Ver.
- [7] Indira Nair, May2014, "Challenges of Rural Development and Opportunities for Providing Sustainable Livelihood" ISSN(E):2321-8851; Vol.2, Issue5.
- [8] Jean-Jacques Dethier, Alexandra Effenberger, september2016, "Agriculture and Development: A Brief Review of the Literature" ECOSYS-380.
- [9] J.G Sreekanthachari, G.Nagaraja, June2013, "An Overview of Rural Education in India" Volume:4, Issue:1.
- [10] Kanu Raheja, June2015, "Rural Development in Haryana" Volume:5, Issue:6, ISSN:2250-3153.
- [11] Karen Coelho, "Infrastructure Investment As Sustainable Development: A Bangladesh Case Study" University of Arizona, USA.
- [12] Moh Abrar, Md.Ibrahim Shaikh, Krunal Dhiraj, Kumar Khandelwal, August2016, "Development of Infrastructure Facilities in Vadi Village" Volume:3, Issue:3, ISSN:2349-6010.
- [13] Ms. Rajwant Sandhu, 2010, "National Rural Drinking Water Programme" Rajiv Gandhi National Drinking Water Mission.
- [14] Mudit Kumar Singh, 2014, "Sanitation in Rural India" Volume:2, Issue:5, ISSN(E):2321-8878, ISSN(P):2347-4564.
- [15] Pinak Ranade, Sunil Londhe, Asima Mishra, July2015, "Smart Villages Through Information Technology need of Emerging India" Volume:3, Issue:7, ISSN: 2321-5976.
- [16] Prof. Minato Takayuki, Prof. Yarime Masaru, 2011, "Investigation of Infrastructure's Impact on Rural Communities Value in China- A Case Study of Hangzhou Bay Bridge" University of Tokyo.
- [17] P. Satish, March2007, "Rural Infrastructure and Growth" : An Overview.
- [18] Saumya Manjunath, Elumalai Kannan, "Effect of Rural Infrastructure on Agricultural Development: District Level Analysis in Karnataka" Volume:62, No:1.
- [19] Shashanka Bhide, D.B.Gupta, Tarujyoti Buragohain, D.V.Sethi, Shailender Kumar, S.K.Bhatla, November2009, "A Quality Assessment of Rural Housing in India" National Council of Applied Economic Research.
- [20] Vaibhav Nasery, May2011, "Biogas for Rural Communities" IIT Bombay.
- [21] Pansar Gram Panchayat, Kalol, Gandhinagar.
- [22] Taluka water data centre, kalol, ghandhinagar