

# Redevelopment and Upgradation of Basic Infrastructural Facilities at Nagor Village, Kutch

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## ABSTRACT

This work deals with study and redevelopment of Nagor village, Kutch. In this we focus on improved resource use efficiency, local self-governance, access to assure basic amenities of village to be redeveloped for easy living of village people. We are redeveloping basic infrastructural facilities like poor road network, drainage facilities, waste disposal facilities and water storage and harvesting by taking smart decisions using various technologies and effective ideas.

**Keywords** : Redevelopment, Up-gradation, Location and introduction of site, Road Development, Eco-Sanitation system, Rain water harvesting Problem solution.

## I. INTRODUCTION

A huge amount of migration of people is observed from rural areas to the urban areas to improve their quality of life. People generally have tended to move permanently to the urban areas instead of daily to and from visits for various urban facilities. Migration mainly occurs due to lack of basic facilities like drainage facilities, water facilities, proper health facilities and most important lack of source of income. Development of rural areas is accidentally ignored in the race of developing urban areas. The motive of this project is to suggest development of the rural areas not only by the means of infrastructure but also increasing its economic growth.

Rural population of Gujarat as per census 2011 India has been decreased to 57.4% from 62.6% as per census year 2001 which indicates migration as one of the main reasons for increase in urban population. Any area is considered as developed area which fulfills all the basic amenities that an individual expects from

government. Keeping this in mind government of India under the keen guidance of former Chief

Minister and present Prime Minister Mr. Narendra Modi has introduced a new concept for physical, social and socio cultural development of rural which was named as rurbanization. This project study is an initiative to draw the village towards the rurbanization.

## II. LITERATURE REVIEW

The entire literature review has been carried out by referring to various papers published in the journals and conferences, manuals and reports published by the eminent National and State government and nongovernment agencies.

For uplifting the rural sector of our country, the Ministry of Rural Development and the Government of India in coordination with Department of Rural Development and Department of Land Resources

have been carrying forward various schemes. These schemes are formulated to benefit the citizens of rural India who will eventually become the pillars of Indian Economy in the long run.

### 1. Pradhan Mantri Gram Sadak Yojana

Launched on 25 December 2000 by then Prime Minister Atal Bihari Vajpayee, the scheme aims at enhancing rural road connectivity. This scheme provides connectivity to the habitations with less or no connectivity at all and helps in poverty reduction by promoting access to economic and social services. This ensures sustainable poverty reduction in the long run as people get an opportunity to get connected with the rest of the world. The scheme has been benefiting several villagers and is helping those lead better lives.

Nearly 82% of roads have been built till December 2017 which have successfully connected several rural areas to cities. Remaining 47,000 habitations will also get connected by all-weather roads by March 2019. Earlier, the scheme was funded only by the central government but after the recommendation of 14th Finance Commission report the expense is shared by both state and central government.

### 2. Smart Village A Case Study of Kolavada Village

Kolavada is a Village in Gandhinagar Taluka in Gandhinagar District of Gujarat State, India. It is Social Infrastructure Design Social infrastructure is a subset of infrastructure accommodating services of health and education. The appropriate development of village needs a touch of design proposals for social infrastructure. The requirement for smart sanitation which can sustain without affecting the environment is typically needed in the village Conclusion From the study of various components and existing infrastructure facilities in Vadi village, design proposals have been made for the lacking waste management system as a sustainable design proposal and proposed designs for other lacking facilities i.e.

Smart sanitation located 3.7 KM towards East from District headquarters Gandhinagar. Urban areas around Kolavada village are Sonipur, Sardhav and Rupal, Moti Adaraj. Nearest town from Kolavda village is Sonipur and it is 2.4 km away from Kolavada.

**Road Network** - A good approach road to reach Kolavada village is available in bed condition. Streets are in Not acceptable condition in village. Internal streets are in fair weather condition and not suitable in all weathers like monsoon. Quality of internal streets is needed to be improving.

**Drinking Water** - Pure drinking water is supplied through underground pipes in easy way from Narmda River to the elevated storage tanks and from tank it is supplied to the village. As per standard data of NBC code, 100 liters of water is required for per person per day in village area. Total 1712200 liters of water is needed for whole village per day. This is sufficient for the whole village.

### 3. Development of Infra-Structural Facilities In Vadi Village

The study paper is about the development of appropriate facility and a suggestion for an upgrade of Vadi village, Surat district, Gujarat - India. It's an approach towards the development of village with all physical, social and renewable facilities in a way to explore possibilities of providing urban amenities within the existing rural setup. This village is located in Umarpadataluka of Surat district. As per census 2011, the village recorded a population of 5,648 persons out of which 2,542 were engaged in economic activities involving 253 cultivators (owner or co-owner) and 1,470 agricultural laborers.

**Planning Proposals** - Designs are the planning done for future implementation of proposed work. The project is concerned with proposal for rural infrastructure, including the above stated most desired amenities.

**Physical Infrastructure** - Design Physical infrastructure facilities narrate to overall water demand of particular area, drainage facilities, sanitation facilities, transportation network with ease of access for public use, availability of electricity (for domestic, commercial, agriculture and other use), and appropriate dwelling condition. Under physical infrastructure design the lacking facility found was a solid waste management system and thus proposal have been made.

**Social Infrastructure Design** - Social infrastructure is a subset of infrastructure accommodating services of health and education. The appropriate development of village needs a touch of design proposals for social infrastructure. The requirement for smart sanitation which can sustain without affecting the environment is typically needed in the village.

### III. OBJECTIVES OF STUDY

The specific objectives of rural development are:

To provide water distribution system equally to every part of village and also provide alternate solution for water distribution.

To provide better sanitation system to village for hygienic environment.

To facilitate effective water harvesting facilities to village, as this is under water scare area village needs water harvesting for daily use. So we can introduce water harvesting facilities to villagers.

To provide roads to internal areas that does not have roads and road development and maintenance for damaged road in internal areas for better transportation. To provide some better waste collection and waste disposal system for clean environment of village.

### IV. NEED OF STUDY

The need of the study is to provide the basic requirements of people in the village and for Rurban Development of the village. For this purpose the information of the village is collected based on different categories such as Education, Water Facilities, Drainage Facilities, Transportation Facilities, Primary Health Care, Bank Facilities, Public Toilets, Community hall and other amenities.

1. Very poor facilities in villages compare to their population so the Gujarat government launching the scheme for smart village.
2. Evaluation taken up so far for these schemes has been more or less in a piecemeal form, i.e. generally for each scheme separately.
3. Need for smart village for poor condition of village and some facilities are not proper and not available facilities so these facilities are provide and improve and make a smart village

### V. SCOPE OF STUDY

Scope of this project is converting a normal village into a smart village for providing or improving facilities like solid waste management, sanitation, road Development of village and Increase living of standers and employment. Trying to providing or improving this solid west management, sanitation facilities, cleanness implement facility between Village development & implement. Above facilities is to be improved or provided through government scheme and fund and under campaign for smart village.

### LOCATION AND INTRODUCTION OF STUDY AREA

Nagor is a Village in Bhuj Taluka in Kutch District of Gujarat State, India. It is located 12 KM towards North from District headquarters Bhuj.

Nagor Village Gram Panchayath name is Nagor. Nagor is 7 km distance from Sub District Head Quarter Bhuj and it is 7 km distance from District Head Quarter Bhuj. Nearest Statutory Town is Bhuj in 7 km Distance. Nagor Total area is 799.38 hectares, Non-Agricultural area is 75.9 hectares and Total irrigated area is 150 hectares



Figure 1: satellite map of Nagor village

Census 2011 data of village

Census Parameter	Census Data
Total Population	2082
Total No of Houses	452
Female Population %	49.8 % ( 1036)
Total Literacy rate %	69.0 % ( 1437)
Female Literacy rate	29.9 % ( 622)
Scheduled Tribes Population %	0.0 % ( 0)
Scheduled Caste Population %	8.4 % ( 174)
Working Population %	35.2 %
Child(0 -6) Population by 2011	282
Girl Child(0 -6) Population % by 2011	50.0 % ( 141)

## Education

Govt Primary and private Secondary Schools are available in this Village. Nearest Private Pre Primary School, Govt Senior Secondary School, Govt Arts and Science Degree College, Govt Engineering College, Private Medical College, Govt MBA College, Govt Polytechnic College and Govt ITA College are in Bhuj. Nearest Private Disabled School is in Madhapar

## Health

1 Primary Health Sub-Centre, 1 Maternity And Child Welfare centre, 1 Medical Shop are available in this village.

## Agriculture

Cotton, Castor and Wheat are agriculture commodities grow in this village. 8 hours agricultural power supply in summer and 8 hours agricultural power supply in winter is available in this village. Total irrigated area in this village is 150 hectares from Boreholes/Tube wells 150 hectares is the Source of irrigation.

## Drinking-Water and Sanitation

Treated Tap Water Supply all-round the year and in summer also available. Un Covered well is other drinking water source. No Drainage System Available in this Village. There is no system to collect garbage on street. Drain water is discharged into sewer plant.

## Communication

Sub Post Office is available in this Village. LandLine available. Mobile Coverage is available. Internet Centre available in this village. Nearest Private Courier Facility is in 5 - 10 km.

### Transportation

Public Bus service available in this village. Private Bus service available in this village. Nearest Railway Station is in 5 - 10 km. Tractors Available in this Village. Animal Driven Carts are there in this village nearest national highway is in 5-10km nearest state highway is in 5-10km district road. Pucca road, Kuccha Road, Macadam Road and Foot Path are other Roads and Transportation within the village.

### Commerce

Nearest ATM is in 5 - 10 km. Nearest Commercial Bank is in 5 - 10 km. Nearest Cooperative Bank is in 5 - 10 km. Agricultural Credit Society is available in this village.

### Other Amenities

This Village has a Power supply with 24 hour power supply in summer and 24 hour power supply in winter, Anganwadi centre, ASHA, Birth & Death registration office, Daily News Paper and Polling station are the other amenities in the village.

## VI. METHEDOLOGY

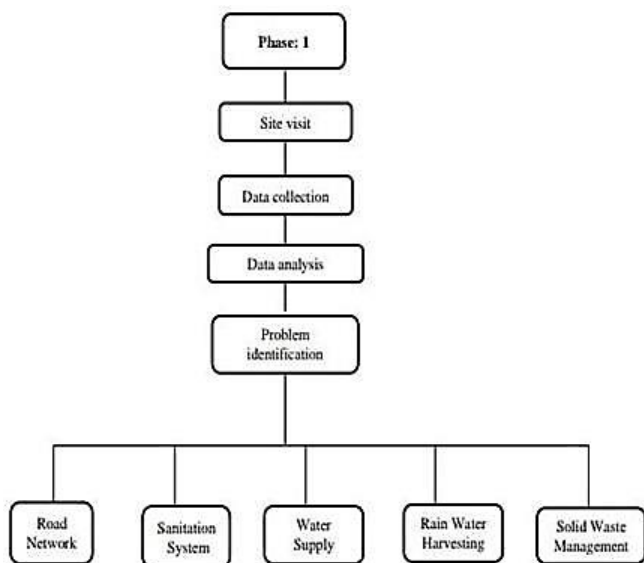


Figure 2: Phase: 1 Methodology

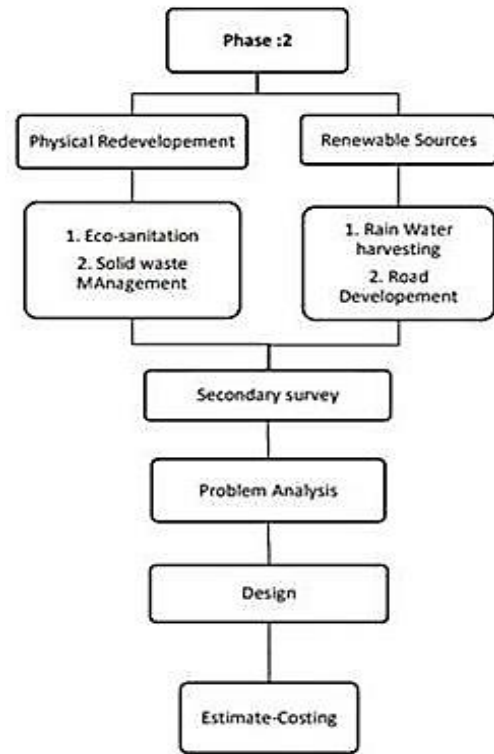


Figure 3: Phase: 2 Methodology

## VII. DATA ANALYSIS AND IDENTIFICATION OF PROBLEMS

There are many problems identified after analysis of the data:

### 1. Road network of Nagor village:

There were many cracked and damaged roads in internal areas of village. Many of them were not even completely constructed and some were ended in wrong alignments. There was lack of maintenance.



Figure 4 : Poor road condition in village.



## 2. Sanitation and drainage

In this village available water for use was not hygienic as sanitation was in really poor condition. Because of polluted earth around and industrial area water is also polluted and drainage facilities are improper so it keeps polluting village area.

## 3. Water supply

This village is under water scare area and also water is available but twice a week or maybe more. Village have elevated tank but in poor condition. There are some hamlets with better houses has that facilities but small houses does not have facilities of water distribution.



Figure 5: Water tanks in village.

## 4. Solid waste management

This village is near from waste disposal area of nearby city, so this village gets polluted by that dump too. Also village have no any waste disposal facilities available, there was no dust bins are provided or no manpower provided for cleaning of roads and village. There was garbage thrown in many area of village and that was making village polluted and unhygienic.



Figure 6 : Plastic waste in village.

## 5. Street lightings

Only main road areas are having street lights. Inside hamlets does not have street light facilities that may lead to problems for villagers during night time.

Some street lights were not in working condition as maintenance is very poor. Primary maintenance is required.

## VIII. PROBLEM SOLUTION

1. Rainwater harvesting at govt. school, Nagor village: Nagor village is located in water scare area of Kutch. Water distribution in Nagor village is done by gram panchayat. In Nagor village the main source of water is elevated tank of capacity 50000. According to the survey, distribution of water is done only one or two times in a week and in limited quantity due to water shortage. So that, the required water demand of the villagers does not meet the actual water demand of villagers. So that, it is required to develop the system of rainwater harvesting in the village.

### Action Plan:

We decided to design a rainwater harvesting system in government primary School which is located in

Nagor village according to the water need of teachers and students of the school. Water harvesting v beautification of school, also for cleaning and sanitation system.

**Objective:**

To aid towards the greater objective of water management and conservation and to increasing recharge of groundwater by capturing and storing rainwater, rainwater harvesting from rooftop.

To use surface water instead of groundwater in daily works like washing, watering land like irrigation and gardening, cooking and canteen cores, it is required to build storing tank to directly collect rainwater and construct pits to collect rooftop run-offs and water from storm water drains etc. and then after proper filtering in settlement tanks and filtration chamber, use the water in daily works.

To minimize cost of draining storm water, get rid-off water logging in the vicinity and put into use all the water bodies in and around run-offs and natural water bodies augment the community development the campus for some good purpose.

To attract the notice of the state and administration on good practices those are environment friendly and help to eradicate pollution and possible green-house effects.

**2. Design of poor road areas in internal streets of village:**

Nagor village is 13 kms near from Bhuj city and has main village road passing through village. In Nagor there are many streets. Some of these streets has bitumen roads and some have R.C.C. roads in different areas.

There are some streets that doesn't have roads and some that have roads but they are damaged.

There were many cracked and damaged roads in internal areas of village. Many of them were not even completely constructed and some were ended in wrong alignments. There was lack of maintenance.

Nagor village has narrow streets so we will be try to provide rural roads where they needed.

Construction of roads is a major requirement for the village.

Roads connecting to main road is pucca . Streets roads are kuchcha and some are RCC, some steets does not have roads. Details for the construction of road have been obtained from the sarpanch.

Total length of the streets/roads in the village which needs to be constructed: 8.8 km.

**Action Plan:**

Identify the various road types (PCC/RCC) and select the ones suitable for paving of different streets/roads. The estimates for road construction will be available only after that step.

Get a survey done by the students to determine the topography of the entire hamlet with slopes required in each street.

**Objectives:**

To provide street roads to the streets that does not have roads.

To identify places having damaged road and repair them.

**3. Design of eco-sanitation system for slum area:**

Eco-san or Ecological sanitation is an environment friendly sustainable sanitation system that includes

the critical components of sanitation services: privacy, dignity, cleanliness, and a healthy environment.

In Nagor village, different type of people live and raise in highly plastic polluted area. There are many houses have toilets in this village in their house. Also in Nagor there is a public toilet is constructed right beside main road passing through village. Nagor village is under water scare area so it is important to think about water availability and minimum usage of water as possible. Eco-san toilets are perfect for this village, as dry toilets require very less amount of water. Also this eco sanitation system is economic and beneficial for village.

There are two pits for toilet that can be used alternatively and after one fills up another one can be used. The pit which is full of waste will start its decomposition during that period and will be resulting as manure that can be used in improvising of landfill of village. Also this system is odor free as pits do not have air vent pipes and it is fully air tight system.



Figure 7 : Public toilet near Nagor bus stand

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#### Action plan:

Decide area of village that lack of sanitation system and provide design of eco-san for that slum area in Nagor village.

Eco-san toilets for village should be effective and economic, free of toxic gases and land pollution. Mostly providing dry toilets which can help saving of water.

Introducing use of byproduct of eco-san toilets as fertilizer to people of that area.



Figure 8 : Eco-san toilet design for village.

#### Objectives:

To protect and promote health – it should keep disease- carrying waste and insects away from people, both at the site of the toilet, in nearby homes and in the neighboring environment.



To protect the environment – avoid air, soil, water pollution, return nutrients/ resources to the soil, and conserve water and energy.

To be affordable – total costs (including capital, operational, maintenance costs) must be within the users' ability to pay.

#### 4. Solid waste management for Nagor village:

The main objectives of waste management are For the protection of environment through effective waste management techniques.

To protect human health and well-being and environment and improve quality of life among people living in rural areas.

To prevent pollution.

To reuse of waste and reduce environment pollution and make areas clean.

To minimize the production of waste.

To convert bio waste into organic manure which is nutrient source of agricultural and horticultural crop.

To generate employment for rural poor by offering new opportunities in waste management by adopting cost effective and environmentally sound solid waste treatment technologies

Transport, sort and manage waste from residential communities and businesses.

Remove and safely manage toxic

Convert waste to energy when it's not recyclable.

### IX. RESULTS AND DISCUSSION

After analysis of infrastructural problems of village and design of sustainable facility we can provide sustainable environment to village and basic facilities easily available. Redevelopment of infrastructural facilities of Nagor village can help more comfortable

living and stop migrating of villagers cause of lack of basic facilities.

It promotes people to get to know about importance of benefits of clean and hygienic atmosphere of village and better aesthetics. By products village will get from solid waste management can be used for different purposes like recycle and use, production of bio-organic manure, recreation of energy sources from that and also it will provide employments and new businesses with it.

At the end Nagor can be upgraded from rural area to rural area by redevelopment of infrastructural facilities like roads, sanitation, waste management and water harvesting with improved living standards of villagers.

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