# **DETAIL PROJECT REPORT**

# VISHWAKARMA YOJNA: VIII AN APPROACH TOWARDS RURBANISATION <u>Moti-Rayan Village</u> <u>Kutch District</u>

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# Veerayatan Institute of Engineering



YEAR: 2020-21 GUJARAT TECHNOLOGICAL UNIVERSITY Chandkheda, Ahmedabad – 382424 Gujarat

# DETAIL PROJECT REPORT ON Vishwakarma Yojana: Phase VIII

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# **CERTIFICATE**

This is to certify that the following students of Degree/ Diploma Engineering successfully submitted

# **Detail Project Report for**,

# VILLAGE : Moti-Rayan DISTRICT : KUTCH

# Under

# Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

# **GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA**

# During the academic year 2020-21.

This project work has been carried out by them under our supervision and guidance.

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# **ABSTRACT**

Gujarat technological university is allotted Important and Prestigious project of Vishwakarma yojana by the government of Gujarat for the year 2020-21. The first phase project is aimed to study the present status and techno-economic survey of villages in district of the state in terms of basic and public amenities, essential commodities, other Infrastructural facilities for the need of people and to prepare Report on adequacy of the available Resources considering Population of the village and growth of the area. The second Phase project include the 'Development Document Preparation' for planning and estimating of proposed development by finding Gap Analysis. The Third Phase includes to prepare the 'Detailed Project Report' with Development strategies and action plan.

The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make a real difference.

Moti - Rayan is a village located in Mandvi Taluka of Kutch district, Gujarat with total 4766 Population of which 2367 are males while 2399 are females as per Population Census 2011. In Moti – Rayan village population of children with age 0-6 is 228 which makes up 10.87 % of total population of village. Average Sex Ratio of Moti-Rayan village is 963 which is higher than Gujarat state average of 919. Child Sex Ratio for the Moti - Rayan as per census is 932, higher than Gujarat average of 890. As per constitution of India and Panchyati Raaj Act, Moti-Rayan village is administrated by Sarpanch who is elected representative of village.

Based on overview information we have seen that there are some actual foundations like Solid Waste Management, ATM, PHC focus, and so on yet among them some are not in usable condition which makes issues for residents. Crafted by Sarpanch and Talati is great according to the criticism given by locals. PHC office is likewise not accessible. All the more such issues are recognized and are to be planned in the venture stages.

First phase of VY, we are planning for the new Solid waste management plnt, ATM, in the Moti-Rayan village. These In proposals are necessary for the village dwellers of the Moti-Rayan village which is find by the Gap analysis procedure, so we planning for that proposals.

In the Moti-Rayan village, there are many facilities which are not adequate such as Repair or maintenance of the Existing public building i.e., Bus station, solid waste management, planning of new ATM, and planning of PHC center is required in the village.

Key Words: west management, Helth care, PHC, Helthy village, Rurbanization, development, sustainablility, Rural Development, etc.



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SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma yojana
РНС	Primary health center
СНС	Community health center
RCC	Reinforced concrete structure
WBM	Water Bound Macadam
BM	Brick Masonry
D	Door
V	Ventilator
W	Window
WC	Water Closet
0	Opening
BARC	Bhabha Atomic Research Centre
URDPFI	Urban and Regional Development Plans Formulation and
	Implementation Guidelines
GDP	Gross Domestic Product
SAGY	Sansad Adarsh Gram Yojana
GHG	Green House Gas
NH	National Highway
SH	State Highway
ODR	Other district roads
MDR	Major district Road
SBA	Swachh Bharat Abhiyan
SC	Schedule Cast
ST	Schedule tribe
NGO	Non-Governmental Organization

# **ABBREVIATIONS**

SWOT



Strength, Weakness, Opportunity, Threats

# <u>Chapter 1.</u>

# **Ideal village visit from District of Gujarat State (Civil Concept) :**

## 1.1 Background & Study Area Location Kera Village :

Ideal village visit is required to understand development of ideal village and required development of allotted village. As a part of Vishwakarma Yojana, we visited kera village, kutch district. We observed the present condition of kera village and noted down some important elements related to various infrastructure, economic growth, population, electricity, water. supply, etc. We also collected the data which were necessary for Tecno-economic survey. We met the Sarpanch and Talati of kera village at the gram panchayat building and also interacted with the localities regarding the facilities and amenities of the village. We visited all the necessary places namely school, post office, hospital, library, police station, banks, community hall, recreational area, etc.

The kera is a village in bhuj taluka of kutch district of gujrat state. The main occupation of the village dwellers is Farming, Employement and Milk sale. The kera is located at distance of about 22 km from bhuj and takes about 45 minutes to reach by car. The telephone or STD code of the kera village is 02832. The pincode of kera is 370430. The Kera village comes under kera panchyat. It is located at 365 km from gandhinagar. Kera is Surrounded by Anjar taluka towards east, Nakhtrana taluka towards west, Mundra taluka towards south, Adipur taluka towards east. Mandvi, bhuj, adipur, anjar, gandhidham, are the nearby cities to kera village. Generally, the gujarati language is used by villagers in the kera. It is also known as "Kera baladiya".

Number of Households	1863
Population	8063
Male Population	3998
Female Population	4065
Children Population	1018 (13.01%)
Sex-ratio	1017
Literacy	77.86 %
Male Literacy	84.09%
Female Literacy	71.77 %

#### **Kera population Facts:**

(T-1- Kera Population Data)

### > Study area location

- Locality Name : Kera
- ✤ Taluka Name : Bhuj
- ✤ District : Kutch
- ✤ State : Gujarat
- Language : Kutchi, Gujarati, Hindi, English
- ✤ Pin code : 370430



#### 1.2 Concept: Ideal Village, Normal Village :

An ideal village which has all basic facilities like proper plumbing system, good sanitation system. An ideal village has good drainage system so dirty water can easily and properly drained.

#### Public

Public of an ideal village has good discipline and awareness of rules and regulation, they have a spirit of services and let go.

#### House

The residential house of an ideal village is very well ventilated and clean. The facilities of plumbing and drainage of house is very well maintained.

#### ✤ Agriculture

People of an ideal village are very intelligent in agriculture business. They use all new technologies for growing crops and take more production from farm.

#### \* Educational Facilities

In ideal village there are primary school and higher secondary school must necessary. The primary education is totally free.

#### Medical Facilities

In ideal village there are basic medical facilities for people and animals. There is also medical store available for medicine.

### Other Facilities

In ideal village there is also post office, anganvadi, play ground, public garden, libraryetc.

#### 1.2.1. Objectives :

- To prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living.
- > To make the model village a "hub" that could attract resources for the development of other villages in its vicinity.
- To provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.
- To contribute towards social empowerment by engaging all sections of the community in the task of village development.
  - > To create and sustain a culture of cooperative living for inclusive and rapid development.
  - > To creating models of local development which can be replicated in other villages.

# 1.2.2. Example / Live Case studies of ideal village of India/Gujarat :

### 1) Dharnai (Bihar) First fully solar powered village:

Dharnai, a village in Bihar, beat 30 years of darkness by developing its own solar- powered system for electricity. Dharnai declared itself an energy-independent village in July. Students no long need to limit their studies to the day time, women no longer limit themselves to stepping out in the day in this village of 2400 residents

# 2) Pothanikkad (Kerala) The village with 100% literacy rate:

Unsurprisingly in Kerala, Pothanikkad village was the first in the country to achieve a 100% literacy rate. Not only does the village boast of city-standard high- schools, but it also has primary schools and private schools. Guess the number of people the village has educated? Well, per the 2001 census there are 17563 residents living in the village.



# 3) Mawlynnong (Meghalaya) Asia's cleanest village:

Mawlynnong, a small village in Meghalaya, was awarded the prestigious tag of 'Cleanest village in Asia' in 2003 by Discover India Magazine. Located at about 90 Km from Shillong, the village offers a sky walk for you to take in the beauty as you explore it. According to visitors, you cannot find a single cigarette butt/plastic bag lying around there



# F-1. Primary school & Library of Kera village

# 1.2.3. The Idea of a model/Smart Village :

- > India is a country of villages, where more the 68 % of the total population residue in villages.
- > Assaid, 'India lives in its villages' Mahatma or 'India's soul is in villages', which is the

backbone of an Indian culture.

> Agriculture is practiced in the country from antiquity (from Harappa Civilization) where, communities settled and civilized structure of villages evolved.

➢ However, even after the collapse of such progressed civilizations, villages continued to exist and flourish through rich heritage and traditional practices.

➢ Now a day's urbanization have taken place on a big scale. Only due to lack of facilities and sources in villages.



▶ It was the dream of Mahatma Gandhi to make the Indian villages smarter and ideal/model by improving them in all aspects like physical, economic and socialetc.

The concept of smartness is popular in respect and honor of human development regardless of rural or urban area, literate or illiterate in all country and India is not omission to it.

> The ideas of —smart village will also attention to multiple challenges such as unplanned

urbanization, under development of village and smart villages.

# Ideal village

In Ideal village access sustainable energy services acts as a catalyst for development enabling the provision of good education and health care, access to clean water, sanitation and nutrition, the growth of productive enterprise to boost income and enhanced security .

# > Key elements of modelvillage

A 21st century model village in India needs to incorporate certain key themes which would be essential for its success. Key elements of a model village are given below:

# **1.** Local business:

Shop, Agriculture, Medical shops

**2.** Education:

Primary school, Secondary school, Anganwadi, Play group

**3.** Health and welfare:

Private hospital, Government hospital, Medical shop

# 1.2.4. Ancient History Civil concept about Indian Villaguisness aboutvillage and its new Development :

A village is a clustered human settlement or community, larger than a hamlet but smaller than a town (although the word is often used to describe both hamlets and smaller towns), with a population typically ranging from a few hundred to a few thousand. Though villages are often located in rural areas, the term urban village is also applied to certain urban neighborhoods. Villages are normally permanent, with fixed dwellings; however, transient villages can occur. Further, the dwellings of a village are fairly close to one another, not scattered broadly over the landscape, as a dispersed settlement. In the past, villages were a usual form of community for societies that practice subsistence agriculture, and also for some non-agricultural societies. In Great Britain, a hamlet earned the right to be called a village when it built a church. In many cultures, towns and cities were few, with only a small proportion of the population living in them. The Industrial Revolution attracted people in larger numbers to work in mills and factories; the concentration of people caused many villages to grow into towns and cities. This also enabled specialization of labor and crafts, and development of many trades. The trend of urbanization continues, though not always in connection with industrialization. Historically homes were situated together for sociability and defense and land surrounding the living quarters was farmed. Traditional fishing villages were based on artisan fishing and located adjacent to fishing grounds.

# India:

"The soul of India lives in its villages," declared M. K. Gandhi at the beginning of 20th century. According to the 2011 census of India, 68.84% of Indians (around 833.1 million people) live in 640,867 different villages. The size of these villages varies considerably. 236,004 Indian villages have a population of fewer than 500, while 3,976 villages have a population of 10,000+. Most of the





villages have their own temple, mosque, or church, depending on the local religious following.

## **Rural Development:**

Rural development is the process of improving the quality of life and economic well- being of people living in rural areas, often relatively isolated and sparsely populated areas. Rural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry. However, changes in global production networks and increased urbanization have changed the character of rural areas. Increasingly tourism, niche manufacturers, and recreation have replaced resource extraction and agriculture as dominant economic drivers. The need for rural communities to approach development from a wider perspective has created more focus on a broad range of development goals rather than merely creating incentive for agricultural or resource based businesses. Education, entrepreneurship, physical infrastructure, and social

infrastructure all play an important role in developing rural regions. Rural development is also characterized by its emphasis on locally produced economic development strategies. In contrast to urban regions, which have many similarities, rural areas are highly distinctive from one another. For this reason there are a large variety of rural development approaches used globally. Rural development is a comprehensive term. It essentially focuses on action for the development of areas outside the mainstream urban economic system. We should think of what type of rural development is needed because modernization of village leads to urbanization and village environment disappears.

# **1.3 Detail study (Socio economic, physical, demographic and infrastructure details) of Ideal** village Kera with photograph :

## Physical, Socio economic and Demographical Details:

- Kera Census Town has total administration over 1,863 houses to which it supplies basic amenities like water and Kera is a Census Town city in district of Kutch, Gujarat. The Kera Census Town has a total population of 8,063 of which 3,998 are males while 4,065 are females as per the report released by Census India 2011.
- In kera village population of children with age 0-6 is 1081 which makes up 13.4 % of the total population of village. Average sex ratio of Kera village is 1017 which is higher than the gujarat state average of 919. Child sex ratio for the Kera village as per census 2011 was 973, it is higher than the gujarat average of the 890. Kera has lower literacy rate compared to Gujarat. In according to census of 2011, the literacy rate of kera village was 77.86% while the literacy rate of Gujarat was 78.03%. In kera village male literacy stands at 84.09% while female literacy ratewas 71.77%.
- sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.
- All approach roads are either bituminous or cement concrete and have well drainage facility of rain water.



#### Kera Work Profile:

Socio economic	
Name of main	Agriculture
occupation in Keravillage	Employment
Keravillage	Milk sale
	T-2. Occupational data of Kera village

- Physical & demographic
- > The main sources of drinking water are rivers and wells.
- > There are total 203 wells in the Kera village.
- > The one river passing near the village.
- > There is also provision of Overhead tank in adequate condition.

## Kera Religion Data 2011:

Town	Population	Hindu	Muslim	Christian	Sikh	Buddhist	Jain	Others	Not Stated
kera	8,063	90.09%	9.82%	0.00%	0.00 %	0.01%	0.01 %	0.00%	0.07%

(T-3 -Kera religion data)

# Kera Literacy:

Kera is a Census Town city in district of Kutch, Gujarat. The Kera Census Town has a total population of 8,063 of which 3,998 are males while 4,065 are females as per the report released by Census India 2011. In kera village population of children with age 0-6 is 1081 which makes up 13.4 % of the total population of village. Average sex ratio of Kera village is 1017 which is higher than the gujarat state average of 919. Child sex ratio for the Kera village as per census 2011 was 973, it is higherthan the gujarat average of the 890. Kera has lower literacy rate compared to Gujarat. In according to census of 2011, the literacy rate of kera village was 77.86% while the literacy rate of Gujarat was 78.03%. In kera village male literacy stands at 84.09% while female literacy ratewas 71.77%.



# Kera Infrastructures facilities (All Types):

Sr no.	Descriptions	Information/D etails	Adequate	Inadequate	Remarks
1.	Post office	Yes	Yes		
2.	Tele communication network/STD booth	Yes	Yes		
3.	General market	Yes	Yes		
4.	Panchyat building	Yes	Yes		
5.	Medical Shop	Yes	Yes		
6	Bank & ATM Facility	Yes	Yes		
7.	Agriculture co- operative Society	Yes	Yes		
8.	Milk Co - operative Society	Yes	Yes		
9.	Internet cafe	Yes	Yes		
10.	Irrigation Facility	Yes	Yes		Tube well
11.	Public library	Yes	Yes		
12.	Community Hall	Yes	Yes		With TV
13.	Anganwadis	Yes	Yes		
14.	Primary / Secondary School	Yes	Yes		
15.	Sub center / PHC / CHC / Maternity Homes	Yes	Yes		
16.	Private Clinic / Hospitals	Yes	Yes		With 24*7

(T-4 -Kera Infra. Facilities)





F-2. Road Network, Post-Office & PHC of Kera





#### **1.4 SWOT analysis of Ideal village :**

SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning. This technique, which operates by 'peeling back layers of the company' is designed for use in the preliminary stages of decision-making processes and can be used as a tool for evaluation of the strategic position of organizations of many kinds (for-profit enterprises, local and national governments, NGOs, etc.). It is intended to specify the objectives of the business venture or project and identify the internal and external factors that are favorable and unfavorable to achieving those objectives. Users of a SWOT analysis often ask and answer questions to generate meaningful information for each category to make the tool useful and identify their competitive advantage. SWOT has been described as the tried-and-true tool of strategic analysis, but has also been criticized for its limitations.

SWOT ANALYSIS						
STRENGTH:	WEEKNESS:	<b>OPPORTUNITIES:</b>	THREATS:			
<ul> <li>INFRASTRUCTUR E FACILITIES</li> <li>HIGH GROWTH RATE</li> <li>ECOFRIENDLY ENVIRONMENT</li> <li>VARIOUS INFRASTRUCTUR E FACILITIES</li> <li>EMPLOYMENT</li> <li>HIGH ECONOMIC GROWTH</li> </ul>	<ul> <li>LESS AVAILABLE SPACE FOR FURTHER CONSTRUCTION AND DEVELOPMENT.</li> <li>LESS SCOPS OF GREEN DEVELOPMENT IN FITURE.</li> </ul>	<ul> <li>SUSTAINABLE ECOFRIENDLY STRUCTURE</li> <li>ENERGY EFFICIENT BUILDING</li> <li>USE OF SOLAR PANEL</li> <li>ADVANCE HOSPITALS</li> <li>GREEN DEVELOPMENT</li> </ul>	<ul> <li>INCREASING POLLUTION</li> <li>POOR MAINTENANCE</li> </ul>			

# (F-4 -SWOT Analysis)

### **1.5 Future prospects of Development of the Ideal village :**

We have done an interaction with villagers and they have suggested some possible future prospects of development of the Kera village. And we personally observed that things & those suggestions are as follows,

- Gas Pipelines
- Biogas Plant
- Increase source of high wages
- > CCTV
- > Opening Skill Development Centers



- Cold Storage Area
- Rain Water Harvesting
- Solar Street Lights
- Public WiFi Facility
- ➢ Fire Station , etc.

These are some of the aspects that need to be improved in the future in the village.

### 1.6 Benefits of the visits of Ideal village :

- Almost all the civil benefits such as, water supply network, pucca roads, LED street lights, Drainage network, waste disposal, water storage tank, waste collection system were observed in the village.
- > We saw all type of basic and physical amenities available.
- > Socioeconomic condition of village.
- > Working of village governing bodies.
- > By this visit, it has improved our communication skills and we knew how to interact with the peoples.
- Apart from this, infrastructure facilities such as, school, collages, roads, post-office, banks, clinics, public health center, bus stop, public toilets, anganwadi, police station, community hall, places of recreation interest etc. also present.
- > To understand allocated village condition.
- > Function of village & amenities that are need by village.
- > We had seen much kind of new technologies which can be used in allocated village.

### **1.7 Civil aspects required in Ideal village :**

We have observed the balance of commercial, residential and recreational land use in the Kera village but as per the feedback which were given by villagers some facilities are lacking in the village from civil aspects and these are, Gas Pipelines, Biogas Plant, Cold Storage Area, Rain Water Harvesting, Solar Street Lights, Public WiFi Connection, Fire Station, etc.

Moreover, by providing skill development centers for the youth, panchayat should also focus on enabling the youth to setup the self-employment units. Water harvesting, Ground water recharge and improvement of village tanks are also projects to be pursued.



# Chapter 2.

# <u>Moti-Rayan Village Literature Review – (Civil Concept)</u>

### 2.1 Introduction: Urban & Rural village concept:

#### Urban village concept:

The urban village is an area occupied by the urban community that lives and resides in the urban environment as a group or in certain group which was formed or naturally due to urbanization. The formation of the urban village concept is based on two circumstances, which is due to the effects of urbanization and the result of the urban village formation concept brought about by the planning and strategy of re-developing the urban area. Hence, the urban village formation concept must take into consideration the basic characteristics of the urban village environment, which consist of its geography, background of the village, type of village, the position or status of the village, traditional practices and culture, local organizations, certified status of the land title and the land, distance from the city cent government reserve land were not included in the definition of the urban village concept because this type of settlement does not have certified characteristics of a land title. The operational definition is important as it determines the scope and study sample that can be used in future.

The world's urban population as of 2014 is 3.9 billion out of 7.4 billion people living on the planet. According to census of India 2011 the definition of urban area is :

- > A place having minimum population of 5000.
- > Population density of 400 persons per sq kilometer or higher.
- > 75% plus of the male working population involved in non -agricultural employment activity.

Places which are being administered by Municipal Corporation, cantonment board are automatically considered as urban areas.

Census 2011 of India has also defined urban agglomeration as an integrated urban area with a core town together with its outgrowths.

### **Rural village concept:**

Rural areas are also known as the 'countryside' or a 'village' in India. It has a very low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery etc. The quest to discover the real rural India still continues in great earnest. Almost every economic agency today has a definition of rural India. Here are a few definitions: According to the Planning Commission, a town with a maximum population of 15,000 is considered rural in nature. In these areas the panchayat makes all the decisions. There are five people in the panchayat. The National Sample Survey Organization (NSSO) 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.



### 2.2 Importance of the Rural development:

It is generally said that the rural areas house up to 70% of India's population. Rural India contributes a large chunk to India's GDP by way of agriculture, self-employment, services, construction etc. As per a strict measure used by the National Sample Survey in its 63rd round, called monthly per capita expenditure, rural expenditure accounts for 55% of total national monthly expenditure. The rural population currently accounts for one-third of the total Indian FMCG sales.

### **Rural development introduction:**

**Rural development** is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas.

Rural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry. However, changes in global production networks and increased urbanization have changed the character of rural areas. Increasingly tourism, niche manufacturers, and recreation have replaced resource extraction and agriculture as dominant economic drivers. The need for rural communities to approach development from a wider perspective has created more focus on a broad range of development goals rather than merely creating incentive for agricultural or resource based businesses. Education, entrepreneurship, physical infrastructure, and social infrastructure all play an important role in developing rural regions. Rural development is also characterized by its emphasis on locally produced economic development strategies. In contrast to urban regions, which have many similarities, rural areas are highly distinctive from one another. For this reason there are a large variety of rural development approaches used globally. Rural development is a comprehensive term. It essentially focuses on action for the development of areas outside the mainstream urban economic system. We should think of what type of rural development is needed because modernization of village leads to urbanization and village environment disappears.

# Need for Rural Development in India:

The rural economy is an example of an agrarian economy. Although farming and agriculture are one of the most important primary activities, the problem lies in the fact that they share in the GDP of the agriculture sector is on a constant decline. At the same time, about two-thirds of India's population depends on agriculture. As a result, the productivity is not up to the mark, with conditions only getting worse.

Moreover, public investment declined since 1991 coupled with a lack of adequate infrastructure, credit, transport, employment, etc. Henceforth the agricultural output has grown at only 3.2% during 2007-2011. All these factors have been denting the process of development. Therefore there is a need to focus on rural development and not just urban development.

# 2.3 Ancient Villages / Different Definition of Rural Urban Villages:

### **Rural area :**

A rural area is a land outside the densely populated urban areas in a city or town. They have low population density, large open areas, lower standard of facilities etc. The primary industry in such area is agriculture.

In general, a rural area is a geographic area that is located outside towns and cities.Whatever is not urban is considered rural." Typical rural areas have a low population density and small settlements. The Census Bureau defines rural as "any population, housing, or territory NOT in an urban area". Its definition of rural is closely tied to its urban definition.



#### **#Characteristics of rural area are:**

- ➢ Lower literacy rate.
- Lack of educational facilities.
- Lack of good health infrastructure.
- Less population density.
- > Agriculture as prime employment (more than 75% male).
- ➤ Lower standard of living and less amenities.
- > Migration in search of opportunities.

### **#Village definition:**

- Village is a clustered human settlement or a community, larger than a hamlet but smaller than a town, with a population ranging from a few hundred to a few thousand.
- > Villages are normally permanent with fixed dwellings.

## **#Characteristics of a village:**

- Village have population between 500 and 10000.
- The villagers managed their own affairs through the traditional institution of Panchayat. The central government had neither inclination nor the means for interfering with the self-government of villages.
- Village has the atmosphere of simplicity, calmness and peace. There is no noise andlittle sophistication.
- Generally the women in villages are less educated and their social status is lower than that of their counterparts in the towns.
- Factors like prevalence of child marriage, joint family system, traditional ideals, oldvalues and lack of education among females are responsible for the low status of women.
- > The poverty and illiteracy of the village people.

# 2.4 Scenario: Rural / Urban village of India population Growth:

The urban population of India has seen a rise from 17.1 per cent to 29.2 per cent between 1950 and 2015. Meanwhile, the rural population declined from 82.9 per cent (in 1915) to 2015's 67.2 per cent. The speculation for the year 2050 suggests that the urban-rural segregation will be 52.8 and 47.2 with a difference of 5.6 per cent. The population growth rates in both urban and rural areas suggest a similar story. The urban rate has consistently overpowered the total population growth rate over the last seventy years. This trend is set to continue for the next 30 years. There was a clear increase in the population growth rate from 1950 to 1975. But, the growth rate took a hit as a result of the forced sterilization program under the Indira Gandhi government. Though the effect was not as evident in rural parts, the overall rate of population growth declined in those years. It came down to 1.23 from the all-time high figure of 2.31 during 1975-80. The urban population saw a steep decline following the implementation of the sterilization program with the growth rate decreasing to 3.35 from 3.84 in the year 1975. The report suggests that the rural population growth rate will turn negative in the next fifteen years. Thus, in 2050, it is expected to be 1.06, in contrast to the urban growth rate of 1.54. The report suggests that the rate of urbanization, which has been increasing since 1950, is expected rise further till 2035. It is supposed to start decreasing slightly in the next few years. Within a decade of globalization, the rate of urbanization increased by one-third of its previous growth. This has resulted



in stress on the country's urban conglomerations; Delhi, Chennai, Kolkata, and Mumbai being four among them. The swelling of the population in the cities has been a result of labor migrations that have taken place in the past decade because of industrial growth. This created millions of employment opportunities for the rural poor. The national capital, Delhi, especially has seen an explosion of population. It saw a 26-time increase since 1950 when the population was just a million people. The current population of the national capital is 28 million, which equals to half of the population of all the ten ASEAN country capitals combined. Kolkata has seen a three-time increase in the urban population while Mumbai's population has increased by over six-fold since 1950. Bengaluru, the new entrant on the list, in 2015 crossed the 10 million-mark, ten times the number of people in 1950s. All these cities will see a further rise in the population in the next fifteen years. The number of urban agglomerations consisting more than a million people is also expected to be doubled by 2035.

**#India : Details of India as per Census 2011** 

Population	Total	1,210,854,977
	Males	623,724,568
	Females	586,469,294
Literacy	Total	74%
	Males	82.10%
	Females	65.46%
Density of population	per km <sup>2</sup>	382
Sex ratio	per 1000 males	940 females
Child sex ratio (0–6 age group)	per 1000 males	914 females

## (T-5 - India Census 2011 Data)

# **2.5 Scenario: Rural / Urban village of Gujarat as per Census 2011 and latest:** Gujarat Population 2020

#### As per projection, population of Gujarat in 2020 is 7.04 Crore...

Description	2011	2001
Approximate Population	6.04 Crores	5.07 Crore
Actual Population	60,439,692	50,671,017
Male	31,491,260	26,385,577
Female	28,948,432	24,285,440
Population Growth	19.28%	22.48%
Percentage of total Population	4.99%	4.93%
Sex Ratio	919	920
Child Sex Ratio	890	883
Density/km2	308	258
Density/mi2	798	669
Area(Km2)	196,244	196,024
Area mi2	75,770	75,685
Total Child Population (0-6 Age)	7,777,262	7,532,404
Male Population (0-6 Age)	4,115,384	4,000,148
Female Population (0-6 Age)	3,661,878	3,532,256



Vishwakarma Yojana: Phase VIII	Village:	Moti-Rayan	District: Kutch
Literacy	78.03 %	69.14 %	
Male Literacy	85.75 %	79.66 %	
Female Literacy	69.68 %	57.80 %	
Total Literate	41,093,358	29,827,750	
Male Literate	23,474,873	17,833,273	
Female Literate	17,618,485	11,994,477	

(T-6-Gujarat population)

#### **Gujarat Urban Population 2011 :**

Out of total population of Gujarat, 42.60% people live in urban regions. The total figure of population living in urban areas is 25,745,083 of which 13,692,101 are males and while remaining 12,052,982 are females. The urban population in the last 10 years has increased by 42.60percent. Sex Ratio in urban regions of Gujarat was 880 females per 1000 males. For child (0-6) sex ratio the figure for urban region stood at 852 girls per 1000 boys. Total children (0-6 age) living in urban areas of Gujarat were 2,952,359. Of total population in urban region, 11.47 % were children(0-6). Average Literacy rate in Gujarat for Urban regions was 86.31 percent in which males were 90.98% literate while female literacy stood at 70.26%. Total literates in urban region of Gujarat were 19,672,516.

### 2.6 Rural Development Issues – Concerns - Measures

### Moti-Rayan Population - Kutch, Gujarat :

Moti - Rayan is a village located in Mandvi Taluka of Kutch district, Gujarat with total 4766 Population of which 2367 are males while 2399 are females as per Population Census 2011. In Moti – Rayan village population of children with age 0-6 is 228 which makes up 10.87 % of total population of village. Average Sex Ratio of Moti-Rayan village is 963 which is higher than Gujarat state average of 919. Child Sex Ratio for the Moti - Rayan as per census is 932, higher than Gujarat average of 890. As per constitution of India and Panchyati Raaj Act, Moti-Rayan village is administrated by Sarpanch who is elected representative of village.



# Graph-1. Population Graph of Moti-Rayan Village



- People are directly or indirectly dependent on agriculture and a large number of landowners have small and medium-sized landholding.
- > Economy of the people living in rural areas is low.
- > The price the farmers get for their produces less than in relation to the work they put in.
- > People have to migrate to the urban areas due to unavailability of education.
- The other rural problems are due to the fact that since the rural people do not live in concentrated masses, the availability of specialized service to them is minimum.
- > Very less people are employed in the rural areas.
- > Lack of physical facilities in rural areas.
- Lack of recreational facilities.
- > Farmers are not having market area for selling their goods directly to the market.

### Any other

- > Poverty is also a major rural concern that prevails.
- > Lack of knowledge about various schemes of government is also an issue.

# **2.7 Various infrastructure guidelines with the Norms for Villages for the provisions of different infrastructure facilities:**

The importance of infrastructure for economic growth and development in rural area can hardly be overemphasized in a developing economy like India. With poor rural infrastructure, even a marginal improvement in its quantity and quality could significantly improve economic development and human well-being. Improving basic infrastructure, such as roads, transport, electricity, telecommunications, housing, health, water and sanitation, is essential for development and well-being of the rural population. The development of rural infrastructure could promote economic growth, improve the standard of living of the population and reduce the incidence of poverty by generating both farm and non-farm employment and earning opportunities, increasing productivity, providing access to basic goods and services and improving the health and physical condition of people. Empirical studies also report a strong relationship between infrastructure, economic growth, rural development and poverty reduction. In spite of the crucial importance of infrastructure, significant deficiencies have persisted in rural infrastructure across Indian states. The quantity and quality of infrastructure facilities are substantially lower in rural areas than in urban areas. A relatively low density of population, low household incomes and the absence of scale economies are considered to be challenges to the expansion of basic infrastructure facilities in rural areas.

# **Rural Infrastructure in India: Scope and Importance:**

Infrastructure is the backbone of any country. It plays a very important role in supporting nation's economic growth and the same is the case with India. If we talk about rural infrastructure in the country, then it is crucial for agriculture, agro-industries and poverty alleviation in the rural areas. Typically, rural infrastructure in the country encompasses rural roads, major dams and canal works for irrigation and drainage, rural housing, rural water supply, rural electrification and rural telecommunication connectivity.



#### **Importance of rural infrastructure in India:**

Basically, rural infrastructure has the potential to provide basic amenities to people that can improve their quality of life. To give an example, development of rural infrastructure can lead to improved access to market centers for the rural producers, better availability of inputs and raw materials at reduced prices and improved mobility. Here is a look at how different sections of rural infrastructure play their role in improving the rural economy as well as life of the people.

- Rural road infrastructure: It provides mobility and connectivity to people living in rural areas. It also provides the much needed boost to agricultural activities by making available water, seeds and other raw materials to the farmers. By improving connectivity, rural roads also enhance employment opportunities for the rural people in non-agriculture sector, thereby, increasing livelihood opportunities. Rural roads also ensure that the rural areas are served with better public services and all the benefits offered by the state reach the far-flung areas easily. They can even provide access to education and health services.
- Rural electrification infrastructure: It basically caters well to the requirements of agriculture and other activities including irrigation pump sets, small and medium industries, khadi and village industries, cold storage chains, healthcare and education
- Rural water supply system: It can lead to sustainability of systems and sources and tackle the problem of water quality, thereby, increasing good health of people.
- Rural housing infrastructure: It has the potential to improve living standard of the people. Overall and as per various studies, development of rural power, irrigation, water, sanitation and road infrastructure can increase productivity, savings, income and tourism and result in better jobs and health of rural people.

### Scope for development of rural infrastructure in India:

- As per the road statistics published by central government for the year 2012-13, rural roads span 60.39 km of every 100 km. The sad part is that most of these rural roads in the country are in bad shape i.e., they are of poor quality, potholed and unable to withstand the loads of heavy farm equipment, thereby, affecting the rural population's quality of life and ability of the farmers to transport their produce to the market. Further, the rural surfaced road is just 33 per cent of the total rural road network in India and remaining are kutcha roads which are highly vulnerable and inaccessible particularly during the rainy season. Thus, there is increasing need for surfaced rural roads in the country.
- Living conditions of people in rural areas has still not improved much and there are majority who live in kutcha houses which are highly vulnerable to rainfall, wind blow, fire and other environmental hazards. Hence, good rural housing infrastructure is needed in the country.
- It goes without saying that the health infrastructure is poorly developed in rural India. Even if it is there, there are no good doctors because the rural areas have very low connectivity and doctors or skilled health workers are unable to access these areas. This poses a great threat to Although there are schools in the rural areas but they lack in terms of the number of classrooms, availability of safe drinking water facilities, toilet facilities etc. Hence, the education infrastructure in rural India also needs a lot more improvement.

- As per the Census 2011, still 45 per cent of the rural households are not connected with electricity and depend on kerosene and other means for lighting. Hence, rural electrification infrastructure is needed to make the lives of rural people better.
- Although there are schools in the rural areas but they lack in terms of the number of classrooms, availability of safe drinking water facilities, toilet facilities etc. Hence, the education infrastructure in rural India also needs a lot more improvement.
- It goes without saying that the health infrastructure is poorly developed in rural India. Even if it is there, there are no good doctors because the rural areas have very low connectivity and doctors or skilled health workers are unable to access these areas. This poses a great threat to
- As per the reports from Census 2011, merely 30 per cent of rural areas are covered with tap water supply. In addition, the sanitation facilities in the rural areas are also not adequate. Thus, there is huge scope for developing drinking water infrastructure and sanitation facilities in the rural areas. With these points, it is clear that there is huge scope for development of all kinds of infrastructure in rural areas. In fact, the gaps in the rural infrastructure need to be addressed properly and as fast as possible so as to achieve redistributive growth and alleviate poverty in the country.

## **Other Facilities :**

- Janani Suraksha Yojana
- Kishori Shakti Yojana
- Balika Samriddhi Yojana
- Mid-day Meal Programme
- Intergrated Child Development Scheme (ICDS)
- Mahila Mandal Protsahan Yojana (MMPY)
- > National Food for work Programme (NFFWP)
- National Social Assistance Programme
- Sanitation Programme (SP)
- > Rajiv Gandhi National Drinking Water Mission
- Swarnjayanti Gram Swarozgar Yojana
- Minimum Needs Programme (MNP)
- ► Etc.

# Sansad Adarsh Gram Yojana : The Main Objective of Sansad Adarsh Gram Yojana,

# **# Improved basic amenities :**

- Higher productivity
- Enhanced human development
- Better livelihood opportunities
- Enriched social capital

# **# Features of the Scheme:**

- All the undeveloped villages will be developed by this scheme and transformed into Model Villages.
- This scheme will provide Safe Water Supply, Proper Electricity Supply, Proper Education



System, Broadband connectivity including CCTVs in public areas, Basic health care facilities to all with the health card, medical examination, and total immunization and much more.

### **# Funding Process:**

- Funds from existing schemes, such as the Indira Awas Yojana, PradhanMantri Gram Sadak Yojana, Mahatma Gandhi National Rural Employment Guarantee Scheme, and Backward Regions Grant Fund, etc.
- The member of Parliament Local Area Development Scheme (MPLADS)
- The gram panchayat's own revenue, Central and State Finance Commission Grants, and Corporate Social Responsibility funds.

Keeping these things in mind, government has taken various proactive steps to boost rural infrastructure. In the Union Budget 2017-2018, an allocation of Rs 19,000 crore has been made towards the Pradhan Mantri Gram Sadak Yojana (PMGSY) to connect far-flung habitats. The rural housing scheme has received more than Rs 9,000 crore and the allocation for rural electrification scheme has been increased by Rs 4,814 crore in the Union Budget 2017-2018. Under the Swachh Bharat Program, the government has taken up the task of construction of individual, cluster and community toilets. All these initiatives are good but still there is huge scope further in rural infrastructure development.

#### 2.8 Other Projects / Schemes of Gujarat / Indian Government :

Rural development is a process of improving quality of life and economic status of people living in villages. Education, entrepreneurship, physical infrastructure and social infrastructure also play a role in developing the rural regions. Rural development is characterized by its emphasis on locally produced economic development strategies. The main objective of the rural development is to remove poverty of the people and fill the widening gaps between rich and poor. Various policies and scheme by Government of India are:

- Pradhan Mantri Gram Sadak Yojana.
- Swarnjayanti Gram Swarozgar Yojana (SGSY)
- Prime Minister Rural Development Fellows Scheme.
- National Rural Employment Guarantee Act (NREGA).
- Sampoorna Grameen Rozgar Yojana (SGRY).
- Sarv Siksha Abhiyan.

Propagation of technology/schemes for rural development is slow and there is a lacking in wider participation of different stakeholders. An ideal approach may therefore, include the government, panchayats, village personals, researchers, industries, NGOs and private companies to not only help in reducing this imbalance, but also to have a multiplier effect on the overall economy.



# Chapter 3.

# **Smart (Cities / Village) Concept Idea and its Visit (Civil Concept) :**

#### 3.1 Introduction: Concepts, Definitions and Practices :

#### **Smart Village Concept:**

In a smart village, access to sustainable energy services acts as a catalyst for development – enabling the provision of good education and healthcare, access to clean water, the growth of productive enterprises to boost incomes, and enhanced security, gender equality and democratic engagement.

Smart Village is a concept adopted by national, state and local governments of India, as an initiative focused on holistic rural development, derived from Mahatma Gandhi's vision of Adarsh Gram (Ideal Village) and Swaraj (Self Reliance). Prime Minister Narendra Modi launched Sansad Adarsh Gram Yojana (SAGY) or SAANJHI) on 2 October 2014, Gandhi's birthday, in addition to Smart Cities and Digital India, as a development program for India. The Parliamentarian's Model Village Scheme main goal is for each Member of Parliament and Minister to adopt a rural village and develop it into a model by 2019 under the SAGY guidelines. The vision of SAGY is an integrated village developmentplan, encompassing Personal, Human, Social, and Economic dimensions.

Smart Village India gets its foundation from Mahatma Gandhi's vision of Adarsh Gram (model village) and Gram Swaraj (Village self-rule/independence). Gandhi in two texts, Hind Swaraj and Gram (Village) Swaraj, promotes the concept of integrated rural development to impact majority of the population, as the primary initiative after India Independence in 1947. The Eco Needs Foundation has initiated the concept of "Smart Village". Under this project the Foundation is adopting villages and putting efforts for sustainable development by providing basic amenities like sanitation, safe drinking water, internal road, tree plantation, water conservation. The Foundation is also working for inculcatingmoral values in the society and for improving the standard of living of the villagers. In the concept of "Smart Village" the development of the village shall be based on the five paths Retrofitting, Redevelopment, Green fields, e-Pan, Livelihood. Under the concept of Smart Village of Rajasthan to develop it as India's First Smart Village. The village is situated 30 km away from Dholpur district headquarter and 248 km from Jaipur. The population of the village is about 2,000.

The village was devoid of its basic needs like sanitation, internal roads. It was also facing various other similar problems such as lack of access to potable water, non-availability of water conservation system, encroachment on theroads, power fluctuation, non-availability of employment oriented education, unemployment and poverty, so on and so forth. Prof. Priyanand Agale Founder of Eco Needs Foundation and Dr. Satyapal Sing Meena (IRS) Joint commissioner of Income Tax has converted this idea into reality and now Dhanora has become role model of Rural Development. Dhanora village was also given an award byPrime minister of India Mr. Narendra Modi in the year 2018.


#### **Smart Village Definitions:**

An urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently. This includes data collected from citizen , devices , and assets that is processed and analyzed to monitor and manage traffic and transportation systems , power plants, water supply networks, waste management , law enforcement ,schools , hospitals etc.

Smart city is one that uses technologies to improve and transform the lives of its citizens and the environment, while closing the digital divide and allowing businesses to thrive and innovate. It's an idea of inclusion and not division, collaboration between citizens, and the public and private sectors for sustainable transformation and growth.

#### **Civil Practices:**

#### 1. Procurement

The procurement practice involves:

- Selecting Appropriate Method for Construction Management
- Selection of Best team for the design
- Selection of best team to deliver
- Select best team to Operate the facility

Contracting by focusing on lowest price tendering and lump sum contracts is a better practice.

#### 2. Partnering

When compared to the traditional approach of working, the partnering is an different working style. This takes a collaborative approach in working.

It has been proved through great projects that working through partnering helps in achieving

- Greater value of money
- Higher Profits for the company
- Quality Improvement
- Prediction of project completion

#### 3. Risk Management

Risk in projected are always expected and it is necessary to maintain a "risk register". This will help to enter all the risk faced from the starting of the project to its end. Along the risk encountered, the method used to manage is also recorded. This helps to be applied in other projects. Risk assessing and analyzing will help to assign appropriate actions to different project team. The risk assessment is an activity that have to be performed in a regular basis and in no case be ignored.

#### 4. Value Management

This key practice takes into account time, cost and risk constraints, in order to meet the client's business needs. The method of value management will involve complete collaboration with the team. The team is in charge of design and delivery of the project. This team will also include the end-users and the stake holders. Value management is a systematic approach. This helps in generating different options to satisfy the requirements of the clients. Value management is practiced through the project life. In parallel the risk management is also followed .At the end of every project, it is analyzed and found how the value management helps in satisfying the requirements of the clients and the stakeholders.

# 5. Benchmarking

This method is practiced by comparing with other completed projects. The performance of different projects are compared each other. The lessons from each project is used to make best performances for new projects. Benchmarking is a method that improves the performance of the project in a logical and systematic way.



### 6. Whole Life Costing

Here, the cost of ownership is measured of a building. This will take into consideration the sum of:

- Initial Capital Cost for making the building
- Cost of maintenance of the building
- Cost of servicing the building

The cost of maintenance of the building is practically more when compared to the initial capital cost. This make the whole life costing an essential practice in construction. As per studies, for a building of capital cost  $\pounds 100$ , the operational procedure will account for  $\pounds 500$  over the life period of the building.

# 7. Health and Safety in Construction

The two main criteria while considering the health and safety in construction are that: The right of workers to be protected against risk and save their health. Effective planning and managing of the construction site to make it safe thus gaining productivity and profitability.

Finally to organize and control the works on the construction site. Along with we need to ensure that:

- Workers are properly trained and competent
- Proper supervision with clear instructions are held
- Right tools, equipment and safety clothing
- Awareness about health and safety

# 8. Sustainable Construction

Sustainable construction focuses to have social, economic and environmental performance of the industry. The practices focus on:

- Getting maximum profit that help to recognize the business.
- Deliver buildings with greater satisfaction, well-being and value
- Respect and fair treatment of the employees. Considering health and safety factors, welfare conditions etc.
- Protection and enhancement of the environment.
- Waste reduction and pollution during the construction process
- Energy efficient buildings by taking energy from renewable resources.

# 3.2 Vision-Goals, Standards and Performance Measurement Indicators :

India is a rural dominated country and villages are said to be the heart of this nation. According to 2011 Census, the population of rural areas comprised of 68.84 per cent. Migration of the people from rural areas to urban areas causes some burden on the urban areas. If the vision of the founders of this nation is to be respected and implemented, then we all need to have the responsibility to make our villages smart, which means self-sufficient, efficient, healthy and educated villagers. To make the villages smart means to make the country self-reliant, stronger and secured. India lives in its villages. Villages are the food basket of the nation. Village Panchayats are the centers of grass root democracy. However, the holistic development of rural India is still under tremendous pressure owing to the declining farm output, increasing trend of distressed migration, absence of basic amenities and emerging problems of environmental pollution and conflicts. The smart village concept is needed for a sustainable and a secured future of the villages. It is about understanding the villages towards the growth model which is inclusive. It's about achieving a higher goal without compromising the roots and the sense of belongingness of the masses. The concept of smart village is contemporary and very reliable today as there is a limit of the growth of cities which is leading to creation of urban jungles, where the population ratio and its related issues per km of land is way above the expected targets.



Parameters	Benchmarks
Sewerage and sanitation.	100% household should have access to toilets.
	100% schools should have separate toilets for girls.
Solid waste management.	100% household are covered by daily door- to- door step
	collectionsystem.
	100% collection of municipal solid waste. 100%
	segregation ofwaste.
	100% recovering of solid wests
	100 % recycling of solid waste.
Storm water drainage.	100% coverage of road network with storm water drainage
	network.
	Aggregate number of incidents of water logging reported.
Electricity.	100% house hold have electricity connection. 27X7 supply
	of electricity.
	100% metering of electricity supply. 100% cost recovery.
	Tariff slabs that work towards minimizing waste.
Telephone connection.	100% house hold have a telephone connection including
	mobile.
WI-FI connectivity	100% of the city has Wi-Fi connectivity. 100 Mbps internet speed

# **T-7 - Smart Cities Bench Marks**

- Determine which technologies, strategies, applications, and institutional arrangements demonstrate the most potential to address and mitigate, if not solve, transportation challenges identified within a city.
- Support and encourage cities to take the evolutionary and revolutionary steps to integrate advanced technologies – including connected and automated vehicle technologies – into the management and operations of the city, consistent with the USDOT vision elements.
- Demonstrate, quantify, and evaluate the impact of these advanced technologies, strategies, and applications towards improved safety, efficiency, and sustainable movement of people and goods.
- Examine the technical, policy, and institutional mechanisms needed for realizing the potential of these strategies and applications – including identifying technical and policy gaps and issues – and work with partners to address them.
- Assess reproducibility and qualify successful smart city systems and services for technology and knowledge transfer to other cities facing similar challenges.



**Smart Cities Performance Measurement Indicators:** 

The indicators for smart cities focus on the monitoring the evolution a city towards an even smart city. The time component "development over the years" is an important feature.

The city indicators may be used to show to what extent overall policy goals have been reached or are within reach.





# **3.3 Technological Options :**

Human society is developing with rapid momentum and achieved various successes for making its livelihood better. The civilization is witness for various changes related to its development through different catalysts like industrial development, green revaluation, science and technology, etc. India has more than 72% of its population living in villages. Near about seven decade had been passed since India got freedom, but the scenario in villages in our country is still unchanged. On one side India has recently selected 100 cities for Smart City project and ready to adapt all the advanced technologies for these smart cities and on other hand villages in our country are still struggling for getting basic amenities like 24 x 7 electricity. On one hand 4G internet technology is being utilized all over the urban areas but on other hand villages in our country are still searching for genuine mobile networks. Our Governments are joining hands with developed countries like America, China, Japan to run bullet trains to connect big cities in India whereas villages in our country are still disconnected and are lacking with basic facilities like drinking water, healthy food, sanitization, toilets, transportation, education, etc. The technology that we use here can be availed to the people living in rural areas to help in improving their lifestyle. This paper summarizes such efforts which can definitely help us to introduce various technologies in these neglected parts of our country fulfilling our responsively to build up our nation. Thus new concept of smart villages can be introduced to make heaven in the heart of our India, because real Bharat is recognized by the villages in our country.



# Various technologies for developing smart villages :

Following various techniques can be promoted improving the life of people in villages and for actual development of smart villages.

- > Enhanced Use of Smart Phones and Optical Fiber Technology for Internet Techniques
- ➢ Online Library and E- Education
- Smart Agriculture
- Smart and Efficient Public Transport System
- Smart Sewage Management System and Sanitation
- Renewable Energy Sources and Solar Energy
- Latest and Affordable Medical Facilities

Indian villages need to be more focused on basic things such as sanitization, health care, drinking water and education. As villages and the villagers have farming - agriculture as their primary source of income. So having villages reap the benefits of irrigation is really very important. The biggest barrier to achieve our goal of developing smart villages will be to deal with the mentality of the villagers and make them understand the real need of modernization. Also to create and develop SMART VILLAGES across the country, the authorities thought process would need a shift. Adopting a village or group of villages by each of MPs and MLAs for its development is good initiative taken by our governments and should be implemented up to a grass root level. Also we can promote many of self-financed firms like industries, educational institutes to adopt such villages or group of villages for developing them and can provide possible technical support. Recently 02 years back, ITM College of Engineering, Kamptee had adopted Ghorpad villages in its vicinity and extended their technical and staff support for few services like drinking water testing, sewage water analysis, etc. Such types of movement can be conducted by other Engineering Institutes too.

# 3.4 Road Map and Safe Guards :





Mahatma Gandhi said, "the future of India lies in its villages". Despite government's focus on villages for many villages decades. remain poorly serviced and governed. India has been an agricultural economy yet the sector is still not a well-paying livelihood option. Generating new avenues of employment in villages, reviving agriculture and improving services in rural areas are some of the components that need to be included right away in rural development policies. The visual perception of Indian villages has not changed much though certain corrective policy measures and infrastructural reforms have taken place Despite government's focus on villages

for many decades, villages remain poorly serviced and governed. India has been an agricultural



economy yet the sector is still not a well-paying livelihood option. Generating new avenues of employment in villages, reviving agriculture and improving services in rural areas are some of the components that need to be included right away in rural development policies. The visual perception of Indian villages has not changed much though certain corrective policy measures and infrastructural reforms have taken place. Governments need to transform our villages into smart habitats by generating lucrative economic opportunities and addressing the basic challenges rural areas are facing for decades. Delhi and Mumbai add almost 200 migrants every day. A combination of factors like agriculture becoming less remunerative, poor civic services, defunct infrastructure, and unavailability of good career opportunities has accelerated the migration from rural areas to cities.

India is a country of villages. Any product or solution that has to succeed and be popular in the country has to be of direct relevance to village life of this country. As per Census of India 2011, the country has a 69% rural population spread across more than 600,000 villages. Now, that being the case, no marketer worth his salt can ever dream of ignoring rural India.

Globally the concept of 'Smart City' is a significant initiative that seeks to improve the quality of life of urban citizens. In India to the new central government's stated priority of building 'Smart Cities' has found a relatively modest budgetary allocation of Rs. 7,060 crore for FY 2014-15, though its significance for the long term can be much larger. Be it the push of the 'Smart City' concept from solution providers, real estate developers or the government itself, the concept finds wide appeal. The Government of India's stated plan to set up 100 Smart Cities across the country has the potential to be a game-changer in the country's urban landscape and the lives of ordinary citizens.

**New avenues** : Like any other field agriculture needs to be viewed with a new prism to make it economically rewarding. Most of the initiatives targeted to transform agriculture have always been seen as philanthropy gestures, not as a sustainable business model in India. The country is supporting start-up culture to give boost to entrepreneur skills among youngsters. There must be some provision where government bodies support the idea of reviving agriculture through various transformative solutions like opening up of market for agriculture produce in strategically targeted locations for greater economic output, providing technical and financial support to the new ideas of marketing and innovation.

For example: a growing demand in cities for organic and chemical-free food was driving a spurt in online and offline stores that sell such products. Many social enterprises were being formed and the concept was being widely discussed to enable villagers to market their goods to cater to this demand. Even Prime Minister Narendra Modi has promoted the idea in many of his election speeches in north eastern states. Rural Development Ministry must take this into account.

**Government initiatives :** Pradhan Mantri Gram Sadak Yojana (PMGSY) has proved to be a transformative scheme. Thousands of villages which were cut-off from the outside world were connected. The national rural road construction program has built paved roads to over 100,000 villages since its launch in 2000. *A* research report 'Market Access and Structural Transformation: Evidence from Rural Roads in India' by Sam Asher and Paul Novosad examines the labor market consequences of high rural transport costs by estimating the causal effects of a USD 37 billion rural road construction program, which has provided over 100,000 Indian villages with paved connections to the wider road network. It states, "These effects are driven by villages close to large cities, where a new rural road represents a larger proportional decrease in total transportation costs to external demand for rural labor and production." Similarly the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has brought significant improvement in employment generation in rural India. The scheme that is termed the biggest poverty reduction scheme provides jobs to over 50 million households. However, the government needs to find out some innovative ways through which rural workforce can be provided skills and improve their employability in the evolving markets in rural India.



#### 3.5 Issues & Challenges :

#### Key issues in development of human being

**1. Misuse of resources -** We have been misusing resources because we do not know why it matters and what it does in the long run. It does not even comes to mind as we have been doing all our lives. This includes money.

**2. Technological evolution -** It has taken a dangerous turn and will come to bite us in the ass. The process has already started, things we used to see in movies are becoming bitter truth of the society. We want comfort, ease and we are getting it at the cost of our civilization. Simple examples - Social Media and Mobile Phones.

**3. Religion and belief system -** If only our ancestors were wise and had a long vision, they would not have dared to write holy books. Mostly, we believe what our society believes without thinking or reasoning. It has taken away our freedom and turned us against each other.

**4. Our irresponsibility -** We do not take responsibility for our actions. If only we could think how it affects everything in the future. Why are we increasing our population only to leave the world to its terrible fate? We play a role to shape our future whether we realize it or not.

There are innumerable problems like this. All these problems can be avoided or solved through a good and proper education system. The root of these issues lies in the growing mind of a child. It will take centuries, but can be achieved if we keep trying and are persistent enough.

**Education / Job opportunities development** 

#### The following are the main problems faced in the progress of education:

#### 1. Lack of funds:

The lack of sufficient funds is the main problem in the development of education. Outlay for education in Five Year Plans has been decreasing. Due to insufficient funds most educational institutions lack infrastructure, science equipment and libraries etc. Due to this reason, desired results cannot be achieved.

#### 2. Expensive higher education:

University, professional and technical education has become costly in India. Fee structure of technical and professional institutes like IIM's is quite high IIM's charge Rs. 2 lakh per semester for MBA classes. It is beyond the reach of common man. Privatization of higher education has led to the growth of profit hungry entrepreneurs. Now a day's higher education is much costly affair.

#### 3. Neglect of Indian languages:

The medium of instruction particularly in science subjects is English. So rural students who are not well versed in English, cannot study science properly in English. They suffer a lot; Indian languages are still under developed. Standard publications are not available in Indian language.

#### 4. Problem of Brain drain:

When intelligent, talented and deserving candidates do not get suitable jobs in the country, they prefer to go abroad for seeking jobs. So our country is deprived of good talent. This phenomenon is called 'Brain drain'.

#### 5. Wastage of resources:

Our education system is based on General Education. The dropout rate is very high in primary and secondary level. Most of the students in 6-14 age groups leave the school before completing their education. It leads to wastage of 5nancial and human resources.

#### 6. General education oriented:

Our educational system is of General Education in nature. Development of technical and vocational education is quite unsatisfactory. So our education is unproductive. Hence number of educated unemployed persons is increasing day by day. This has become a great concern for Govt.

#### Urban water and sanitation challenges

For urban India, the situation is critical. In 2015, about 377 million Indians lived in urban areas

and by 2030, the urban population is expected to rise to 590 million. Already, according to the National Sample Survey, only 47% of urban households have individual water connections and about 40% to 50% of water is reportedly lost in distribution system due to various reasons. Further, as per the 2011 census, only 32.7% of urban Indian households are connected to a piped sewerage system. When distribution becomes challenging, the workaround is to tap ground water. According to a study by the Centre for Science and Environment, 48% of urban water supply in India comes from ground water. Ground water exploitation for commercial and domestic use in most cities is leading to reduction in ground water level.

Distribution and water loss issues: - Distribution challenges, such as water loss due to theft, pilferage, leaky pipes and faulty meter readings, result in unequal and unregulated distribution of water. In New Delhi, for example, water distribution loss was reported to be about 40% as per a study.

#### **3.6 Smart Infrastructure - Intelligent Traffic Management :**

#### **Intelligent Traffic Management System for Smart Cities:**

In present-day times, the number of vehicles has increased drastically, but in contrast, the capabilities of our roads and transportation systems still remain underdeveloped and as a result, fail to cope with this upsurge in the number of vehicles. As a consequence, traffic jamming, road accidents, increase in pollution levels are some of the common traits that can be observed in our new age cities. With the emergence of the Internet of Things and its applicability in Smart Cities, creates a perfect platform for addressing traffic-related issues, thus leading to the establishment of Intelligent Traffic Management Systems (ITMS). The work presented in this paper talks about an intelligent traffic management system that lays its foundation on Cloud computing, Internet of Things and Data Analytics. Our proposed system helps to resolve the numerous challenges being faced by traffic management authorities, in terms of predicting an optimum route, reducing average waiting time, traffic congestion, travel cost and the extent of air pollution. The system aims at using machine learning algorithms for predicting optimum routes based upon traffic mobilization patterns, vehicle categorization, accident occurrences and levels of precipitation. Finally, the system comes up with the concept of a green corridor, wherein emergency services are allowed to travel without facing any kinds of traffic congestion.

#### Smart Infrastructure:

#### **# Social Health Indices:**

The number of businesses per ten lakh population can form a city's level of economic activity and economic performance. It provides a single indication of the business climate in a jurisdiction, and attitudes towards entrepreneurship. The unemployment rate is measured by taking the unutilized labor supply and then tracks business cycles. It is measured in terms of working-age city residents who during the survey period were not considered in paid employment or self-employment and were searching for work divided by the number of total labor force.

#### **# Sanitation :**

The sanitation front will see figuring out of sanitary toilet facilities used by the people and community toilet facilities provided at public places. The rate is 10 people per seat. Share of primary, secondary or tertiary treatment of wastewater shall give ranking in matters of handling of waste water. For solid waste management, disposal by bio digestion, landfills, burning or recycling will end the Smart Cities their place in the ranking.

#### **# Electricity:**

All the electrical lines will be present underground by not disturbing aesthetics of a place or making any kind of nuisance. The power generated will be available from renewable sources like wind energy farm, hydroelectric plant or natural gases will also be used for not exhausting natural resources. # **Transportation:** 



An entire intermodal transport available to all at affordable rate with minimum time delay and maximum possible comfort. It has an elaborated recommendation to keep track of transport facilities such as high capacity public transport and light passenger transport. The results will be expressed in annual number of public transport trips per capita and ridership of public transport. **# Security system**:

CCTV camera present everywhere in every gate. Specially trained policemen will be present System to detect probe of water and electricity, parking or anything necessary.

#### **3.7 Cyber Security :**

Securing smart cities is a not-for-profit global initiative which aims at solving the existing and future cyber security problems of smart cities through collaboration between companies, government, media outlets and individuals across the world.

Over the past few years, Technology has begun to play an important role in our daily lives. Internet enabled gadgets have changed the way in which we work or do our daily chores. Digitization has an impact on personal lives, education, health, government and national security. Due to increase in complexity of smart city systems and globally connected social, economic, political systems, etc. has increased vulnerability of security of a city. The cyber threats have amplified due to infinite supply of data. Smart surveillance technology or analytics to manage the crowd, traffic, cyber security, data privacy, building codes to manage natural/man-made disasters, etc. are some parameters that would make a city safe. Different challenges to our security and expectations of privacy have arrived due to innovations in IT. Humans are already interconnected via gadgets. Standards are evolved for all these potentially connected systems. This will lead to improve in quality in life.

Smart Transportation will also provide an access to a web of connected data from GPS location. Integrated systems and cyber security will aid public safety. We examine two important challenges : Security and Privacy.

#### 3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling :

#### **Retrofitting:**

Retrofitting is one of the strategic components which when will be introduce planning in an existing built-up area, will help us to achieve several objectives for smart city like making the existing area more efficient and liveable along with others. In this method, generally an area more than 500 acres will be identified by the city in consultation with citizens. After identification and observation

of the current situation of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. The whole process of retrofitting must be completed in a shorter time frame, as it will lead to help and assistance in other part of city or another city of similar condition. SMART-RETROFITS are projects to mitigate major issues affecting urban resilience; are catalytic in nature, effective, requires policy initiatives & some investments for pre-take-off. Now days, one of the most commonly method used for the retrofitting for any buildings is Green retrofitting.

#### **Redevelopment:**

Redevelopment causes the tremendous development in infrastructure by using the mixed land use patterns and also increasing the density at the same time. When the area is more than 50 acres , then for the sake of concerns of citizens redevelopment is adopted. For example, By implementing high ground coverage, mixed land use is done by preparing new layout for the area. Vacant land represents both a significant problem and an attractive opportunity for many central cities. Vacant land and abandoned structures impose both economic and social costs on cities and the neighborhoods or districts in which they are located. On the economic side, such properties lower neighboring property



values and tax revenues even as they create pressure to raise taxes to maintain

service levels. Addressing the issue of vacant and abandoned land and structures, state governments play an important role as well. In many cases, the ability to overcome the problems associated with vacant properties and convert them to productive use requires legislative powers that are found only at the state level. Even when demand for new or restored land uses is sufficient for redevelopment to occur, the path to success is troubled by the displacement of previous residents and the elimination of their neighborhoods. Displacement can occur directly through property clearance and conversion to new uses, or indirectly through gentrification when land prices and rents are bid-up to a level unaffordable to the neighborhood's long-term residents. The redevelopment process can create winners and losers, with the losers too often racial and ethnic minorities and the economically disadvantaged. Physical and economic redevelopment are virtual imperatives for cities, but paths to redevelopment that minimize displacement and offset its negative consequences are unsure. Redevelopment has created new, vibrant central city areas. Historic buildings have been restored to physical and economic vitality. At the same time, affordable housing has filtered upward in price and economic class. Historic buildings have been lost. Residences and neighborhoods have been destroyed. People have been displaced. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.

#### Green field development:

Greenfield development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population. from a legal perspective, the challenges in obtaining timely, effective, and affordable approvals for Greenfield residential development. In particular, we focus on the constraints on Greenfield developments (not all green fields are equal); the need to integrate land use planning with the provision of infrastructure; and the opportunities provided by the Special Housing Area legislation. Greenfield areas are seen as the low hanging fruit in terms of providing land for urban expansion, however the reality is quite different. There will be no perfect sites where the conversion of land for urban use will have no effects; all areas will be constrained, and the conversion of any area will need to occur in the context of compromises HAVING been made. One of the most important issues with Greenfield developments is to ensure that the development area can be appropriately served with infrastructure. New areas (Greenfield) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services that includes physical as well as social infrastructure.

Unlike retrofitting and redevelopment, Greenfield developments could be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA). Some of the important determining factors about Greenfield development are:

- > Areas of land that have never been used for construction, areas of natural, often grassed, land.
- Nothing to demolish, and no existing issues
- Cheaper to develop
- Demand for rural/suburban housing
- Easier to comply with environmental standards
- > Profitable for local farmers to sell their land on, and they have a right to do so.



# District Cooling Systems - Integrated chilled water production system for efficient cooling of buildings in cities:

District Cooling Systems are positioned as an effective technology to mitigate the heat island effect exacerbated by conventional, stand-alone cooling systems.

#### **Key features**

- > 50% energy efficiency improvement while electricity consumption is decreased by 35%.
- ➢ 50% CO2 emissions savings and decrease of water usage by 65%.
- Architectural heritage preservation.

# Profitability

- This solution significantly reduces usage costs for end customers, compared to stand-alone units.
- > The comparable reductions in cost relative to energy and water use.

# **Categories of Application**

- Advanced grid infrastructure
- ► Etc.

In particular, we focus on the constraints on Greenfield developments (not all green fields are equal); the need to integrate land use planning with the provision of infrastructure; and the opportunities provided by the Special Housing Area legislation. Greenfield areas are seen as the low hanging fruit in terms of providing land for urban expansion, however the reality is quite different. There will be no perfect sites where the conversion of land for urban use will have no effects; all areas will be constrained, and the conversion of any area will need to occur in the context of compromises HAVING been made. One of the most important issues with Greenfield developments is to ensure that the development area can be appropriately served with infrastructure. New areas (Greenfield) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services that includes physical as well as social infrastructure. Historic buildings have been restored to physical and economic vitality. At the same time, affordable housing has filtered upward in price and economic class. Historic buildings have been lost. Residences and neighborhoods have been destroyed. People have been displaced. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation

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#### **3.9 Strategic Options for Fast Development :**

Some typical features of comprehensive development in Smart Cities are described below.

- 1. Promoting mixed land use in area based developments-planning for 'unplanned areas' containing a range of compatible activities and land uses close to one another in order to make land use more efficient. The States will enable some flexibility in land use and building bye-laws to adapt to change;
- 2. Housing and inclusiveness expand housing opportunities for all;
- **3.** Creating walkable localities –reduce congestion, air pollution and resource depletion, boost local economy, promote interactions and ensure security. The road network is created or refurbished not only for vehicles and public transport, but also for pedestrians and cyclists, and necessary administrative services are offered within walking or cycling distance;
- **4.** Preserving and developing open spaces parks, playgrounds, and recreational spaces in order to enhance the quality of life of citizens, reduce the urban heat effects in Areas and generally promote eco-balance;
- **5.** Promoting a variety of transport options Transit Oriented Development (TOD), public transport and last mile para-transport connectivity;
- 6. Making governance citizen-friendly and cost effective increasingly rely on online services to bring about accountability and transparency, especially using mobiles to reduce cost of services and providing services without having to go to municipal offices. Forming e-groups to listen to people and obtain feedback and use online monitoring of programs and activities with the aid of cyber tour of worksites;
- 7. Giving an identity to the city based on its main economic activity, such as local cuisine, health, education, arts and craft, culture, sports goods, furniture, hosiery, textile, dairy, etc.;
- 8. Applying Smart Solutions to infrastructure and services in area-based development in order to make them better. For example, making Areas less vulnerable to disasters, using fewer resources, and providing cheaper services.

#### 3.10 India's Urban Water and Sanitation Challenges and Role of Indigenous

#### **Technologies :**

The water supply and sanitation in India has increased greatly from 1980 to present. Still, many people lack access to clean water, toilets, and sewage infrastructure. Various government programs at national, state, and community level have brought rapid improvements in sanitation and the drinking water supply. These various programs are ongoing. In 1980 rural sanitation coverage was estimated at 1% and reached 95% in 2018. Also, the share of Indians with access to improved sources of water has increased significantly from 72% in 1990 to 88% in 2008. At the same time, local government institutions in charge of operating and maintaining the infrastructure are seen as weak and lack the financial resources to carry out their functions. In addition, only two Indian cities have continuous water supply and according to an estimate from 2018 about 8% of Indians still lack access to improved sanitation facilities.



# Water supply continuity : Challenges

As of 2010, only two cities in India — Thiruvananthapuram and Kota — get continuous water supply. In 2005 none of the 35 Indian cities with a population of more than one million distributed water for more than a few hours per day, despite generally sufficient infrastructure. Owing to inadequate pressure people struggle to collect water even when it is available. According to the World Bank, none have performance indicators that compare with average international standards. A 2007 study by the Asian Development Bank showed that in 20 cities the average duration of supply was only 4.3 hours per day. None of the 20 cities had continuous supply. The longest duration of supply was 12 hours per day in Chandigarh, and the lowest was 0.3 hours per day in Rajkot. According to the results of a Service Level Benchmarking (SLB) Program carried out by the Ministry of Urban Development (MoUD) in 2006 in 28 cities, the average duration of supply was 3.3 hours per day, with a range from one hour every three days to 18 hours per day. In Delhi residents receive water only a few hours per day because of inadequate management of the distribution system. This results in contaminated water and forces households to complement a deficient public water service at prohibitive 'coping' costs; the poor suffer most from this situation. For example, according to a 1996 survey households in Delhi spent an average of ₹2,182 (US\$30.60) per year in time and money to cope with poor service levels. This is more than two times as much as the 2001 water bill of about US\$18 per year of a Delhi household that uses 20 cubic meters per month.

#### Sanitation :

Most Indians depend on on-site sanitation facilities which means mainly pit latrines in rural areas. In rural areas, the government has been promoting community-led sanitation approaches such as the Total Sanitation Campaign, with some success. In urban areas, a good practice example is the Slum Sanitation Program in Mumbai that has provided access to sanitation for a quarter million slum dwellers. Sewage, where available, is often in a bad state. In Delhi the sewage network has lacked maintenance over the years and overflow of raw sewage in open drains is common, due to blockage, settlements and inadequate pumping capacities. The capacity of the 17 existing wastewater treatment plants in Delhi is adequate to cater a daily production of waste water of less than 50% of the drinking water produced. Of the 892 million people in the world that defecate openly, some 15 million live in India, making it the country with the highest number of people who defecate in the open. This has serious public health implications. A specific Indian problem is also the (officially prohibited) "manual scavenging" which is connected to the officially banned caste system, and relates to unsafe and undignified emptying of toilets and pits, as well as handling of raw, untreated human excreta.

# Responsibility for water supply and sanitation

Water supply and sanitation is a State responsibility under the Indian Constitution. States may give the responsibility to the Panchayati Raj Institutions (PRI) in rural areas or municipalities in urban areas, called Urban Local Bodies (ULB). At present, states are generally plan, design and execute water supply schemes (and often operate them) through their State Departments (of Public Health Engineering or Rural Development Engineering) or State Water Boards. Highly centralized decision-making and approvals at the state level, which are characteristic of the Indian civil service, affect the management of water supply and sanitation services. For example, according to the World Bank in the state of Punjab the process of approving designs is centralized with even minor technical approvals reaching the office of chief engineers. A majority of decisions are made in a very centralized manner at the headquarters. In 1993 the Indian constitution and relevant state legislations were amended in order to decentralize certain responsibilities, including water supply and sanitation, to municipalities.



Since the assignment of responsibilities to municipalities is a state responsibility, different states have followed different approaches. According to a Planning Commission report of 2003 there is a trend to decentralize capital investment to engineering departments at the district level and operation and maintenance to district and gram panchayat levels.

**Rural areas :** There are about a 100,000 rural water supply systems in India. At least in some states, responsibility for service provision is in the process of being partially transferred from State Water Boards and district governments to Panchayati Raj Institutions (PRI) at the block or village level (there were about 604 districts and 256,000 villages in India in 2002, according to Subdivisions of India. Blocks are an intermediate level between districts and villages). Where this transfer has been initiated, it seems to be more advanced for single-village water schemes than for more complex multi-village water schemes. Despite their professed role Panchayati Raj Institutions, play only a limited role in provision of rural water supply and sanitation as of 2006. There has been limited success in implementing decentralization, partly due to low priority by some state governments.<sup>[41]</sup> Rural sanitation is typically provided by households themselves in the form of latrines.

**Indigenous technology :** Technologies employed and discovered by the native inhabitants of a country are regarded as Indigenous technology. It constitutes an important part of its cultural heritage and protects the country against exploitation by industrialized countries. Scientists like C.V Raman, Homi J. Bhabha, Visvesvaraya etc. played an important role to shape the structure of Indigenous technology.

**Importance of indigenous technology :** It provides effective alternatives to western; it gives local people and development workers extra points when designing projects. They can choose from indigenous knowledge or combination of indigenous and western technology instead of searching only western technologies for the feasible solution. Indigenous technologies are cheaper than western technologies. They rely on locally available skills, materials and require little or no cash outlay. Some of the examples of indigenous technologies are given below:

- Plastic Roads
- Thorium-based nuclear reactors
- Defense Technology
- Space Technology

#### 3.11 Initiatives in village development by local self-government :

The institutions of Local Government have flourished in India since time immemorial. The Panchayats or Village Governments, as they were called, were ancient institutions and were themselves small republics. They exercised power in various spheres such as industrial, commercial, administrative, and social including civic education and religious functions. The development of Urban Local Self-Government, as compared to that of Rural Local Self Government, has been very slow after independence. The first two Plans did not carry much for the improvement of Urban Local Bodies. It was only at the end of the Second Plan that the planners focused their attention on the Urban Local Bodies. In the Third Plan, it was suggested strengthening the Municipal Administration by the way of better Personnel and Finances and by enlarging their jurisdiction and functions. It was also suggested to cover all the Towns and Cities having a population of over one lakh under the scheme of planning in an organic way. Election to Municipalities- The superintendence, direction, and control of the preparation of the electoral rolls for, and the conduct of, all elections to the Panchayats and



Municipalities shall be vested in the State Election Commission. Audit and Accounts- The maintenance of the Accounts of the Municipalities and other audit shall be done in accordance with the provisions of the State law. The State Legislatures will be free to make appropriate provisions in this regards, depending upon the local needs and institutional framework available for this purpose. Committee for District Planning- There shall be constituted in every State at the District level a District Planning Committee to consolidate the plans prepared by the Panchayats and the Municipalities in the District and to prepare a Draft Development Plan for the District.

#### **3.12 Smart Initiatives by District Municipal Corporation :**

Talking about the smart city initiative by Vadodara district the goal of the initiative is "Smart utilization of Vadodara city's potential for enhancing quality of life for the citizens of providing equal access to best quality physical infrastructure, social infrastructure and mobility through leveraging state of the art and technology : thus making Vadodara a futuristic Global city with focus on enhancing economy, protecting the ecology and preserving the identity and culture of the city".

#### The initiatives taken by Vadodara Municipal Corporation are :

- Solar roof Panels
- Green Vadodara campaign
- > Integrated command and control center.
- Installation of CCTV Cameras
- Installation of smart toilets
- Installation of public wi-fi
- Parking encroachment drive

# **3.13** Any Projects contributed working by Government / NGO / Other Digital Country concept :

**Digital India Initiative :** The initiative comprises of several projects which will focus on better governance, knowledge and universal phone connectivity across the country.

- Digi Locker
- > MyGov.in
- eSign Framework
- Swachh Bharat Mission mobile app
- National Scholarship Portal
- ➢ eHospital
- Digitize India Platform
- Bharat Net
- ➢ Wi-fi Hotspots
- Next Generation Network
- Electronics Development Fund
- Centre of Excellence on Internet of Things (IoT)

# **3.14** How to implement other Countries smart village projects in Indian village context (Regarding Environment , Employment) :

#### **Smart Environment**

Smart villages can be stewards of the environment aided by technologies to monitor key environmental indicators such as forest health, water quality, soil conditions and changes to the

landscape. They can also reduce pressure on deforestation using efficient cook stoves to decrease the need for traditional biomass energy sources such as charcoal and wood a key driver of unsustainable forest use. Smart villages can host community-run recycling facilities ranging from those equipped to recycle wastewater and organic waste from agro -processing, to next-generation facilities for the recycling of e-waste, including energy-storage and generation technologies such as batteries and solar panels. Depending on geographical endowments, some smart villages will be able to operate as regional ecotourism hubs, an activity that can improve the welfare and connectivity of rural and urban communities. The aforementioned Villages have all emerged as Smart Villages but only in a particular domain. It's not holistic in nature. However, the pressing need of hour is to have a Smart Village with all sorts of comprehensiveness in it.

#### Smart cities revolution to boost employment in India

Government of India's 'smart cities mission', a flagship initiative, is aimed at developing 100 sustainable and citizen friendly cities across the country. Each of these smart cities will be a key driver of economic growth boosting the GDP of the country and creating multiple new-age employment opportunities. With increased urbanization, urban areas are expected to house 40 per cent of India's population and contribute to over 75 per cent of India's GDP by 2030. This calls for large scale infrastructural development which is not just physical and institutional but also social and economic infrastructure. Only then would these cities will attract investments leading to continuous growth and development. A key way of developing smart cities is by enabling using smart evolved technology for local area development in the cities. Such development will generate employment for a large segment of local population. Application of smart solutions will enable cities to use technology, information and data to improve their services. Integration of technology is a major challenge and implementation of technology across smart cities needs a lot of hand holding at the moment. To understand the dynamics of smart cities and to create a strong eco-system it is important that the workforce has advanced skill sets. Smart cities have emerged as a potential job creator in the past few months. Many new-age profiles are likely to witness potential growth especially in the areas of ICT (Information Communication Technology), Data Management & Analytics and e-Governance. As there is a large pool of data being used in the building and management of smart cities, data monitoring and surveillance will become a crucial aspect. Whether the data is used for intelligence gathering, prevention of crime, public health, investigation or surveys; surveillance will hold a lot of importance for citizens. It is important for us to understand that the existing workforce and the new workforce entering the labor market need to align their skill sets basis the requirements of smart cities. Each and every sector and job roles will need enhancement of knowledge, specialized skills training and continuous upskilling. People with varied skill sets will be needed to manage and monitor data across smart cities. Data Skills, Communication skills, Business Intelligence and Analytics, Visualization, Data Modelling, Numerical skills, Quantitative Analysis, Product Development are few key skills that will be required for continuous surveillance at smart cities.



# Chapter 4.

# About Moti-Rayan VILLAGE :

# 4.1 Introduction :

### 4.1.1. Introduction About Moti-Rayan Village details :

Moti - Rayan is a village located in Mandvi Taluka of Kutch district, Gujarat with total 4766 Population of which 2367 are males while 2399 are females as per Population Census 2011. In Moti – Rayan village population of children with age 0-6 is 228 which makes up 10.87 % of total population of village. Average Sex Ratio of Moti-Rayan village is 963 which is higher than Gujarat state average of 919. Child Sex Ratio for the Moti - Rayan as per census is 932, higher than Gujarat average of 890. As per constitution of India and Panchyati Raaj Act, Moti-Rayan village is administrated by Sarpanch who is elected representative of village.

Moti-Rayan - Village Overview			
Gram Panchayat :	Moti-Rayan		
Block / Tehsil :	Mandvi-Kutch		
District :	Kutch		
State :	Gujarat		
Pincode :	370465		
Area :	1878.00 hectares		
Population :	4,766		
Households :	1444		
Nearest Town :	Mandvi (08 km)		

# (T-8 - Moti-Rayan Overview)

#### Working Population as per Census 2011

In Moti-Rayan village, The main Occupation of the village Dwellers is agricultural Work and Contract based Work. The occupation of the other village dwellers is as Labour, Masons, Gate keepers, Drivers, Managers, etc. in nearest companys & industries. The small Market is available for occupation in village. The uneducated People of the village work as labour.

#### > The Main occupation of village :

- ✤ Agricultural
- ✤ labour work
- $\diamond$  construction work
- ✤ Gate keepers
- Managers in nearest companys



#### **Moti-Rayan Details:**

Particulars	Total	Male	Female	
Total No. of Houses	1444	-	-	
Population	4766	2367	2399	
Literacy	77.61 %	86.53 %	69.16 %	
Total Workers	916	667	249	
Main Worker	870	-	-	
Marginal Worker	46	35	11	

# (T-9 - Moti-Rayan details)

#### 4.1.2. Justification/ need of the study :

The Vishwakarma Yojana Project focuses on technical results of the problems that villagers go through from the engineer\_s point of view. The hurdles that are mainstream to the village are solved by the engineering students. It is an initiator program leading the villages towards Rurbanization, held by the Government of Gujarat handed over to the prime developers of GTU that are students. The students allocated as engineers and the Faculty Members as a guide/ Nodal Officer meet all the stakeholders of the villages to conduct survey on the existing features. After that, engineers re-think upon the present facilities and according to that they give the new designs for the needs. Almost 69% of our population lives in villages and the need to be provided with the best of facilities and lifestyle to take India forward as a country. Being future civil engineers it is our duty to observe even the smallest issue and work towards its improvement. Even if a small amount of people migrate from villages to cities the pressure on the city increases, be it : overcrowding, pollution, traffic etc., this affects the whole nation Migration occurs mainly due to job opportunities and better facilities like hospitals, educational facilities, good infrastructure, basic requirements like pucca houses or awaas, water supply etc. are required considering the environmental and need of people.

#### 4.1.3. Study Area :

The MOTI-RAYAN Village is situated at Mandvi Taluka, Kutch District. The Distance from Mandviis 08km. The distance from District Bhuj kutch to Moti-rayan is 55km & Distance Between CapitalGandhinagar & Moti rayan is 398km (approx). The Pin Code of village is 370465. The village is nearthe Arabian Sea. The Village Moti rayan is surrounded by Bhuj taluka towards North, Mandvi Taluka Towards south, Mundra Taluka towards East, Anjar taluka towards East, Nakhtrana towards North. **Nearby Villages of Moti-Rayan :** The Moti-Rayan Village is situated at Mandvi Taluka, Kutch District. The Distance from Mandvi is 08 km and another town / city near the village i.e. koday at 04km Distance. The distance from District Bhuj kutch to Moti-Rayan village According to census 2011, the total Population is 4766 & according to census 2001 the Total Population is 3522.



#### **4.1.4. Objectives of the study :**

The Main objectives of the Study are as below:

- > The main aim is to "Developing village with a Rural soul, but with urban amenities that a city may have".
- > Prevent Migration of People from villages.
- > To provide Employment to villagers.
- > To promote villagers towards agriculture field or to guide villager towards various activities, house based occupation.
- To provide all type Infrastructure facility to the villagers i.e. Physical infrastructure facilities, Social Infrastructure facilities, Sustainable Infrastructure facilities, Required Additional Infrastructure facilities etc.
- > Improvement in existing unplanned growth.

#### **4.1.5.** Scope of the Study :

The study will focused on the development trend, intensity of the growth of the village, find out problems related to physical development in the villages, Infrastructure services of the villages and provides requirements by suitable and sustainable design techniques. The study focused on the villages having population is not more than 10,000 and having no Nagarpalika as specified rules by Authority of vishwakarma Yojana. The study is carried out on allottedvillage Moti-rayan.

#### 4.1.6. Methodology Frame Work for development of your village :

#### **Project roadmap : Method for development of village**

#### Part-I (Odd Semester) Includes:

- Literature Review
- Visit of Ideal Village of Respective District
- Data Collection- Techno economic survey
- Data Presentation
- Sustainable Design Planning Proposals (Rain water harvesting, Biogas plant, waste to energy models, eco sanitation, Renewable Energy sources Application & Other)
- > Repair & Maintenance of Existing Infrastructure
- > Facilities Suggestions and Recommendation.

#### Part-II (Even Semester) Includes:

- > Design Proposals for Over all development of Village includes
  - 4.1.4..1.Physical Infrastructure Facilities
  - 4.1.4..2. Social Infrastructure Facilities
  - 4.1.4..3. Socio Cultural Infrastructures Facilities
- Recommendation & Suggestions For Village Development
- Conclusion



# 4.1.7. Available Methodology for development of related to Civil :

#### Methodology:

The step by step procedure carried out to complete the project. The Methodology or study frame work for the phase three project is present in the below flow chart:

- Design objective
- Technical approach
- Proposed sustainability features
- Identify customer needs
- Identify local/state/federal engineering and construction specifications
- Project management structure
- > Budget
- ➢ Gantt chart of project schedule
- Resumes of team members

# Flow chart of Methodology / Study frame work





#### 4.2 Moti-Rayan Study Area Profile

The MOTI-RAYAN Village is situated at Mandvi Taluka, Kutch District. The Distance from Mandvi is 08km. The distance from District Bhuj kutch to Moti-rayan is 55km & Distance Between Capital Gandhinagar & Moti rayan is 398km (approx). The Pin Code of village is 370465. The village is near the Arabian Sea. The Village Moti rayan is surrounded by Bhuj taluka towards North, Mandvi Taluka Towards south, Mundra Taluka towards East, Anjar taluka towards East, Nakhtrana towards North.

4.2.1. Study Area Location with brief History land use details :

The Moti-Rayan Village is situated at Mandvi Taluka, Kutch District. The Distance from Mandvi is 08 km and another town / city near the village i.e. koday at 04km Distance. The distance from District Bhuj kutch to Moti-Rayan is 55km & Distance Between Capital Gandhinagar & Moti-Rayan is 398km (approx). In Moti-Rayan village According to census 2011, the total Population is 4766 & according to census 2001 the Total Population is 3522.

The Pin Code of village is 370465. The Postal Head office of the tunda is Mandvi. The village is near the Arabian Sea. Due to Availability of Arabian sea Near the village, there is chances of Develop the Garden, Theater, Park, Hotels, i.e. Recreational Centers Etc. The main occupation groups in village is agriculture, labour work & construction work. Most of the people in this village work as farmers & labour. In This Village there is no Mahanagar Palika. Village is only depended on panchayat office. Moti-rayan juth Panchayat. The Juth Panchayat is allotted for three village like Moti-rayan, Nani-rayan & rajpar timbo. Nani-rayan is the nearest village of Moti-rayan in which charan Tribal Population Situated. In this village there was a NGO working in past. A founder of navneet group is belong to Moti-rayan, but now navneet becomes a big company.



4.2.2. Base Location map, Land Map, Gram Tal Map :

F-7 - Google Map of Moti-Rayan village



#### 4.2.3. Physical & Demographical Growth :

**Demographics :** The Various Demographical Data are gathered by the assistance of Talati and Edhara administrator of the mamlatdar. As per Census 2001 And 2011 the Population of the town With Male Female proportion, we see that after the year 2001 there is a lot of expansion in Population of the town up to year 2011.

**Growth of population :** Population of the village has increased by 20% in last 10 years. In 2001 census total population here were 3522. Female population growth rate of the village is 23% which is 6% higher than male population growth rate of 17%.

Sr. No	Census	Population	Male	Female	House hold	
1.	2001	3522	22 1880 1900		1190	
2.	2011	4766	2367	2399	1444	

#### **T-10 - Population Data of Moti-Rayan Village**

Country	India
State	Gujarat
District	Kutch,
Location	Moti-Rayan, Mandvi
Population(2011)	4766
Males	2367
Females	2399
Households	1444
Latitude	22.8852N
Longitude	69.3592E

#### (T-11 - Moti-Rayan Profile)

#### 4.2.4. Economic generation profile :

The main Occupation of the village Dwellers is agricultural Work and Contract based Work. The occupation of the other village dwellers is as Labour, Masons, Gate keepers, Drivers, Managers, etc. in nearest companys & industries. The small Market is available for occupation in village. The uneducated People of the village work as labour.

The Main Three occupation of village is Agricultural, labour work & construction work **4.2.5.** Actual Problem faced by Villagers and smart solution :

During an interaction with people of Moti-Rayan village we understood their problems and issues like:

- 1.1.1.1. There is no proper solide waste management,
- 1.1.1.2. There is no PHC Center available in the village,
- 1.1.1.3. There is no ATM in the village
- 1.1.1.4. There is no Grocery store in nani-rayan village.

Other than these the villagers have no any issues and they are satisfied with the work of Grampanchayat of Moti-Rayan.



#### **Smart solutions:**

- 1.1.1.5. Solid waste management plant
- 1.1.1.6. PHC
- 1.1.1.7. Amphetheater
- 1.1.1.8. ATM
- 1.1.1.9. Cybercafe
- 1.1.1.10. Grocery Store
- 1.1.1.11. Entrance Gate
- 1.1.1.12. Public garden
- 1.1.1.13. Skill development center
- 1.1.1.14. Solar street lights and dustbins

# 4.2.6. Social scenario -Preservation of traditions, Festivals, Cuisine :

#### **Gujarat Social Scenario**

**CULTURE** : The Gujarati's are known for their diverse cultural heritage and rich traditions. It is a vibrant mix of Hinduism, Islam, Jainism and Buddhism and also a blend of different cultures of the Gujarat's like arts, beliefs, customs, traditions, institutions, inventions, language, technology and values. The culture of the people does not stop with one particular generation but instead the elders of the community see to that the future generations also practice it which automatically leads to the wisdom and appreciation of cultural traditions and lifestyles. They also as a part of their culture join hands to greet the guests and the elders. The lifestyle of the people of Gujarat is very balanced because of the fact that they have a perfect system of learning, religious practices and excellent forms of artistic expressions. The culture of the Gujarati's does not only prevails in Gujarat but it has been widespread to different parts of the world and now recognized as an international culture. There is not much of energy to face different challenges raised by the global scenario.

**CUSTOMS AND TRADITIONS** : Though modern and sophisticated houses have come in Gujarat, still there are places which have their traditional homes and wooden houses. Most of these traditionally built houses have beautiful and intricately designed interiors but as a customary practice each house has a special "Chabutara" built for bird feeding. Pachchikam jewelry is one of the traditional jewelry of the people of Gujarat where instead of gold, the metal used in making of this ornament is silver. The Gujarati women as a part of their tradition carry a bunch of keys on their waist and the ring holder is usually made of silver. Some other jewelry which is worn by the ladies as part of their customs includes mangalsutra, earrings, necklace, rings and bangles. The Gujarati have lot of belief in various gods and goddesses. Cow is considered as mother God or "Gau-Mata" and the Gujarati's have lot of faith in them. Some of the ceremonies which are must to be celebrated by the people of Gujarat are birth, thread ceremony, marriage and death. In all these ceremonies the rituals and poojas are performed by the Brahmans. As a part of the Gujarati's custom and tradition they celebrate festivals like Navratri and Diwali.

**CUISINE** : Mostly Gujarati food is vegetarian because the state is dominated by Jains and the Vaishnavas. Most of their staple food includes wheat and millet varieties like jowar and bajri. No meal of Gujarati will miss roti along with a variety of vegetable curries and dishes. The food is generally served on a metal tray which is called as thali and 4-5 small bowls placed on it These thali mainly consists of roti, dal or kadhi, sabzi also known as shaak and rice. The Gujarati's are noted for their sweet tongue and every meal will be accompanied by a sweet dish. Sugar is also sometimes alternated



by jaggery. Some of the other common food which is a must for the Gujarati's in their thali are dal, steamed vegetables, homemade pickles, buttermilk and salad. Vaghaar is Gujarat food a blend of spices, which is purified in hot oil and then added to the dal. Gujaratis generally use lot of salt, sugar, tomato and lemon in their cuisine. Desserts, which were in the ancient times offered only on festivity or some special occasions, have now found their way in the daily meals. Ghee is a must in the food of Gujarati's. Srikhand is a rich dessert made with curds and spiced with saffron, cardamom, nuts, and fruit. The Gujaratis evening snack include bhakri-shak or khichdi kadhi.

**OCCUPATION** : The major occupation of the people of Gujarat is agriculture for at least one-half of the total land area is cultivable. Other area of economy and job sector includes dairy farming, primarily concerned with milk production. There are lot of industries which are involved in the production of fertilizers and petrochemicals.

4.2.7. Migration Reasons / Trends :

Moti-Rayan Migration Reasons as per the data available in Village Profile & Taluka Planning Atlas :

- 1.1.1.15. Number of families who have migrated from village to village/city to get higher education.
- 1.1.1.16. Number of families who have migrated from village to other place in the country are.
- 1.1.1.17. Number of families who have migrated from village to out of the country are.

Other reasons : Lack of physical and infrastructure facilities in the village like waste management, ATM, PHC, etc.

Migration Trend:One important facet of study on population is the study of migration arising out of various social, economic or political reasons. For a large country like India, the study of movement of population in different parts of the country helps in understanding the dynamics of the society better. At this junction in the economic development, in the country, especially when many states are undergoing faster economic development, particularly in areas, such as, manufacturing, information technology or service sectors, data migration profile of population has become more important.

Reason for migrations	Number of Migrants			Percentage to Migrants		
	Persons	Males	Females	Persons	Males	Females
Total migrants	98,301,342	32,896,986	65,404,356	100.0	100.0	100.0
Reason for migration : Work / Employment	14,446,224	12,373,333	2,072,891	14.7	37.6	3.2
Business	1,136,372	950,245	186,127	1.2	2.9	0.3
Education	2,915,189	2,038,675	876,514	3.0	6.2	1.3
Marriage	43,100,911	679,852	42,421,059	43.8	2.1	64.9
Moved after birth	6,577,380	3,428,673	3,148,707	6.7	10.4	4.8
Moved with households	20,608,105	8,262,143	12,345,962	21.0	25.1	18.9
Other	9,517,161	5,164,065	4,353,096	9.7	15.7	6.7

(T-12 - Migration data India)



When a person is enumerated in census at a different place than his / her place of birth, she / he is considered a migrant. This may be due to marriage, which is the most common reason for migration among females-or for work, what is the case as generally among males, etc. It also happens that many return to their place of birth after staying out. To capture such movements of population census collect information on migration by last helps to understand the current migration scenario better. In India, as per census 2001, about 307 million person have been reported as migration by place of birth. Out of them about 259 million (84.2%), migrated from one part of the state to another, i.e., from one village or town to another village or town. 42 million (2%) from outside the country. The data on migration by last residence in India as per Census 2001 shows that the total number of migrants has been 314 million. Out of these migrants by last residence, 268 million (85%) has been intra-state migrants, those who migrated from one are of the state to another. 41 million (13%) were interstate migrants and 5.1 million (1.6%) migrated from outside of the country.

# 4.3. Data Collection Moti-Rayan village (Photograph/Graphs/Charts/Table) :

# **4.3.1. Describe Methods for data collection :**

The main methods for data collection are :

# 1) Individual interviews.

- > Interviews can be conducted in person or over telephone.
- > Interviews can be done formally or informally.
- > Questions should be focused , clear , and encourage open ended responses.
- > They should be qualitative in nature.

# 2) Focus groups

- ▶ A facilitated group interview with individual that has something in common.
- > Gathers information about combined opinions.
- > Responses are often coded in categories and analyzed.

# 3) Observations - Field trips

- Allows for the study of the dynamics of a situation , frequency counts of target behavior.
- ➢ Good source for providing extra information about a certain group , can use videography.

# 4) Questionary Survey

- Responses can be analyzed with quantitative methods by assigning numerical values to like type scales
- ➢ Results are generally easier to analyze.
- Other than this survey forms are prepared which are distributed to responders to record their opinions, data so that it can be analyzed.

# 4.3.2. Primary details of survey :

The Village Moti-rayan is surrounded by Bhuj taluka towards North, Mandvi Taluka Towards South, Mundra Taluka towards East, Anjar taluka towards East, Naliya taluka towards West. The Nearby Villages of the Moti-rayan are Koday (3.9km), Mandvi (7km), Bidada (12km), Vada (8.6km), Dhokda (17km), Merau (8.8km). The Moti-Rayan Village is situated at Mandvi Taluka, Kutch District. The Distance from Mandvi is 08 km and another town / city near the village i.e. koday at 04km Distance. The distance from District Bhuj kutch to Moti-Rayan is 55km & Distance Between Capital Gandhinagar & Moti-Rayan is 398km (approx). In Moti-Rayan village According to census 2011, the total Population is 4766 & according to census 2001 the Total Population is 3522.



### 4.3.3. Average size of the House - Geo-Tagging of House :

In Moti-Rayan : Average size of the house in the village is 5 X 10m

Geo-Tagging: The process of tagging infrastructure with geographical information like Latitude, Longitude, Distance, place name, etc. It is connected to GPS which are monitored through computer internet networks. It can be used to locate important places like labs, dispensaries, milk center, etc. Geo Tagging is not implemented in Moti-Rayan village.

### 4.3.4. No of Human being in One House :

Total number of population in Moti-Rayan is 4766 as per 2011 census. There are different number of people in each house as there are nuclear families as well as joint families, but the average no of human beings in one house is 4 or 5.

# 4.3.5. Material available locally in the village and Material Out Sourced by the villagers:

The materials like milk, other materials, wheat, cotton and other agricultural cereals are used locally as they are locally easily available.

# 4.3.6. Geographical Detail:

The total geographical area of village is 1878.8 hectares, total residential area is 119 hectares and total Agricultural land area is 478 hectares. Latitude : 69°21'33.26'' East

Longitude : 22°53'6.73'' North

# **4.3.7.Demographical Detail - Cast Wise Population Details / Which ID proof using by villagers :**

Total No. of houses : 1444Population: 4766 (Male : 2367 ; Female : 2399)Literacy: 71.80%Total Workers9164.3.8.Occupational Detail - Occupation wise Details / Majority business :

The main Occupation of the village Dwellers is agricultural Work and Contract based Work. The occupation of the other village dwellers is as Labour, Masons, Gate keepers, Drivers, Managers, etc. in nearest companys & industries. The small Market is available for occupation in village. The uneducated People of the village work as labour.

The Main Three occupation of village is Agricultural, labour work & construction work.

4.3.9. Agricultural Details / Organic Farming / Fishery :

Majority of the population of Moti-Rayan village are occupied in farming. The main crops grown in the village are: wheat, cotton, peanuts, etc. There are no any farmer or villager using organic farming or fishery.

#### **4.3.10.**Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses :

Transportation facilities are Government bus service is available from main highway road. Road Rail Way Station , Bhuj Junction Rail Way Station are the nearby railway stations to Moti-Rayan. Local transportations are autorickshaw, chagdaa, private vehicles are available in Moti-Rayan village. The village approach roads are made of Bitumen and internal roads are of CC and also paver blocks and it is available in all streets in village. One overhead tank is available. Apart from this primary school, anganwadi, dairy, U/G sump, etc. are also present in the Moti-Rayan village. There are no any ware houses or manufacturing hub activities active in the Moti-Rayanvillage.



**4.3.11.Tourism development available in the village for attracting the tourist :** 

In Moti-Rayan village there are no any tourism activities available.

#### **4.4 Infrastructure Details (With Exiting Village Photograph) :**

#### 4.4.1. Drinking Water / Water Management Facilities :



In Moti-Rayan village the main source of drinking water is from a very big Yogna which is narmada yojna & bore well, in village with a help of narmada yogna water comes to the village every morning and evening and that water is stored in village overhead water tank which is of 2,00,000 lit., there is a toe overhead tank in village one in moti-rayan area and second is in nani – rayan and there are 2 different underground sumps as one in village area, first from Rukmavati river area and second from Sati vada chhela area.

F-8 - Over head tank

#### 4.4.2. Drainage Network / Sanitation Facilities :

The Moti-Rayan village has underground drainage facility. There is a good sanitation facility available in Moti-Rayan village. Khaadkuvaas are available in all the households. Dumping of garbage is done out of the village and other solid wastes are dumped in corner part of the village, so that to manage a solid waste there are no any facility available. Sanitation is done daily by villagers and there is no any solid waste collection system available in the village. government sweepers are coming frequently for other waste collection and forcleaning of the village.



F-9 - Waste Collection & Dumping Area



#### 4.4.3. Transportation & Road Network :

Nearest State Highway: SH 44 ; Railway station : Not present (nearest railway station is in Bhuj) ; Bus stop is available at main road of Moti-Rayan village bus stop.. The main approach road of village is of Bitumen and village streets are of CC and internal streets having paver blocks.

#### **4.4.4. Housing condition :**

In Moti-Rayan village the major structures such as schools, panchayat buildings and majority of the houses are pucca houses and some are kuchha houses. Rest of the houses are made of cement and bricks but with metal corrugated roof.

As per the data observed, 56% houses are Pukka houses & 44% houses are Kuchha houses

#### 4.4.5. Social Infrastructure Facilities , Health , Education , Community Hall , Library :

#### **Social Infrastructures:**

In Moti-Rayan village there are 4 anganwadi in moti-rayan,nani-rayan & rajpar timbo, 3 primary school , 9 or 10 temples , 1 Post office , 1 Panchayat building in working condition. There is one secondary school available but there are no any higher secondary schools. Village does not have primary health care center, or public garden.

#### **Health Facilities**

In the village no PHC Center are available, but there is a one sub-center are available but in not bad condition. The villagers go to Mandvi village for any kind of health facility.

#### **Education Facilities**

In Moti-Rayan village there are 4 anganwadi in moti-rayan,nani-rayan & rajpar timbo, 3 primary school. The school consists of Grades from 1 to 8. The school is Co-educational and the school have an attached playground section. Gujarati is the medium of instructions in this school. This school is approachable by all-weather roads. The school is Government building. It has got 8-10 classrooms for instructional purposes. As per the observation classrooms are in good condition. There is one secondary school available. Which is newly made by govt. The school has a separate room for Head master/Teacher. The school has electric connection. The source of Drinking Water in the school is Tap Water and it is functional and according to Talati there is rain water harvesting in school. The school has 1 boys toilet and it is functional, and 1 girl's toilet and it is functional.









# F-10 - secondary school of Moti-Rayan

**Waste management :** In Moti-Rayan village there is no proper waste management, but it is required in the village and also during interaction with villagers they have also suggested for proper management of waste collection in the village. As per the suggestion we have proposed the solid waste management plant design in part 1.

**ATM :** There is no ATM in the Moti-Rayan village and people are suffering for case. The villagers also suggested for one ATM. As per the suggestion we have proposed the ATM design in part 1.

4.4.6. Existing Condition of Public Buildings & Maintenance of existing Public Infrastructures : In the Moti-Rayan village as per the interaction with the villagers the maintenance is required in the Community Toilet. Water tank is present but is not in good condition and village officials have said that new water tank will be constructed in place of current water tank with higher capacity. Panchayat building, Anganwadi, Public library and primary school are also in good working condition. 4.4.7. Technology Mobile/ WIFI / Internet Usage Details :

Almost in all the households the villagers are using mobile phone and they are also using the internet facility for personal usage. There are no private WIFI users in the village as per the data collected. But in the panchayat building there is a WIFI connection available.

# 4.4.8. Sports Activity as Gram Panchayat :

There are no any sports activities are being done by gram panchayat. The primary & secondary school has some sports equipment and tools & also children and students are using these facilities.

# 4.4.9. Socio-Cultural Facilities, Public Garden/ Park/ Playground/ Pond/ Other Recreation Facilities :

The Moti-Rayan village has panchayat building and it is in good condition. The separate Post office building is there in village. Public Library is available in the village. Dairy building is available in the village. A small playground outside the primary school is present. The village has no public garden, or any other recreational facilities. There is some village pond but it is not in good condition and its water is also not drinkable.

# **4.4.10.** Other Facilities (e.g. like foot path development-Smart toilets-Coin operated entry, self-cleansing, waterless, public building) :

There are no any kind of facilities like smart toilet-coin operated entry, footpath development, selfcleansing, waterless public building, etc. in the Moti-Rayan village. And according to current population the village has a smart thing which is RO water plant which is in private sector.

# 4.4.11. Any other details :

There are agriculture co-operative office building, 4 wells, 7-8 tube wells in farms or agriculture areas and 1 pump. The farmers have the farming equipment like tractor, etc. in the Moti-Rayan village.



#### 4.5 Existing Institution like - Village Administration – Detail Profile :

4.5.1. Bachat Mandali : In the Moti-Rayan village there is no any Bachat Mandali existing

**4.5.2.** Dudh Mandali : There is one Dudh Mandali existing in the Moti-Rayan village in Dairy.

#### 4.5.3. Mahila forum :

A mahila forum is active in the village anganwadi. There is no any mahila mandal existing in the Moti-Rayan village. As per the interaction with villagers there is a system of asking before any kind of decision implementation in the village and that is a good thing in village so that mahilas have the decision making authority.

#### **4.5.4.Plantation for the Air Pollution :**

There is no such activity done of tree plantation for the air pollution in the Moti-Rayan village. But that kind of activities are done in the primary & Secondary school by the students of the Moti-Rayan village.

#### 4.5.5.Rain Water Harvesting - Waste Water Recycling :

In the Moti-Rayan village no one is using the system of rain water harvesting and there is no any kind of waste water recycling process done. According to Talati there is rain water harvesting in the village Secondary school.

#### 4.5.6.Agricultural Development :

There is one agricultural co-operative office building in the Moti- Rayan village so all the village agriculture related decisions are being operated from this office. The village farmers have agricultural tools and equipment. All the agri-materials are available from mandviwhich is 08 km away from the Moti-Rayan village.

#### 4.5.7. Any Other :

There are no any other kind of institutions existing in the Moti-Rayan village apart from panchayat building, dairy, primary school, Secondary School, public library, temples, agricultural co- operative office building, anganwadi, etc.



# Chapter 5.

# <u>Technical Options with Case Studies : (FOR ANY ONE TOPIC,</u> <u>Take a new concept design , prototype model with actual costing) :</u>

# 5.1 Concept (Civil) :

# **5.1.1.** Advance Sustainable construction techniques / Practices and Quantity Surveying:

India's construction sector is assessed at Rs.4000 billion or \$100 billion. As a result of government spending, private investments as well as foreign direct investment, has made India number one of the top ten spending nations on construction in the world. We manufacture more than 250 million tons of cement and are second only to China. A recent report "Global Construction 2020", estimates that India will be the third largest global construction market after China and USA. In order to improve the standard of living of her population, one of the key hurdles that faces today's India is to overcome the challenge of infrastructure bottlenecks. Consequently the federal government has announced our 11<sup>th</sup> five years plan which allocates 9% of the GDP to infrastructure projects. The National Planning commission - an apex federal body has estimated an allocation of \$515 billion which is equivalent to Rs.23 trillion to infrastructure sectors over the next five years. This includes construction of Roads, Highways, Airports, Bridges, Ports, Railways as well as water supply and sanitation amongst few others. The 12<sup>th</sup> five years plan projects an investment of 10% of the national GDP into infrastructure which equates to a staggering \$1 trillion or equivalently Rs.45 trillion.

# **Drivers for Sustainability :**

While India is preparing to tackle these growth plans with enthusiasm, it is imperative that the country should analysis and take into account the price that the future populations of the world and here will have to pay and the world in turn will have to pay, should this unprecedented growth take place without adequate thought to sustainability. Should we consume all our energy, materials, water resources without considering for the needs of our children and grandchildren, the future of the world and our nation is at peril. Obviously GHG emissions, climate change and sustainability are at stake. It is estimated that GHG emissions would increase from 2 billion tons to 6-7 billion tons of  $CO_2$  in 2030. Some of us may question why India must slow down her pace of development and pay for the sins of already developed and industrialized Western nations. Clearly, the OECD or the industrialized countries must take the lead in mitigating climate change, reducing greenhouse gas emissions, but also large developing countries such as India and China will also have to start to reduce their emissions over the next 20 to 30 years if we truly want to give our children a chance at a future. Developing countries with large emissions should have some responsibility, although differentiated and different from the industrialized world. While sustainable practices and products may be slightly unintuitive and perceived as counterproductive to the growth of GDP in the short-term, in the long- term, the future growth of the country depends on it. Growth that is not sustainable is not true growth.



#### **Recommendations :**

In mapping out sustainable practices that India must adopt a "cradle to grave" analysis is required. And for this we need to have a total approach than a patch work point system or a grade based certification system. In order to have a comprehensive plan for sustainable construction, every structure may be thought about based on the following parameters:

- 5.1.1.1. Planning, design and specifications based on performance and service life
- 5.1.1.2. Construction Practices
- 5.1.1.3. Material Conservation and Selection
- 5.1.1.4. Demolition and recycling
- 5.1.1.5. Energy Conservation

# 1. Planning, Design and Specifications :

Structures in India are designed well however so far in most specifications, there is no reference to any service life or calculations thereof. To this effect, deeper study of various service life prediction models and calculations are essential. Specifications must to be performance based as opposed to their present form of being prescription based.

#### 2. Construction Practices :

It is acknowledged that wastage in the construction industry is as high as 30%. That means at current valuation, we are talking about wastage to the tune of Rs.1200 billion or \$27 billion in India. This is in itself a large, yet relatively simple and straight forward challenge to tackle. These wastages are activities that absorb resources, man hours and materials but create no value. Most developed countries have different forums / institutes / researchers / academic institutions for seeking solutions to mitigate these wastages and lean construction practices that emerged have yielded encouraging. Lean construction is a "way to design production systems to minimize waste of materials, time and efforts in order to generate the maximum possible value". While some novel initiatives are being taken in some parts of India to adopt leaner construction practices, India does not have a fully focused lean construction forum. Creation of an industry consortium or lean construction forum may be a good beginning.

#### 3. Material Conservation and Selection :

Concrete is the largest synthesized material which has a per capita consumption of 1.5 tons per annum in India. Presence of concrete is all pervading simply because it has the capacity to utilize locally available ingredients, develop adequate engineering properties for a variety of applications, easily adapt to any shape and size and has comparatively low initial and maintenance costs. While concrete not be as big of an energy consumer as structural steel, aluminum and glass; concrete and particularly cement still remains a major energy 'sink' due to its sheer volume of production and also environmentally unsustainable due to large quantities of CO<sub>2</sub> evolution associated with its manufacture. Raw materials for cement manufacture include non-renewable natural resources like lime stone, aggregates, manufactured sands (fine aggregates), and so on. Hence the Indian concrete Industry needs to take a fresh look at these challenges. Some of the problems faced by Indian concrete industry towards achieving sustainability in concrete utilization are as follows:

Increase the use of fly ash and other cement substitutes ; Use of manufactured sand ; Use of lightweight aggregates



#### 4. Demolition and Recycling :

In India, the use of recycled aggregates has not been adequately explored. Reportedly, the construction and demolition waste has substantially increased as new super structures are being built on land after tearing down the smaller structures that previously existed. It is estimated that the construction industry in India generates about 10-12 million tons of waste annually. Projections for building materials requirement of the housing sector indicate a shortage of aggregates of about 55,000 million cu. m. An additional 750 million cu.m. of aggregates would be required for achieving the targets of the road sector. Recycling of aggregate material from construction and demolition waste may reduce the demand-supply gap in both these sectors. There is also an increasing-acute shortage of dumping grounds and landfills particularly in metropolitan cities. SERC, Ghaziabad had taken up a pilot R&D project on Recycling and Reuse of Demolition and Construction Wastes in Concrete for Low Rise and Low Cost Buildings in mid-nineties with the aim of developing techniques/methodologies for use of recycled aggregate concrete in construction. The experimental investigations were carried out in Mat Science laboratory and Institutes around Delhi/GZB to evaluate the mechanical properties and durability parameters of recycled aggregate concrete made with recycled coarse aggregate collected from different sources. Also, the suitability in construction of buildings has been studied.

#### **5. Energy Conservation :**

Since sources of good quality, aggregates are fast depleting, the concrete industry in India needs to prepare itself to use locally available 'marginal' aggregates. The use of local materials helps reduce the carbon footprint associated with transport. Thus, from sustainability angle, the emphasis should be placed on using locally-available aggregates, even if there are small deficiencies in their quality. It has been amply demonstrated that desired properties of concrete can be obtained by intelligent blending of available aggregates with crushed sand, inert fillers, supplementary cementitious materials and chemical admixtures. Another important issue is that river sand and other construction materials are usually transported by road. India has a well-developed and efficient rail and water transport system that need to be leveraged by the construction industry. This is not only more sustainable option but also most cost effective.

#### **Conclusion :**

- ➢ India is an astoundingly growing economy and hence the pressure on the use of natural resources is very heavy.
- > There is an awakening about the words durability and then sustainability.
- > Though the durability is understood to a point the real meaning and importance of sustainability is not fully comprehended by engineering fraternity as well as planners.
- Some sporadic efforts are carried out in the form of very repetitive academic experimentation; however, these efforts are in extreme primitive conditions.
- Industry has not opened to this "Sustainability aspect" proactively as they are busy joining the band wagon of growth machine.
- Federal authorities also are not well informed and hence not equipped to adopt 'Sustainability initiative'.
- Also use of renewable energy and resources is not much sought after option and not given due importance as the initial costs are high.
- At the same time, there is definite internal feeling in all that something is definitely needed to be done for next generation. Typically not to leave them with depleted resources.
- At the behest of ACI international India Chapter of ACI has organized couple of international conferences on sustainability along with the help of other organizations and Institutions.
- > But this effort to create and spread awareness should be all pervasive. The proactive participation of all the institutions, professional bodies, academicians, industry as well asfirm

patronage and participation of government is extremely essential.

- > 'Lean Concrete' and 'Reduce Wastage' initiatives in the industry are very necessary.
- > India chapter of ACI has decided to take the lead role in this initiative by forming "JSI" like efforts in India. It was suggested by late President Dick Stehly to the chapter after he witnessed the capability of chapter to galvanize the support and participation of many in the recent international conference on "Sustainability".

# 5.1.2. Soil Liquefaction :

**Soil liquefaction** occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid.

In soil mechanics, the term "liquefied" was first used by Allen Hazen in reference to the 1918 failure of the Calaveras Dam in California. He described the mechanism of flow liquefaction of the embankment dam as: If the pressure of the water in the pores is great enough to carry all the load, it will have the effect of holding the particles apart and of producing a condition that is practically equivalent to that of quicksand... the initial movement of some part of the material might result in accumulating pressure, first on one point, and then on another, successively, as the early points of concentration were liquefied.

**Type of soil causes liquefaction** : Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.



# (F-11 - Soil Liquefaction)

# **5.1.3. Sustainable Sanitation :**

**Sustainable sanitation** is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal. The Sustainable Sanitation Alliance (SuSanA) includes five features (or criteria) in its definition of "sustainable sanitation": Systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and natural resources. The purpose of sustainable sanitation is the same as sanitation in general: to protect human health. However, "sustainable sanitation" attends to all processes of the system: This includes methods of collecting, transporting, treating and the disposal (or reuse) of waste.



#### **5.1.4. Transport Infrastructure / system :**



#### (F-12 - Transport Infra.)

**Transport infrastructure** consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals.

Transport infrastructure consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals.

**Road :** A road is an identifiable route of travel, usually surfaced with gravel, asphalt or concrete, and supporting land passage by foot or by a number of vehicles. The most common road vehicle in the developed world is the automobile, a wheeled passenger vehicle that carries its own motor. As of 2002, there were 591 million automobiles worldwide.Other users of

roads include motorcars, motorcycles, buses,

trucks, bicycles and pedestrians, and special provisions are sometimes made for each of these. For example, the use of bus lanes give priority for public transport, and cycle lanes provide special areas of road for bicycles to use

Transport is vital to the well-functioning of economic activities and a key to ensuring social wellbeing and cohesion of populations. Transport ensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems. In their endeavour to facilitate transport, however, decision-makers in governments and international organizations face difficult challenges. These include the existence of physical barriers or hindrances, such as insufficient or inadequate transport infrastructures, bottlenecks and missing links, as well as lack of funds to remove them. Solving these problems is not an easy task. It requires action on the part of the governments concerned, actions that are coordinated with other governments at international level.

#### 5.1.5. Vertical Farming :

**Vertical farming** is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned mine shafts. As of 2020, there is the equivalent of about 30 ha (74 acres) of operational vertical farmland in the world. The modern concept of vertical farming was proposed in 1999 by Dickson Despommier, professor of Public and Environmental Health at Columbia University. Despommier and his students came up with a design of a skyscraper farm that could feed 50,000 people. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical farming coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through



traditional farming methods. The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. The increased ability to cultivate a larger variety of crops at once because crops do not share the same plots of land while growing is another sought-after advantage. Additionally, crops are resistant to weather disruptions because of their placement indoors, meaning less crops lost to extreme or unexpected weather occurrences. Because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna. Vertical farming technologies face economic challenges with large start-up costs compared to traditional farms. In Victoria, Australia, a "hypothetical 10 level vertical farm" would cost over 850 times more per cubic meter of arable land than a traditional farm in rural Victoria. Vertical farms also face large energy demands due to the use of supplementary light like LEDs. Moreover, if non-renewable energy is used to meet these energy demands, vertical farms could produce more pollution than traditional farms or greenhouses.

# 5.1.6. Corrosion Mechanism, Prevention & Repair Measures of RCC Structure :

**Mechanism :** In the case of Reinforced concrete structure the ingress of moisture or air may lead to corrosion of steel, cracking and spalling of the concrete cover thereby reducing durability of the concrete structure . Repair has been suggested as the protective solution for damaged structure due to corrosion. Corrosion of reinforcing steel is a significant economic and safety problem, preventing many buildings from attaining their design life. It is now a must look into field as corrosion of reinforcing steel is seen almost in every 10 out of 100 constructions within a life of 10 years. Nowadays the increase content of pollutants in the city atmosphere has very much affected the lifespan of RCC structures. The increased content of pollutants include a very high rates of Sulphates and Chlorides which when these mixes with rain water and falls over these structures and damages the visible parts. **Prevention :** Corrosion of steel in reinforced concrete structures can be divided into four different categories, based on how they provide protection:

1) Alternative reinforcement and slab design method includes materials that electrically isolate the steel from the concrete and create a barrier for chloride ions, materials that protect steel galvanic-ally, and materials that have significantly higher corrosion thresholds than conventional reinforcing steel. Concrete slabs have been designed without any internal reinforcement.

**2**) Barrier methods protect reinforced concrete from corrosion damage by preventing water, oxygen, and chloride ions from reaching the reinforcement and initiating corrosion.

# **5.1.7. Sewage treatment plant :**

Sewage treatment plant is a plant where waste water is treated. Sewage treatment is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment.

A by-product of sewage treatment is a semi-solid waste or slurry, called sewage sludge. The sludge has to undergo further treatment before being suitable for disposal or application to land. Sewage treatment may also be referred to as wastewater treatment. However, the latter is a broader term that can also refer to industrial wastewater. For most cities, the sewer system will also carry a proportion of industrial effluent to the sewage treatment plant that has usually received pre-treatment at the factories to reduce the pollutant load. If the sewer system is a combined sewer, then it will also carry urban runoff (stormwater) to the sewage treatment plant. Sewage water can travel towards treatment plants via piping and in a flow aided by gravity and pumps. The first part of the filtration of sewage typically includes a bar screen to filter solids and large objects that are then collected in dumpsters


and disposed of in landfills. Fat and grease are also removed before the primary treatment of sewage.

The term "sewage treatment plant" (or "sewage treatment works" in some countries) is nowadays often replaced with the term wastewater treatment plant or wastewater treatment station. Sewage can be treated close to where the sewage is created, which may be called a "decentralized" system or even an "on-site" system (in septic tanks, biofilters or aerobic treatment systems). Alternatively, sewage can be collected and transported by a network of pipes and pump stations to a municipal treatment plant. This is called a "centralized" system (see also sewerage and pipes and infrastructure).



(F-13 - Sewage Treatment Plant)

## 5.1.8. Technical Case Study On "Bhunga House" :

We have selected Ludia village of Kutchh district near Khavda. It has traditional kutchhi bhunga houses which are constructed traditionally. Bhungas are climate responsive structures. The village of Ludiya epitomizes the case of the traditional village of these parts, with characteristic lifestyles and builtform. The building pattern emerges out of the processes of evolution of a socio-culturally and geoclimatically relevant and contextual builtform. This village also has a stark and visibly distinct character which easily helps distinguish it as representative of villages in this region. Strategically located near Khavda, and being nodal in terms of proximity and available infrastructure (electricity, water supply etc.), the village was ideal for demonstration of the participatory method of design.

## Village Profile

## 1) Name: Ludiya

2) Location: Banni District, Kutch. 70 kms towards North from Bhuj, 500 kms to the NorthWest of Ahmedabad, 3 kms from Khawda.

3) Area: 5 sq. kms



### 4) Address:

Ludiya village Banni District Kutch

5) Population: 1800 people (350 Harijans, 1450 Muslims) 225 families

## 6) Communities:

Scheduled castes: 66 nos. (50 in Naya Vaas, 16 in Purana Vaas) Muslims : 159 nos.

Lokmani Phaluji Jagmalani Phaluji Tajvani Paru Mahepayi Vaadh Gova Vaadh Movar Vaadh

## 7) Occupation:

Decorative furniture (men) Bharat potan (women)

Agriculture (monsoon farming) and labour Cattle breeding and animal husbandry

8) Education: Primary education (upto 4th std - Govt. primary school: 2 teachers)

## 9) Amenities:

Electricity available

Panchayat Ghar existed, but is now obsolete Water supply from tankers and Khavda pipeline

## **10) Organisational features:**

- $\cdot$  Lies on the north-eastern edge of Banni, forming part of area called Pachcham
- · Village comprises of 2 large clusters Muslim and Hindu (harijan)
- · Organic plan geometry
- $\cdot$  No streets residual spaces between houses used for movement
- $\cdot$  Unit edge defined by plinth, Cluster edge defined by brush fence
- $\cdot$  Incremental growth of unit and cluster
- · Intricately decorated dwellings from inside and outside
- $\cdot$  Characteristic typology of 'bhunga' dwellings



Location



(F-14 - The SOU Location)

#### **History** :

The earthquake of January 26, 2001, that left most parts of Kutch devastated and in ruins, came at a time when the villagers had begun to give up the traditional building form in favour of the "pucca" houses in stone masonry, an influence from the urban centers signifying a more 'permanent' and 'prestigious' habitat. The fact that very few of the traditional dwelling types were affected severely by the quake, while almost all of the so-called 'permanent' dwellings were more or less razed to the ground, brought to the fore the wisdom of the ancients once again. This accidental but practical test, allayed the fears of the villagers, made them realise the sense behind the 'bhunga' and became the opportunity to convince them of their inheritance and the need to conserve it, at the same time not having to compromise on their aspirations.

## **Construction :**

The bhongas are a typical traditional house form peculiar and characteristic of this part of the country. They are manifestations of the vernacular building traditions exemplary of thesocio-cultural and geo-climatic contexts of this region, thus in part, contributing to the distinct identity of this area. Ludiya village, lying deep in the hinterlands of the Kutch region, has more or less completely retained its authentic and original character, both in terms of the built environment as well as the lifestyles of the people without getting affected by extraneous forces. The Harijan community, traditionally, are more inclined to construct these elaborately decorated and intricate dwelling forms characteristic of these places than the other Muslim communities. The Harijans also exemplify the characteristic means of livelihood through the traditional crafts of decorated wooden furniture, embroidered clothing and leather, while the Muslims are more often employed in pastoral pursuits. There was a general trend of neglect and unwillingness on the part of the Harijans in the younger generations towards the continuation of this tradition of 'bhunga' construction due to various external influences and pressures - primarily economic and otherwise (time taken for construction, periodic maintenance, fire hazard etc.) deteriorated to that of a 'shelter' alone, resulting in the undervaluation of the traditional wisdom behind their making.Ludiya epitomizes the case of the traditional building pattern emerging out of the processes of evolution of a socio-culturally and geo-climatically relevant and contextual built form. This long established and successful pattern, which holistically integrated lifestyles, resources and



resultant builtform, was suddenly being abandoned and vandalized due to modern economic pressures.

Bhunga is circular in plan having an inner diameter typically between 3m to 6m, generally has only three openings one door and two small windows. Bhungas are connected through plinths and circulation is also carried out in that way (as shown in Figure 6). A cluster of Bhunga is built on one plinth usually the cluster contains settlements of one whole family.

#### Context

The factors influencing Bhunga design are:

- Climate: The thick walls, made of mud, keep the interior cool when the temperature rises to 40+ degrees Celsius in summer and warm when it drops below 5 degrees inwinter.
- Culture: Culture is revealed in the decoration of the Bhunga (outside as well as inside) from painting on exterior walls to Glass designing on interiorwalls.
- Calamities: It performed very well in the recent M7.6 Bhuj earthquake in 2001. Very few Bhungas experienced significant damage in the epicentre region and the damage that did occur can be mainly attributed to poor quality of the construction materials or improper maintenance of the structure. It has also been observed that the failureof
- Bhungas in the last earthquake caused very few injuries to the occupants due to the type of collapse. **Stages of construction Bhunga**

#### The components required for the construction of walls and foundations are:

- 1) Clayey soil and rice husk for earthblocks.
- 2) Cement mortar used forfoundations.

### Construction stages of walls are asfollows:

- 1) A trench 30 cm deep and 45 cm wide is dug. The process of laying the blocks is locally calledchanter.
- 2) Walls are raised on foundations, using cow dung plus local mud mortar, mixed with water to make the compoundworkable.
- 3) Lintels and doors and window frames are inserted wherenecessary.
- 4) A platform-otla-is then built using rubble stone and earth, up to a height of about 45cm.



F-15 - plan view & section view of Bhunga.



## Wall Construction

The mixture for the plaster layer, locally called gobar Lipan, is made with cow dungandlocalmud. Water is added to improve its workability. A first layer is applied on the outer surface of the wall, and smoothe dusing hands. It takes aboutaday to completeit, and then another layer is applied on the inner surface. These inner and outer layers are alternated; up to seven layers are applied on both surfaces of the wall. The last layer of Lipan is done using earth sourced from Banni. The roofing in wall is resisted throughshellactionprovidingexcellentresistancetolateralforces. Inmaterialsis generally very light weight, and developslow inertiaforces.





## **Roof Costruction**

The components required for roof's construction are:

- One ĥorizontal beam (diameter 15 to 18cm).
- A base for the vertical kingpost patli size5x7x25.
- A central kingpost (ranging from 180 to 270 cm, diameter 10cm).
- A cone MANN at the top of the kingpost (diameter 40 cm, 45 cm high). Babool wood rafters forming the backbone of the roof VALI (having a diameter between 6 365 cmlong).
- Culms of split bamboo which constitute the secondary warping KHAPATIS (diameter 2 .5 cm, length 365cm).
- Rope KATHI -, (1.25 cm thick. 30 kg of rope arerequired).
- Straw KHEEP (forroofing).



## Material and labours

- Theseconstructions are carried outby local village masons with very few unskilled labourers and dcan be completed within 30 days.
- The locally available soft stone can easily be cut or chiselled into rectangular blocks, which are used for wallmasonry.
- The local soil is used for mud mortar and to make adobe blocks. Locally available timber and bamboo are used forroof.
- The entire construction cost of 1 Bhunga is approximately 10000-15000, with maximum cost is covered by labour and materials.
- The rent of a conventional Bhunga is approximately Rs. 2000 and that of air conditioned Bhunga is Rs.5000.

## Architectural elements



The circular mud house is an integration of exact geometry and property of materials for the climati conditions to evolve perfect architectural form of the house. Due to circular shape of wall in plan, inertial forces developed in wall are resisted through shell action providing excellent resistan cetolateral forces. In addition, the thick walls required for the rmalin sulation have high in - plane stiffness which provides excellent performance under lateralloads.

### Site photos :



F-16 – Case study of Bhunga House



# **5.2Electrical concept.**

## **5.2.1.** Programmable load shedding.

In today's world, there is a continuous need for automatic appliances with the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life. The project is designed to operate an electrical load multiple number of times as per the program. It overcomes the difficulties of switching the load ON/OFF manually. This proposed has an inbuilt real time clock (RTC) to keep tracking the time and thus to switch ON/OFF the load accordingly.

Load shedding is what electric utilities do when there is a huge demand for electricity that exceeds the supply. Thus in a distribution system it needs to be precisely controlled for specific period of time. Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock(RTC) interfaced to a microcontroller of 8051 family. While the set time equals to the real time, then microcontroller gives command to the corresponding relay to turn ON the load and then another command to switch OFF as per the program. Multiple ON/OFF time entry is the biggest advantage with this project. A matrix keypad helps enter.

## Block Diagram



F-17 - Block Diagram Programmable load shedding.



## > MICROCONTROLLER.

The AT89S52 is a low-power, elite CMOS 8-cycle microcontroller with 8K bytes of in-framework programmable Flash memory. The gadget is produced utilizing. Atmel's high-thickness nonvolatile memory innovation and is viable with the business standard 80C51 guidance set and pinout. The on-chip Flash permits the program memory to be reconstructed in-framework or by a regular nonvolatile memory developer. By consolidating an adaptable 8-digit CPU with in-framework programmable Flash on a solid chip, the Atmel AT89S52 is an amazing microcontroller which gives a profoundly adaptable and financially savvy answer for some installed control applications. The AT89S52 gives the accompanying standard highlights: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog clock, two information pointers, three 16-bit clock/counters, a six-vector two-level interfere with engineering, a full duplex sequential port, on-chip oscillator, and clock hardware. In additon, the AT89S52 is planned with static rationale for activity down to zero recurrence and supports two programming selectable force saving modes. The Idle Mode stops the CPU while permitting the RAM, clock/counters, sequential port, and intrude on framework to keep working. The Power-down mode saves the RAM substance yet freezes the oscillator, crippling any remaining chip capacities until the following hinder or equipment reset.Transformer.

A transformer is a static electric that transfers energy by inactive coupling between its winding circuits. A varying current in the primary winding creates a varying magnetic flux in the transformer's core and thus a varying magnetic flux through the secondary winding. this varying magnetic flux induces a varying electromotive force(emf) or.

## **REGULATOR.**

A controller is a framework used to keep a consistent voltage. The obstruction of the controller fluctuates as per the heap bringing about a steady yield voltage. The controlling gadget is made to act like a variable resistor, persistently changing a voltage divider organization to keep a steady yield voltage, and consistently scattering the contrast between the info and managed voltages as waste warmth. On the other hand, as witching controller utilizes a functioning gadget that turns on and off to keep a normal estimation of yield. Since the managed voltage of a direct controller should consistently be lower than input voltage, productivity is restricted and the info voltage should be sufficiently high to consistently permit the dynamic gadget to drop some voltage.

## > RTC.

The DS12885, DS12887, and DS12C887 continuous tickers (RTCs) are expected to be quick exchanges for the DS1285 and DS1287. The contraptions give a constant clock/plan, once of-day ready, three maskable impedes with an ordinary barge in on yield, a programmable square wave, and 114 bytes of battery-maintained static RAM (113 bytes in the DS12C887 and DS12C887A). The DS12887 organizes a quartz valuable stone and lithium fuel source into a 24-pin exemplified DIP pack. The DS12C887 adds a century byte at address 32h. For all contraptions, the date toward the month's end is normally adjusted to months with under 31 days, including amendment for hop years. The devices also work in either 24-hour or 12-hour plan with an AM/PM pointer. An exactness temperature-reimbursed circuit screens the circumstance with VCC. If a fundamental power frustration is recognized, the device thusly changes to a support. supply. A lithium coin-cell battery can be associated with the VBAT input.



nail to the DS12885 to keep up time and date activity when essential force is missing. The gadget is gotten to through a multiplexed byte-wide interface, which sup-ports both Intel and Motorola modes.

## > LCD.

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and soon. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

## > KEY PAD.

Matrix keyboards are common as an input device in microcontroller-based projects. A conventional way of connecting a matrix keyboard to a microcontroller is to use multiple I/O pins of the MCU. The MCU then uses a scanning algorithm to identify which keys are pressed. A drawback of this method is that it requires a large number of the MCU's I/O pins to connect the keyboard. For example, to connect a  $4\times3$  keyboard requires seven digital I/O pins.It scans row and coloumn to know what is the input.

## **RELAY OUTPUT.**

Relay is used to obtain the output. From the output of the relay, the control goes to the main power supply. The whole system acts as an automatic switch.

## > CIRCUIT OPERATION.

The programmable burden shedding time the executives for utility division circuit comprises of a 8592 microcontroller ic,16\*2 LCD module,7805 voltage controller ic,4\*3 keypad ,DS12887 RTC IC,relay,aCrystal oscillator The 7805 voltage controller changes the information voltage over to 5V and is given to the Vcc (pin :40) of the 8952 microcontroller. This voltage is important to empower the microcontroller .A DS12887 RTC interfaces with port0 of the microcontroller ie,from pins 32 to 39. The rtc shows the constant at each moment. When the RTC is customized ,it will work consistently despite the fact that the force goes off in between. The keypad is interfaced with port2 of the microcontroller ie from pins21 to28. The keypad is utilized to set the genuine time, the time for load shedding time and the time duration. The 16\*2 LCD is interfaced to port10 f the microcontroller ie from pins 1 to 8. The precious stone oscillator assists with giving the working recurrence 11.059MHz to the microcontrollerThe microcontroller modified so that we can set the real time and burden shedding time. Using the program we can screen both ongoing and burden shedding time. Program consistently check the correspondence and at whatever point it get coordinated with yield hand-off turn off. Then it started to check balance with target time and genuine time, whenever it get coordinated with hand-off turns on.



## 5.2.2 Railway security system using IoT.

An IoT Based Railway Security System for Automated Manning at Level Crossings.To implement this technology, we are fixing two Infrared Sensors at a pre-calculated distance to calculate the speed of train and time taken by the train to reach level crossings.

The fundamental goal of this venture work i.e., design the electronic equipment utilizing the 32bitARM Microcontroller 2002 design to existing Indian train and update the boundaries to the focalworker.ObservingofboundariesincorporateslikeMotorTemperature,AlternatorVoltage,Alternatorc urrent, Air temp, train speed and so on Control framework likewise coordinates with WatchfulnessControl Gadget (VCD) to know the readiness of driver and on the off chance that he isn't reacting ofopportune nature at that point apply the train brakes to save the existence of travellers in safe mannerupdatingthe statusto Focal Worke



## F-18-Block diagram of railway security system using IOT

## 5.2.3. Management through energy harvesting concept.

Energy reaping (otherwise called power collecting or energy searching or surrounding power) is the interaction by which energy is gotten from outer sources (e.g., sun oriented force, nuclear power, wind energy, saltiness angles, and motor energy, otherwise called encompassing energy), caught, and put away for little, remote self-sufficient gadgets, similar to those utilized in wearable hardware and remote sensor networks.

 $\succ$  Energy collectors give a modest quantity of force for low-energy hardware. While the information fuel to some huge scope age costs assets (oil, coal, and so on), the fuel hotspot for energy collectors is available as encompassing foundation. For instance, temperature slopes exist from the activity of a burning motor and in metropolitan territories, there is a lot of electromagnetic energy in the climate on account of radio and TV broadcasting.



 $\succ$  Probably the soonest utilization of encompassing force gathered from surrounding electromagnetic radiation (EMR) is the precious stone radio. The standards of energy gathering from encompassing EMR can be exhibited with fundamental segments. This article analyzes how gathering ecological energy in sensor networks changes the manner in which an application engineer sees energy the executives, and examines model gadgets. At that point it proposes gadgets that consolidate energy reaping and information securing. At that point it investigates novel methodologies for advancing the force separated utilizing piezoelectric materials. The last one investigates dynamic and nuclear power collecting from human clients' exercises. We normally use energy reaping frameworks to change over and gather the climate's energy streams.



F-19- Block diagram of energy harvesting system.

## 5.2.4 Moisture monitoring system.

Planting a tree in an environment where the seed or the plant would not get water agreeably through ordinary sources like deluge or ground water in its fundamental stages has been reliably a matter of stress for tree producer. This is the spot a self-ruling clamminess screen for plants system can help. The structure advantageous screens the sogginess level of the soil. In case that at the hour of noticing it comes to understand that the sogginess level of the soil is lower than recommended then it will raise a general media alert. This alert is then gotten by the supervisor of the plant. Exactly when the gatekeeper waters the plant the caution goes off and the checking cycle continues.

In this structure we use a clock IC to time the checking cycle. A sogginess level sensor is used to recognize the suddenness level of the earth. A Drove is used to give visual ready and a Signal is used to give sound alert to the gatekeeper of the plant. Thusly in this endeavour with the help of an essential combinational circuit and a sensor we can help spare a plant by keeping up the sogginess level of the earth of the plant, thusly keepin the plant strong. Planting a tree in a climate where the seed or the plant would not get water sufficiently through characteristic sources like downpour or ground water in its underlying stages has been consistently a matter of worry for tree grower. This is the place where a self-sufficient dampness screen for plants framework can help.



The framework ideal screens the dampness level of the dirt. In the event that at the hour of checking it comes to realize that the dampness level of the dirt is lower than suggested then it will raise a general media alert. This alarm is then gotten by the overseer of the plant. At the point when the overseer waters the plant the alert goes off and the checking cycle proceeds.We recently utilized a dirt dampness sensor with ESP8266 to assemble a keen water system framework. Today we utilized soil dampness sensor with ESP32 to assemble an IoT based dampness checking System, where the dirt dampness will be shown in rate (%) on Adafruit dashboard in type of chart just as on OLED show in type of numbers.



F-20-Block Diagram of Moisture monitoring system



## TOPIC TAKEN FOR ELECTRICAL CONCEPT

## 5.2.5. Home Automation using IoT

Prior to proceeding with any further, what about we research IoT. 'Web of Things' is an umbrella term used for all progressions that engage the relationship of a contraption to the Internet.

Such structures depend upon the variety of data. The data is then used for checking, controlling and moving information to various contraptions by methods for the web. This grants unequivocal exercises to be thus established at whatever point certain conditions arise. In a fundamental model, consider a sharp pot. The pot can be altered to normally murder once it shows up at a specific temperature. It might moreover send an admonition to the customer on the same.

## Home automation has three major parts:

- ➢ Hardware
- Software/Apps
- Communication protocols

Every one of these parts is similarly significant in building a genuinely brilliant home insightfor your clients. Having the correct equipment empowers the capacity to build up your IoT model iteratively and react to innovation turns easily.

A convention chose with the correct testing and cautious thought helps your dodging execution bottlenecks that in any case would confine the innovation and gadget coordination capacities with sensors and IoT entryways.

Another significant thought is the firmware that lives in your equipment dealing with your information, overseeing information move, firmware OTA updates and performing other basic tasks to make things talk.

### Applications of home automation

Reconstructing buyer desires, home mechanization has been extended to target wide cluster applications for the new advanced purchaser. A portion of the zones where consumers can expect to see home automation led IoT-enabled availability are:

- Lighting control
- > HVAC
- Lawn/Gardening management
- Smart Home Appliances
- Improved Home safety and security
- > Home air quality and water quality monitoring
- Natural Language-based voice assistants
- Better Infotainment delivery
- > AI-driven digital experiences
- Smart Switches
- Smart Locks

## Smart Energy Meters

### **Home Automation Sensors**

- Temperature sensors
- Lux sensors

Water There are probably countless such sensors out there that can be a piece of this overview. Since this is an introduction towards keen home development, we will keep it brief. We will slow down IoT sensors for home automation by their identifying capacities:

- level sensors
- Air composition sensors
- Video cameras for surveillance
- Voice/Sound sensors
- Pressure sensors
- Humidity sensors



- Accelerometers
- Infrared sensors
- Vibration's sensors
- Ultrasonic sensors

Depending on what you need you may utilize one or a large number of these to construct a genuinely brilliant home IoT item.

## List of components use in home automation system

- Components
- State machine
- Event bus
- Service registry
- > Timer
- > Fan
- Module
- > Diode
- Regulator
- > Capacitor



## Block diagram home automation system

These parts coordinating make a reliable consistent nonconcurrent structure for splendid home IoT. In the earlier interpretation of Home Assistant community, the middle routinely expected to stop while looking for new device information. Nevertheless, with the new types of home partner, a retrogressive suitable API, and antsy focus have been introduced making things essentially speedier for IoT applications.

The most awesome aspect about home colleague's centre design designing is the methods by which mindfully it has been arranged and made to assist IoT with homing.



Vishwaka	arma Yojana: Phase VIII	Villag	Village: Moti-Rayan		
Sr. no.	Item	Quantity	Cost/Qty (INR)	Total cost (INR)	
1	Node MCU	1 nos.	450	550	
2	Temperature Sensor	1 nos.	250	250	
3	Intensity Sensor	1 nos.	280	200	
4	Moisture Sensor	1 nos.	120	150	
5	Power Supply 5v,12v	1 nos.	500	400	
6	Relays	6 nos.	70	420	
7	Electronics Components	-	150	250	
8	Misc. item	-	100	200	
	2420				

## **T-13 Cost estimation**

## 5.2.6. PC Based Electrical Load Control

- The point of this venture is to control the electrical machines through a (PC). For instance, theatre lighting can be halfway controlled structure the PC for better stage the board.
- The point of this undertaking is to control the electrical apparatuses through a (PC). For instance, theatre lighting can be halfway controlled structure the PC for better stage the board. By and by, they are physically overseen which makes it hard to arrange the lighting with the separate scene. With this framework, one can handle the electrical machines ON/OFF simply by being situated at one spot utilizing a PC.
- This framework is incorporated with the electrical burdens and furthermore associated with the PC where unified control happens. It utilizes a RS-232 convention from the microcontroller to speak with the PC. To turn on/off the apparatuses, we utilize Hyper Terminal on PC. When the association is set up with the PC, at that point the framework begins working. The microcontroller utilized in this task has a place with 8051 family.
- This task can be additionally improved by actualizing a GUI put together control board with respect to the PC with fitting inserted programming. The force control can likewise be fused utilizing power gadgets. Note: The undertaking works just on working frameworks having hyper terminal (For example Windows XP). The PC should have a RS232 sequential port.
- Electrical machines can be controlled through a PC interfaced to a microcontroller. This interface is done through a level shifter IC. The heaps are then controlled through the transfers appropriately interfaced to the hand-off driver which thusly is associated with the microcontroller.

## **Hardware Specifications**

- 8051 Microcontroller
- Crystal Oscillator
- Resistors
- Capacitors
- > Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- > LED





## F-21- Block Diagram of PC Based Electrical Load Control

- > Software Specifications
- $\succ \quad \text{Keil } \mu \text{Vision IDE}$
- > MC Programming Language: Embedded C

## **5.2.7. Electrical Parameters Measurements**

Electrical measurements are the methods, devices and calculations used to measure electrical quantities. Measurement of electrical quantities may be done to measure electrical parameters of a system. Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded. High-precision laboratory measurements of electrical quantities are used in experiments to determine fundamental physical properties such as the charge of the electron or the speed of light, and in the definition of the units for electrical measurements, with precision in some cases on the order of a few parts per million. Less precise measurements are required every day in industrial practice.

- 5.2.7.1. Electrical opposition and electrical conductance
- 5.2.7.2. Electrical reactance and susceptance
- 5.2.7.3. Magnetic motion
- 5.2.7.4. Electrical charge by the methods for electrometer
- 5.2.7.5. Partial release estimation
- 5.2.7.6. Magnetic field by the methods for Corridor sensor
- 5.2.7.7. Electric field
- 5.2.7.8. Electrical power by the methods for power meter.



## Chapter 6.

## Swachh Bharat Abhiyan (Clean India) :

## Swachh Bharat Mission (SBM), Swachh Bharat Abhiyan (SBA), or Clean India Mission

It is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management (SWM). Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.

Initiated by the Government of India, the mission aimed to achieve an "open-defecation free" (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi. The objectives of the first phase of the mission also included eradication of manual scavenging, generating awareness and bringing about a behavior change regarding sanitation practices, and augmentation of capacity at the local level. The second phase of the mission aims to sustain the open defecation free status and improve the management of solid and liquid waste. The mission is aimed at progressing towards target 6.2 of the Sustainable Development Goals Number 6 established by the United Nations in 2015.

The campaign's official name is in Hindi. In English, it translates to "Clean India Mission". The campaign was officially launched on 2 October 2014 at Rajghat, New Delhi by Prime Minister Narendra Modi. It is India's largest cleanliness drive to date with three million government employees and students from all parts of India participating in 4,043 cities, towns, and rural communities. At a rally in Champaran, the Prime minister called the campaign Satyagrah se Swachhagrah in reference to Gandhi's Champaran Satyagraha launched on 10 April 1916. The mission was split into two: rural and urban. In rural areas "SBM - Gramin" was financed and monitored through the Ministry of Drinking Water and Sanitation; whereas "SBM - urban" was overseen by the Ministry of Housing and Urban Affairs.

As part of the campaign, volunteers, known as Swachhagrahis, or "Ambassadors of cleanliness", promoted indoor plumbing and community approaches to sanitation (CAS) at the village level. Other activities included national real-time monitoring and updates from non-governmental organizations (NGOs) such as The Ugly Indian, Waste Warriors, and SWaCH Pune (Solid Waste Collection and Handling).

The government provided subsidy for construction of nearly 110 million toilets between 2014 and 2019, although many Indians especially in rural areas choose to not use them. The campaign was criticized for using coercive approaches to force people to use toilets. Many households were threatened with a loss of benefits such as access to electricity or food entitlements through the public distribution system.

## 6.1 Swachhta needed in Moti-Rayan village -Existing Situation with photograph :

We have done one survey on existing condition of village condition of village regarding swachhta. The people are maintaining cleanliness of the village but in some streets there is no swachhata because there are animal and their waste, mud, etc.

- Our village is confronting issues viewing the Swachchhta as there are no offices accessible in village for discharge of waste.
- > There are no offices given by government for the executives of waste.
- > No office is accessible for the administration of strong waste also.



## 6.2 Guidelines - Implementation in Moti-Rayan village with Photograph :

According to Talati, Sarpansh and villagers, the people are cleaning their nearby area regularly and collect that waste and dispose it to out of the village and burn it. No daily basis waste collection is there in the Moti-Rayan village.



## (F-22 - Existing Photos of village streets)

## 6.3 Activities Done by Students for Moti-Rayan village :

- While traveling doesn't throw any wrapper, paper or any dry west on road. Keep it in your bag or pocket(as it is a dry waste your can keep them in your bag/pocket).
- ➤ Keep paper bags with yourself to store wet waste and throw them in dustbin only.
- Spitting on roads (as it can be the reason of viral disease).
- Avoid chewing Pan-Masala, Gutka and tobacco.
- > Avoid use of plastic bag and use cloth bag.



# <u>Chapter 7.</u>

# Village condition due to Covid-19:

With respect to COVID 19 pandemic, Ministry of Panchayati Raj, Government of India in close collaboration with State Governments has taken various initiatives. Close consultation and guidance of the State as well as District authorities is being maintained to ensure that lock down conditions are not violated and norms of social distancing are scrupulously followed to contain the spread of the disease. India has overtaken Brazil and become the second-worst affected country in the world by the coronavirus pandemic, with more than 4 million cases. COVID-19 had mostly remained in India's cities, but the disease is now spreading to rural India - an area with over 850 million people and far worse healthcare. The reason for this shift appears to be migrant workers who have been returning to their villages since lockdown was eased at the end of June. Close consultation and guidance of the State as well as District authorities is being maintained to ensure that lock down conditions are not violated and norms of social distancing are scrupulously followed to contain the spread of the disease. India has overtaken Brazil and become the second-worst affected country in the world by the coronavirus pandemic, with more than 4 million cases. The medical response to stop the spread and treat those infected has been inadequate, according to media reports. With one trained doctor for every 1,497 people, against the World Health Organization recommended one per 1,000, and public health expenditure for 2018 at just 1.3% of GDP, India faces an uphill struggle in dealing with the pandemic. While two-thirds of India's population lives in rural areas, there are almost four times as many health workers per person in cities. Most rural communities rely on untrained health workers. Over two-thirds of these rural health providers have no formal medical training, but remain the only option of medical support for most of the rural population.

## 7.1. Taken steps in Moti-Rayan village related to existing situation with photograph :

The village Moti-Rayan has larger land area like 1878 hector approximate. & villageans, sarpanch ji and talati ji is a aware citizen in this village. All people are followed rules and regulations & guidelines of government. When we go first to meet talati ji & sarpanch ji, we & they also told us to wear a mask and maintain a social distancing.

Panchayat sanitizing a village 2 or 3 times in week. Sarpanch ji is highly aware in this situation. They

always told to wear mask and sanitize hand frequently.

## Awareness about COVID-19 transmission and protective measures

- Clean your hands often
- Cough or sneeze in your bent elbow not your hands!
- Avoid touching your eyes, nose and mouth
- Limit social gatherings and time spent in crowded places
- Avoid close contact with someone who is sick
- Clean and disinfect frequently touched objects and surfaces.

## 7.2. Activities Done by Students for Moti-Rayan village with Photograph :

In this pandemic situation, we learn to use a technology. We update from offline to online and do work from home & many others. Because of our team face a many problems to meet talati ji & sarpanchji but we understand a situation. We do many activities to aware people.

7.2.1. First we mostly use & take advantages of online technology, we make a social media group and give a information about this pandemics.

7.2.2. We explained to people the importance of wearing a mask.

7.2.3. Panchayat distribute a hand sanitizer to many poor peoples.

In this pandemic people and government both are working together. And fight against covid -19 situation.



(F-23 - Covid 19 Awareness Activity Photos)

## **7.3.** Any other steps taken by the students / villagers :

During interaction with the Talati, he told us that quarantine place and home quarantine facility were implemented during the lockdown. In the COVID-19 situation cleaning, fogging and sanitization were done in the village



Chapter 8.

# Sustainable Design Planning Proposal (Prototype Design) - Part- I (Scenario / Existing Situation / Proposed Design in Auto cad / Recapitulation Sheet / Measurement Sheet / Abstract Sheet / Sustainability of Proposal / Any other software):

## **8.1 Design Proposals : Observation and brief write up about each design**

## Sustainable Design : ATM

Here we have designed the ATM for Moti-Rayan village. The population of Moti-Rayan village is 4766 as per 2011 census. So it is required to have one ATM in the village. The villagers have to go in Mandvi for cash requirement so that we have decided and finalized the design of ATM.

## Physical design : Solid waste management plant

In the Moti-Rayan village there is no proper management of solid waste. So according to the feedback given by the villagers, one waste management plant should be there in the village. So that we have designed one waste management plant for the villagers.

### **Social Design : Amphitheatre**

Amphitheater is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole Society or for a specialized group. A Amphitheater of village generally consists for events, like marriage, receptions etc.

## Socio-Cultural Design : Grocery store

Grocery store is a shop offering a wide variety of food, beverages, and household products, organized into sections. It is not larger like super market. and has a average selection for shopping.

## Smart Village Design : Cybercafe

A cybercafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer related tasks and access of these is charged based on time.

## Heritage Village Design : Entrance Gate

The Moti-Rayan village has one main entrance gate at the village approach road. But has no any entrance gate in nani-rayan area. So that we have designed the village entrance gate as heritage village design.



#### 8.1.1 Sustainable Design (Civil) : ATM

#### Scenario :

The residents of far-flung or rural areas are unable to pay visit to branches located at distant places on account of resource constraints viz., time, cost and opportunity. Thus, it has become imperative for banks to reach out customers through a variety of technology driven delivery channels such as Micro ATMs, Bio-metric ATMs, Mobile ATMs, and Smart Cards etc., which are most cost effective compared to Brick and Mortar model. ATM has brought sea change in Indian Banking space with significant qualitative improvement in delivery of banking services and within short span the presence of ATMs are outnumbered the physical branch network. Thus, it has become imperative for banks to reach out customers through a variety of technology driven delivery channels such as Micro ATMs, Bio-metric ATMs, Mobile ATMs, and Smart Cards etc. Thus, it has become imperative for banks to reach out customers through a variety of technology driven delivery channels such as Micro ATMs, Bio-metric ATMs, Mobile ATMs, and Smart Cards etc. The higher growth percentage of white-label ATM (WLA) operators is an indication of rural growth but its not limited to that. Banks have also been expanding in rural regions. However, the ATM industry numbers (3% growth) do not reflect that as the expansion was offset by the 10-PSU-bank merger plan, which led to closure of ATMs in urban areas.

## **Existing Situation in Moti-Rayan :**

Here we have designed the ATM for Moti-Rayan village. The population of Moti-Rayan village is 4766 as per 2011 census. So it is required to have one ATM in the village. A village have banking facility but there are no ATM so The villagers have to go in Mandvi for cash requirement so that we have decided and finalized the design of ATM.

### Sustainability of the design :

#### **ATM as an important tool :**

## Design Utilized by,

Illiterate/ Semi-literate users ; Under served ; Unbanked ; People living in remote area; etc.

#### Needs :

Basic banking facilities ; Security ; Ease of use ; A suitable and simple product ; etc.

## **Design brief :**

Atm design to assist illiterate, semi-literate with banking; Providing services through familiar devices; Net reduction in transaction processes; Aim to help in financial inclusion policies; etc.

ATM Design :

Length : 2.67m ; Width : 2.67m : Height : 3.35m



# **Proposed Design in Auto cad;**







ELEVATION (F-25 – ATM Elevation)





(F-26 – ATM section)



## ATM : Measurement Sheet (T-14)

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quanti ty(m <sup>3</sup> )
1	GLASS DOOR WITH ALUMINU M FRAME	1.397	0.02	2.2098	1	1
2	BASIC ROOF: GENERIC	2.667	2.667	0.152	1	1.15
3	FLOOR: 10"	2.667	2.667	0.254	1	1.81
4	BASIC WALL: 9" EXTERIOR	2.4384	0.2286	3		4.68
5	BASIC WALL: 9" EXTERIOR	1.6002	0.2286	3	1	3.47
6	CAST-IN- PLACE STAIR:	0.1778	1.524	0.1778	4	0.75
7	PCC IN FOOTI NG	10.22	0.90	0.4	1	2.80
8	BASIC WALL: 0.40	10.22	1.6	0.4	1	1.64
9	BASIC WALL: 00.30	10.22	1.2	0.4	1	1.22
10	BASIC WALL: GENERIC – 0.50	10.22	2	0.4	1	2.04
11	EXCAVATIO N	10.22	1.2	1.5	1	18.40



TM : Abstract Sheet (T-15)

SR NO.	Description	Quantity (m <sup>3</sup> )	Rate	Per	Amount
1	BASIC WALL: 9" EXTERIOR 1	220.48	130	$FT^2$	28662
2	BASIC WALL: 9" EXTERIOR 2	25.84	90	$\mathrm{FT}^2$	2325.6
3	GLASS DOOR WITH ALUMINUM FRAME:	-	3000	-	3000
4	BASIC ROOF: GENERIC – 12"	1.15	3500	M <sup>3</sup>	4025
5	FLOOR: 10"	1.81	4100	M <sup>3</sup>	7421
6	CAST-IN- PLACE STAIR:	-	3000		3000
7	EXCAVATION	1.215*4	350	M <sup>3</sup>	1701
8	PCC	9.32	3500	M <sup>3</sup>	32620
9	BASIC WALL: 00.30	4.08	90	$FT^2$	13140
10	BASIC WALL: 0.40	5.44	90	$FT^2$	13140
11	BASIC WALL: GENERIC -0.50	6.78	90	FT <sup>2</sup>	13140
				GRAND TOTAL	104752

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

## Total cost = ₹ 104752/-



### 8.1.2 Physical design (Civil) : Solid waste management plant

#### Scenario :

Currently total solid waste generated is around 42 Million tons annually. Waste generation varies from 200-600 kg/capita/day and collection efficiency ranges from 50-90%. And solid waste collection efficiency in india is around 70% india. A Solide waste management plant is are a plant where solid waste of village dump in this plant. In this method, solid waste is field in the Low lying areas. The Dumping is done in layers of 1 to 2 metres. The layers are covered by good earth of at least 20cm thickness. A gap of 7 days is given before Dumping the material in next layer. After 7 day a solid waste convert in solid compost and a farmar cab be able to use for agricultural area and can be use in different types of farming.

### **Existing Situation in Moti-Rayan :**

In the Moti-Rayan village there is no proper management system of solid waste. So according to the feedback given by the villagers, one Solide waste management plant should be there in the village. The villagers have to collect a solid waste and dump at the plant. And after some day they can be use a compost which is convert from waste collection. So that we have designed one Solid waste management plant for the requirement of waste collection for the villagers.

### Sustainability of the design :

### Solid waste management plant as an important tool :

### Design Utilized by,

All the people living in the village of even outsiders from nearby villages can use or utilize Plant for their waste collection.

#### Needs :

To reduce a solid waste in village and make village clean. All the people living in the village of even outsiders from nearby villages can use or utilize Plant for their waste collection.etc.

## **Design brief :**

In this method, solid waste is field in the Low lying areas below the Ground Level. The Dumping is done in layers of 1 to 2 metres. The layers are covered by good earth of at least 20cm thickness. A gap of 7 days is given beforeDumping the material in next layer.

Solid waste management plant Design :

## Length : 12m ; Width : 4m : Height : 2.3m



# **Proposed Design in Auto cad :**









F-28- Cross section of Solid waste management plant



## Solid waste management plant : Measurement Sheet (T-16)

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantit y(m <sup>3</sup> )
1	Earth work Excavation of Box/Pits	4	12	2.3	20	2208
2	Perforated pipes	12	-	-	40	480m

## Solid waste management plant: Abstract Sheet (T-17)

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1	Earth work Excavation of Box/Pits	2208	95	m³	209,760
2	Perforated pipes	480	125	m	60,000
				GRAND TOTAL	2,69,760

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 2,69,760/-



#### 8.1.3 Social design (Civil) : Amphitheatre

#### Scenario :

Amphitheater is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole Society or for a specialized group. A Amphitheater of village generally consists for events, like marriage, receptions etc.

#### **Existing Situation in Moti-Rayan :**

In the Moti-Rayan village there is no any community meet up area so that according to the village population there should be one Amphitheatre in village Amphitheater is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole Society or for a specialized group. A Amphitheater of village generally consists for events, like marriage, receptions etc.

#### Sustainability of the design :

#### Amphitheatre as an important tool :

#### Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a Amphitheatre for their different uses with the permission of Sarpanch, Talati and some authorized people of the village.

#### Needs :

where members of a Society gather for group activities, events, festivals and social purpose ; for mahila mandal in the village ;etc.

#### **Design Brief :**

Amphitheatre is an public building in a prominent location. Village and Amphitheatre are the average buildings that can be accommodate a sports program alongside the customary social and art pursuits. There are a wide variety of types and sizes, all with the following in common. A main activity and assembly space together with ancillary accommodation that might include additional place. The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

#### Amphitheatre Design :

Length : 12.6m ; Width : 20m : Height : 3m



# **Proposed Design in Auto cad :**



(F-29 - Amphitheatre plan)







## **Amphitheatre : Measurement Sheet (T-18)**

SR.	Description	Length	Width	Height	Count (Nos.)	Total Ouantity
NO.		Area	(m2)	(m)	(11050)	$(m^3)$
1.	Excavation		-	-	-	-
	1 <sup>st</sup> Step	29	.76	0.45	-	13.39
	2 <sup>nd</sup> Step	26	.03	0.90	-	23.43
	3 <sup>rd</sup> Step	22	.31	1.35	-	30.11
	4 <sup>th</sup> Step	76	.14	1.80	-	137.05
	Stair	13.7	7m3	-	2	27.54
		Total Ex	cavation			231.52
2.	РСС	-		-	-	-
	1 <sup>st</sup> Step	12.94		0.45	-	5.82
	2 <sup>nd</sup> Step	11.46		0.45	-	5.16
	3 <sup>rd</sup> Step	9.97		0.45	-	4.49
	4 <sup>th</sup> Step	8.47		0.45	-	3.82
	PCC for Stage	19	.51	0.45	-	8.78
		Total	PCC			28.07
3.	Waist slab of Flight	6.32	1.2	0.14	4	1.06
4.	Landing	1.5	1.2	0.14	2	0.504
5.	Steps Whitout Nosing	1.2	0.3	0.14	24	0.605
6.	Reinforcement		10mm & 8	mmD Bars		2.169
7.	Side wall	3.	31	1.8	2	11.92



Vishwakarma Yojana: Phase VIII			Village	e: Moti-Rayan	District	District: Kutch	
8	Stage back side wall	5	0.3	3	1	4.5	

## Amphitheatre : Abstract Sheet (T-19)

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1.	Excavation	231.52	95	m <sup>3</sup>	21,994.4
2.	P.C.C	28.07	3500	m <sup>3</sup>	98,245
3.	R.C.C (including centering & Shuttering but excluding reinforcement)	2.17	5800	m <sup>3</sup>	12,586
4.	Reinforcement	-	-	-	-
	10mm D Bars	98.92	55	kg	5,440.6
	8mm D Bars	29.42	55	kg	1,618.1
5.	Walls	-	-	-	-
	Side wall	11.92	3600	m <sup>3</sup>	42,912
	Stage back side wall	4.5	3600	m <sup>3</sup>	16,200
				GRAND TOTAL	1,98,996.1

Add water charges 1.5% = 2,984.9/-, contractor's profit 10% = 19,899.6/-, contingencies 3% = 5969.9/-,

Total cost = ₹ 2,27,850.5/-



#### 8.1.4 Socio-Cultural design (Civil) : Grocery Store

#### Scenario :

Grocery store is a shop offering a wide variety of food, beverages, and household products, organizedinto sections. It is not larger like super market. and has a average selection for shopping.

### **Existing Situation in village :**

In the Nani-Rayan Area there is no any Grocery shop and having variety in it. So we have designed a Grocery store as socio-cultural design or structure of the village. Grocery store is a shop offering a wide variety of food, beverages, and household products, organized into sections. It is not larger like super market. and has a average selection for shopping.

#### Sustainability of the design :

#### Grocery store as an important tool :

### Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a store for their different uses.

#### Needs :

Ease of use; Availability of more grocery and food products for nani-Rayan Area, in flood condition villager to be trapped between river & not able to went moti-Rayan; etc.

## **Design brief :**

Grocery store - a smaller self-service store selling groceries and dairy products and household goods food market, grocery, grocery store, market - a marketplace where groceries are sold; "the grocery store included a meat market" hypermarket - a huge supermarket . A self-service retail market selling especially for the foods and household merchandise ; something resembling a supermarket especially in the variety or volume of its goods or services.

Grocery store Design :

Length : 10.7m ; Width : 5.1m : Height : 4.2m


# **Proposed Design in Auto cad :**



(F-31 - Grocery store plan)



(F-32 - Grocery store section & Elevation)



**Grocery store : Measurement Sheet (T-20)** 

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m <sup>3</sup> )
1.	Excavation	30.7	0.9	1.2	1	33.15
2.	P.C.C (1:4:5) in Foundation	30.7	0.9	0.2	1	5.53
3.	Brick masonry in foundation and plinth 1:6	-	-	-	-	-
	1 <sup>st</sup> Step	31.1	0.5	0.3	1	4.66
	2 <sup>nd</sup> Step	31.2	0.4	0.3	1	3.74
	3 <sup>rd</sup> Step	31.3	0.3	1	1	9.39
	Steps	-	-	-	-	-
	1 <sup>st</sup> Step	1.5	2.1	0.20	1	0.63
	2 <sup>nd</sup> Step	1.5	1.8	0.20	1	0.54
	3 <sup>rd</sup> Step	1.5	1.5	0.20	1	0.45
4.	Brick masonry above plinth up to slab level in cm 1:6	31.3	0.3	2.85	1	26.76
	Deduction for D / W	-	-	-	-	-
	D1	0.9	0.3	2.1	2	1.134
	Glass	3.3	0.3	2.1	1	2.079
	Deduction for lintels	-	-	-	-	-
	D1	1.2	0.3	0.15	2	0.108



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	Glass	3.6	0.3	0.15	1	0.162
		Net quantity	r = 26.76-3.21	-0.27		23.28
5.	Earth filling in plinth	-	-	-	-	-
	Room 1	4	4.5	0.6	1	10.8
	Room 2	4	4.5	0.6	1	10.8
6.	R.C.C work for slab (1:2:4)	11	5.1	0.15	1	8.41
7.	Smooth plaster	-	-	-	-	-
	Inside room 1	4	-	2.85	2	22.8
	Room 2	4.5	-	2.85	2	25.65
	Outside wall1	8.9	-	4.2	2	74.76
	Wall 2	5.1	-	4.2	1	21.42
	Тс	otal plaster = 4	48.45 + 96.18	=144.63		139.28
		Deduction	n = 144.63 - 5	.35		
8.	Parapet walls	-	-	-	-	-
	Wall 1	11	0.15	0.6	2	1.98
	Wall 2	4.5	0.15	0.6	2	0.81



## **Grocery store : Abstract Sheet (T-21)**

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1.	Excavation in foundation	33.15	95	m <sup>3</sup>	3,149.25
2	B.B.C.C. in foundation (1:3:6)	5.53	3500	m <sup>3</sup>	19,355
3.	Brick work up to plinth in c.m. (1:6) with steps	19.41	3600	m <sup>3</sup>	69,876
4.	Earth filling in plinth	21.6	60	m <sup>3</sup>	1,296
5.	R.C.C work for slab (1:2:4)	8.41	9200	m <sup>3</sup>	77,372
6.	Brick work in super structure (1:6)	23.28	3600	m <sup>3</sup>	83,808
7.	Mosaic tiles flooring room	36	600	m <sup>2</sup>	21,600
8.	Smooth plaster on inside & outside	139.28	180	m <sup>2</sup>	25,070.4
9.	Brick work for parapet wall 150mm thick	2.79	3600	m <sup>3</sup>	10,044
10.	Glass	6.93	220	m <sup>2</sup>	1,524.6
11.	Wood work for doors	1.89	8200	m <sup>2</sup>	15,498
				Grand totel	3,28,593.2

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

#### Total cost = ₹ 328593.2/-



## 8.1.5 Smart Village Design (Civil) : Cybercafe

#### Scenario :

A cybercafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer-related tasks. In most cases, access to the computer and internet is charged based on time.

#### **Existing Situation in Moti-Rayan :**

In the Moti-Rayan village there is no any cybercafe existing in the village. From the feedbacks which were given by the villagers we have decided to design a cybercafe as a smart village design for the main purpose of internet availability at any time for any person in the village.

#### Sustainability of the design :

#### **Cybercafe as an important tool :**

#### Design Utilized by,

People living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a cybercafe for their different uses.

#### Needs :

Ease of use; Availability internet and for the people who can know about the internet ;etc.

#### **Design brief :**

A cybercafe alternatively referred to as an Internet cafe, PC bangs, or Net cafe. Cybercafe is a place to use computers to access the Internet, play games, create documents, chat with friends using voice and video, and other computer-related tasks. At most Internet cafes the computer and Internet access is provided for an hourly or daily fee. The cybercafe first came into existence in July 1991 in San Francisco, when Wayne Gregori started up the SFnet Coffeehouse Network. He built and set up 25 coin operated computer stations in multiple coffeehouses in San Francisco. The Binary Cafe was the first cybercafe in Canada, started up in June 1994. At most Internet cafes the computer and Internet access is provided for an hourly or daily fee. The cybercafe first came into existence in July1991 in San Francisco, when Wayne Gregori started up the SFnet Coffeehouse Network. Today, there are thousands of cybercafes all over the world, providing the computer and Internet access that people need to go about their daily lives.

Cybercafe Design :

Length : 4.79m ; Width : 4.79m : Height : 4.11m



# **Proposed Design in Auto cad :**



(F-33 - Cybercafe plan)





(F-35 - Cybercafe section)



## Cybercafe : Measurement Sheet (T-22)

SR.	Description	Length	Width	Height	Count	Total
NO		(m)	(m)	(m)	(Nos.)	Quantity
						(m <sup>3</sup> )
1	BASIC WALL: GENERIC - 9" 2	4.572	0.2286	3.0	1	12.82
2	BASIC WALL: GENERIC - 9" 2	4.572	0.2286	0.762	1	12.82
3	CURTAIN WALL: CURTAIN WALL 1	1.905	0.0254	3.048	1	-
4	DOOR- EXTERIOR- DOUBLE-TWO LITE: 72" X 80"	1.8288	0.0508	2.0574	1	-
5	1452181752750- CURTAIN WALL DOOR: AUS SGL GLASS FRAMED W D-PULL	0.8382	0.0127	2.1082	3	-
6	WINDOW- CASEMENT- DOUBLE: 49" X 60"	1.2192	0.101	1.524	3	-
7	BASIC ROOF: GENERIC - 1	4.572	0.2286	0.1524	1	7.45
8	FLOOR: GENERIC - 1	4.572	0.2286	0.1524	1	6.99
9	PCC	4.1148	0.90	0.4	1	5.02
10	BASIC WALL: 00.30	18.3	1.2	0.4	1	2.2
11	BASIC WALL: 0.40	18.3	1.6	0.4	1	2.94
12	BASIC WALL: GENERIC - 0.50	18.3	2	0.4	1	3.66
13	EXCAVATION	22	1.2	1.5	4	3.6



#### **Cybercafe : Abstract Sheet (T-23)**

SR NO	Description	Quantity $(m^3)$	rate	per	Amount
1	BASIC WALL: GENERIC - 9" 2	10.92	130	Ft <sup>2</sup>	66818.7
2	BASIC WALL: GENERIC - 9" 2	1.91	90	$Ft^2$	8077.5
3	DOOR-EXTERIOR- DOUBLE-TWO LITE: 72" X 80"	-	-	-	4000
4	1452181752750- CURTAIN WALL DOOR: AUS GLASS FRAMED W D- PULL	-	-	-	5400
5	WINDOW- CASEMENT- DOUBLE: 49" X 60"	-	-	-	4800
6	CAST-IN-PLACE STAIR: MONOLITHIC STAIR	-	-	-	6000
7	BASIC ROOF: GENERIC - 12" 2	3.73	3500	m³	13055
8	FLOOR: GENERIC - 12"	3.5	3500	m³	12250
9	EXCAVATION	1.215*4	350	m <sup>3</sup>	1701
10	PCC	9.32	3500	m³	32620
11	BASIC WALL: 00.30	4.08	90	Ft <sup>2</sup>	13140
12	BASIC WALL: 0.40	5.44	90	Ft <sup>2</sup>	13140
13	BASIC WALL: GENERIC - 0.50	6.78	90	Ft <sup>2</sup>	13140
				GRAND TOTAL	194142

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

#### Total cost = ₹ 194142/-



#### 8.1.6 Heritage Village Design (Civil) : Entrance gate

#### Scenario :

A village entrance gate as a heritage village design, a gate or gateway is a point of entry to a space which is enclosed by walls. Gates may prevent or control the entry or exit of individuals, or they may be merely decorative. Other terms for gate include yett and port. The word is derived from old Norse "gat", meaning road or path, and originally referred to the gap in the wall or fence, rather than the barrier which closed it. Gates may prevent or control the entry or exit of individuals, or they may be merely decorative. Other terms for gate include yett and port. The moving part or parts of a gateway may be considered "doors", as they arefixed at one side whilst opening and closing like one.

#### **Existing Situation in Moti-Rayan :**

The Moti-Rayan village has one main entrance gate at the village approach road which is made by Navneet group. But has no any mainentrance gate in nani-Rayan area. So that we have designed the village entrance gate as heritage villagedesign.

#### Sustainability of the design :

#### **Entrance Gate as an important tool :**

#### Design Utilized by,

People living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a village entrance gate for their different uses.

#### Needs :

For better esthetic entrance view; Ease of use; Availability of good approach road ;etc.

#### **Design brief :**

The village entrance gate design as a heritage village design is for better esthetics and looks of the village approach road.

Entrance Gate Design :

Length : 7.12m ; Width : 2m : Height : 4.88m



# **Proposed Design in Auto cad :**



## F-36 – plan & elevation of EG



## **Entrance Gate : Measurement Sheet (T-24)**

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m <sup>3</sup> )
1.	Excavation for foundation	2	0.8	1.4	2	4.48
2.	P.C.C (1:4:8)	2	0.8	0.1	1	0.16
3.	R.C.C	-	-	-	-	-
	Footing without slope	2	0.8	0.3	2	0.48
	Footing with slope	-	-	-	-	0.64
	Part of column below GL	1.35	0.45	0.4	1	0.243
	Column	1.35	0.45	0.45	1	0.27
4.	R.C.C for circular column	0.1	6 m2	3.25	4	2.08
5.	R.C.C slab from gate	10.3	1	0.45	1	4.635
6.	R.C.C from gate top	8.50		1	1	8.50
7.	R.C.C from circular column top	1.35	0.6	0.3	2	0.486



#### **Entrance Gate: Abstract Sheet (T-25)**

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1.	Excavation for Foundation	4.48	95	m³	425.6
2.	P.C.C (1:4:8)	0.16	3500	m³	560
3.	R.C.C from foundation	1.63	9200	m <sup>3</sup>	14,996
4.	R.C.C from circular column	2.08	9200	m³	19,136
5.	R.C.C from circular top	0.486	9200	m³	4,471.2
6.	R.C.C slab from gate	4.635	9200	m³	42,642
7.	R.C.C from gate top	8.50	9200	m³	78,200
8.	Column footing bars	85	55	kg	4,675
9.	Column footing formwork	9.34	120	m <sup>2</sup>	1,120.8
				GRAND TOTAL	1,66,226.6

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

#### Total cost = ₹ 166226.6/-

8.2 Reason for Students Recommending this Design :

- > ATM to provide flexibility of urgent cash requirements to the villagers
- Solid waste management plant to manage a solid waste in proper way
- > Amphitheater to organize events easily for the villagers
- ➢ Grocery store to provide extra feasibility to the public
- > Cybercafe to provide a source of internet as a smart village concept
- > Entrance gate for the better aesthetic of the village main entrance



#### 8.3 About designs Suggestions / Benefit of the villagers :

### 1. ATM :

The population of Moti-Rayan village is 4766 as per 2011 census. There are one bank in moti-rayan village but have no ATM facility. So it is required to have oneATM in the village. The villagers have to go in Mandvi village for cash requirement so that we have decided and finalized the design of ATM.

#### 2. Solid waste management plant :

In the Moti-Rayan village there is no proper management of solid waste. So according to the feedback given by the villagers, one waste management plant should be there in the village. So that we have designed one waste management plant for the villagers.

#### 3. Amphitheater :

Amphitheater is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole Society or for a specialized group. A Amphitheater of village generally consists for events, like marriage, receptions etc.

#### 4. Grocery store :

By designing the Grocery store in the Nani-Rayan Area, many needs of the villagers will be satisfied. Grocery store is a shop offering a wide variety of food, beverages, and household products, organized into sections. It is not larger like super market. and has a average selection for shopping.

#### 5. Cybercafe :

The design of cybercafe is the smart concept in the Moti-Rayan village. A cybercafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer related tasks. And mainly internet facility will be available for all the villagers at any time.

#### 6. Entrance Gate :

The Moti-Rayan village has one main entrance gate at the village approach road. But has no main entrence gate in nani-Rayan area. So that we have designed the village entrance gate as heritage village design.

These are proposed designs for the development of moti-rayan village for Vishwakarma Yojana phase VIII, Part 1 Design.



#### **8.4 About Maintenance :**

Maintenance can help:

- > Prevent the process of decay and degradation.
- > Maintain structural stability and safety.
- > Prevent unnecessary damage from the weather or from general usage.
- Optimise performance.
- > Determine the causes of defects and so help prevent re-occurrence or repetition.
- Ensure continued compliance with statutory requirements.For maintenance to be most effective, it should be organized through a programme of cyclical maintenance. At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines.

For maintenance to be most effective, it should be organized through a programme of cyclical maintenance. At the moste basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on daily basis.

## **Common maintenance tasks include:**

- Exterior painting and plastering.
- Landscaping and gardening.
- ➢ Inspection.
- ➢ Failure finding task.
- Electrical tasks.
- ➢ Leakage.
- ➢ Waterproofing.
- > Paving repairs.
- ➢ Window and door repairs.
- > Debris/rubbish removal and clearance.
- > Jet washing with chemical cleaning agents to remove fungal stain or mould.
- ➢ Gutter clearance and repair.
- ➢ Carpentry.
- ➢ Lighting repairs.
- > Re-plastering and plaster repairs.
- Tiling.
- > Carpeting and flooring.
- Plumbing.
- Repairing cracking or leaning walls



# **8.1.7 Electrical Design**

#### Design of solar in-home rooftop



Typical Rooftop PV System

## F-37-Design of solar in-home rooftop.

Automatic street light control (Electrical Design 1)





## F-38-Design of Automatic street light control



#### **Concept behind Auto Intensity Control of Street Lights**

We have used a combination of RTC Module (DS3231) and LDR for controlling the street lights. This combination is not something new but the way it is implemented is. Basically, there are twomodes of operation of this project: RTC Mode and LDR Mode. In RTC Mode, the street lights turn on automatically based on the ON Time set in the code and turn off based on the OFF TimeIn the LDR Mode, the street lights have an intensity control based on the ambient light near the LDR.

#### Circuit Diagram

The following image shows the circuit diagram of the Auto Intensity Control of Street Lights using Arduino project.



F-39-Circuit Diagram of automatic street light control

#### **Components Required**

- Arduino UNO
- DS3231 RTC Module
- LDR
- 16×2 LCD Display
- LED
- 10KΩ Potentiometer
- 10KΩ Resistor
- Push Button
- Connecting Wires
- PCB
- •



#### > Working

After making the connections and uploading the code to Arduino, turn on the Power supply to the project. Initially, the Arduino runs in RTC Mode where there are two times set in the code: the ON TIME and the OFF TIME.

Arduino compares the ON TIME with the time from RTC Module and when they match, the LED is turned ON. After this, the Arduino waits for the OFF TIME and once the time from RTC Modulereaches the OFF TIME, the LED is turned OFF.

During anytime of this operation, if the button (connected as an external interrupt to Pin 2) is pushed, the Arduino enters LDR Mode. In this mode, the Arduino reads the value of the LDR from A3 and based on the value, it adjusts the intensity of the LED. At the place of led we can put relayand control all the street lights of area/village. In order to switch back to RTC Mode, all you haveto do is push the button.

#### > Conclusion

A simple project for saving power is implemented using Auto Intensity Control of Street Lights using Arduino. With slight modifications and enhancements, this project can beapplicable for realtime use.

Sr. no.	Item	Quantit y	Cost/Qt y(INR)	Total cost (INR)
1	Arduino uno	1 nos.	600	600
2	Solid state relay	1 nos.	1700	1700
3	DS3231 RTC module	1 nos.	250	250
4	16×2 LCD display	1 nos.	350	350
5	Ldr	1 nos.	2 0	2 0
6	Power supply circuit	1 nos.	250	300
7	Electronic components resistor,capacitor, transistor etc.	-	200	250
8	Misc item	-	150	150
	Total cost	3620		

## Cost Estimation

T-26 Cost estimation



#### District: Kutch

#### **5.1.8 Smart Water Supply System (Electrical design 2)**



#### F-40-Smart water supply system

Water is fundamental need of individual. Water treatment is one of the significant interaction engaged with the water dissemination measure. In PCMC territory the water dispersion framework is broadly spreaded successfully. Water the executives involves high need in India and those liable for significant tasks of water dissemination need to be taught in this undertaking. Computerization gives enhanced answer for all issues of conveyance of water framework. The whole framework has highlights of SCADA (Administrative Control and Information Securing) framework to control and

screen the water supply and in the event of force disappointments to keep up coherence of force supply. Presently a-days, Water conveyance framework deals for certain issues like water spillage and ill-advised water supply. This spillage causes exceptional decrease in pressing factor of water moving through supply line. Because of this, purchaser gets less measure of water. By, considering above situation we are attempting to discover answer for the issue. Consequently, we are working with Water Supply

Branch of Pimpri Chinchwad Civil Company. The principle point of this task is to give compelling watersupply to every buyer and to recognize the spillage locales and misbehaviors. In this undertaking we are chipping away at the disseminated network under the zone of single water tank. For the most part we are zeroing in on the pressing factor transmitter which are situated at various branches in circulation organization to demonstrate pressure variety at various area. Hence, we are going to build up a framework in which we can investigate the pressing factor from various parts of conveyance organization and contrastit and fixed benchmark. Along these lines, we can control& screen the entire framework.



#### Solar system

#### Cost estimation Smart water supply system

Environmentally friendly power is the way in to India's jolt plan. Smaller than usual frameworks with the limit of 10-500 KW is assuming an undeniably significant part. With regards to every day use of power, the sun based housetop is the most ideal alternative to introduce all over India.

Sr. no.	Item	Quan tity	Cost/Qty (INR)	Total cost (INR)
1	PLC	1 nos.	12,00 0	12,000
2	Motorized actuator	1 nos.	18,00 0	18,000
3	HMI unit	1nos.	15,00 0	15,000
4	Misc.	-	-	4,000
ſ	49,000			

## T-27 Cost estimation

Since sun powered housetop can be effortlessly shipped everywhere on the nation even to those edges zones which don't have any legitimate vehicle office yet, these sunlight based roof frameworks require insignificant support. Till Walk 22, 2020, sun oriented roof frameworks of an overstate limit of 1,922 MW has been introduced in India, of which 346 MW has been introduced in the private areas

#### What is Solar Rooftop?

There are three kinds of solar rooftop systems that can be considered:

**On-lattice Sunlight based Housetop Framework:** This on-network sun based roof framework is incorporated with the primary matrix supply. This most clear sort of sunlight based housetop just coordinates with lattice power and has no other back-up power sources. This is known as an on-matrix sunlight based housetop framework since this sun powered roof framework is consistently in a state of harmony with the lattice. This on-network sunlight based roof is suggested for those associations which have an ensured supply of on-lattice power. Since, supposing that you experience the ill effects of continuous force interference accordingly, a plant will not work if the network doesn't work. This sunlight based housetop framework permits ability to be utilized from the lattice supply just when the sun oriented roof framework can't supply the necessary force. In this way ultimately, the sun oriented housetop saves the costs of constant matrix power. Also, this sun oriented housetop framework can procure incomes as any overabundance power created gets aggregated in the lattice for future purposes. Off-network Sunlight based Housetop Framework: This sort of sun based roof framework isn't coordinated with any lattice power; all things considered, this sun oriented roof framework just incorporates with batteries or diesel generators. The power produces from the sun based roof boards charges the battery, which can be utilized to control different applications later. This sort of sunlight based housetop framework is suggested in such areas that are not associated with the lattice by any

means. This kind of sun oriented housetop is ideal for little loads.
 Hybrid Sun based Roof Framework: This sort of sun based housetop framework can be incorporated with matrix force, batteries, and diesel generators. The principle advantage is if the battery gets charged by the power that produces from the sun oriented housetop framework, the overabundance power aggregates in the matrix as incomes. Half breed sun based housetop frameworks are suggested for those energy purchasers who have matrix power yet with regular interferences and who need basic



burdens to be fueled persistently. Generally modern and business purchasers in India fall under this half breed sunlight based roof framework.

 $\blacktriangleright$  Net Metering: Net metering, which is also known as the billing system, credits the owner of the solar rooftop system's owner for feeding the excess energy to the grid. For example, if a house has a solar rooftop system or a PV system that has the ability to generate more electricity than the home uses during daylight hours. If the house is net-metered, then the electricity meter would run backward to provide the houseowner with the credits.

Sr. no.	Installation	Quantity	Cost/Qty (INR)	Total cost(INR)
1	Solar panel	19 nos.	8,000	1,52,000
2	Inverter	1 nos.	70,000	70,000
3	Structure	1 nos.	10,000	10,000
4	Chemical earthing	1 nos.	8,000	8,000
5	Installation	6000 watts	2.5	15,000
6	20A DC MCB double pole	2 nos.	800	1,600
7	32A AC MCB double pole	1 nos.	800	800
8	DC Surge protection device	2 nos.	1,500	3,000
9	Miscellaneous cost	-	-	10,000
	Total cost of ins	tallation		2,70,000
	Government s	ubsidy		-81,000
	Final cos	st		1,89,000

**T-28** Cost estimation of solar system



#### **Selection of solar components**





## Types of solar cells

# The Most Common Types Of Solar Panels





Monocrystalline

## > Monocrystalline

This board are the most famous sun based boards utilized in housetop sun powered establishments today. One reason individuals will in general pick monocrystalline sun based boards is a direct result of what they look like. The sun based cells inside monocrystalline boards are a solitary, level dark tone, which makes them famous among mortgage holders. You can distinguish a monocrystalline board by the state of the silicon wafers, which are formed like squares with the corners cut off.

#### > Development

Monocrystalline sun oriented boards get their name from how they are made. Every one of the individual sun based cells contain a silicon wafer that is made of a solitary gem of silicon. The single gem is shaped utilizing the Czochralski technique, where a 'seed' precious stone is put into a tank of liquid unadulterated silicon at a high temperature.

The seed is then drawn up and the liquid silicon structures around it, making one gem. The enormous precious stone, additionally called an ingot, is then cut into slim wafers that are utilized to make the sun oriented cells. Generally, a monocrystalline board will contain either 60 or 72 sun based cells, contingent upon the size of the board. Most private establishments utilize 60-cell monocrystalline silicon boards.

## Execution

Monocrystalline sun based boards typically have the most elevated proficiency and force limit out ofa wide range of sunlight based boards. Monocrystalline board efficiencies can go from 17% to 22%. Since monocrystalline sunlight based cells are made out of a solitary precious stone of silicon, electronscan stream simpler through the cell, which makes the PV cell productivity higher than different kindsof sun powered boards.

The higher productivity of monocrystalline sunlight based boards implies that they require less space



to arrive at a given force limit. Thus, monocrystalline sun oriented boards will ordinarily have a morepowerful yield rating than either polycrystalline or slim film modules.

At the end of the day, you would require less monocrystalline sunlight based boards in your sun oriented force framework to produce a similar measure of force that, say, a more prominent number ofpolycrystalline sun powered boards would.

### > Cost

As a result of the way that monocrystalline boards are made, they wind up costing more than different sorts of sun powered boards. Their high productivity and force evaluations additionally knock up the cost. Most superior sun oriented boards, similar to the SunPower X-arrangement and the LG NeON boards, are monocrystalline. As per the Lawrence Berkeley National Laboratory, monocrystalline sun oriented boards sell for about \$0.05 per watt higher than polycrystalline modules. As sun based innovation and assembling has improved, the value distinction among polycrystalline and monocrystalline boards has contracted.

## Polycrystalline boards

once in a while alluded to as multicrystalline boards, are famous among mortgage holders hoping to introduce sun based boards on a careful spending plan. Typically, polycrystalline silicon sun based cells will not have the corners cut off of them, so you will not see the huge blank areas on the facade of the board that you see on monocrystalline boards.

The manner in which they are produced makes the boards have a blue tone, which a few group consider to be a blemish. The assembling cycle additionally makes them less proficient than monocrystalline boards.

#### > Development

Polycrystalline sun powered cells are produced like monocrystalline boards - a seed precious stone is put into liquid silica. Be that as it may, rather than pulling out the silicon seed gem, the entire tank of silicon cools. This cooling cycle makes different precious stones structure.

The numerous gems are what cause the boards to have that 'marbled' blue appearance. Actually like monocrystalline boards, polycrystalline boards will contain either 60 or 72 cells.

#### > Execution

The different silicon gems in each sun oriented cell makes it harder for electrons to stream. This gem structure makes the productivity pace of polycrystalline boards lower than monocrystalline boards. Polycrystalline board productivity appraisals will commonly go from 15% to 17%.

In any case, because of new innovations, polycrystalline boards are presently a lot nearer in proficiency to monocrystalline sunlight based boards than they have been before.

## > Cost

Polycrystalline sunlight based boards are less expensive to create than monocrystalline boards, whichpermitted them to make up a critical piece of the pie in private establishments somewhere in the range of 2012 and 2016.

However, while they're as yet less expensive than monocrystalline boards, it's not by definitely. This, in addition to their lower execution has made more individuals pick monocrystalline sunlight based boards over the long run.

#### > Thin film

Meager film sunlight based boards are totally unique in relation to monocrystalline and polycrystallinesun powered boards. They are strong dark, without the ordinary silicon cell traces you see on the substance of a glasslike sun powered board. Normally, slight film sun based boards are lightweight.



and adaptable, making them simple to introduce.

Slender film sun based cells are generally utilized in enormous scope activities, for example, utility ormechanical sunlight based establishments in view of their lower proficiency appraisals.

## > Development

Slim film sun based boards are made by saving a meager layer of a photovoltaic substance onto astrong surface, similar to glass. Instances of these photovoltaic substances include:

Indistinct silicon (a-Si) Cadmium telluride (CdTe) Copper indium gallium selenide (CIGS) Color sharpened sun powered cells (DSC)

Every one of these materials makes an alternate 'kind' of sunlight based board, be that as it may, they throughout the fall under the umbrella of being slight film sun powered cells. As a result of the assembling cycle, the boards wind up being lightweight and, at times, adaptable. In any case, it additionally makes them less proficient than translucent sunlight based boards.

## > Execution

Slender film innovation has gained notoriety for being the most noticeably awful of the sunlight basedboard advancements since they have the least productivity.

As of late as a couple of years prior, slight film efficiencies were in the single digits. Specialists have as of late accomplished 23.4% proficiency with slender film cell models however dainty film boards that are economically accessible by and large have productivity in the 10–13% territory.

The low proficiency rating implies you would have to introduce all the more flimsy film boards to create a similar measure of power as a mono or polycrystalline sun oriented board.

Along these lines, slight film sunlight based boards don't actually bode well for private establishments, where space is restricted. All things being equal, they work better in bigger scope establishments, as modern or utility sunlight based tasks, since more boards can be introduced to fulfill energy needs.

Slim film boards additionally have more limited life expectancies than different sorts of sun powered boards. Since they corrupt faster, you may need to supplant them all the more regularly.

> Cost

Dainty film sun oriented boards have the least expense out of the three sun powered board types on account of their low exhibition. They are additionally simpler to introduce than translucent silicon boards, which drops their cost even lower. The straightforward establishment measure is another motivation behind why slight film boards are incredible for huge scope business projects. Nonetheless, the cost of monocrystalline and polycrystalline sun powered boards keeps on getting less expensive. This implies an all the more impressive and proficient monocrystalline or polycrystalline framework will not set you back substantially more than a bigger, less productive flimsy film framework.



# **Electric design : 3**

DESIGN METHODOLOGY OF OFF SOLAR SYSTEMS.





NOTE: ALL DIMENSIONS ARE IN METERS

## F- 41- Design of rooftop solar cell



## **T-29 Calculating Energy Usage**

Appliance	Applianc	Quantity	Watts	Operation	Watts
	e		(V*A) Multi*	Hours/day	Hours/da
	categorie		1.5	"from	У
	S		for AC	table"	
LED Lights	Night use	2	3	14	80
High Flux LED	Night use	6	18	14	1008
Cell phone charger	24 Hours use	2	5	15	150
WI-FI router	24 Hours use	1	20	24	480
Solar charger	24 Hours use	1	1	24	24
controller					
Sensor	24 Hours use	1	1	24	24
Total Watt Hours per	r day		•		1770.00



# <u>Chapter 9.</u>

# **Proposing designs for Future Development of the Village for the PART-II Design :**

For future development of the Moti-Rayan village we are proposing the designs for Part II design in which following points should be considered,

## 1. Sustainable design : Rain water harvesting

An additional source of water will be available which could be used at the time of emergency orwater shortage by implementing the Rain Water Harvesting system in the village households.

## 2. Physical design : Death & birth register center

Currently the villagers are use a panchayat office as a death & birth register center. And village have 4766 totel population as per census 2011.so that it should have a one separate birth & death register center in Moti-Rayan village.

## **3.** Social design : PHC center

There is no any PHC center in Moti-Rayan village. Villager have to go mandvi or other place for any emergency. And suffered for their treatment. So that there should be one PHC center in the village.

## 4. Socio-Cultural design : Super Market

There is no any super Market in Moti-Rayan village. Villager have to go mandvi or other place for any grocery or food. So that there should be one super market in the village.

## **5.** Smart village design : Solar Street Lights

For the smart development of the Moti-Rayan village we have proposed the smart concepts as the solar street lights.

## 6. Heritage village design : Public Garden

In the Moti-Rayan village there is no any recreational area existing. So that for the better living standard and entertainment purpose we have proposed one design of public garden as recreational area in the village.

These are the proposed designs for the future development of Moti-Rayan village for Vishwakarma Yojana phase VIII, Part 2 design.



# Chapter 10.

## **Conclusion of the Entire Village Activities of the Project :**

We have visited the ideal village Kera and that visit helped us to know about the type of infrastructure needed by the village. With help of techno-economic survey and gap analysis and also studying / surveying our ideal village Kera , we were able to broadly define requirements of development for people of Moti-Rayan village.

In the Moti-Rayan village, the basic requirements like death & birth register centerl, any recreational area, etc. were not existing. By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area which will in turn reduce pressure on cities.

The village Moti-Rayan has Various Infrastructure facilities, but there are not adequate. So there is needs to providing various infrastructure facility. Also providing changes in the inadequate facilities. The various facilities described in the observation should be provide for the villagers on the sustainable planning base. Due to availability of all type infrastructure facilities with employment for villagers the migration of peoplecan be easily prevent.

The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make a real difference.

Students who want to work towards preservation of rural soul of country can do many things for our own good and environment. By implanting given design proposals, we can say that all themissing amenities are provided will stop the migration of rural people towards the urban area. This can cause reduce the load on urban areas as well as pollution in both sector can be minimized gradually.



# Chapter 11.

# **References refereed for this project :**

- \* www.vyojana.gtu.ac.in
- \* www.onefivenine.com
- \* www.censusgujarat.gov.in
- ✤ www.census2011.com
- \* www.indikosh.com
- \* www.wikipedia.com
- ✤ GTU guidelines and briefings
- URDPFI norms
- ✤ www.censusindia.gov.in
- ✤ www.researchgate.net
- \* www.villageinfo.in
- www.villagemaps.in
- \* www.ijser.org
- https://sswm.info/node/7722
- https://www.indianmirror.com/culture/states-culture/gujarat.html
- https://www.academia.edu/38054706/SUSTAINABLE\_CONSTRUCTION\_AN\_IND IAN\_PERSPECTIVE
- https://india.smartcitiescouncil.com/article/see-how-district-cooling-system-willmake-raiya-coolest-smart-city
- https://www.eurekalert.org/pub\_releases/2014-06/uosf-iti061814.php
- http://smartcities.gov.in/upload/uploadfiles/files/What%20is%20Smart%20City.pdf
- http://ijaerd.com/papers/special\_papers/NCAN09.pdf
- https://freeprojectsforall.com/civil-project-on-corrosion-mechanism-preventionrepair-measures-of-rcc-structure/



# <u>Chapter 12.</u> <u>Annexure attachment :</u>

## 12.1 Survey form of Ideal Village Scanned copy attachment in the report for Part-I :

Guiarat Technological University, Abmedabad, Gujarat Vislovatarma Yojana: Phase VIII Techno Economic Survey

Techno Economic Survey For Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurhanisation for Village Development

Name of Village:	Kera
Name of Taluka:	Mundra
Name of District:	kutch
Name of Institute:	Verzoyation Institute engineering
Nodal Officer Name & Contact Detail:	Vodgama Nilesh 94290 81163
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	laghes acual / 210 shall Bel, al. grosse.
Date of Survey:	Obtivitation

#### 1. Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	5009	2123	2886	1066
ii)	2011	8063	3998	4065	1863

#### 2. Geographical Detail:

ŋ	Area of Village (Approx.) (In Hector) Coordinates for Location:	4055.84 23° 5'0" Noath 69° 36' 0" East
	Forest Area (In hect.)	86.69
	Agricultural Land Area (In hect.)	2272-27
	Residential Area (In hect.)	1696-88
	Other Area (In hect.)	371.60
	Water bodies	Lake, River, Tube-well
	Nearest Town with Distance:	Bhuy - 20 Km [APPROD]



Village: Moti-Rayan

District: Kutch

Gujarat Technological University, Ahmedabad, Gujarat



Vishwakarma Yojana: Phase VIII Techno Economic Survey

3. Occupational Details:

Name of Three Major Occupation groups in	1. Aggiculture			
Village	2. Employment			
	3. Milk Sole			

#### 4. Physical Infrastructure Facilities:

No.	Descriptions	Detail	Adequate	Inadequate	Remarks		
A.	Main Source of Drinking water						
	<ul> <li>Tap Water (Treated/ Untreated)</li> <li>RO Water</li> <li>Well (Covered/ Uncovered)</li> <li>Hand pumps</li> <li>Tube well/ Borehole</li> <li>River/ Canal/ Spring/ Lake/ Pond</li> </ul>	Untreated Uncovered V-3 Yes 3 Pond	1 1 1 1 1		Evezy Home Poivate In village Arec In Agricul -ture o		
Sugge	estions if any:						
B.	Water Tank Facility						
	Overhead Tank	Capacity:	-	en a sér contractionel d'again	4 lakh l		
	Underground Sump	Capacity:	L		7 lath li		
Sugge	stions if any:						
C.	Drainage Facility		t <sup>an</sup> as a grant f				
	Available (Yes/ No)	Yes	-				
Sugge	stions if any:	States .					
D.	Type of Drainage						
	Closed/ Open	closed	~				
132	If Open than Pucca / Kutchcha	Pucca	-	angel generation	closed		
	If Open than Pucca / Kutchcha Whether drain water is discharged directly in to Water bodies/ Sewer plants	Pucca Riveð	1 1		closed		



District: Kutch

	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM						
	Village approach road	Keza -	Bhuj				
	Main road	BT- Road					
	Internal streets	C.C. Rood					
	Nearest NH/SH/MDR/ODR Dist. in kms.	S.H. Io km.					
Sugge	stions if any:						
F.	Transport Facility				NUT HE SAN		
	Railway Station (Y/N) (If No than Nearest Rly StationKms)	No 20 km					
	Bus station (Y/N) Condition: (If No than Nearest Bus StationKms)	Yes Grood	1				
The second	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Chhalcda And Psivate Vehicles	~	1.9.9			
Sugg	estions if any:			alle an Billion			
G.	Electricity Distribution						
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	GIOVE 24 hos.	2		Jyoti goasn Yogna.		
	Power supply for	24 has Grove.	~		11		
	Domestic Use	Anna and the second second					
	Power supply for Agricultural Use	S has. Govt.	-		N		
	Power supply for Agricultural Use Power supply for Commercial Use	8 has. Govt. Yes	2		* 24 Has.		



	LED Facilities	708	1-		
	Renewable Energy Source	Building-		-	12
	LED Facilities	7.00			
Sugge	stions if any: Required 2	Hasin -	Agricultu	ival Are	ou
H.	Sanitation Facility				The California
A CONTRACT	Public Latrine Blocks	Required	ALL DESCRIPTION OF THE PARTY OF	(reality in the second	
	If available than Nos. Yes	24 Hosin Agriculchool	1		
	Location Condition	azeen			
	Community Toilet (With bath/ without bath facilities)	Yes	~		
	Solid & liquid waste		5		
	Disposal system available	Yes	137 830	viding Lal	chavat
	Any facility for Waste collection from road	Yes	By coll	ecting ve	hical,
Sugges	tions if any:				
l	Irrigation Facility:				A SALA
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Tubewal And Well	~		
Sugges	tions if any:	and the second s			
J.	Housing Condition:				
	Kutchha/Pucca	Kutchha	399		
	(Approx. ratio)	Pucca.	1463		
5.	Social Infrastructural Faci	lities:		IN CARLIE	
Sr.	Descriptions	Information/	Adequate	Inadequate	Remarks
NIG		Detail			



Village: Moti-Rayan District: Kutch

	Health Facilities:	- ajarat	5 Technol	Economic Survey			
	Sub center/ PHC/ CHC						
	/Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes	V				
	Private Clinic/Private		149059				
	Hospital/ Nursing Home	Yes	-				
gesti	ons if any:			approx. distance nom			
1000	Agganua di/ pi						
	Primary School	Yes	~	A DECEMBER OF A			
	Secondamical	Yes	2				
	Higher are S. L. L	Yes	L				
	ITI college/ vocational Training Center	Yes No					
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No					
	If any of the above Facility village:kms.	is not available	in village that	an approx. distance from			
gestion	sifany: —						
1	Socio- Culture Facilities	Harriston Constant		And the second			
0	Community Hall (With or without TV)	yes Grood					



illage:	kms.			
fanyo	of the above Facility is no	t avaiiable in vill	age than appro	ox. distance from
-	Condition:	Good		
	Location:	Ponchayat		
	Registration Office	403		
	Birth & Death			
	Location:	Groud		
	Station			
	Assembly Polling	Yes	V	
8	Condition:	Avai lable		
	Location:	Not		
	Cinema/ Video Hall			
	Condition:			North Provide State
	Location:	Yes	~	
	Recreation Center	G100d		
	Condition:	village	~	
	Village Pond	Yes 3 pont in		
	Condition:	olog		
	Location:	Gund		
1	Public Garden	Yes	~	
	Condition:			
	Location:	stood		
	Y/N)	Grand	~	
	daily newspaper supply:	Yes	i series i	
	Public Library (With			


District: Kutch

General Market	Yes	~		
Shops (Public Distribution System)	Yes	~		
Panchayat Building	Yes	-		1
Pharmacy/Medical Shop	709	-		
Bank & ATM Facility	Yes	-		
Agriculture Co- operative Society	Yes	-	and mind	
Milk Co-operative Soc.	Yes	~	-	
Small Scale Industries	Yes	~		12
Internet Cafes/ Common Service Center/Wi Fi	Yes	V		
Other Facility		-	14	-

(dester)

## 6. Sustainable /Green Infrastructure Facilities:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
0.	Adoption of Non- Conventional Energy Sources/ Renewable Energy Sources	703	L		
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	N0 703 708	Requised -	for kera	village.
Q	Any Other	Ro-Plant	De trans	By Provid	ling Sector

# 7. Data Collection From Village

Village Base Map	in panchayat.
Available: Hard Copy/Soft Copy	La
F3 . ~~	
53 ~~~~	Proposition 1



Gujarat Technological University, Ahmedabad, Gujarat	Vishwakarma Yojana: Phase VI Techno Economic Survey
Recent Projects going on for Development of Village	NO.
Any NGO working for village development	No.

# 8. Additional Information/ Requirement:

Descriptions	Information/ Detail	Remarks
Repair & Maintenance of Existing	Repair &	
Public Infrastructure facilities(School	Maintenesace of	
Building, Health Center, Panchayat	Road Network	
Building, Public Toilets & any other)		
Additional Information/ Requirement		
Requised a losges pani	charlat office an	of Publ
	Descriptions Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other) Additional Information/ Requirement	Descriptions       Information/Detail         Repair & Maintenance of Existing       Repairs &         Public Infrastructure facilities(School       Maintenance of         Building, Health Center, Panchayat       Maintenance of         Building, Public Toilets & any other)       Requirement         Additional Information/ Requirement       Required a larges Panchayat office and

## 9. Smart Village Proposal Design

Sr. No.	Descriptions	Information/ Detail	Remarks	
1.		NA	-	



Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties: GTU VY Section: Contact No – 079-23267588 Email ID: rurban@gtu.edu.in

Gujarat Technological University



0 0 0

## 12.2 Survey form of Smart Village Scanned copy attachment in the report for Part-I:



Vishwakarma Yojana: Phase VIII Techno Economic Survey

# **Techno Economic Survey**

Vishwakarma Yojana: Phase VIII

## SMART VILLAGE SURVEY

# An approach towards "Rurbanisation for Village Development"

Name of District:	Waltch
Name of Taluka:	uardvi
Name of Village:	Mori Rayan
Name of Institute:	Veeladatan
Nodal Officer Name &	Vadgama Nilesh
Contact Detail:	84290 81263
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/	Scile Paral
Gram Sevak/ Aaganwadi	and 212(2) 322 100
worker/Village dweller)	di, enoti
Date of Survey:	29/10/2020

### L DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	3522	1880	1900	1190
2.	2011	и766	2367	2399	th un

### II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1878. Hechil (APBer)
2.	Forest Area (In hect.)	10 HECKS
3.	Agricultural Land Area (In hect.)	UTS Hector
4.	Residential Area (In hect.)	119 Hector CAPPSon)
5.	Other Area (In hect.)	12.71 HALLAS ( ")
6.	Distance to the nearest railway station (in kilometers):	60 kilometeks



District: Kutch

	Gujarat Technological University, Ahmedabad, Gujarat	Viahwakarma Yojana: Phase VIII Techno Economic Survey
7.	Name of Nearest Town with Distance:	Mandui - 07 KM
8.	Distance to the nearest bus station (in kilometers):	avoiluble in vinage.
9.	Whether village is connected to all road for the any facility or town or City?	yes

## III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Agricukilai			
Village	2. Whoreh avortes			
	3. Construction and a			
Major crons grown in the village:	1. Peanzits			
and the Brown on the Lumber	2. Cotton			
	3. Whats			

#### <u>IV.</u> PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks	
А.	Main Source of Drinking w	ater				
1.	PIPED WATER Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe	pi Ped inte oweding	V			
2.	DUG WELL Protected Well Un Protected Well WATER FROM SPRING	un Bockes uesu	~			
3.	Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	Reinaut) G	V			
4.	SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CAN AL/ Irrigation Channel Bortled Water Hand Pump	Qiven onullane sharhaten enannel	1			

15



unges	tions if any:				
<b>B.</b> ,	Water Tank Facility				
-	Overhead Tank	Capacity:	v		3 Lakh Ltx
	Underground Sump	Capacity:	~		6 LOING L.T.R.
Sugger	tions if any:				
C.	The Type of Drainage Faci	lity	100		
-	A. UNDERGROUND				10 20 Aug
	DRAINAGE		V		OPEN aut
	1				outlet.
	2 B ODEN WITH OUTLIET				
	C. OPEN WITHOUT OUTLET		_		
Sugge	stions if any:				
n	Road Network All Weath	er/ Kutchha (Gr	avel)/ Blac	k Topped pu	cca/ WBM
** <u>*</u>	Million analysish and	withdu -			
	vinage approach road	Rusen	V		
	Main road	BT- Rayd	$\lor$		
	Internal streets	C C Road			
	Nearest	BH	14		
	NH/SH/MDR/ODR	7445	<i>v</i>		
Sugg	estions if any:				
E.	Transport Facility		-		12 10 31 10 10 10 10 10
	Pailuray Station (V/N)	NO			
	(If No than Nearest Rly	E6 4.45		~	
	StationKms)	(RPPART)	<u></u>		
	Bus station (Y/N)	yes			
	(If No than Nearest Bus	in good	V		
	StationKms)	(Olderick			
	Local Transportation	chhauda		V	Private
	(Auto/ Jeep/Chhakda/				Ven cles
Sugg	estions if any;	-			
F.	Electricity Distribution			Jog California	
	(V/N) > Court / Private	Cout		1	Talleti Chan
	(Less than 6 hrs./	24 125			at its
	More Than 6 hrs)	Con These			youna.



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Sugg	estions if any:	rest th	Requised	fes	24 h	S.
K.	Education Facilities:	2.0 MV 10-2	to an entry of the			
	Aaganwadi/ Play group	yes	L			
	Primary School	yes	V			
	Secondary school	Yes	V			
	Higher sec. School	No				
	ITI college/ vocational Training Center	NO				
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	100				
	If any of the above Facility is village:	not available i	n village than appro	x. distance	from	



yes/amage Nood Yes/food No		yes	
Yes/Good NO			
NO HANI /ANI	а Т	Jes	
Le Artil /and			NO
of the first first		yes	
			NO
NO			No
Good		yes	AUG
Aced		YPC	2000
Condition	Location	of Orthe &	Drath Rogestation
Conumon	Location	(YES)	Available (NO)
Good		YES	
food		405	
			NO
yes/lood	-	Yes	
Ves / Pood		yes	
Good		yes	
Good		yes	
Good		yes Jes	
Good Good Acod		yes Jes Jes	
Good Good Good	~	yes Jes Jes –	No
Good Good - Good	~	yes Jes Jes - Jes	No
food food food - food	*	yes Jes Jes - Yes	NO
	NO Good good able in village th ePath & ma Condition Good food Yes/food Yes/food Good	NO Good Good able in village than approx. ePath & moundmonce Condition Location Good Pood Ves/Bood Ves/Bood Dood	A/C Bood B



	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	Qood		yes	
	Other Facility	-	-		NO
Sugges	tions if any: May any of	the the U	m = m + m	PRESENCE S	ante Samule
N.	Other Facilities	Condition		Available (YES)	Available (NO)
_	1. Have these programme			Yes	
	implemented the village?			0	
	<ol> <li>Are there any beneficiaries in the village from the following</li> </ol>			yes.	
	3 Janani Suraksha Vojana			-	
	4. Kishori Shakti Yojana			1.5	
	5. Balika Samriddhi Yojana			7/25	
	6. Mid-day Meal Programme			(Jen	
	7. Intergrated Child			05	
	Development Scheme (ICDS)			yes	
	8. Mahila Mandal Protsaban			40	and the second s
	Yojana (MMPY)	a second second			1992
	Programme (NFFWP)				NO
	10. National Social Assistance				NO
	Prognamme				
	11. Sanitation Programme (SP)			105	
	12. Rajiv Gandhi National			1.000	
	Drinking Water Mission			11.00	
	13. Swamjayanti Gram Swarozga	rt.		Jes	
	14 Minimum Needs Programme				
	(MNP)				601
	15. National Rural Employment				N/0
	Programme				110
	16. Employee Guarantee Scheroe				5
	(EGS)			10080	
	7. Prime Minister Rojgar Yojana			1/ES	
	18 Jawahar Rezone Voiana (IRV			Yes	
	19. Indira Awas Yaoina (IAY)			105	
	20. Samagra Awas Yojana (SAY)			act	NO
	21. Sanjay Gandhi Niradhar				NO
	Yojana (SGNY)			10000	
	22. Jawahar Gram Samridhi			40	
	Yojana (JGSY)				
_	23. Other (SPECIFY)		-	-	
	ET KD	CHURCH			[1174]



VI.

Gujarat Technological University, Alumedabad, Gujarat



SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Vishwakarma Yojana: Phase VIII Techno Economic Survey

#### Sr. Descriptions Information/ Adequate Inadequate Remarks No. Details. 1. Adoption of Non-NO Conventional Energy Sources/ **Renewable Energy Sources** 2. Bio-Gas Plant RETOUTEd for moti- Ruses NO 3 Solar Street Lights Rain NO Water Harvesting -s available in Phyvet seeks Jes System 3. Any Other Ro - Plent 69 Phivale sectors.

## VIL DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Saft @Py	~		Mem American
2.	Recent Projects going on for Development of Village	NO		4	
3.	Any NGO working for village development	NOVNEEL	V	r#t	welking in Balt Noce clare
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	No			

## VIIL ADDITIONAL INFORMATION/ REOUIREMENT:

	Sr. No.	Descriptions	Information/ Detail	Remarks	
					00
del II	(Felin		D		SIT
		A Distance			



### Village: Moti-Rayan Dist

<u>.</u>		17	
Jist	ricti	:Κι	itch

	Gujarat Technological University, Wi Ahmedabad, Gujarat Te	dwakarna Yojana: Phase VIII chno Economic Survey
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Regulated PHL New Reg. Germaintemanie al bister & south allo
2.	Additional Information/ Requirement	
3,	During the last six months how many times CLEANING	CLECANING & BOOLING 53 LABOUR aniche Provinsio 100 Churcher Schutzert

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	PHC/ANDE HOSOGARA 4 RETERNATE	RETAILA



Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties: GTU VY Section Contact No - 079-23267588 Email ID: rurban@gtu.edu.in





## 12.3 Survey form of Allocated Village Scanned copy attachment in the report for Part-I :

Gujarat Technological University, Ahmedahod, Gujarat



Vishwakarına Yojana: Phase VIII Techno Economic Survey

# **Techno Economic Survey**

Vishwakarma Yojana: Phase VIII

## ALLOCATED VILLAGE SURVEY

# An approach towards "Rurbanisation for Village Development"

Name of District:	Moti - Rathin, Wiltch
Name of Taluka:	Manavi
Name of Village:	Mati - Ratin
Name of Institute:	UPE Ra Haran
Nodal Officer Name &	Vad Jama Nilesh
Contact Detail:	84290 81103
Respondent Name:	1
(Sarpanch/ Panchayat Member/ Teacher/	And
Gram Sevak/ Aaganwadi	तिलाही शामा पंथायत
worker/Village dweller)	MA 210(2) 34 -920.
Date of Survey:	291 20/2020

### L DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	3522	1880	1800	17 90
2.	2011	U766	2367	2309	Jhun.

### IL GEOGRAPHICAL DETAIL:

ea of Village (Approx.) Hector)Coordinates for Location:	1878. (APAKox)
	and the second se
rest Area (In hect.)	to Hector
ricultural Land Area (In hect.)	U78 Hector
sidential Area (In hect.)	11 3 HECTOR ( A PPROX)
her Area (In hect.)	1271 Hector (APPRax)
stance to the nearest railway station (in ometers):	Bhuj 60 Kilometels
	ricultural Land Area (In hect.) sidential Area (In hect.) her Area (In hect.) stance to the nearest railway station (in ometers):



## Village: Moti-Rayan

District: Kutch

	Gujarar Technological University, Ahmedabad, Gujarat	Vishwakarma Yojana: Phase VIII Techno Economic Survey
7.	Name of Nearest Town with Distance:	Mandri - 8 U.M.
8.	Distance to the nearest bus station (in kilometers):	Available in Village.
9.	Whether village is connected to all road for the any facility or town or City?	Hes.

## III. OCCUPATIONAL DETAILS:

Nume of Three Major Occupation around in	1. policultural
Name of Three Major Occupation groups in	2. Labour aprilus.
Village	3. Construction and la

Malas come aroun in the village	L. Pean UB
widlor crops grown in me vinage.	2. cotton
	3. amerik

# IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks	
A.	Main Source of Drinking w	vater	IT IT			
1.	PIPED WATER Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	pipedaith Devening	2			
2.	DUG WELL Protected Well Un Protected Well	un Potecte aca	V			
3.	Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	Rainacura	V			
4.	SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CA AL/ Irrigation Channel Bottled Water Hand Pump	DAUI Luve ISA SUBON Chunned	V			2
DA.		D.am			[ip]	



	Other(Specify)Lake/ Pond	Pchd	V		
ugges	tions if any:				
k.	Water Tank Facility	2010			
_	Overhead Tank	Canacity:	~		Brach LAR
	Underground Sump	Capacity:	V		6 Lurin L.T.R.
Sugger	tions if any:				
(°.)	The Type of Drainage Faci	lity	_		
	The type of braninger act				ADDE CRITE
	A. UNDERGROUND DRAINAGE		V		oren com-
	1.1				OULLES
Sugge	stions if any:				and the second se
D.	Road Network :All Weath	er/ Kutchha (G	ravel)/ Black	K Topped pu	icca/ WBM
	Village approach road	Manau1-	V		BT Racid
	Main road	AT - Rocal	V		
_	Internal streets	C.C. Road			
	Nearest NH/SH/MDR/ODR	SH	-		
Sug	gestions if any:				
	Turnenert Facility		_	-	
E.	I ransport racinty	1 4/2	r		1
	Railway Station (Y/N) (If No than Nearest Rly StationKms)	50 4 MS		v	Contractor.
	Bus station (Y/N) Condition: (If No than Nearest Bus StationKins)	yes in good condition	V		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Chauda		×	Phivelle VPM'cles
Su	ggestions if any:				
F.	Electricity Distribution	There are a series		-	
-	(Y/N) Govt./ Private	Gour			syon - Oserm
	(Less than 6 hrs./	Zu HAS			yosha
	More Than o hrs)	and the second	-	-	



	Power supply for Domestic Use	74 HAS	6		Syloti Ban Vicina
	Power supply for Agricultural Use	5 455 BOUT	~		11
	Power supply for Commercial Use	ges	V		zu whs
	Road/ Street Lights	10 495	V		
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	V		Shool/Cove Buis These Gram Huno
	Renewable Energy Source Facilities (Y/N)	NO		V	pequilled
	LED Facilities	12/19		V	
iugge	Semistion Facility	zu has ih	n Aglic	uudad	RIPO.
	Saunation Factory	1 11/25		-	
	Public Latrine Blocks If available than Nos.	2 NOS	V		
	Location Condition	Good whether	e.		
	Community Toilet (With bath/ without bath facilities)	yes	V		
	Solid & liquid waste Disposal system available	tes	59	Pibli dei L	aborth of Arnchastat
	Any facility for Waste collection from road	yes b	e povi	ling fan	cn year
Sug	restions if any:	of an	nni 210 ita	tellet	peruiled
H.	Main Source of Irrigatio	on Facility:		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	2 December 19
	TANKPOND STREAMRIVER CANAL WELL	Tribentur Braient		V	
	TUBE WELL OTHER (SPECIFY)		CAL DOWN	1104	
Sug	gestions if any: One Mo	se race a	ere renter	MEN.	the second second
L	Housing Condition:		10-22-01	110	The Barrisson of
	Kutchha/Pucca (Approx, ratio)	puera	644/800		



District: Kutch

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# Y. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr.	Descriptions	Information/ Detail	Adequate	Industrials	INCIDULINE
I.	Health Facilities:				a start a start a
	ICDS (Anganwadi)	yes	V		Arrite
	Sub-Centre	Yes	×		A23 5 875
	РНС	n/o	1 1	~	neguella
	BLOCK PHC	NO		v	
	CHC/RH	AV 0		2	
	District/ Govt. Hospital				
	Govt. Dispensary	NU			
	Private Clinic	403			
	Private Hospital/		1 percentation		
				1	
	Nursing Home				
	Nursing Home AYUSH Health Facility	1			
Su	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:kms. <u>Ne</u> ggestions if any: PHCPHC	nuo not available in vi ach est to ach 201.00	llage than app whi m Adr 20	onox. distance fi ax. AUA a. AUA	morn
Su K	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:	rvo 10t available in vi 10A est to 10A 13A 60	llage than app wh m At w	inox. distance fi crx.du/ i lx&S	men
Su K	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:	nuo not available in vi achest ton nes norde yes	llage than app wh m Alt W	onox. distance fi ax. AUA a. ALAS	nom
Su K.	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:	nuo not available in vi cul est to nen ville yes yes	llage than app 2n m Alt 20 U	inox. distance fi cr2. Hor tr2.S	SUR .
Su K.	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:kms. <u>NE</u> . ggestions if any: <u>PHC cendic</u> <u>Education Facilities:</u> Aaganwadi/ Play group Primary School Secondary school	nue not available in vi altest to altest to altes ges ges ges ges	llage than app wh m Lik w U U	inox. distance fi ax. ALA! a. ALAS	
Su K	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:	nuo not available in vi cul est to neg whee yes yes yes No	llage than app 2n m Alt 20 U U	inox. distance fi cr2. Hori in Jr.A.S	SUTA
Su K	Nursing Home AYUSH Health Facility sonography /ultrasound facility If any of the above Facility is n village:kms. <u>we</u> . ggestions if any: <u>PHC cendle</u> <b>Education Facilities:</b> Aaganwadi/ Play group Primary School Secondary school Higher sec. School ITI college/ vocational Training Center	NO NO AVAILABLE IN VI CUL ESE ED ROG NOLOC YES YES YES NO NO	llage than app wh m lin m lin to u u u u	inox. distance fi ax.du/ a h.\$S	



	If any of the above Facility is not ava village:	illable in villag これがに	e than appro	in maneu	m
Suggest	ionsifany: NEED OF His	nn Secon	ndaaq i	School	
L	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Jood Lood		yes	
	Public Library (With daily newspaper supply: Y/N)	Good		Yes	0/0
	Public Garden	NO		1465	100
	Village Pond	u rens [ food		100	R.10
	Recreation Center				100
	Cinema/ Video Hall	NO	-	des	NO
	Assembly Polling Station	Good		30	
	Birth & Death Registration Office	Good		1 90	
	Post-office	0 000		Yes	
М.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office Telecommunication	Acad	-	1400	
	Network/ STD booth	0000		Aco	NO
	General Market		-	yes	
	Phase (Dublic	Aug 2			
	Shops (Public Distribution System)	Good		1	
	Shops (Public Distribution System) Panchayat Building	Good Cood		yos	
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop	Cood Cood Cood		yes yes	
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Bank & ATM Facility	Cood Cood Cood Dood		yes yes yes	RTH REPUBLIC
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Bank & ATM Facility Agriculture Co-operative Society	Cood Cood Cood Cood		yos yos yos yos yes	RTAL REPAILING
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Bank & ATM Facility Agriculture Co-operative Society Milk Co-operative Soc.	Cood Cood Cood Cood Cood Cood Cood		yes yes yes yes yes	ATH REPAILA
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Bank & ATM Facility Agriculture Co-operative Society Milk Co-operative Soc. Small Scale Industries	Cood Cood Cood Cood Cood Cood Cood		yos yos yos yos yes yes	RTH REAULAN
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Battk & ATM Facility Agriculture Co-operative Society Milk Co-operative Soc. Small Scale Industries Internet Cafes/ Common Service Center/Wi Fi	Cood Cood Cood Cood Cood Cood Cood Cood		yes yes yes yes yes yes	RTAL REAULING
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Bank & ATM Facility Agriculture Co-operative Society Milk Co-operative Soc. Small Scale Industries Internet Cafes/ Common Service Center/Wi Fi Youth Club	Cood Cood Cood Cood Cood Cood Cood		yes yes yes yes yes yes	RTH REAUIN NO NO
	Shops (Public Distribution System) Panchayat Building Pharmacy/Medical Shop Battk & ATM Facility Agriculture Co-operative Society Milk Co-operative Soc. Small Scale Industries Internet Cafes/ Common Service Center/Wi Fi Youth Club Muhila Mandal	Cood Cood Cood Cood Cood Cood Cood		yes yes yes yes yes yes yes	RTAL REAULAN



	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	Oco d	Yes	
-	Other Facility	~		
angger	stions if any: New Post of	tre & MRU	- CH - O PERENIVE	South hequile
N.	Other Facilities	Condition	Availa (YES)	ble Available (NO
	<ol> <li>Have these programme implemented the village?</li> <li>Are there any beneficiaries in the village from the following</li> </ol>		yes	
	programme? 3. Janani Suraksha Yojana 4. Vishad Shatal Vishad		yes	
	Schult Shakii Yojana     Seatika Samriddhi Yojana     Mid-day Meal Programme     Intergrated Child Development		des	
	Scheme (ICDS) 8. Mahila Mandal Protsahan Yojana (MMPY)		yes Yes	
	National Food for work     Programme (NFFWP)     10. National Social Assistance     Programme			NO
	11. Sanitation Programme (SP) 12. Rajiv Gandhi National Drinking Water Mission		yes	NO 9
	<ol> <li>Swarnjayanti Gram Swarozgar Vojana</li> <li>Minimum Needs Programme</li> </ol>		Yes	
	(MNP) 15. National Rural Employment Programme			N/D N/D
	(EGS) 17. Prime Minister Rojgar Yojana (PMRY)		yes	
	<ol> <li>Jawahar Rozgar Yojana (JRY)</li> <li>Indira Awas Yaojna (IAY)</li> <li>Samagra Awas Yojana (SAY)</li> <li>Samagra Finish Ninedhar Yojana (SAY)</li> </ol>		र्भव इन्ह	NIS
	(SGNY) 22. Jawahar Gram Sarnridhi Yojana (JGSY)		yes	No
	23. Other (SPECIFY)		4	-



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# VL SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non- Conventional Energy Sources/ Renewable Energy Sources	No		2	
2.	Bio-Gas Plant Solar Street Lights Rain	Νο	-7 RP9	WRED RA	moti-Ruken-
	Water Harvesting System	jes o	aumicabil	in produce	secteds
3.	Any Other	Do - Pleint		by = Phil	et stells

## VIL DATA COLLECTION FROM VILLAGE

LN		Details	Adequate	Inadequate	Remarks
A	illage Base Map Available: Hard Copy/Soft Copy	soft copy	v		19tem Paradam
2.	Recent Projects going on for Development of Village	NO		v	
3.	Any NGO working for village development	NOUNEEM N Do			all Alling The Perst Maar (10)
	In a natural calamity in the illage during the last one year: ARTHQUAKES FLOODS YCLONE DROUGHT ANDSLIDES AVALANCHE DTHER (SPECIFY)	NU			



-

District: Kutch





Vishwakarma Yojana: Phase VIII Techno Economic Survey

# VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	редийев Рнс Уталькопис св ыят. Узат ОАС	REW DEQ.
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING	CLEANING & Fos by Lubrade will by Punch	OINO NE PSevider 444

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	PHC/ Walle management	Remuiler



Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties: GTU VY Section Contact No - 079-23267588 Email ID: rurban@gtu.edu.in

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TL.am

9

III''

0	VILLAGE GAP	Analysis				
	Bianaind	Vittage Name:	MOTI-RI	YAN		
Village Facilities	Commission/UDPPI Norths	Popula Existing	tion Required an par Norms	U.7.65 Smart Vilage / Cities / Hentage Future Projection Design	Gap	
	Regial Infrastructu	a Facilities	L			
		and the second second			0	
Anustuces	Each or Per 2500-population	3	1		Yes-	
Primary Scholl	Each Per 2500 reputation	3				
Secondary Schmill	Plan 7,500 population	1	0	-		
Higher Secondary Schma	Per 15 000 Pegulation	0	0			
College	Det 100000 Population		0			
Tech Traning Institute	Per 100000 Population	ø	0			
Pagescature Research Centre	Per 100000 Population	0.	Ø			
Photo and the second seco					0	
Contifications Dispersion or Dub PHC or Frank	n Each Viloge	1	1		0	
Centre	In a straight dation	4	H.		0	
Printing Health & Child Health Cettle	Per 10 000 ponulation	*	1	-	0	
Chat wera and Materialy nome	Per 100000 Perutatain	0	0	-	0	
Public Lorrison	If for SO families of tolet is not there in home specially for shart	σ	50		0	
	Physical Infrastruct	ure Facilities		-		
Transportation		Vito (Briggle, y.	A do Fran			
	Trank attants	te a mercolitie	4		0	
Putza Wilagii Approach (1000	AF Vitages connected by PT (ST				10	
Drinking Water (Minimum 70 (pol)	Hus-or Auto)	2 A desparato A	2			
	1/3 of Total Damand	4 24 3 4 4 601	I SLOVE		So overal	
Over Head Tarm 3/G Sump Transis Michaels - Onen	2/3 of Total Demand	\$ googo ru /	6 cant		1 Quer (4)	
and a second			=7=173		-	
Dramage Network - Cover Naste Manogement System		HOCAULLS	EXODE			
	Socio- Cultural Infrastr	ucture Facilities			in me	
Community Hall	Per 10000 Pepulation	1	1 +		0	
community had and Public Library	Per 15000 Population	4	+		1	
Committee All	Her 20,000 pepulation	2	2		6	
Paul Office Irem Pancheynt Building	Each individuality out panchayat	1	- ±		0	
Plac	P= 100000 Population	0	1			
WW Sallion	Per 100000 Population	0	1		T.	
unin Gariton	Per vilage	0	2		2	
ones port	Per 40,000Population	0	-		-	
pppning shill						
feeting in terms (	Electrical D	Adviguane /	3 get atan			
	Any Smart Viller	ae Facility				
ed paracelle day	Contract Contract					
		ESR cap		0		
		Sump cap		0		
		4.61		0		
	-					

# 12.4 Gap Analysis of the Allocated Village : (T-12.4- Gap Analysis)



## 12.5 Summary Details of All the Villages Designs in Table form as-Part-I and Part-II:

Sr.No.	Village Name	Discipline	Part-I	Part-II
1.	Moti- Rayan	Civil	Solid waste management plant	Rain Water Harvesting
			ATM	Death & birth ragistar Center
			Amphitheater	PHC center
			Cybercafe	Public Garden
			Grocery store	Super Market
			Entrance Gate	Solar Street Lights
		Electrical	Automatic street light	Electrical design in PHC
			Smart water supply system	Design of starter in agriculture
			Solar system	Electrical design for street light
2.	Bhujodi	Civil	Public toilet	Overhead tenk
			Hospital	Pickup bus station
			Gymnasium Building	Rain water harvesting
			Recreational park	Vegetable Market
			Police station	Post office
			Pond development	Entrance Gate
		Electrical	Solar Street light	Solar photovoltaic water pumping system
			Solar System	CCTV for village security
			Electrical wiring in Public Toilet	Based on Civil

# (T-30 - Summary of designs)

# 12.6 Drawings (If, required, A1, A2, A3 design is not visible then Only) :

All the drawings and images are attached in their respective chapters along with designs and their listing are mentioned in the list of figures along with their page numbers. And we have added A3 sheets of proposed designs at the end of the Vishwakarma Yojana Phase VIII part 1 report.



**12.7 Summary of Good Photographs in Table Format (village visits, Ideal, Smart Village or any other) : (T-12.7- Summary of all village photographs)** 

Summary Of Photographs Of Moti-rayan – Allocated Village :





# Summary Of Photographs Of Kera – Ideal Village :





## **12.8 Village Interaction with sarpanch/talati report**









# Chapter 13.

# From the Chapter- 9 future designs of the aspects (Feasibility, Construction, Operation and maintenance of various design options in Rural Areas along with cost with AutoCAD designs / planning with any software

**13.1 Design Proposals : Observation and brief write up about each design** 

# **1.** Sustainable design : Rain water harvesting

An additional source of water will be available which could be used at the time of emergency or water shortage by implementing the Rain Water Harvesting system in the village households.

# **2.** Physical design : Death & birth register center

Currently the villagers are using a panchayat office as a death & birth register center. And village have 4766 total population as per census 2011.so that it should have a one separate birth & death register center in Moti-Rayan village.

# **3.** Social design : PHC center

There is no any PHC center in Moti-Rayan village. Villagers have to go mandvi or other place for any emergency. And suffered for their treatment. So that there should be one PHC center in the village.

# 4. Socio-Cultural design : Super Market

There is no any super Market in Moti-Rayan village. Villagers have to go mandvi or other place for any grocery or food. So that there should be one super market in the village.

# **5.** Smart village design : Solar Street Lights

For the smart development of the Moti-Rayan village we have proposed the smart concepts as the solar street lights.

## **6.** Heritage village design : Public Garden

In the Moti-Rayan village there is no any recreational area existing. So that for the better living standard and entertainment purpose we have proposed one design of public garden as recreational area in the villag.

# 13.1.1 Sustainable Design (Civil) : Rain water harvesting

## Scenario :

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation, so that it seeps down and restore the ground water.



## **Existing Situation in Moti-Rayan :**

In Moti-Rayan village there is no anything arrangement for rain water harvesting. And Moti-Rayan is located in Kutch area so there was a many problems for water, people are suffering for drinking water. And also very low ground water table level, so it can help a villager to improve in water table level in village area and they will able to farm and drink pure water.

## Sustainability of the design :

Solid waste management plant as an important tool :

## Design Utilized by,

All the people living in the village of even outsiders from nearby villages can use or utilize Methods for their water collection.

## Needs :

An additional source of water will be available which could be used at the time of emergency or water shortage by implementing the Rain Water Harvesting system in the village households.

## **Design brief :**

In this method, we collect rain water from the roof top of houses and store in underground tank through a normal pvc pipes than Rainwater is collected from a roof like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation, so that it seeps down and restore the ground water.

Design of Rain water harvesting :

## Area of underground tank ; 16.5 m3

# **Proposed Design in Auto cad :**



# (F-42 Plan & system of rainwater harvesting)



**Rainwater harvesting:** Abstract Sheet (T-31)

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1.	Excavation	16.5	90	m³	1485
2.	Reinforced cement concrete (1:2:4) Including steel bars, shuttering etc.	2.25	4700	m <sup>3</sup>	10575
3.	Plain cement concrete (1:3:6)	1.14	1500	m³	1710
4.	PVC piping for rainwater pipes (3") with fitting	5.5	250	Meter	1375
5.	PVC Elbow	3	90	NOS	270
				GRAND TOTAL	15,415/-

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

# Total cost = ₹ 15,415/-

# 13.1.2 Physical design (Civil) :Death & Birth register center

## Scenario:

Registration of births and deaths is an important source for demographic data for socio-economic development and population control in developing countries. The data on population growth, fertility and mortality serves as the starting point for population projections. Apart from these vital indicators, an adequate evaluation of a number of programs in the health sector, including family planning, maternal and reproductive health, immunization programs, is dependent upon the availability of accurate, up-to-date fertility and mortality data. In India, the need for dependable demographic data was felt soon after independence heralding the era of five year planning. The registration of births and deaths started on voluntary basis and there was no uniformity in statistical returns resulting in both under-registration and incomplete coverage. In order to unify the civil registration activities, the

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Registration of Births & Deaths Act, 1969 was enacted. Despite having the registration of birth & death compulsory under the statute, the level of registration of births and deaths under the Act has continued to be far from satisfactory in several states/UTs. With a view to generate reliable and continuous data on these indicators, the Office of the Registrar General, India, initiated the scheme of sample registration of births and deaths in India popularly known as Sample Registration System (SRS) in 1964 65 on a pilot basis and on full scale from 1969 70. The SRS since then has been providing data on regular basis.

## **Existing Situation in Moti-Rayan:**

In the Moti-Rayan village, registration of Death & Birth is held in panchayat building. There is a no proper space & proper management because of lake of space. According to population of village there should be a one separate center for registration of Death & Birth.

## Sustainability of the design :

## Amphitheatre as an important tool :

## Design Utilized by,

All the people living in the village and relatives of the villagers can use or utilize a Death & Birth register center for their different uses with the permission of Sarpanch, Talati and some authorized people of the village.

## Needs :

Where members of a Society and people of village went there for their certificate of Death & Birth. Currently the villagers are using a panchayat office as a death & birth register center. And village have 4766 total population as per census 2011.so that it should have a one separate birth & death register center in Moti-Rayan village.

## **Design Brief :**

Register center is an public building in a prominent location. Village and center are the average buildings that can be accommodate a registration for death and birth of people. There are a wide variety of types and sizes, all with the following in common. A main activity and assembly space together with ancillary accommodation that might include additional place. The place has a strong or special association with a particular community.

Design of Death & Birth Register center :

Length : 4.75m ; Width : 3.6m : Height : 4.65m



# **Proposed Design in Auto cad :**



(F-43 plan of Death & Birth registrar center)



(F- Section & elevation of Death & Birth register center)



Death & Birt	h register	center	: Measurement	Sheet	( <b>T-32</b> )
--------------	------------	--------	---------------	-------	-----------------

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m <sup>3</sup> )
1	Excavation in foundation	15.5	1	1.1	1	17.05
2	PCC (1:4:8) in foundation	15.5	1	0.2	1	3.1
3	Brick masonry in foundation and plinth in cm 1:5					
	First step	15.5	0.6	0.3	1	2.79
	Second step	15.5	0.5	0.3	1	2.32
	Third step	15.5	0.4	0.3	1	1.86
	Fourth step	15.5	0.3	0.6	1	2.79
					Total	9.76
4	Brick masonry above plinth up to slab level in cm 1:6	15.5	0.3	3	1	13.95
	Deduction for D/W					
	D1	0.9	0.3	2.1	1	0.567
	W	0.9	0.3	1.2	3	0.972
					Total	1.539
	Deduction for lintels					
	D1	1.2	0.3	0.10	1	0.636
	W	1.2	0.3	0.10	3	0.108
					Total	0.144
	Net quantity					12.267
5	Earth fill in plinth R1	3	4.15	0.6	1	7.47



Vishwa	ishwakarma Yojana: Phase VIII				ti-Rayan	District: Kutch
6	RCC work for slab (1:2:4)	3	4.45	0.15	1	2.00
	D	1.2	0.45	0.10	1	0.054
	W	1.2	0.45	0.10	3	0.102
					Total	2.216
7	Smooth plaster inside room	3	-	3	2	18
		4.15	-	3	2	24.9
					Total	42.9
	Outside room	3.6	-	4.05	2	29.16
		4.75	-	4.05	2	38.45
					Total	67.63
	Total plaster					110.53
	Deduction 110.53-1.68					10.8.85
8	Parapet wall 1	3	0.3	0.9	2	1.62
	Wall 2	4.15	0.3	0.9	2	2.24
					Total	3.86
9	Step First step	1.2	1.5	0.15	1	0.27
	Second step	1.2	1.2	0.15	1	0.216
	Third step	1.2	0.9	0.15	1	0.162
					Total	0.648



# Death & Birth register center : Abstract Sheet (T-33)

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1	Excavation in foundation	17.05	95	m³	1619
2	B.B.C.C in foundation (1:4:8)	3.1	3500	m³	3503
3	Brick work up to plinth in cm with step	10.41	3600	m³	37476
4	Earth filling in plinth	7.47	60	m³	448
5	R.C.C work for slab (1:2:4) and chajja	2.216	9200	m³	20387
6	Brick work in super structure	12.27	3600	m³	44172
7	Mosaic tile flooring room	12.45	600	M2	7470
8	Smooth plaster on inside & outside	108.85	180	M2	19593
9	Brickwork for parapet wall 150mm thick	3.86	3600	m³	13896
10	Wood work for door & window	1.89	8200	m³	15498
				Total	164062
		8203			
				GRAND TOTAL	172265

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

## Total cost = ₹ 1,72,265/-



## 13.1.3 Social design (Civil) :PHC center

## Scenario :

Primary health care is a whole-of-society approach to health and well-being centered on the needs and preferences of individuals, families and communities. It addresses the broader determinants of health and focuses on the comprehensive and interrelated aspects of physical, mental and social health and wellbeing. It provides whole-person care for health needs throughout the lifespan, not just for a set of specific diseases. Primary health care ensures people receive comprehensive care - ranging from promotion and prevention to treatment, rehabilitation and palliative care - as close as feasible to people's everyday environment.

## **Existing Situation in village :**

In the Moti-Rayan Area there is no any PHC center. So we have designed a Primary health care center as social design or structure of the village. PHC center is a center to do care and wellness of health of people of village. And offering a first-aid, medicines, and primary health care.

## Sustainability of the design :

## Grocery store as an important tool :

## Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a PHC center for their health care.

### Needs :

There is no any PHC center in Moti-Rayan village. Villagers have to go mandvi or other place for any emergency. PHC center is a center to do care and wellness of health of people of village. And offering a first-aid, medicines, and primary health care.

## **Design brief :**

PHC center is a center in which, Primary health care is a whole-of-society approach to health and well-being centered on the needs and preferences of individuals, families and communities. It addresses the broader determinants of health and focuses on the comprehensive and interrelated aspects of physical, mental and social health and wellbeing. It provides whole-person care for health needs throughout the lifespan, not just for a set of specific diseases.

Design of PHC center :

Length : 14.2m ; Width : 21m : Height : 3.6m



# **Proposed Design in Auto cad :**



(F-45 plan of primary healthcare center)



(F-47 Section of PHC center)




# (F-47 Elevation of PHC center)

# PHC center : Measurement Sheet (T-34)

Sr. No.	<b>Description Of Item</b>	Nos.	Length (m)	Breadth (m)	Height (m)	Quantity
1	Excavation for foundation Net center line $=131.1 - (\frac{1}{2} \times 0.9 \times 14) =$ Number of junction = 14	1	124.8	0.9	1. 1	123.55 m <sup>3</sup>
2	PCC for foundation	1	124.8	0.9	0.3	33.70 m <sup>3</sup>
3	Brick Masonry upto Plinth					
	<b>Step 1 (Width 0.6 m)</b> L = 131.1 - $(\frac{1}{2} \times 0.6 \times 14) = 126.9$	1	126.9	0.6	0.2	15.23 m <sup>3</sup>
	Step 2 (Width 0.5 m) L = 131.1 -( $\frac{1}{2} \times 0.5 \times 14$ ) = 127.6	1	127.6	0.5	0.2	12.76 m <sup>3</sup>
	<b>Step 3 (Width 0.4 m)</b> L = 131.1 -( $\frac{1}{2} \times 0.4 \times 14$ ) = 128.3	1	128.3	0.4	0.2	10.26 m <sup>3</sup>
	<b>Step 4 (Width 0.3 m)</b> L = 131.1 - $(\frac{1}{2} \times 0.3 \times 14) = 129$	1	129	0.3	0.2	7.74 m <sup>3</sup>
	<b>Step 5 (Width 0.3 m)</b> L = 131.1 - $(\frac{1}{2} \times 0.3 \times 14) = 129$	1	129	0.3	0. 45	17.41 m <sup>3</sup>
				Total B	rickwork	63.40 m <sup>3</sup>
4	Sand filling up to G.L.					
	<b>Quantity</b> = (Excavation –PCC- Brickwork up to GL) = (123.55 – 33.70 –45.99) =43.86	-	-	-	-	43.86 m <sup>3</sup>



5	Brick Masonry above plinth up to slab level					
	Compound wall L = 28.2	1	28.2	0.3	2.1	17.77 m3
	3 m Height wall L = 131.1 -( 1 × 0.3 × 14) = 129 2	1	129	0.3	3	116.1 m3
	Deduction for door-windows					
	D	1	3	0.3	2.1	-1.89 m3
	D1	1	1	0.3	2.1	-0.42 m3
	D2	1	0.9	0.3	2.1	-0.57 m3
	W1	1	1.2	0.3	1.2	-0.43 m3
	V	3	0.4	0.3	0.4	-0.14 m3
	Entry	1	1.2	0.3	2.1	-0.756
	Deduction for door-windows lintel					
	D	1	3.3	0.3	0.1	-0.1 m3
	D1	1	1.3	0.3	0.1	-0.039 m3
	D2	1	1.2	0.3	0.1	-0.036 m3
	W1	1	1.5	0.3	0.1	-0.045 m3



		-				<b>.</b>
	V	3	0.7	0.3	0.1	-0.021 m3
	Entry	1	1.5	0.3	0.1	-0.045 m3
				Tot	tal	111.60 m <sup>3</sup>
6	Sand filling for Plinth level					
	For office, dispensary room, special ward and general ward	4	5	4.5	0.3 3	29.7 m <sup>3</sup>
	For toilet and store	2	5	3.5	0.3 3	11.55 m <sup>3</sup>
	For passage	1	3	13.1	0.3 3	12.97 m <sup>3</sup>
				Tota	al	$54.22 \text{ m}^3$
7	BBCC above sand filling					
	For office, dispensary room, special ward and general ward	4	5	4.5	0.0 75	6.75 m <sup>3</sup>
	For toilet and store	2	5	3.5	0.0 75	$2.625 \text{ m}^3$
	For passage	1	3	13.1	0.0 75	2.95 m <sup>3</sup>
				Tot	tal	12.32 m <sup>3</sup>
8	Marbal flooring					
	For office, dispensary room, special ward and general ward	4	5	4.5	-	90 m <sup>2</sup>
	For toilet and store	2	5	3.5	-	$35 \text{ m}^2$
	For passage	1	3	13.1	-	$39.3 \text{ m}^2$
				Tot	al	$164.3 \text{ m}^2$
						2
8	Concreting for slab	1	14.2	13.7	0.1 5	29.18 m <sup>3</sup>
9	Formwork for slab	2	14.2	-	0.1 7	$4.83 \text{ m}^2$



Vishv	vakarma Yojana: Phase VIII		Villa	ge: Moti-Ra	yan Di	strict: Kutch
		2	13.7	-	0.1 7	4.66 m <sup>2</sup>
				Tot	al	$9.55 \text{ m}^2$
10	Inside plaster					
	For office, dispensary room, special ward and general ward	8	5	-	3	$120 \text{ m}^2$
		8	-	4.5	3	$108 \text{ m}^2$
	For toilet and store	4	5	-	3	$60 \text{ m}^2$
		4	-	3.5	3	$42 \text{ m}^2$
	For passage	2	3	-	3	$18 \text{ m}^2$
		2	-	13.1	3	$78.6 \text{ m}^2$
	Parking	1	13.6	-	3	$40.8 \text{ m}^2$
		1	13.6	-	2.1	$28.56 \text{ m}^2$
		2	7	-	2.1	$29.4 \text{ m}^2$
	<b>Deduction for door-windows</b>					
	D	$1 \times \frac{1}{2}$	3	-	2.1	$-3.15 \text{ m}^2$
	D1	8×12	1	-	2. 1	$-8.4 \text{ m}^2$
	D2	$4 \times \frac{1}{2}$	0.9	-	2. 1	-3.78 m <sup>2</sup>
	W1	$11 \times \frac{1}{2}$	1.2	-	1. 2	$-7.92 \text{ m}^2$
	V	$3 \times \frac{1}{2}$	0.4	-	0. 4	$-0.24 \text{ m}^2$
	Entry	$2 \times 1$ 2	1.2	-	2. 1	-2.52 m2
				Tota	l	499.35 m <sup>2</sup>
11	Outside plaster					
	Compound wall	1	29.1	-	2.1	61.11
	Main wall	1	41.9	-	3	125.7
	Deduction for door-windows					
	W1	$7 \times {}^{1}_{2}$	1.2	-	1. 2	$-5.04 \text{ m}^2$
	V	3×12	0.4	-	0. 4	-0.24 m <sup>2</sup>
	D	$1 \times \frac{1}{2}$	3	-	2. 1	$-3.15 \text{ m}^2$
				To	tal	178.38 m <sup>2</sup>



# PHC center : Abstract Sheet (T-35)

Sr. No.	Description Of Item	Quantities	Rate	Per	Amount
1	Excavation	$123.55 \text{ m}^3$	110	Cu. M	13591
2	PCC	33.70m <sup>3</sup>	965	Cu. M	32521
3	Sand Filling	98.08 m <sup>3</sup>	90	Cu. M	8828
4	Concreting Work	$194.53 \text{ m}^2$	130	Sq. M.	25290
5	Brick Work	175 m <sup>3</sup>	1250	Cu. M.	218750
6	Inside Plaster	499.35 m <sup>2</sup>	150	Sq. M	74903
7	Outside Plaster	178.38 m <sup>2</sup>	250	Sq. M	44595
8	Steel Work	194.53 m <sup>2</sup>	200	Sq. M	38906
9	Shuttering	194.53 m <sup>2</sup>	70	Sq. M	13620
10	Marble work	194.53 m <sup>2</sup>	600	Sq. M	116718
11	BBCC	$12.32 \text{ m}^3$	2700	Cu. M.	34500
12	Cement	720 bags	280	Bag	201600
13	Sand	94.2 m <sup>3</sup>	900	Cu. M.	84780
14	Aggregate	55.71 m <sup>3</sup>	1000	Cu. M.	55710
15	Brick	94000 nos.	4	Brick	376000
16	Steel	2291 kg	55	Kg	126005
17	Binding Wire	23 kg	60	Kg	1380
				GRAND TOTAL	14,67,697
		Add 1.5% w	vater charg	ge Rs.	22,016
		Add 10% contractor profits Rs.			1,46,770
		<b>Total Cost</b>			16,36,500 Rs.

Total cost = ₹ 16,36,500/-



#### 13.1.4 Socio-cultural Design (Civil) : Super Market

#### Scenario :

A super market is a self-service shop offering a wide variety of food, beverages and house hold products, organized into sections. It is larger and has a wider selection than earlier grocery stores, but is smaller and more limited in the range of merchandise than a hypermarket or big-boxmarket.

#### **Existing Situation in village :**

In the Moti-Rayan village there is no any self-service shop and having variety in it. So we have designed a Supermarket as socio-cultural design or structure of the village. Supermarket is a self-service shop offering a wide variety of food, beverages, and house hold products, organized in to sections. It is larger and has a wider selection than earlier grocery stores.

#### Sustainability of the design :

#### **Super Market as an important tool :**

#### Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a supermarket for their different uses.

#### Needs :

Ease of use; Availability of more grocery and food products ;etc.

#### **Design brief :**

Supermarket - a large self-service grocery store selling groceries and dairy products and household goods food market, grocery, grocery store, market - a marketplace where groceries are sold; "the grocery store included meat market "hypermarket – a huge supermarket. A self-service retail market selling especially for the foods and household merchandise ; something resembling a supermarket especially in the variety or volume of its goods or services.

Design of Super market :

Length : 9.14m ; Width : 6.1m : Height : 4.36m



# **Proposed Design in Auto cad :**



PLAN

(F-48 Plan of Super Market)



ELEVATION

# (F-49 Elevation of Super Market)





### SECTION

# (F-50 Section of Super Market)

### **Super Market: Measurement Sheet (T-36)**

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m <sup>3</sup> )
1	ROOF	9.144	6	0.15	1	12.74
2	WALL 9"	21.336	0.2286	3	1	18
3	PLINTH WITH STAIRS	21.336	0.2286	0.762	4	5.89
4	FLOOR	9.144	6	0.15	1	8.5
5	DOOR	1.8796	-	2.1336	1	-
6	WINDOW	1	-	1.524	4	-
7	PCC	29.98	1.2	0.4	1	8.22
8	BASIC WALL: 00.30	29.98	1.2	0.4	1	3.6
9	BASIC WALL: 0.40	29.98	1.6	0.4	1	4.8
10	BASIC WALL: GENERIC -0.50	29.98	2	0.4	1	6
11	EXCAVATION	33.58	1.2	1.5	4	60.44



Super Market : Abstract Sheet (T-37)

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1	WALL	18	4590	Ft <sup>2</sup>	82636.32
2	DOOR		6000	-	6000
3	WINDOW		4*2400	-	9600
4	ROOF	12.74	3500	m³	44590
5	FLOOR	8.5	3500	m³	29750
6	PLINTH WALL STAIRS	5.89	90	Ft2	18720.31
7	EXCAVATION	1.215*4	350	m³	1701
8	PCC	8.22	3500	m³	28770
9	BASIC WALL: 00.30	3.6	90	Ft2	11520
10	BASIC WALL: 0.40	5.44	90	Ft2	11520
11	BASIC WALL: GENERIC - 0.50	6	90	Ft2	11520
				GRAND TOTAL	256327

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

### Total cost = ₹ 256327/-

# 13.1.5 Smart village Design (Civil) : Solar Street Light

### Scenario :

Street lighting is a core piece of urban and rural infrastructure. Lighting helps create a safe environment for both pedestrians and drivers. Many streetlights around the world are now being updated to LED lighting, which uses less energy and is more reliable than traditional sodium lamps, significantly reducing the cost of keeping streets illuminated. Increasingly, solar power is being used for street lighting around the world. The long term power saving, conservation of precious natural resources and elimination of the need for generating additional power are leading to the fast adoption of solar street lighting around the world. Solar street lights are able to provide reliable, quality lighting both in developing and developed countries, thereby reducing light poverty and the economic and environmental costs of electric outdoor lighting. Rapid technical innovation and dramatic price reduction in the LED, PV module, and battery components, which has occurred in the last years, will accelerate the penetration of solar street lights across the world.



#### **Existing Situation in village :**

In the Moti-Rayan village there is no any arrangement for street lights. A government authorities was provide a street lights previously many year ago in some area of village but now lights are not in working condition. So we have designed a Solar street lights as smart village design.

#### Sustainability of the design :

#### Grocery store as an important tool :

#### Design Utilized by,

All the people living in the village and relatives of the villagers can use or utilize a lights for their different uses.

#### Needs :

Ease of use; Availability of more lighting and use of renewable energy in Moti-Rayan village, in condition of no electricity in village, if a solar street lights are there village will always illuminated. : etc.

#### **Design brief :**

Solar street lights – we provide a best quality of solar cell, a cell has warranty for 20 year. We provide a best battery for energy storage, has lion or lifepo4 type of battery & maximum power of LED lamp is 24W, also has a 50000 hours life of lamp & also battery back up about 2 or 3 day after single charge.

Design of Solar Street Lights :

Length of base plate : 0.3m ; Width :0.3m : Height of G.I. pole : 11m

# **Proposed Design in Auto cad :**



#### (F-51 Design of solar street lights)





# (F-52 Design of lamp & base plate)

#### Specification & Abstract Sheet of 24W all in one Solar Street Light (T-38)

1.	Solar Panel	Max power	60W/ 20V
		Life time	25 Years
2.	Battery	Туре	Lion / Lifepo4
		Life time	2 Years / 5 Years
3.	LED Lamp	Max power	24W
		LED chip brand	Bridgelux with high brightness
		Lumen (LM)	2520
		Life time	50000 Hours
		Viewing Angle	$120^{0}$
4.	Charge time	By good sunshine	6 – 7 Hours
5.	Working time	Bright mode 100%	6 Hours
		Dim mode 75%	9 Hours
		Dim mode 50%	12 Hours
6.	Color temperature	Rang (K)	6000 - 6500k
7.	Mounting height	Rang (m)	8M
8.	Lamps material of main	Aluminum Alloy	
9.	Back up	2 – 3 Day	
Price o	ffer for 24W all in one Solar Street Lig	ht	
Model		Warranty	Price RS.
24W Se	olar Street Light Price	1 Year	21,000.00 Rs.
Sr. no	Items / Descriptions		Rate per no. (Rs)
10.	G.I. pole 11m Height 80 mm diameter (2 procurement, transportation loading and etc Work.	3 feet grouting) with unloading R.C.C. Fitting	3500.00
		Sub total	24,500/-



#### 13.1.6 Heritage village Design (Civil) : Public Garden

#### Scenario :

According to smart village survey there is no Recreational park in village so village people can't fresh their mind by natural way so park is very useful for health or walking and entertainment purpose. Park is useful for senior citizen for walking purpose after implementation of public park its very useful for increase in health of public and as well tourist.

#### **Existing Situation in Moti-Rayan :**

In the Moti-Rayan village there is no any Public Garden. So we have designed a public garden as Heritage design of the village. Public Garden is a very useful for children or also for health for young persons to walking and entertainment purpose.

#### Sustainability of the design :

#### **Cybercafe as an important tool :**

#### Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a Public Garden for their different uses.

#### Needs :

Ease of use; Public Garden is a very useful for children or also for health for young persons to walking and entertainment purpose ;etc.

Design of Public Garde :

Length : 9.14m ; Width : 6.1m : Height : 4.36m

# **Proposed Design in Auto cad :**



(F-53 Plan of Public Garden)



**Public Garden : Measurement Sheet (T-39)** 

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m <sup>3</sup> )
1	Excavation for	35	0.4	0.6	2	( <b>III</b> ) 17
1	foundation of wall	55	0.4	0.0	2	17
		25	0.4	0.6	2	12
					Total	29.00m3
2	PCC in foundation	35	0.4	0.6	2	5.6
		25	0.4	0.6	2	4
					Total	9.60m3
3	Brickwork in foundation to 1.5m height	60	0.3	0.2	1	3.6
		35	0.23	1.7	2	27.4
		35	0.23	1.7	2	20
					Total	51m3
4	Clay filling	35	25	0.2	1	175
5	Sand filling	35	25	0.2	1	175
					Total	350m3
6	Paver block for walkway path	20.54	1	-	2	41.08
		30.54	1	-	2	61.08
					Total	102.16m3

**Public Garden : Abstract Sheet (T-40)** 

SR NO.	Description	Quantity (m <sup>3</sup> )	rate	per	Amount
1	Excavation in ordinary soil	29	85	m³	2465



Vishwak	arma Yojana: Phase VIII		Village:	Moti-Rayan	District: Kutch
2	PCC in foundation 1:3:6	9.6	3200	m³	30720
3	Brickwork in foundation up to 1.5m	51	3500	m <sup>3</sup>	178500
4	Clay and sand filling	350	50	m³	17500
5	Paver block for walkway path	103	750	M2	77250
6	Approx. benches	25	200	Nos	50000
7	Beautification items trees	125	30	Nos	3750
8	Grass etc.	900	50	M2	45000
				GRAND TOTAL	405185

The rates of their respective works provided in the abstract sheet along with quantities are inclusive ofwater charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 4,05,185/-

# **Electrical Designs**

# 13.1.7 Social design (Electrical) : electric design in PHC



# (F-54 PHC center Wiring Design)



SR no.	Name of component	Quantity	Cost / QTY	Total
1	Solar panel	4	4,300	17,200
2	Dc isolator	1	1500	1500
3	Ac isolator	1	1500	1500
4	Inverter	1	2,500	2500
5	Energy meter	1	2,000	2000
6	4-pole switch	1	1500	1500
7	Single way switch	45	15	675
8	SA socket	14	20	280
9	Fan regulator	13	25	325
10	SBMB	4	400	1600
11	Mics. cost	-	-	5000
		Total		34,080

**Cost Estimation for PHC Center Wiring Design (T-41)** 

The rates of their respective works provided in the abstract sheet along with quantities are inclusive ofwater charges, contractor's profit, contingencies, utilities and labor charges.

### Total cost = ₹ 34,080/-

### 13.1.8 (Electrical) : Design of starter in Agriculture

### > Introduction.

Agriculture is the main source of food grains and plays an important role in the economic development of agricultural countries. India is a agriculture country with 70% of population depending on agriculture or related fields. Income generated from agriculture accounts for the one third of nation's capital. However, this is one side of the coin, the other side contain several problems that decreases the production yield due to inadequate rainfalls, uncertainty in power supply, and traditional methods followed by farmers. The primary requirement for any crop growth is the sufficient and uninterrupted water supply. In many parts of the country, due to inadequate rainfalls the irrigation systems were developed that stores the water during heavy rainfall and releases to the farm field for the crop growth whenever required using single phase or three phase motors that need to be operated manually by farmer. Usually the distance from farm field to water source ranges in few kilometers and farmer need to walk all the way in order to operate the motor. In some cases, due to insufficient water present in well, motor runs in dry state and leads to complete failure. And, fluctuations in electrical supply result



in voltage variation of higher than  $\pm 10\%$  of prescribed nameplate rating also leads to motor failure. All the above stated reasons will significantly decrease the efficiency of agriculture production.

Integration of modern technologies with agricultural methods will reduce the burden on farmer and improves overall efficiency. Wireless Sensor Network (WSN) consist of sensors and actuators to monitor different parameters and act accordingly. One of the best application of WSN is in agriculture domain where different parameters are monitored and communicated wirelessly to take appropriate actions. In general WSN applications in agriculture domain consist of sensor nodes, gateway that collects the data and sends to cloud for processing. Such applications are in demand and impose challenges in real time implementation. Some of such challenges are low cost, power requirement, and ease of use for farmers. Terrestrial Wireless Sensor Network (TWSN) and Wireless Underground Sensor Network (WUSN) are the two most commonly used networks in agriculture domains. In TWSN, sensor nodes are placed above the surface of ground and will communicate with gateway using Industrial, Scientific, Medical (ISM) bands of 902-928 MHz and 2.4 GHz. On other hand, WUSN uses sensors that are deployed under the surface of ground. Soil moisture sensor use to measure soil wetness is one of the examples for WUSN. Short range wireless communication is used between sensor nodes and gateway. IEEE 802.15.4 Zigbee, IEEE 802.15.1 Bluetooth, and IEEE 802.15.6 Ultra Wide Band (UWB) are The communication between gateway and remote desktop supports long range for which IEEE 802.11b/g Wireless Local Area Network (WLAN) are used.

This paper is organized as follows. Section 2 presents different wireless communication technologies available with their features. Section 3 presents the complete implementation of AMSU for real time implementation in agriculture environment. This section also presents the hardware details for the prototype.



# **Electrical Proposed Design :**

(F-55 Wiring design of three phase motor)





(F-56 System Model.)

# > Hardware design.

In our AMSU prototype system we used microcontroller, GSM shield, relay circuit, and float switch. We have used Arduino Pro mini as microcontroller which is based on ATmega328. It operates on 3.3 V and consist of fourteen digital input/output pins, six analog input pins. SIM900A is used as GSM shield that operates in dual band 900/1800 MHz. It is used in voice, SMS, data, and low power consumption applications. It consist of sim holder for placing sim card, antenna, General Purpose Input Output (GPIO) pins, serial interface, 12 V battery slot, and Analog to Digital Converter (ADC). The relay circuit consist of 250 VAC 10 A ice cube relays, LM7805 voltage regulator, 1000  $\mu$ F 25 V Aluminum Electrolytic Capacitor, 470  $\mu$ F 25 V Aluminum Electrolytic Capacitor, IN4007 diodes, and prototype Printed Circuit Board (PCB) 4" x 2". A vertical float switch is used to detect the water level. The prototype model is shown in fig.

# > Working Model.

AMSU is installed at the field level by connecting it to the CU which is already connected to the three phase or single phase motor in the field.

• Four wires from AMSU are connected to existing CU (by opening the case cover ) to automate its performance.

• The present module works with line 2 (L2) supply and ground, which provides 230 VAC which is stepped down to 12 V 3 A supply which is fed to the Chipset.

• Power to the AMSU module is supplied by connecting it to the line (L2) of three phase supply which is already given to the existing CU.



There is an optional availability of two wires from AMSU to connect the float switch to find the availability of water level in the well.

• Only registered contact numbers can get access to the AMSU.

• A registered contact can add any number of contacts to operate it. (Limited to SIM memory)

• Once a number is registered and the power in the farm field is available, then AMSU will automatically send a message about the POWER and WATER STATUS to the registered mobile numbers.

• The AMSU can be operated by an SMS or MISSED CALL to the Number that is placed in AMSU.

• If water is not available in the well then the AMSU will detect it through the float switch and turns



off the motor. A message is sent to the farmer mobile, stating that motor is off and water is not available.

(here AMSU will continuously read the status of the water level and keep itself updated). If farmer tries to switch on the motor without sufficient amount of water in the well i.e. about 5 inches, AMSU will not switch on the motor.

Advantages.

- Save time by avoiding travelling to motor room every time to switch on and off motor.
- Save electricity by turning motor off while not needed.
- Save life by avoiding attack of wild animal while going to motor room in night time.
- Protect motor from dry run.
- Flexible wiring kit in modular way helps to make easy wiring and handling.
- Protect motor from phase imbalance and low voltage.

**Cost Estimation for starter Design (T-42)** 

SR no.	Name of component	Quantity	Cost / QTY	Total
1	GSM Module	1	300	300
2	Temp sensor	2	150	300
3	Relay	1	250	250
4	ADC	1	180	180
5	Flot switch	2	80	160
6	Antenna	1	130	130
7	Micro controller	1	350	350
8	Buzzer	1	50	50
9	Starter	-	-	-
10	Motor	-	-	-
11	Other cost	-	500	500
		2,220		

Total cost = ₹ 2,220/-



#### 13.1.9 (Electrical) : Electrical Design for street light

#### ➢ Introduction

With the intensification of energy crisis all over the world, all the countries are looking for the way to solve this serious problem. One way is to search the new energy and take advantage of the renewable energy. Another way is to exploit the new energy-saving technologies to reduce energy consumption, and improve utilization efficiency of energy.

Solar energy is the most direct, common, and clean energy on our planet we have already found until now. Total solar energy absorbed by the Earth is about 3,850,000exajoules (EJ) in one year, which is even twice as much as all the non-renewable resources on the earth found and used by human being, including coal, oil, natural gas, and uranium etc. The solar resources can be seemed inexhaustible. LED is a solid state semiconductor device which can convert electrical energy into visible light. It is characterized with small size, low power consumption, long service life, environmental protection and durance. The spectrum of the LED is almost concentrated in the visible light spectrum, so it has a high luminous efficiency which can be described as the great reform in the solid light source. This essay briefly describes the solar led street lighting system. It uses the solar radiation energy to charge the battery with the solar panel during day time, and offer energy to the LED light equipment at night. This system has a double advantage in both utilization of new energy and energy-saving

- Basic components
  - (1) Solar cell
  - (2) LED lamps
  - (3) Light pole
  - (4) Control box (charger, controller, battery)



According to principle of photovoltaic effect, the solar panels receive solar radiation during the day time and then convert it into electrical energy through the charge and discharge controller, which is finally stored in the battery. When the light intensity reduced to about 10 lx during night and open circuit voltage of the solar panels reaches at a certain value, the controller has detected voltage value and then act, the Battery offer the energy to the LED light to drive the LED emits visible light at ascertain direction.

Battery discharges after certain time passes, the charge and discharge controller will act again to end the discharging of the battery in order to.

#### > Solar panel

Working principle

Gujarat Technological University



The Photovoltaic (PV) cell is composed of at least two layers of the semiconductors which have been "doped" with different impurities. This makes an excess of free electrons (n-type) on one side of the junction, and a lack of free electrons (p-type) on another side.

When the photovoltaic cells are irradiated with sunlight, some photons are reflected and the others are absorbed by the solar cell. When the photovoltaic cells keep enough photons, the negative electrons are released from the semiconductor material. Due to the manufacturing process of the positive layer, these free electrons naturally migrate to the positive layer which creates voltage differential.

When these olarcellis connected with the external load,

there will be a current circulation in the circuit. Each single solar energy cell produces only 1-2 watts. In ordertoin crease output power, thesecells (from one to several thousands) are connected in series Orin parallel with others, what is called asolararray.



(F-57 Principle of Solar Cell)

# V-I Characteristic of Solar Cell

Fig. 2.1.2 shows the V-I characteristic curve and output power of a solar panel. The curve has two parts; one indicates the trend of current with respect to increasing voltage. The other curve is the power-voltage curve and is obtained by the equation=V\*I. If no load is connected with the solar panel which is working in sun light, an open-circuit voltage Voc will be produced but no current follows. If the terminals of the solar panel are shorted together, the short-circuit current ISC will flow but the output voltage will be zero. In both cases, when a load is connected, we need to consider V-I



curve of the panel and V-I curve of the load to find out how much power can be transmitted to the load. The maximum power point (MPP) is the spot near the knee of the V-I curve, and the voltage and current at the MPP are designated as Vmand I'm. For a particular load, the maximum point is varying following insolation, shading and temperature. It is important to operate panels at their maximum power conditions.



(F-58 V-I curve of a solar panel)

Selection of solar panels

The solar panel is the core part of the solar street light system which converts the sun's radiant energy to electrical energy, and then transmits through the controller to be stored in the battery.

In sunny areas, the Polycrystalline silicon solar cell is more appropriate, because the price of the Polycrystalline silicon solar cells is lower than the Monocrystal silicon solar cells. But in the more-rainydays areas where sunlight is relatively not very adequate; it is better to choose the Monocrystalline silicon solar cells, because the optical conversion efficiency of the monocrystalline silicon solar cells is higher

> Power of solar panels

Output power of the solar panel is random, it means output power is different at different time and places for the same piece of the solar panels. So we should consider not only the intensity of the local average solar radiation but also the daily working hours and the power of lighting lamp during calculation of the solar panel power.

Installation of solar panel

The azimuth angle of the square solar cells is the angle of south direction and Vertical plane of the square, which is the direction during installation of the solar panels. In general, efficiency of the solar cell is highest when the square faces south (i.e. Azimuth angle of  $0^{\circ}$ ).

The declining angle is the angle between the surface of the solar cell and the horizontal plane which is the best declining angle that the square can make the maximum generating capacity per year. The optimum declining angle is related to the local latitude and with the raise of the latitude, the inclination will also increase.

However, we should also take into account of some limiting conditions at the same of azimuth, just like the declining angle of the roof and the snow sliding. In one word, the best angle will make the daily power output reach maximum value.





All described above are the relationship between the azimuth angle, the declining angle and the power generation amount. For the particular design of a square, we should consider all-around according to actual situations. Furthermore, when a multi-block square solar cells is arranged, we should pay attention to impact of shadow which will decrease the generation capacity of 10% to20%. So during arrangement of the every single square, we need adjust height to the optimum state. In snowy areas, the inclining angle of snow fall also cannot be ignored. If the optimum declining angle conflicts with the declining angle of snow, we should follow the program which can generate more electricity.

(F-59 Solar angles used in power calculations for PV panels)

All described above are the relationship between the azimuth angle, the declining angle and the power generation amount. For the particular design of a square, we should consider all-around according to actual situations. Furthermore, when a multi-block square solar cells is arranged, we should pay attention to impact of shadow which will decrease the generation capacity of 10% to20%. So during arrangement of the every single square, we need adjust height to the optimum state. In snowy areas, the inclining angle of snow fall also cannot be ignored. If the optimum declining angle conflicts with the declining angle of snow, we should follow the program which can generate more electricity.

# **Electrical Proposed Design :**







### ➢ LED light

Most solar LED street light systems choose the high-power white LED as the lighting source now. Compared to other lighting source, it has a remarkable energy saving, low maintenance cost and several advantages, Thus it's very suitable for the public lighting.

> Principle of LED light

All LEDs emit light spectra with narrow-band light (almost monochromatic).Heterochromatic light which is required to illuminate environments is obtained by radiation mixing. There are two primary ways to produce white light-emitting diodes. One is to use two or more different lights and then mix them together to form the white light. For example, the RGB technic which use the three primary colors (red, green, and blue). Hence the method is called as the multi-color white LEDs. This method is particularly interesting in many uses because of the flexibility of mixing different colors. In principle, this mechanism also has higher quantum efficiency in producing white light. Also there are many other types of the multi-color white LEDs : Dichromatic, Trichromatic and Tetra chromatic. Another technic is Phosphor-based LEDs, that means a phosphor material is used to convert monochromatic light from a blue or UV LED to broad-spectrum white light, much in the same way as fluorescent light bulb works.

SR no.	Name of component	Quantity	Cost / QTY	Total
1	Solar panel	1	4500	4500
2	LED light	1	550	550
3	Solar rechargeable battery	1	1100	1100
4	Smart solar controller	1	700	700
5	Motion sensor	1	1700	1700
6	Pole	1	1700	1700
7	Interconnecting cables	-	500	500
8	Control box	-	150	150
9	Other charges	-	1000	1000
		9,600		

Cost Estimation for solar street light Design (T-43)

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

# Total cost = ₹ 9,600/-



### **13.2 Reason for Students Recommending this Design**

- Rain water harvesting to provide flexibility of urgent water requirements to the villagers & recharge ground water level.
- > Death & birth register center to provide a death & birth certificate to people.
- > PHC center to provide a batter health to the villagers.
- Super market to provide extra feasibility to the public
- Solar street lights to provide a batter night view & design as a smart village concept
- > Public Garden to provide a wide area for children to play & too young for their health.

#### **13.3 About designs Suggestions / Benefit of the villagers**

#### 1. Rain water harvesting:

An additional source of water will be available which could be used at the time of emergency or water shortage by implementing the Rain Water Harvesting system in the village households.

#### 2. Death & birth register center:

Currently the villagers are use a panchayat office as a death & birth register center. If there should be one separate office for registration people of village can easily collected there certificates.

#### 3. PCH center:

There is no any PHC center in Moti-Rayan village. Villager has to go mandvi or other place for any emergency. So if there should be one phc people can easily take treatment for their emergencies.

#### 4. Super market:

By designing the supermarket in the Moti-rayan, many needs of the villagers will be satisfied. Supermarket is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections.

#### 5. Solar street lights:

The design of solar street lights is the smart concept in the Moti-Rayan village. Solar street lights are independent of the utility grid. It requires much less maintenance compared to conventional street lights. So this design can help to village on batter night view.

#### 6. Public garden:

The Moti-Rayan village has no public garden. It increases physical activity through walking & playing. People can come with their relative to reduce their stress & and enjoy a nature.

These are proposed designs for the development of moti-rayan village for Vishwakarma Yojana phase VIII, Part 2 Design.



# Chapter 14.

# <u>Technical options with case studies</u> (EXPLAIN ALL TOPIC AND FOR MINIMUM ONE TOPIC EXPLAIN NEW CONCEPT, DESIGN, PROTOTYPE MODEL WITH ACTUAL COST ESTIMATION):

### **14.1 Civil engineering**

### 14.1.1 Advanced Earthquake resistant:

### > Introduction

Whenever there is an earthquake related disaster in the news with collapsed buildings &other structure all over the place, one may think that earthquake resistant design(EQRD) of structure are still in dark age. Thus we desperately need advanced earthquake resistant design to make structure less vulnerable to earthquake even for large earthquake.

Seismology is the branch of Geophysics concerned with the study and analysis of Earthquakes and the science of energy propagation through the Earth's crust. Engineering Seismology is concerned with the solution of engineering problems connected with the Earthquakes. Seismology is extremely important because: Study of earthquakes gives us important clues about the earth's interior Understanding earthquakes allows us to minimize the damage and loss of life.

### > What is an earthquake?

- An earthquake is the vibration of Earth produced by the rapid release of accumulated energy in elastically strained rocks.
- Energy released radiates in all directions from its source, the focus.
- Energy propagates in the form of seismic waves.
- Sensitive instruments around the world record the event.
- > Causes of an earthquake
  - Movement of Tectonic Plates

Earth is divided into sections called Tectonic plates that float on the fluid-like interior of the Earth. Earthquakes are usually caused by sudden movement of earth plates.

• Rupture of rocks along a fault

Faults are localized areas of weakness in the surface of the Earth, sometimes the plate boundary itself.

### How Earthquake Causes Damage

- The severe shaking produced by seismic waves can damage or destroy building & bridges, topple utility poles & fracture gas and water mains.
- S wave can put stress on building to tear them apart. Also trigger landslide or avalanches.
- Construction Methods
  - Base-isolation are designed in buildings. It is a building designed to reduce amount of energy that reaches the building during earthquake.



• Flexible joints and automatic shut off valves can be installed.

### > PROTECTING AGAINST EARTHQUAKE DAMAGE

- Prepare a Seismic Risk Map for the globe which identifies rock types, liquefaction potential, and landslide potential.
- Extensive geologic surveying has to be done to identify all active faults, including hidden faults.
- Earthquake Resistant Design of Structures Enact building codes to design and build earthquake-resistant structures in high seismic risk areas. wood, steel and reinforced concrete are preferred as they tend to move with the shaking ground (unreinforced concrete and heavy masonry tend to move independently and in opposition to the shaking, battering one another until the structure collapses)

Earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are great enough to withstand a given level of earthquakegenerated force. This is generally accomplished through the selection of an appropriate structural configuration and the careful detailing of structural members, such as beams and columns, and the connections between them. But more advanced techniques for earthquake resistance is not to strengthen the building, but to reduce the earthquake-generated forces acting upon it.

### Earthquake Resistant Design Techniques for Buildings and Structures

Among the most important advanced techniques of earthquake resistant design and construction are:

- Base Isolation
- Energy Dissipation Devices
- > Base Isolation Method



A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. (See Figure 1.) A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

# (F-61 Base-Isolated and Fixed-Base Buildings)

# > Earthquake Generated Forces

To get a basic idea of how base isolation works, examine Figure 2. This shows an earthquake acting on both a base-isolated building and a conventional, fixed-base, building. As a result of an earthquake, the ground beneath each building begins to move. In Figure 2, it is shown moving to the left. Each building responds with movement which tends toward the right. The building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia. The inertial forces acting on a building are the most important of all those generated during an earthquake. It is important to know that the inertial forces which the building undergoes are proportional to the building's acceleration during ground motion. It is also important to realize that buildings don't actually shift in only one direction. Because of the



complex nature of earthquake ground motion, the building actually tends to vibrate back and forth in varying directions.

### > Deformation and Damages to Structures



In addition to displacing toward the right, the un-isolated building is also shown to be changing its shape-from a rectangle to a parallelogram. It is deforming.

The primary cause of earthquake damage to buildings is the deformation which the building undergoes as a result of the inertial forces acting upon it.

### > Response of Base Isolated Building

By contrast, even though it too is displacing, the base-isolated building retains its original, rectangular shape. It is the lead-rubber bearings supporting the building that are deformed. The base-isolated building itself escapes the deformation and damage, which implies that the inertial forces acting on the base-isolated building have been reduced. Experiments and observations of base-isolated buildings in earthquakes have been shown to reduce building accelerations to as little as 1/4 of the acceleration of comparable fixed-base buildings, which each building undergoes as a percentage of gravity. As we noted above, inertial forces increase, and decrease, proportionally as acceleration increases or decreases. Acceleration is decreased because the base isolation system lengthens a building's period of vibration, the time it takes for the building to rock back and forth and then back again. And in general, structures with longer periods of vibration tend to reduce acceleration, while those with shorter periods tend to increase or amplify acceleration. Finally, since they are highly elastic, the rubber isolation bearings don't suffer any damage. But the lead plug in the middle of our example bearing experiences the same deformation as the rubber. However, it generates heat. In other words, the lead plug reduces, or dissipates, the energy of motion, i.e., kinetic energy--by converting that energy into heat. And by reducing the energy entering the building, it helps to slow and eventually stop the building's vibrations sooner than would otherwise be the case, in other words, it damps the building's vibrations.

### > Energy Dissipation Devices

The second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead-rubber bearings. As we've said, a certain amount of vibration energy is transferred to the building by earthquake ground motion. Buildings themselves do possess an inherent ability to dissipate, or damp, this energy. However, the capacity of buildings to dissipate energy before they begin to suffer deformation and damage is quite limited. The building will dissipate energy either by undergoing large scale movement or sustaining increased internal strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage. Accordingly, a wide range of energy dissipation devices have been developed and are now being installed in real buildings. Energy dissipation devices are also often called damping devices. The large number of damping devices that have been developed can be grouped into three broad categories:

- Friction Dampers: these utilize frictional forces to dissipate energy
- Metallic Dampers : utilize the deformation of metal elements within the damper
- Viscoelastic Dampers : utilize the controlled shearing of solids



• Viscous Dampers: utilized the forced movement (orificing) of fluids within the damper

# > Fluid Viscous Dampers

General principles of damping devices are illustrated through Fluid Viscous damper. Following section, describes the basic characteristics of fluid viscous dampers, the process of developing and testing them, and the installation of fluid viscous dampers in an actual building to make it more earthquake resistant.

# Damping Devices and Bracing Systems



Damping devices are usually installed as part of bracing systems. Figure shows one type of damper-brace arrangement, with one end attached to a column and one end attached to a floor beam. Primarily, this arrangement provides the column with additional support. Most earthquake ground motion is in a horizontal direction; so it is a building's columns which normally undergo the most displacement relative to the motion of the ground. Figure also shows the damping device installed as part of the bracing system and gives some idea of its action.

(F-62 Damping Device Installed with Brace)

# > Conclusion

In the coming years the work in the field of EQRD (EARTHQUAKE RESISTANT DESIGNS) is very important to have safe structures which can take the effect of earthquake with less damage to the society.

# 14.1.2 Seismic Retrofitting of Buildings:

# > INTRODUCTION

Seismic retrofitting of constructions are vulnerable to earthquake. Most of the Indian building stock is vulnerable to seismic action even if located in areas that have long been considered of high seismic hazard. In the past thirty years moderate to severe earthquakes have occurred in India at intervals of 5 to 10 years. Such events have clearly shown the vulnerability of the building stock in particular and of the built environment in general

Aim is to focus on a few specific procedures which may improve the state-of-the-art practice for the evaluation of seismic vulnerability of existing reinforced concrete buildings and for their seismic retrofitting by means of innovative techniques such as base isolation and energy dissipation.



(F-63 Seismic zone of India)



### > SEISMIC RETROFITTING

- To provide existing structures with more resistance to seismic activity due to earthquake
- Includes strengthening of weak connections found in the roof to wall connections, continuity ties, shear walls and roof diaphragm

### > NEED FOR SEISMIC RETROFITTING

- To ensure the safety and security of a building, employees, structure functionality, machinery and inventory
- Essential to reduce hazard and losses from non-structural elements
- Predominantly concerned with structural improvement to reduce seismic hazard

### > METHODS FOR SEISMIC RETROFITTING

- Conventional Strengthening Methods
- Traditional Methods of seismic retrofitting
- Retrofit of structures using innovative materials
- Base Isolation
- Supplemental Energy Dissipation and Structural Control

### CONVENTIONAL STRENGTHENING METHODS

- Conventional retrofitting method includes addition of new structural elements to the system and enlarging the existing members. Methods such as
- Addition of post cast shear walls
- Additional foundation to support the shear walls to be constructed around the stairs
- Concrete jacketing of a column
- Addition of column members to vertical irregularities



(F-64 Addition of post cast shear walls)

# > TRADITIONAL METHODS OF SEISMIC RETROFIT

- Structural design
- Mass reduction





(F-65 Seismic Retrofitting by Mass reduction (removal of Storey))



#### > RETROFIT OF STRUCTURES USING INNOVATIVE MATERIALS

- High Performance Concrete
- High Performance Steel
- Fiber Reinforced Plastic

#### > SUPPLEMENTAL ENERGY DISSIPATION AND STRUCTURAL CONTROL

- Cost efficient retrofitting strategy compared to base isolation is installation of supplemental energy devices in structures as a means for passive or active structural control
- Objective of structural control is to reduce structural vibrations for improved safety and serviceability under wind and earthquake loadings

#### > Other methods used for seismic retrofit are:

Carbon fiber retrofit, Mending Application of Reinforced Sheets, Aramid Fiber Retrofitting System, Precast Retrofit Shear Wall System, Pitacolumn Method, Tufnes Method, Outer-frame brace, Taisei Anchor-less Retrofit system

### > ADVANCED METHODS

- SDOF equivalent systems
- Storey force-displacement (Push over analysis)
- Seismic Resistance in terms of effective Peak Ground Acceleration (PGA)

### > CONCLUSION

This paper considers the retrofitting of buildings vulnerable to earthquakes and briefly discuss about the traditional, conventional and innovative methods of seismic retrofitting, In conclusion it is hoped that the material presented in this paper will be useful in understanding of the earthquake engineering problems and of seismic retrofitting.

### 14.1.3 Advance practices in construction field in modern Material, Techniques & Equipment's:

### > INTRODUCTION

Now days the construction technology and equipment's becomes very advanced. The advanced construction techniques such as under water construction, trenchless technology and many new innovative materials used in advanced construction techniques and equipment's to speed up the construction of any building works. So that we will discuss about few techniques and materials used in that.

There are various modern Materials are available in market, which is given below:

### **>** List of modern Material & future construction Materials

- Translucent Concrete
- SensiTile
- Electrified Wood
- Flexicomb
- RichLite
- Self-Repairing Cement
- Carbon Fiber
- Liquid Granite



- Bendable Concrete
- Concrete Canvas
- Low-E Glass / Films

# 1. Translucent Concrete

Concrete buildings are known more for their stability than their great lighting. That was until translucent concrete started to make its way on to the market. Translucent concrete is mixed with glass fiber optical strands, which create a solid but sheer block. LitraCon, as the concrete is known, can be used in flooring and pavement. According to the concretes manufacturers, the optical fibers make up only 4 percent of the mixture. Meaning that blocks made from this material still have the ability to support load-bearing walls.



# 2. SensiTile



As you walk across your kitchen floor to get something from the refrigerator, the floor twinkles with lighted path that guides your way through the dark room. At least it would, if you had SensiTiles. The concrete of the tiles is embedded with acrylic fiber optic channels that transfer light from one point to another. As shadows move across Terrazzo's surface, the light channels flicker with a randomized, twinkling effect. Their tiles are available for use as flooring, in bathrooms and even ceilings, so you can have twinkling lights follow you all over the house.

# 3. Electrified Wood

You may never have to deal with the tangle of wires again thanks to "Wood.E." This Europeandesigned material incorporates a source of electricity directly into tables and chairs. Two metal layers are pressed between the wood of the furniture, making it possible to pass an electrical current through the whole thing. The 12-volt power is fed to the metal layers via one connector, and lamps and other devices can be connected via the other. Not sure if this furniture will work with all electrical outlets, but we're for any piece of furniture that means we don't have to find a way to tie all our wires together.





# 4. Flexicomb



### 5. RichLite

A counter-top made of paper might not sound too sturdy, but a Richlite counter is almost indistinguishable from one made of wood. 70 % of the material is made with recycled paper. The countertops are made by treating paper with a resin, and then baking it to create solid sheets. Richlite was first used in the aerospace, boating, and sports industries as reinforcement for surfaces like fiberglass, but now is available for architectural purposes as well. The Flexicomb's name describes it quite well. Designed by PadLab's Dan Gottleib while he was still an undergraduate at the Yale School of Architecture, the Flexicomb is a flexible honeycomb matrix, which can be used to build lighting fixtures, furniture and sculptural installations. • The material is made from thousands of closely packed polypropylene tube that will bend in the convex direction while remaining rigid in the concave one. Flexicomb is so versatile; it can be used for almost any imaginable purpose.



# 6. Self-Repairing Cement



It may seem that most of the materials have been designed to replace concrete, but cement is itself still evolving. New self-healing cement is currently being developed which has the ability to repair its own cracks. This cement is mixed with microcapsules that release a glue-like epoxy resin that will automatically repair any cracks that form in the sidewalk or roadway. In addition this cement will have the ability to regulate heat. Phase-change materials that can absorb or release large amounts of heat have also been included in the ingredients. With this material we would be able to save energy by developing buildings that can control their own temperature, and save money on repairs as well.

# 7. Carbon Fiber

Carbon fiber is an extremely strong, lightweight material. It's five times as strong as steel, two times as stiff, yet weighs about twothirds less. Carbon fiber is made up of carbon strands that are thinner than human hair. The strands can be woven together, like cloth, and then that can be molded to any shape you might want. In addition to being strong, carbon fiber is also flexible, so it's the perfect material for construction projects in areas with that are exposed to hurricanes and tornados.



### 8. Liquid Granite

According to its creators, liquid granite has the ability to completely replace cement in concrete. The material is a lightweight and has the same load bearing capacity of cement, but is made of recycled materials. Liquid granite has none of the environmental impacts that cement and concrete do. It is made up of between 30 and 70 percent recycled material, and uses less than one third of the cement used in precast concrete. Which means that it has a greatly reduced carbon footprint. Finally, liquid granite is astoundingly fire resistant. It can withstand temperatures of up to 1,100 degrees Celsius while still maintaining its structural properties. Unlike concrete it does not explode in high temperatures.

#### 9. Bendable Concrete



#### **10.** Concrete Canvas

Concrete Canvas is a flexible cement impregnated fabric that hardens on hydration to form a thin, durable water proof and fire proof concrete layer. Essentially, it's concrete on a roll Just Add Water. CC is available in man portable rolls for applications with limited access or where heavy plant equipment is not available. Once hydrated, CC remains workable for 2 hours and hardens to 80% strength within 24 hours.

- Rapid
- Flexible
- Strong
- Durable



Traditional concrete is a very brittle material; any buckling or bending will cause it to crack. A new type of fiber-reinforced bendable concrete might just be putting an end to that issue. This new concrete is around 500 times more resistant to cracking than regular concrete thanks to the tiny fibers, which account for two percent of its makeup. The fibers slide within the concrete when bending occurs, providing it with enough give to prevent breakage. It isn't just the fibers though; the materials in the concrete itself are designed for maximum flexibility as well. And thanks to these precautions, this concrete has a much longer life expectancy, which means it will cost a less in the long run too.





- Water Proof
- Fire Proof
- CO2 Savings
- Environment Agency Approval (UK)

# > Advance practices in construction field in Techniques & Equipment's

# **\* UNDER WATER CONSTRUCTION**



During the construction of bridges, dams or any other structure where foundation part of the structure is mostly like to lie underwater, we have to opt for underwater construction. Construction in water poses many difficulties especially in the places where there the depth is considerable. During underwater construction our main objective is to create a dry and water free environment for working in such a manner that the structural stability of the structure is not compromised.

# **\*** CLASSIFICATIONS OF UNDER WATER CONSTRUCTION <u>UNDER WATER CONSTRUCTION</u>

- CONSTRUCTION TECHNIQUES
- METHODS OF PLACING OF CONCRETE

# **UNDERWATER CONSTRUCTION TECHNIQUES**

- CAISSONS
- COFFERDAMS

# METHODS OF PLACING OF CONCRETE

- TREMIE METHOD
- PUMP METHOD
- TOGGLE BAGS
- BAG WORKS

# \* CAISSONS

Caissons are the structure used in underwater construction work, consisting of an air tight chamber, open at the bottom and containing air under sufficient pressure to exclude the water.

# **\* TYPES OF CAISSONS**

- BOX CAISSON
- OPEN CAISSON
- PNEUMETIC CAISSON







### **\* COFFERDAMS**

A cofferdam is a type of watertight construction designed to facilitate construction projects in areas that are normally submerged, such as bridges and piers.

### **\* TYPES OF COFFERDAM**

- Cantilever sheet piles
- Braced cofferdam
- Double wall cofferdam
- Cellular cofferdam
- Earth embankment
- Rock fill cofferdam

# \* METHODS OF PLACING OF CONCRETE

- TREMIE METHOD
- TOGGLE BAGS
- PUMP METHOD
- BAG WORKS







(F-67 Coffer DAM)

### **\* TRENCHLESS TECHNOLOGY**

Trenchless technology methods include all methods of installing or renewing underground utility systems with minimum disruption of the surface or subsurface. Trenchless technology consists of various methods, materials and equipment for inspection, utilization and rehabilitation. Trenchless technology has become popular for underground utility construction road crossings. In recent years, there has been remarkable progress in development of new trenchless technology equipment and methods.

### **\* OBJECTIVE OF TRENCHLESS TECHNOLOGY**

- Cost-effectiveness
- Ease of Design
- Production rates
- Extends underground assets
- Benefits environment

### **\* SITE INVESTIGATION**

Common problems at site are,

- Loss of invert walls, ceiling due to corrosion
- Leaking joints
- Settlement
- Shape deformation
- In adequate flow capacity
- Voids in embankment around and above the culvert

Hence before take the trenchless excavation work the site investigation must be made.

### **\*** ADVANTAGES OF TRENCHLESS TECHNOLOGY

Expenses and dates are much easier to calculate, Surface life stays mainly undisturbed, Up to 95 percent lesser load for landfills due to minimal excavations, Small stress for streets and traffic, Minimization of CO2 emissions.

# > CONCLUSION

Hence the following techniques such as under water construction and trenchless technology or like that are very use full in today's life. These new emerging building materials should be replaced with the old ones to improve the properties of materials and helps in recycling of the materials to save energy, time, money and make our country as pollution free. So more innovative materials should be created and make construction of the building simpler with more strength.

### 14.1.4 Engineering Aspects of Soil mechanics – Environmental Impact Assessment:

### > Introduction:

Soil mechanics is the branch of civil engineering that concerns the application of the principles of hydraulics, mechanics and chemistry to engineering problems related to soils. Thus soil mechanics enables a civil engineer to understand engineering properties and behavior of the soils in order to provide satisfactory solution to soil problems when the civil engineering structures such as building, overhead tanks/silos, sunk/semi sunk water reservoirs, bridges, road/railway embankments, tunnels, canals or dams are founded on soils which ultimately supports in such a manner that the structure do not get excessively settled or tilted or damaged due to some kind of failure of the foundation soil.


Field of soil mechanics is very vast and its thorough knowledge and clear understanding is a prerequisite in predicting its behavior as regards to the safety of structures is concerned and characterization of underground soil conditions is a fundamental step for the successful design. Soil being very complex natural material, is different than other materials of construction known to man and it exhibits wide range of characteristics from peats to gravel. Sometimes even at the same site and from the same stratum, soil samples taken from two locations not too far apart, show widely varying properties.

# > Objective:

Soil may be grouped under three basic types: Coarse-grained, fine grained and organic soils. Coarse grained soils are granular or cohesion less soils. Gravel and sands constitute coarse grained soils while fine grained soils which are predominantly made of particles not visible to naked eye include silts and clays. Silts may have little or no cohesion but clays possess plasticity and cohesion. The particle size according to I.S.CODE 1498 shown below:

Clay		Silts		Sands			Gravels
	Fine	Medium	Coarse	Fine	Medium	Coarse	
< 0.002mm	0.002mm	0.006mm	0.02mm	0.075mm	0.2mm	0.6mm	4.75mm to 75mm

#### (T-43 Size table of soils)

## > Preliminary Soil Data:

The soil sample (disturb/undisturbed) brought from either from a freshly excavated pit or by conducting insitu tests (Plate Load Test, Standard Penetration Test) will be subjected to preliminary tests such as Water Content 'w' which is an important parameter influencing soil behavior particularly cohesive soils significantly), Unit weight 'Y= W/V' to determine looseness/compactness of soil deposit, Specific Gravity 'G=Ys/Y w' used for computation of several quantities, Plasticity Indices (Liquid limit 'wl', Plastic limit 'wp' and 'ws') are required to identify and classify fine grained soils-and further it gives an idea of swelling expansiveness/shrinkage, consistency thixotrophy and activity of clays

Particle size (Sieve and Sedimentation/Pipette analysis) would enable to determine percentage of various fractions, determining grading and classifying coarse grained soils. To study hydraulic aspects of soil are most essential before predicting its behavior when soil comes in contact with water (water adversely affects cohesive soils by reducing its cohesion by softening) or behavior of soil under submerged conditions. The knowledge of permeability (in horizontal and vertical directions), void ratio, porosity ' $\eta$ ', degree of saturation 'Sr', specific surface 'S', critical hydraulic gradient 'Ic' etc is a pre requisite to assess draining characteristics of soil, well water supply, construction dewatering and further to assess conditions of bulking and possibility of liquefaction in cohesion less soil below W.T

# Classified Soil Data:

The next step will be to undertake classified lab tests such as consolidation ( primary and secondary ) tests to estimate deformation and probable settlement, Direct Shesr Test to determine shear strength parameters (C and Ø) of specially coarse grained soils, Triaxial compression test ( confined/unconfined and with or without pore pressure measurements) to determine shear strength parameters (C and Ø) of coarse and fine grained soils both along with stress-strain modulus, shear modulus, Poisson's ratio). For satisfactory performance a foundation must satisfy shear failure and settlement criterion. Consolidation tests on soil samples extracted from beneath the footing at different



depths encountering plastic stretches falling within the pressure bulb will give Cc (coefficient of compressibility), initial and final void ratios along with initial and final effective pressure at the middle of plastic layer to determine final settlement ( $\sigma f = H/1+e1$  Cc log10  $\sigma f/\sigma i$ ). The settlements will govern the size of the footings and ultimately the bearing capacity. The shear characteristics of soil will decide the modes of failure (general, local and punching shear) and would ultimately lead to determine of bearing capacity. The shear characteristics (general, local and punching shear) and would ultimately lead to determine of bearing capacity. For soil conditions which result in local shear (or worse, a punching shear) condition, a reduced set of shear strength parameters (Cm=2/3, tanØm=2/3Ø) are used and then procedure follow along standard lines.

## qs = 1/F (CNc+YD (Nq-1) +0.5YBNr)+YD

For design purpose purpose allowable bearing capacity is used to number of considerations such as adequacy of subsurface soil exploration program, adequacy of soil testing procedures, type of structure to built, significance of failure, reliability of design load, magnitude and type.

The design methodology is a three part process. Acquiring adequate knowledge of general ground and surface conditions at and near the site, providing adequate resistance against bearing capacity failure and achieving tolerable footing settlements.

It should be recognized that all footings settle. Even footings on rock have small but measurable settlements due to elastic compression of the parent material. It becomes unavoidable to design the foundation without estimating settlement that will occur which may be immediate (not time dependent) in case of granular soils and time dependent settlement (both primary and secondary compression phenomenon) in case of fine grained silts and clays.



# > Seepage

The structure of soil particles within our two-phase continuum is considered to be stationary and effectively rigid, and we shall study the flow of water through it. This restriction means that we are investigating states of steady flow only.

#### Excess Pore-pressure

A simple apparatus for investigating the one-dimensional flow of water through a soil is the permeameter. The apparatus consists of a Perspex cylinder containing soil specimen, in this case saturated sand, supported by a gauze mesh with suitable size of aperture. De-aired water is supplied from a source at a constant head higher than the top of the permeameter, so that water is forced to flow upwards through the sand specimen.



#### Control of Seepage

The use of a conceptual model for seepage: the word 'model' in our usage has much the same sense as the word 'law' that was used a couple of hundred years ago by experimental workers such as Darcy. Rather than going on to explain further techniques of solution, which are discussed by Harr2, we will turn to discuss the simplifications that occur when a designer controls the boundaries of a problem.

Serious consequences may attend a failure to impound water, and civil engineers design major works against such danger. There is a possibility that substantial flow of seepage will move soil solids and form a pipe or channel through the ground, and there is also danger that substantial pore-pressures will occur in ground and reduce stability even when the seepage flow rate is negligibly small. The first risk is reduced if a graded filter drain is formed in the ground, in which seepage water flows under negligible hydraulic gradient. The materials of such filters are sands and gravels, chosen to be stable against solution, and made to resist movement of small particles by choosing a succession of gradings which will not permit small particles from any section of the filter to pass through the voids of the succeeding section.

These drains have a most important role in relieving pore-pressure and, for example, reducing uplift below a dam: wells serve the same function when used to lower groundwater lavels and prevent artesian pressure of water in an underlying sand layer bursting the floor of an excavation in an overlying clay layer. The technical possibilities could be to insert a porous tipped pipe and cause local spherical flow, or to insert a porous-walled pipe and cause local radial flow, or to place or insert a porous-faced layer and cause local parallel flow. These three possibilities correspond to more simple solutions than the two-dimensional problem.

#### **Conclusion:**

Lack of understanding and optimistic considerations of the nature of subsoil by the engineer without making thorough assessment of the soil properties such as gravimetric volumetric data, strength parameters, compressibility indexes and permeability of various soils stretches and without investigating/evaluating suitability of various subsoil stratums falling particularly within the critical stress distribution zone of the pressure bulb to support the incoming loads safety and without risk of either shear failure or excessive settlements, would only compromise with the safety /stability the structure. One should understand the complexity of soil nature which significantly varies both laterally and vertically and often by large orders of magnitude leaving no choice to engineer to either overestimate or to underestimate underlaying so il which ultimately supports the structure without having satisfactory soil data based on intensive soil tests. It is not difficult to see that engineering judgment will play a significant role in practice but the proper application of engineering judgment requires that engineer is equipped with site profile, intensive soil property data and also some geological information to arrive at a safe, economical and practical design.

#### 14.1.5 Water Supply – Sewerage system – Waste Water – Sustainable Development Techniques:

#### > Introduction

Sustainable water systems should provide adequate water quantity and appropriate water quality for a given need, without compromising the future ability to provide this capacity and quality. Accessing the sustainability features in water supply, that is to say, the three fold goals.



#### Water is used

(1) for drinking as a survival necessity, (2) in operations industrial (energy production. manufacturing of goods, etc.), (3) domestic cleaning, applications (cooking, bathing, sanitation), and (4) agriculture.  $\Box$  Sustainable water supply is a component of integrated water resource management, the practice of bringing together multiple stakeholders with various viewpoints in order to determine how water should best be managed. In order to decide if a water system is sustainable, various economical, social and ecological considerations must be considered.



#### > The Basics: Water Sources

#### • Surface water

Surface freshwater is unfortunately limited and unequally distributed in the world. In addition, pollution from various activities leads to surface water that is not drinking quality. Therefore, treatment systems (either large scale or at the household level) must be put in place. Structures such as dams may be used to impound water for consumption. Dams can be used for power generation, water supply, irrigation, flood prevention, water diversion, navigation, etc. If properly designed and constructed, dams can help provide a sustainable water supply.

The design should consider peak flood flows, earthquake faults, soil permeability, slope stability and erosion, water table, human impacts, ecological impacts (including wildlife) and other site characteristics. There are various challenges that large-scale dam projects may present to sustainability. A sustainability impact assessment should therefore be performed to determine the environmental, economic and social consequences of the construction.

#### • Ground water

Groundwater accounts for greater than 50% of global freshwater; thus, it is critical for potable water. Groundwater can be a sustainable water supply source if the total amount of water entering, leaving, and being stored in the system is conserved. There are two main factors which determine the source and amount of water flowing through a groundwater system:

- ✤ PRECIPITATION
- EVAPORATION
- ✤ INFILTRATION



# (F-69 Ground Water flow)

#### • Rainwater Harvesting

Collecting water from precipitation is one of the most sustainable sources of water supply. Reduces over-exploitation of groundwater and surface water sources. Directly provides drinking water quality. Rainwater harvesting systems must be properly designed and maintained in order to collect water efficiently. Must be treated to prevent contamination



#### • Reclaimed water

Reclaimed water, or water recycled from human use, can also be a sustainable source of water supply. It is an important solution to reduce stress on primary water resources such as surface and groundwater. There are both centralized and decentralized systems which include greywater recycling systems and the use of micro porous membranes. Reclaimed water must be treated to provide the appropriate quality for a given application (irrigation, industry use, etc.) It is often most efficient to separate greywater from blackwater, thereby using the two water streams for different uses.Greywater comes from domestic activities such as washing, whereas blackwater contains human waste. The characteristics of the two waste streams thus differ.

• Desalinization

Desalinization has the potential to provide an adequate water quantity to those regions that are freshwater poor, including small island states. A widely used procedure is involved in REVERSE OSMOSIS for removing salt and adaption of this technology is a challenge. If desalination can be provided with renewable energies and efficient technologies, the sustainable features of this supply source would increase.

# • Concepts of sustainability in sanitation

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. In order to be sustainable a sanitation system has to be not only economically viable. socially acceptable and technically and institutionally appropriate, but it should also protect the environment and the natural resources.

(1) Health: includes the risk of exposure to hazardous substances that could affect public health at all points of the sanitation system from the toilet via the collection and



treatment system to the point of reuse or disposal. The topic also covers aspects such as hygiene, nutrition and improvement of livelihood achieved by the application of a certain sanitation system, as well as downstream effects.

(2) Environment and natural resources: involves the required energy, water and other natural resources for construction, operation and maintenance of the system, as well as the potential emissions to the environment resulting from use. It also includes the degree of recycling and reuse practiced and the effects of these, for example reusing the wastewater, returning nutrients and organic material to agriculture, and the protecting of other non-renewable resources, for example through the production of renewable energy

(3) Technology and operation: incorporates the functionality and the ease with which the system can be constructed, operated and monitored using the available human resources (e.g. the local community, technical team of the local utility etc.). Furthermore, it evaluates the robustness of the system, its vulnerability towards disasters, and the flexibility and adaptability of its technical elements to the existing infrastructure, to demographic and socio-economic developments and climate change.



#### • Storm Water Drainage



A storm drain is designed to drain excess rain and ground water from paved streets, parking lots, sidewalks, and roofs. Storm drains vary in design from small residential dry wells to large municipal systems. The storm water drainage system is a route of drainage for precipitation (rain or snow). Once the precipitation hits the ground and starts to flow over land it is called runoff.

(F-70 Storm drain)

#### • Inlet

There are two main types of storm water drain (storm sewer) inlets: side inlets and grated inlets.

Side inlets are located adjacent to the curb many inlets have gratings or grids to prevent people, vehicles, large objects or debris from falling into the storm drain.



(F-71 Inlet)

#### • Piping

Pipes can come in many different cross-sectional shapes (rectangular, square, bread-loaf-shaped, oval, inverted pear-shaped, and most commonly, circular) Pipes made of different materials can also be used, such as brick, concrete, highdensity polyethylene or galvanized steel. Fibre reinforced plastic is starting to see widespread use for drain pipes and fittings.

#### • Outlet



Most drains have a single large exit at their point of discharge (often covered by a grating) into a canal, river, lake, reservoir, sea or ocean. Other than catch basins, typically there are no treatment facilities in the piping system. Storm drains may discharge into man-made excavations known as recharge basins or retention ponds.

#### (F-72 Outlet)

#### • Reducing storm water flows

Runoff into storm sewers can be minimized by including sustainable urban drainage systems To reduce storm water from rooftops, flows from eaves troughs (rain gutters and downspouts) may be infiltrated into adjacent soil, rather than discharged into the storm sewer system. In many areas detention tanks are required to be installed inside a property and are used to temporarily hold rainwater runoff during heavy rains and restrict the outlet flow to the public sewer.



(F-73 Storm Water Flow Reducer)



#### > Conclusions

A water supply system will be sustainable only if it promotes efficiencies in both the supply and the demand sides. Initiatives to meet demand for water supply will be sustainable if they prioritize measures to avoid water waste. Avoiding wastage will contribute to reducing water consumption and, consequently, to delaying the need for new resources. On the supply side, it is fundamental to enhance operation and maintenance capabilities of water utilities, reducing non-revenue water (NRW), leakages, and energy use, as well as improving the capacity of the workforce to understand and operate the system. It is also necessary to ensure cost-recovery through a fair tariff system and "intelligent" investment planning. In addition, all alternatives to increase the water supply must be analysed considerably reduce water consumption. Investments in less water intensive industrial processes and more efficient buildings lead to a more sustainable water supply. Concrete possibilities of economic savings, social benefits (such as the involvement of different sectors of society to reach a common objective, environmental awareness of the population, etc.) and a range of environmental gains make the adoption of water efficient technologies viable.

#### 14.1.6. Technical Case Study on "Site Planning of institutional Building":

Site planning is the art and science of arranging the uses of portions of land. These uses are designated in detail by selecting and analyzing sites, forming land uses plans, organizing vehicular and pedestrian circulation, developing visual form and materials concepts, readjusting the existing landforms by design grading, providing proper drainage, and developing the construction details necessary to carry out the projects.

Aim: To understand the Site Planning & its importance in Civil Engineering

Objective: To understand working & implementation of Site planning in ESI (Selected Site).

Methodology: Beginning with brief information about Site planning, its reasoning; Factors affecting, its importance in architecture leading towards the main focus on the selected site; understanding its methods, constraints & presentation. Some brief information about issues & solutions on the topic.

The report will be focusing on the site planning & its importance, getting the detailed layout of the method for thorough assimilation; also, the understanding its limits/issues (if any).

#### > Objective

- 1. To Learn and practice a logical method of fitting design program and sites harmoniously.
- 2. To understand interaction of the following factors in design process:
- a. Natural Forces (landscape)
- b. Socio-economic forces (planning)
- c. Technological functions (architecture and engineering)
- 3. To understand the site development process by observing natural and human factors affecting the form and appearance of the environment.
- 4. To collect information and data concerning planning or design issue.
- 5. To classify and analyse the data.
- 6. To make recommendations for issues at hand. To draw guidelines for planning, architecture and landscape.



#### > Methods of establishing a site:

Site Selection Process: Selection of site from a list of potential sites that best suits the given use and requirements of the project.

Development suitability process: Selection of the best possible use and development suited for a given site.

> Factors:

- 1. Natural factors
  - a. Geology
  - b. Geomorphology: physiography, landforms, soils, drainage, topography and slopes, and soil erosion.
  - c. Hydrology: surface and ground water
  - d. Vegetation: Plant ecology
  - e. Wildlife: Habitats
  - f. Climate: Solar orientation, wind & humidity.

- 2. Aesthetic Factors:
  - a. Natural factors
  - b. Spatial patterns spaces and sequences
  - c. Visual resources views and vistas

- 3. Cultural Factors:
  - a. Existing Land use: ownership of adjacent property, off-site nuisances.
  - b. Traffic & transit: Vehicular and pedestrian circulation on or adjacent to site.
  - c. Density & zoning: Legal and regulatory controls
  - d. Socio economic factors: Population, density, literacy, sex ratio, occupation pattern, ethnicity, cultural typology
  - e. Utilities: sanitary, Storm water, water supply, power supply and communications
  - f. Historic Factors: Historic buildings, Landmarks and archaeology.

#### Institutional Site Planning:

• Definitions

Institutional building simply refers to any structure that fulfils a role related to health care, education, recreation, or public works. Construction services teams that specialize in this type of work build everything from hospitals and elementary schools to athletic facilities and university buildings.

• Factors Affecting

The following are the few factors which must be taken into account while selecting a site for an institutional building.

**1. Location:** The value of an institutional building depends upon its location, whether it is located in the center of the region or at the borders or on the main road or away from the main road. For any location it has its pros & cons.

**2. Climate of Region:** The strength and stability of building mainly depends upon the climate of the region in which it is going to be constructed. As institutional buildings are very important, it must be constructed according to the terms and conditions of region. So that it can be remain safe form floods, rains, snowfalls etc.

3. Availability of Raw materials: Usually institutional buildings require more construction materials



as compared to a normal residential house. So before the construction of the institutional building it must be sure that raw materials are available nearby. Otherwise it will become uneconomical.

**4.** Cost and time frame: Before the construction of an institution, a thorough investigation should make for the cost and time frame for the building. Cost and time frame mainly depends upon the location and the availability of Raw materials.

**5. The Water Table:** The water table at the site of residential building should not be very high. Otherwise it will affect the quality of water which are used for drinking and domestic purposes. A plot with normal water table will be more preferred as compared with other plots having high water table.

Site Planning of ESI – Ahmedabad

• Brief Introduction

Name: Environmental sanitation Institute

- ✤ Location: Sughad, Ahmedabad
- Climate: Hot & Dry
- ✤ Temperature: 27-49 C
- Sky condition: Clear
- ✤ Humidity: 10-50%
- ✤ Area: Rural
- Type of building: Institutional
- Precipitation: Less & variable
- ✤ Wind: Local whirl are often created
- Vegetation: Dry deciduous, dry soil
- Solar radiation: Strong & Direct
- ✤ Annual Rain Fall: 50-150mm/annum



(F-74 contextual map)

- ✤ Availability of Raw materials: The materials used it exposed brick & RCC which was locally available to reduce the construction cost.
- Cost and time frame: 2000-2005 2 Crore
- So its evaluation point according to GRIHA is 1.
- The building site is about 2.5kms away from Ahmedabad city limit and having a public transport (bus stop) within half km. from the site.



#### About the Institution:

The Environmental Sanitation Institute (ESI) is a non-governmentl organization that strives to provide a better quality of life to rural people and the urban poor through improved sanitation. ESI was established in the year 1985 under the guidance of Padmashri Ishwarbhai Patel out of its mother organization Safai Vidhyalaya ("Sanitation Institute.")

Design Philosophy and considerations:

Blue – Site

The design results from adressing four primary considerations – the program, the physical context of the site, the ideology of design and the demonstration of environmental sustainability and ecological balance.

The site contraint was the smaller triangular plot on the southeast which is the only accessible area from the road and thus becomes the entry plaza, initializing the movement sequence into the institute. The existence of three trees in this plot is exploited by using them as visual guides in this process. Residential and service areas are accomodated in the southern half of the development with clear demarcation from the institutional area, the garden is on the north. Higher massing at the south west of the site exploits view to the garden as well as shades the lower masses on the north.

lue – Site

Red - the triangular plot, the narrow road, the bridge

Green – Three existing trees



#### (F-75 site location)

The site has farmlands on its either side and the site is located beside a bridge and it has got a narrow road of only 6mts wide for the entrance. Later on, it was widen and made 9mts wide road.

#### Construction timeline:







(2020)

#### **Documented Drawings:**



(F-76 Plan of Ground floor)





(F -77 Plan of first floor)



NORTH EAST ELEVATION



#### CROSS SECTION THROUGH CLASSROOM



SOUTH EAST ELEVATION





#### Site Planning:

The site planning consideration of this institute is based on the environmental sustainability like:

Land management:

- The soil excavated from the site for the subterranean area was piled to raise the ground level.
- Land management is done in the site such that slope is worked out properly so that rain water is not clogged anywhere.
- Artificial contours are made for aesthetic purpose and for slope management and it is made sure the mud/clay dig out from one part of the site is only used to make the contour on the other part of the site; i.e. no mud is transported from outside.
- As can be seen in the plan, the site is divided into 4 parts and percolating wells are provided to increase ground water level.
- Reproductive resource exploited through creation of kitchen gardens and herbal/ fruit plantation through seasonal organic farming.



(land optimization)





(section of the slope)



(landscape area)



#### Water Harvesting & recycling:

Water Harvesting & waste water recycling is done to convert storm water and grey water into reusable water.

- Storm Water: Storm water harvesting or storm water reuse is the collection, accumulation, treatment or purification, and storing of storm water for its eventual reuse. It differs from rainwater harvesting as the runoff is collected from drains or creeks, rather than roofs.
- Grey Water: The relatively clean waste water from baths, sinks, washing machines, and other kitchen appliances is known as Grey water.

#### Sources & Uses:

- Water falls as rain, snow or ice; most seeps into ground. But if ground is saturated, frozen or paved; the water flows known as Storm water. There are openings through which the surface runoff is conveyed to the storm water sewer.
- Water after it is used in washing or cleaning becomes grey water. Grey water can be treated & can be used again as clean water.
- Their uses will vary According to the type of the building:
- Residential Buildings: People use the storm water in gardening, Dewats system is also seen. (eg: Aurroville houses)
- Commercial Buildings: Dewarts system is seen.
- Institutional Buildings: Percolating wells are made, Root zone system is adopted and water filters are used to use the waste water again. Septic tanks are made where grey water can be used. (ESI, Sughad & DAIICT, Gandhinagar)

#### **Storage & Conveyance:**

- The Storm water is stored in the open pond system, the grey water is stored in root zone system (Which we will learn further).
- It is all stored within the system and through natural channels & inlets they enter the system.
- Following are the methods of treating storm **water:**



(for rain water harvesting)





(location of well, tanks and pond)



# **Open pond**:

- Runoff from the ground is stored in an open pond which satisfies the gardening water requirement of the entire year. It also aids micro climate modulation.
- The fish (Gappi) in this pond keeps the water clean by eating the impurities. Hence the water can be used again in gardening.

# **Pros:**

- It makes surrounding cool.
- It is used for aesthetic purpose also.
- It filters water, making it possible to use it again.
- The fish in the water eats impurities; hence it takes care of its survival.

# Cons:

- There is a possibility of algae developing in the pond.
- It increases the number of flies and mosquitoes in its surrounding.
- If not maintained properly bad odour can be developed.

# Percolating wells:

• Water as site run-off is channelized into four percolation wells 3mts diametrically & 10mtts deep & capacity of 50,000litres. (These measurements are taken as an example for better understanding)

# **Pros**:

- It improves the ground water level.
- It disposes the excess water from the ground.
- There are less chances of water getting stagnant. Cons:
- If Filters are not provided, there is chance large size waste particles might enter the ground.
- If the location of percolating well is in a city area; Chances are there that the water transporting to the bore well might be impure.
- They should be placed very carefully, keeping in mind, the slope of the site or else the water will get collected on the ground instead of getting into the wells.



(open amphitheatre whose lowest level is used for catching storm water)



(open pond)



(percolating well)



#### **Root Zone system:**

- The Plant Australis- Phragmatis is grown in a specially designed bed through which grey water is passed.
- After a cycle of 40days totally clean water is discharged to be reused in toilet flushing, washing etc.
- Capacity 5000litres/day for 50 persons.

#### **Pros:**

- Low maintenance cost, since it involves no machinery and its maintenance.
- It requires negligible attendance for operation and monitoring.
- It has no sludge handling problem.
- It enhances the landscape and gives the site a green appeal.
- Though it is a sewage treatment plant, doesn't have odour problem.

#### Cons:

- Relatively area requirement for advanced treatments.
- Current imprecise design and operating criteria.
- Possible problems with pests.
- Biological and hydrological complexity, our lack of important process dynamics.



(root zone system in ESI)



# > Observations & Findings:

Started with what site planning is in general context and for ESI (institutional case study), and its importance. Its objectives & factors is covered and then it was narrowed down to institutional buildings and its site planning and their affecting factors.

The building I took had passive techniques used for every aspect of design which is quite helpful for site planning. Starting from deciding the slope to managing the contours to treating the water around the site to electricity and everything which is all covered in this report.

From this report, I understood that each building could create an eco-system of itself and it hence becomes a self-sufficient building. It is been reported that practicing the percolating wells system; in the last 15years they have increased the ground water level of their site and surroundings as well. But it took a long time to do that as only this site was doing it. Also this building is isolated from the city, and so it get benefits of its own such as the eco system of the site can work better as there is no pollution in the surrounding. But we should also consider that this might not happen every time & we may have to take few measures according to the location of the site. The points to remember would be to use the site to its optimum limit in terms of creating an ecosystem and to build according to the byelaws so that land abuse does not happen.



#### **14.2 Electrical Engineering**

#### **14.2.1 Design of Power Electronics converter:**

#### > Introduction to Power Electronic Converters

Power electronic technology deals with processing and controlling the flow of electrical energy in order to supply voltages and currents in a form that optimally suited for end user's requirements. A power electronic converter uses power electronic components such as SCRs, TRIACs, IGBTs, etc. to control and convert the electric power. The main aim of the converter is to produce conditioning power with respect to a certain application.



#### (F-79 Simple Block Diagram of Converter)

The square chart of a force electronic converter is appeared in figure above. It comprise of an electrical fuel source, power electronic circuit, a control circuit and an electric burden. This converter transforms one type of electrical energy to other type of electrical energy. The force electronic circuit comprises of both force part and control part. Force part moves the fuel from source to load and it comprises of force electronic switches (SCR or TRIAC), transformers, electric gag, capacitors, wires and once in a while resistors. The control circuit or square directs the components in the force part of the converter. This square is worked with a mind boggling low force electronic circuit that comprises of one or the other simple or computerized circuit gathering.

Power electronic converters perform various basic power conversion functions. This converter is a single power conversion stage that can perform any of the functions in AC and DC power conversion systems.Depending on the type of function performed, power electronic converters are categorized into following types.

- AC to DC = Rectifier: It converts AC to unipolar (DC) current
- **DC to AC** = Inverter: It converts DC to AC of desired frequency and voltage
- **DC to DC** = Chopper: It converts constant to variable DC or variable DC to constant DC
- AC to AC = Cycloconverter, Matrix converter: It converts AC of desired frequency and/or desired voltage magnitude from a line AC supply.

These types of power electronic converters may be found in a wide variety of applications such as switch mode power supplies (SMPS), electrical machine control, energy storage systems, lighting drives, active power filters, power generation and distribution, renewable energy conversion, flexible AC transmission and embedded technology. Let us go in detail about each converter.

#### > AC to DC Converters or Rectifiers.

An AC to DC converter is also called a rectifier, which converts AC supply from main lines to DC supply for the load. The block diagram of an AC to DC converter is shown in figure below. The essential components in this rectifier include transformer, switching unit, filter and a control block.





(F-80 Circuit Diagram of AC to DC Converters or Rectifiers)

Here, the transformer adjusts the primary AC source supply to the input of rectifier stage. Usually it is a step-down transformer that reduces the supply voltage to a circuit operating range. The rectifier converts the low voltage AC supply into DC supply. It comprises diode and/or thyristors based on type of rectifier. The output of the rectifier is of pulsed DC and hence it is filtered using filter circuit, which is usually made with a capacitor or a choke. The control block controls the firing angle of thyristors in case of phase controlled rectifiers. Since the diode is not a controllable device, control block is not needed in case of diode rectifiers.

Rectifiers are majorly classified into two types

- > Uncontrolled diode rectifiers
- Controlled rectifiers

# > Uncontrolled Diode Rectifiers

This type of rectifier converts AC voltage from mains into a fixed DC voltage.Since the diodes are uncontrollable components (which do not require any triggering), these converters are called as uncontrolled converters as they produce a fixed voltage. The input voltage can be either single phase or three-phase.The diode rectifiers are classified into following types.

- > Single phase half-wave rectifier.
- > Single phase center-tapped full-wave rectifier.
- Single phase full-wave bridge rectifier.

# 4. Three-phase Half-wave diode rectifier.

It employs three diodes and its anode terminals are connected to three phase source via transformer as shown in figure. The load is connected between the common cathode point and neutral terminal of star connected source.







When R-phase is at its peak value, maximum conduction occurs through diode D1 as it is forward biased and no conduction takes place through it during negative alteration of phase R. During Y-phase and B-phase maximum values, other two diodes conduct in a similar manner. The main disadvantage of this rectifier is that the secondary winding consists of DC component of current which can cause the transformer core to go under saturation problem. Therefore, it is not advisable to use three-phase half-wave rectifier for large power applications.

# 5. Three-phase full-wave diode bridge rectifier.

This type of rectifiers is suitable for high power applications, typically the power output higher than 15KW. The circuit of full-wave diode bridge rectifier is shown in figure below. It requires six diodes for the operation of the circuit. This type of circuit doesn't need any neutral connection from three phase source therefore, a star as well as delta-connected sources can be used.



(F-82 Three-phase full-wave diode bridge rectifier)



Here the yield current courses through one diode of the upper gathering and one diode of lower gathering diodes. On the off chance that anode of a diode is at high potential, this upper gathering diode will direct while other two diodes are switched one-sided. Essentially, the diode having the cathode at lower potential will direct while other two diodes are off. The diode pair's conduction for above circuit is given as D6 D1, D1 D2, D2 D3, D3 D4, D4 D5 and D6 D1. Since, one diode from upper gathering and one diode from lower bunch are continually directing; negative individuals from three-stage voltages are corrected, so the yield voltage comprises of six sections of line voltage during one cycle. Therefore, three stage connect rectifiers are called as six heartbeat rectifiers. These are proficient rectifier when contrasted with half-wave converters. Because of six heartbeat yield, swell substance in the yield is low, regularly about 4.5%. This dodges the extra channel circuit in numerous powerful applications. Indeed, even it a channel is required, a little measured channel is sufficient as a result of expansion in swell recurrence to multiple times the info recurrence.

#### > Single phase half-wave rectifier.

In this a single thyristor or SCR is connected between the secondary of the transformer and a resistive load as shown in figure. The primary of the transformer is connected to a single phase supply and consider that load is of resistive.



(F -83 Single phase half-wave rectifier)

During the positive half cycle of the input AC supply, thyristor T1 is forward biased, and when it is triggered at some firing angle though gate terminal, it starts conducting current to the load.Since the SCR is a unidirectional device, it turns OFF during negative half-cycle. So the output voltage is produced only for positive half cycle.The output power delivered by this half-wave rectifier is controlled by phase control, i.e., varying firing angle to the gate terminal. The load of this rectifier can be a RL load and RLE load with free wheeling diode.

#### > Single phase full wave mid-point rectifier.

This converter rectifies both positive and negative half-cycles of the input supply. It uses two SCRs with center-tapped secondary transformer as shown in figure.





(F -84 Single phase full wave mid-point rectifier)

In positive half-cycle of the input supply, thyristor T1 is forward biased while T2 is reverse biased. WhenT1 is triggered, the supply voltage appear across the load.It conducts till 180 degrees of input supply and turns OFF due to natural commutation. During negative half cyle, thyristor T2 is forward biased and when it is triggered, it starts conducting. It conducts till next positive half cycle.The load could be RL or RLE depending on the type of application it is employed. This type converter produces an output voltage twice that of single phase half-wave rectifier.These are essential when one of the terminals on DC side has to be grounded. However, a center-tapped transformer with a VA rating twice that of load is required and also high voltage rating thyristors are needed in this converter.

# > Single phase full wave bridge rectifier.

The circuit graph of a full wave connects rectifier utilizing thyristors in appeared in figure underneath. It comprises of four SCRs which are associated between single stage AC supply and a heap. This rectifier produces controllable DC by fluctuating conduction of all SCRs.



(F -85 Single phase full wave bridge rectifier)

# > Single phase full wave bridge rectifier.

In certain half-pattern of the info, thyristors T1 and T2 are forward one-sided while T3 and T4 are opposite one-sided. Thyristors T1 and T2 are set off all the while at some terminating point in the positive half cycle, and T3 and T4 are set off in the negative half cycle. The heap current beginnings coursing through them when they are in conduction state. The heap for this converter can be RL or RLE relying upon the application. By shifting the conduction of each thyristor in the scaffold, the normal yield of this converter gets controlled. The normal estimation of the yield voltage is double that of half-wave rectifier.

#### > Three-phase half-wave converter.

The output from single phase converter is small; when high power is required, three phase rectifiers are used. A three-phase half-wave rectifier with thyristors is shown in figure below. The three-phase supply is given to this converter through a three-phase transformer with star connected secondary.



(F -86 Three-phase half-wave converter)

It functions as like the three-stage diode connect rectifier. In this, thyristor T1 is at most elevated positive anode voltage in the stretch  $\pi/6$  to  $5\pi/6$ . During this stretch, T1 can be made to lead by giving a terminating heartbeat to its entryway. This thyristor T1 keeps on leading till thyristor T2 is made to direct in the stretch  $5\pi/6 < \text{wt} < 3\pi/2$ . Presently the heap current beginnings coursing through T2. Likewise, thyristor T3 is begins directing once thyristor T2 is killed. In this, there are three beats of yield voltage during each total pattern of supply voltage. In this manner the wave recurrence is multiple times the stock recurrence. Consequently, this converter is additionally called as 3-beat converter. This converter can be associated with various loads, for example, RL and RLE loads.

#### > Three-stage full wave converter.

It is gotten by interfacing a DC terminal of two three-beat converters in arrangement. It is additionally called as 6-beat connect converter. This sort converter is utilized in modern applications where twoquadrant activity is required. Here the heap is associated by means of a three-stage half wave association with one of three inventory lines. In this manner, there is no need of transformer; be that as it may, for disconnection reason a transformer is associated as demonstrated in figure.



(F -87 Three-stage full wave converter)



Here thyristors T1, T3 and T5 forms a positive group, whereas thyristors T4, T6 and T2 forms a negative group. And thus positive group SCRs are turned ON for positive supply voltage and negative group thyristors are turned ON for negative supply voltages. In this, one of the thyristors from positive, whose anode voltage is maximum positive will conduct at any instant and simultaneously one of the thyristors from negative group, whose cathode voltage is maximum negative will conduct. This converter can be connected to RL or RLE loads. By controlling the firing angle to respective thyristor, average power delivered to the load is changed. The firing angle of particular thyristor in positive group measured from the instant when its anode becomes maximum positive. Similarly, the firing angle for a thyristor in negative group is measured from the instant when its cathode terminal attains a maximum negative value.

#### **DC to DC Converters.**

Many DC operated applications need different levels of DC voltage from a fixed DC source.Some of these applications include subway cars, DC traction systems, control of large DC motors, battery operated vehicles, trolley buses, etc. They require variable DC to produce variable speed, so a power conversion device is needed.A DC chopper is a static device that converts a fixed input DC voltage to variable DC output or a fixed DC output of different magnitude (which can be lower or higher) than input value. The block diagram of a DC chopper is shown in figure below.



(F -88 DC to DC Converters)

The chopper circuit is connected between DC input source and DC load. This chopper consists of power electronic switching devices such as thyristors which are connected in such a way that they produce required DC voltage to the load. The output voltage is controlled by adjusting ON time of the thyristor (or switch) which turn changes the width of DC voltage pulse at the output. This method of switching is called as pulse width modulation (PWM) control. The output of the chopper can be less or greater than the input and also it can be fixed or variable. These can be unidirectional or bidirectional devices based on the application it is intended for.DC choppers are mainly used in DC drives, i.e., electric vehicles and hybrid electric vehicles.DC choppers are classified into three basic types based on input and output voltage levels and are discussed below.

# > Step-down Chopper or Buck converter.

A step-down chopper produces an average output voltage lower than the input DC voltage. The circuit for this converter is shown in figure below. Here the switching component is a thyristor that switches the input voltage to the load when it is triggered at particular instants.

A diode acts as a free wheeling diode that allows the load current to flow through it when thyristor is turned OFF. If this diode is absent, a high induced EMF in inductance may cause damage to the switching devic.





## (F -89 Step-down Chopper or Buck converter)

The average output voltage of the converter is varied by controlling turn ON/OFF periods of thyristor. When thyristor is turned ON, the output voltage is same as the input voltage and if it is turned OFF, the output voltage is zero. The output voltage is equal to (TON / T) Vin. So, by controlling the duty ratio K = (TON / T), the output voltage will be increased.

#### > Step-up Chopper or Boost converter.

In this chopper, the output voltage is always greater than input voltage. The configuration of a boost converter is shown in figure below.Here also a switch is used, which is connected in parallel with the load. This switch is a thyristor or an SCR.As similar to the buck converter, a diode is placed in series with the load that allows the load current to flow when the thyristor is turned OFF.When the thyristor is turned ON, the diode is reverse-biased and hence it isolates the load circuit from the source. So the inductor charges to the maximum input voltage source.



# (F -90 Step-up Chopper or Boost converter)

When the thyristor is turned OFF, the load gets the voltage from input as well as from inductor. So the voltage appearing across the converter output will be more than the input. Here the output voltage is equal to (1/1 - d) times the input voltage, where d is the duty ratio (TON / T). By varying this duty ratio, the output voltage will be varied till the load gets desired voltage.



#### **Buck/Boost converter.**

This chopper can be used both in step-down and step-up modes by continuously adjusting its duty cycle. The configuration of buck-boost converter is shown in figure below that consists of only one switching device, i.e., one thyristor. Along with an inductor and diode, additional capacitor is connected in parallel with this circuit.



(F -91 Buck/Boost converter)

When the thyristor is turned ON, the supply current flows to the inductor through the thyristor and induces the voltage in inductor. When the thyristor is OFF, the current in the inductor tends to decrease with the induced emf reversing polarity. The output voltage of this converter remains constant as capacitor is connected across the load. By varying the value of duty ratio to a certain value, the output voltage is lower than the input voltage, typically in the range  $0 \ge k > 0.5$ , thus a buck converter. And the output is higher than the input voltage if the duty ratio is in the range of  $0.5 > K \ge 1$ , thus acts as a boost converter.

# > AC to AC Converters.

AC/AC converters connect an AC source to AC loads by controlling amount of power supplied to the load. This converter converts the AC voltage at one level to the other by varying its magnitude as well as frequency of the supply voltage. These are used in different types of applications including uninterrupted power supplies, high power AC to AC transmission, adjustable speed drives, renewable energy conversion systems and aircraft converter systems. The types of AC to AC converters are discussed below.

# > AC/AC Voltage Converters.

These converters control the rms value of output voltage at a constant frequency. The common application of these converters includes starting of AC motors and controlling power to heaters. A single phase AC/AC voltage converter consists of a pair of anti-parallel thyristors along with a control circuit as shown in figure below. The other names of this controller are single phase full wave converter and AC voltage controller. During positive half pattern of the info signal, thyristor-1 is forward one-sided and it begins leading, when the setting off is applied. In this manner the force streams from source to stack. In negative half pattern of the info, thyristor-2 is forward one-sided and begins directing when it is set off, while thyristor-1 is killed by characteristic substitution. By differing the setting off or conduction heavenly messenger of each thyristor during every half-cycle, the extent of voltage showed up across the heap is controlled. The other famous type of AC voltage regulator is the utilization of TRIAC instead of two enemy of equal thyristors. The figure underneath shows



TRIAC based AC regulator alongside setting off control circuit. Here diac controls the positive and negative setting off to the TRIAC so that normal yield voltage to the heap is controlle.

#### > AC/AC frequency Converters.

These converters are basically utilized for shifting the recurrence of the information source to wanted level of the heap. An Air conditioner/AC recurrence converter changes the recurrence of info voltage/current of the heap contrasted with the recurrence of the source. A portion of these converters may control size of voltage other than the recurrence control. These are basically utilized for changing the speed of AC drives and furthermore for enlistment warming.

#### > The two significant classes of these converters incorporate

- Cyclo converters
- Matrix converters.

#### Matrix Converter.

Since the cyclo-converters satisfactorily work only for a certain range of frequencies, matrix converters are invented that has unrestricted frequency conversion capability. These are constructed using full-controlled static devices, mostly uses bidirectional switches. With the use of these switches in three-phase matrix converters, any phase of the load can be connected to any phase of the input supply. By using pulse width modulation techniques, the load frequency and voltages are controlled from zero value to their maximum values.

#### **DC to AC Converters or Inverters.**

These converters are connected between DC source of fixed input, and variable AC load. Most commonly, these DC to AC converters are called as inverters. An inverter is a static device that converts fixed DC supply voltage to variable AC voltage. Here the fixed DC voltage is gotten from batteries or by DC interface in most force electronic converter. The yield of the inverter can be variable/fixed AC voltage with variable/fixed recurrence. This transformation from DC to AC alongside factor supply is delivered by fluctuating the setting off point to the thyristors. The greater part of the thyristors utilized in inverters are utilized with constrained compensation procedure. These can be single stage or three stage inverter relying upon the stockpile voltage. These converters are chiefly isolated into two gatherings. One is PWM based inverters and other staggered inverters. Further, these are arranged voltage source inverter and current source inverter. Each type is partitioned into various sorts like PWM, SVPWM, and so on Staggered inverters are more well known in mechanical applications. The inverters conquer the downsides of PWM based inverters.

#### 14.2.2 Electronic Soft Starter for 1/3 Phase Induction Motor for Agriculture:

#### Introduction of starter.

Motor starters are one of the major inventions for motor control applications. As the name suggests, a starter is an electrical device which controls the electrical power for starting a motor. These electrical devices are also used for the purpose of stopping, reversing and protecting electric motors.

#### > Types of starters.

- 1. Direct Online Starter (DOL)
- 2. Stator Resistance starter
- 3. Rotor Resistance or Slip Ring Motor Starter
- 4. Autotransformer Starter
- 5. Star Delta Starter



- 6. Soft Starter
- 7. Variable frequency drive (VFD)
- Direct Online Starter (DOL)

A **DOL starter** (also known as a **direct on line starter** or **across the line starter**) is a method of starting a three phase induction motor. In a DOL Starter, an induction motor is connected directly across its 3-phase supply, and the DOL starter applies the full line voltage to the motor terminals.Despite this direct connection, no harm is done to the motor. A DOL motor starter contains protection devices, and in some cases, condition monitoring. A wiring diagram of a DOL starter is shown below.



(F -92 line diagram of Direct Online Starter (DOL))

Since the DOL starter connects the motor directly to the main supply line, the motor draws a very high inrush current compared to the full load current of the motor (up to 5-8 times higher). The value of this large current decreases as the motor reaches its rated speed.

A direct on line starter can only be used in circumstances when the high inrush current of the motor does not cause an excessive voltage drop in the supply circuit. If a high voltage drop needs to be avoided, a star delta starter should be used instead. Direct on line starters are commonly used to start small motors, especially three phase induction motor.

As we know, the equation for armature current in the motor. The value of back emf (E) depends upon speed (N), i.e. E is directly proportional to N.At beginning, the estimation of E is zero. So beginning current is high. In a little appraising engine, the rotor has a more extensive pivotal length and little width. So it gets sped up fastly. Subsequently, speed increments and hence the estimation of armature current abatements quickly. Consequently, little appraising engines easily run when it is associated straightforwardly to a 3-stage supply.

In the event that we interface a huge engine straightforwardly across 3-stage line, it would not run easily and will be harmed, on the grounds that it doesn't get sped up as quick as a more modest engine since it has short hub length and bigger measurement more gigantic rotor. Be that as it may, for enormous evaluated engines, we can utilize an oil-submerged DOL starter.

Warm over-burden assurance is a sort of safety when the engine draws over current or inordinate current and causes overheating of the hardware. Over-burden is additionally the kind of over current.



So over-burden transfers are utilized to restrict the measure of current drawn.

Yet, that doesn't imply that secures the short out. Wire or MCB utilized in the framework ensures the over current. Over-burden assurance opens a circuit at moderately low flows that are somewhat higher than the rating of the engine. Over-burden flows are probably going to harm in the event that they endure for quite a while, for example it won't trip if a high estimation of current streams for a brief period like turning over of the engine.

We regularly give over-burden assurance by means of an over-burden transfer. Over-burden transfers might be strong state gadgets with movable outing setting additionally called as the electronic hand-off or by communicating with related temperature sensors called as a warm hand-off or assuming just works for abundance current stream, called as an attractive hand-off. For most engines, the greatest rating of the over-burden insurance gadget is 125% of the full burden ampere rating.

#### > DOL Starter Working Principle.

The working rule of a DOL starter starts with the association with the 3-stage primary with the engine. The control circuit is associated with any two stages and invigorated from them as it were. At the point when we press the beginning catch, the current courses through the contactor curl (charging loop) and control circuit moreover.

The current stimulates the contactor loop and prompts close the contacts, and consequently 3-stage supply opens up to the engine. The control circuit for a DOL Starter is appeared underneath.

On the off chance that we press the stop button, the current through the contact gets ceased, thus supply to the engine won't be accessible, and the comparative thing will happen when the over-burden hand-off works. Since the inventory of engine breaks, the machine will stop.

The contactor loop (Polarizing Curl) gets supply despite the fact that we discharge start button since when we discharge start button, it will get supply from the essential contacts as represented in the graph of the Direct Online Starter.

#### **DOL Starter Applications.**

- The applications of DOL starters are primarily motors where a high inrush current does not cause excessive voltage drop in the supply circuit (or where this high voltage drop is acceptable).
- Direct on line starters are commonly used to start small water pumps, conveyor belts, fans, and compressors. In the case of an asynchronous motor (such as the 3-phasesquirrel-cage motor) the motor will draw a high starting current until it has run up to full speed.

#### > Advantages of DOL Starter.

- Simple and most economical starter.
- More comfortable to design, operate and control.
- Provides nearly full starting torque at starting.
- Easy to understand and troubleshoot.
- DOL starter connects the supply to the delta winding of the motor.

#### 14.2.3 Advanced Wireless Power Transfer System:

#### > INTRODUCTION

The Exchange of electrical force in dependable and productive manner is continually trying for the planners and designers. As of now all electrical force from the creating stations to the conveyance station is moved by the employments of wires what's more, underground links. One of the significant issues in these kinds of frameworks is the misfortunes because of opposition of the material. For the



most part the level of loss of force during the transmission and circulation is 26% . In current innovation the utilization of compact gadget has expanded like portable robots and electric vehicle. Versatility is the principle worry of these hardware for example they are not associated with the principle wellspring of force. Every one of these issues are the principle inspiration for specialists. Nikola Tesla was the primary who present the idea of remote force move. Yet, this innovation from the hour of Tesla is immature because of absence of subsidizing and innovation .However research from recent years has continually going on and late improvement has been seen in the field . Remote force move can be accomplished by a few strategies (examined later). Here we examined not many techniques for example, enlistment coupling, reverberating coupling, LASER innovation for electrical force move.



(F -93 Wardenclyffe Tower)

# > WIRELESS POWER TRANSFER METHOD.

- MAGNETIC RESONANCE COUPLING WPT
- MICROWAVE WPT
- LASER WPT
- INDUCTIVE COUPLING
- > INDUCTIVE COUPLING



This sort of WPT is basically founded on inductive coupling between two curls. This is a sort of close to handle method estimating with apparatus close to the source. It is for the most part dependent on the guideline of shared acceptance, where two loops are set area to one another and there is no actual association between these two curls. The least complex model is transformer

where the exchange of energy happens because of electromagnetic coupling. Every one of these loops associated without wires and it has been a significant and mainstream innovation to move power without wires in view of its straightforwardness and unwavering quality. In light of this innovation there are different application gadget has been as of now made including rotating brush and charging cushion for cells or PC. Yet, this sort of strategy additionally have some limit for example the reach can be extremely less upto few cm and partition distance is not exactly the loop measurement.

# > MAGNETIC RESONANCE COUPLING WPT.

This is also one of the important method for transferring power based on near field technique. It generally overcome the disadvantage of up to some extent which arise in non-full inductive coupling. This kind of coupling utilized the idea of reverberation. At reverberation we realize that characteristic recurrence and excitation recurrence are same. This prompts the greatest plentifulness, that implies a most extreme measure of energy is moved between two loops. Here the beneficiary and transmitter



curls are tuned to be at same resounding recurrence .This permit us to move huge measure of force bv expanding distance between loops These kind of . framework are utilized for building mid reach power move. Mid reach can be determined by distance upto



multiple times the measurement of the sending loop. Attractive reverberation coupling have a few benefit, for example, productivity increments with decline in the radiation and force misfortune and reach can be increment upto some meter and it is directional. The fundamentally hindrance is that choice of reverberation recurrence which tunes with the common recurrence and it can't be utilized for long reach application.



(F -94 Functional block diagram of WPT)

# 14.2.4 Industrial Temperature Controller:

The microcontroller based temperature control framework controls the temperature of any gadget as per its necessity for any mechanical application. This report targets controlling the temperature of a fertilizing the soil measure which is being warmed by a 50 watt warming component. For controlling the temperature of the warming loop the current through the warming component is controlled. The nuclear power delivered by the radiator is straightforwardly corresponding to the square of the current going through the radiator coil.Hence, by controlling the currentthrough the radiator loop, the warmth delivered by the warmer is controlled. The objective is to control the temperature of the plate between room temperature and 100 °C with the ideal control range being from 50°C to 70°C. Following this meaning of temperature control in cycles to utilized various sorts of temperature regulator for fertilizing the soil machine.

# > CONCEPT OF TEMPERATURE CONTROL TECHNIQUE.

To build the creation of an industry, smooth control of temperature is the key function.5 Diverse industry has its own individual temperature prerequisite for explicit job. Ordinarily, mechanical temperature estimation instrument thermometer is utilized to quantify the temperature. Subsequent to noticing temperature perusing, administrator controls temperature physically. Some of the time



controlling isn't proper due to tedious human worked control of cooling gadget and warming gadget. Thus, productivity of temperature control falls flat and creation is hampered in businesses. Other than that, indoor regulator is utilized to select temperature which isn't effective due to disintegration of metal and losing to strength of metal for progressive utilizing. Thusly, simple framework loses its own linearity work since it is precisely planned temperature control gadget. The temperature can be controlled all the more effectively utilizing interface between temperature sensors LM35 which produce direct voltage signal with rising temperature and microcontroller which takes reaction part of



(F -95 Block Diagram of Total System)

millisecond to reaction. Microcontroller takes signal from temperature sensor and contrast and pre-set estimation of temperature at that point take choice when warming gadget or cooling gadget would be turned on and the length of kept up temperature in framework. The pseudo code for control the general warming and cooling framework can be composed as.

When asking temperature > real-time temperature Heating element = 1 for (asking temperature + 1 Degree Celsius) Cooling element = 0 for 1 minute When asking temperature < real time temperature Cooling element = 1 for (real-time temperature – 1 Degree Celsius) Heating element = 0 for 1 minute

A buzzer is turned on when unexpected or large temperature is found in the system can be cause to damage industry. Figure 1 shows block diagram of total system.

# 14.2.5 Accident Alerts in Modern Traffic Signal Control System – Camera Surveillance System:

# > Introduction

in the present world as the populace builds step by step the quantities of vehicle likewise increments out and about and expressways. This outcome in more mishap that prompts the gridlocks and public not get help momentarily. This issue is because of rider's helpless practices, for example, speed driving, smashed driving, riding with no head protector insurance, riding without adequate rest and so on . So street security is one issue that needs exceptional attension. In a large portion of the mishap cases, the casualties lose their lives as a result of inaccessibility of clinical offices on the opportune time. The urgent time between the mishap and getting casualty clinical consideration can regularly be the distinction among life and demise. It is hard to tell that a mishap has happened and to find the position where it is occurred. To settle prob- lem like these, this mishap recognition and detailing framework is utilized to save the lives by making the clinical offices showing up on schedule.

In this paper we are built up a remote framework utilizing MEMS accelerometer and GPS/GSM for mishap discovery and re-porting. On the off chance that any mishap happens, this remote gadget will send computerized message to Crisis clinical benefits (EMS) and relative giving the specific situation of where the accident had happened. So they can give appropriate clinical treatment to patients. This framework is utilized to record information identified with mishap like temperature information, position information and so on So it very well may be utilized to dissect the mishap effectively and to settle numerous questions identified with mishap, for example, protection settlements. This framework is likewise used to identify whether the driver was in intoxicated state and the vehicle would not

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beginning thereaf-ter. The entire framework depends on arm regulator. This control-ler is utilized to co-ordinate every one of the exercises in the framework.

#### > SYSTEM OVERVIEW.



The main objective of this work is to reduce the human death rate in road accident. The paper proposed a system to give quick assistance to the people who got the accident. The fall detection and reporting system for the vehicle can gain the attention because the system will save the life and give medi- cal treatment on time.

#### (F -96 System Overview)

The framework comprises of ARM7 miniature regulator unit, MEMS accelerometer, GPS gadget, GSM module, Temperature sensor, gas sensor and Liquor sensor. An Accelerometer is utilized to distinguish the speed increase. It is the fundamental sensor used to recognize the mishap. When the mishap is identified GPS gather the current position esteems which incorporate scope (N or S), longitude (E or W), date and time. The area esteems are given to microcon-trawler. Regulator gives this data to GSM module. By utilizing GSM module we can send the message to family mem-bers or EMS. Here the sequential correspondence interface UART is utilized for the correspondence between the microcontroller, GSM and GPS module. The RS232 correspondence stand-ard is utilized for the electrical sign qualities, for example, volt-age levels. This correspondence empowers highlight point information move. An elite 16/32 cycle microcontroller unit is utilized to measure and store continuous sign from the accelerome-ter and different sensor. Through Temperature sensor we can quantify temperature in vehicle and which is show on LCD consistently. Engine stop consequently when liquor is recognized through liquor sensor. Gas sensor is utilized for gas spillage identification and red Drove flicker when gas is distinguished. All the information of these sensor and GPS information are put away in memory card for investigation of mishap cause. The complete framework is set inside a vehicle which isn't noticeable to other people. We can imple-control and medical system.

#### > HARDWARE DESIGN

Hardware framework for accident detection and reporting is shown in fig. 2. Hardware consists of ARM, MEMS accelerom-eter, GSM modem, GPS device, temperature sensor, gas sensor and alcohol sensor.

#### > ARM7TDMI-S

it is a versatile processor designed for mobile devices and other low power electronics. The ARM7TDMI processor core implements ARM architecture v4T. The processor supports both32bit and 16-bit instructions via the ARM and Thumb instruction sets.

#### MEMS Accelerometer

An accelerometer is electromechanical device that measure acceleration forces. These forces may be static, like the con- stant force of gravity pulling at our feet, or they could be dy- namic-caused by moving or vibrating the accelerometer. Ac- celerometers are sensor or transducers that generally measures acceleration forces applied to body by being mounted directly on to a surface of the accelerated body. Accelerometer in terms of 'g' ('g' is acceleration measurement for gravity which is equal to 9.81 m/s<sup>2</sup>). It is useful in detecting motion of the ob- ject. The MMA7361L is 3-axis accelerometer. It is low profile capacitive MEMS sensor featuring low pass filter, temperature compensation and g-Select which allows for the selection among two sensitivities (1.5g / 6g).



MMA7361L mostly used for free fall detection, car crashes detection, tilt and motion sensing, text scroll, image stability etc.

#### > GPS Device

The Worldwide Situating Framework (GPS) is a space based worldwide route satellite framework (GNSS) that gives solid area also, time development altogether climate and times anyplace on the globe. At the point when individuals talk about a GPS, they generally mean a GPS collector. GPS utilized a star grouping of 27 earth circling satellites (24 in activity and three additional items on the off chance that one fizzles). These satellites, which are outfitted with nuclear tickers, send radio sign that contain their definite area, time and other data. The GPS satellites go about as a kind of perspective point from which beneficiaries on the ground identify their position. The basic route guideline depends on the action.ment of pseudo reaches between the client and four satellites.

Ground station accurately screen the circle of each satellite what's more, by estimating the movement season of the sign sent from the satellite four distances among beneficiary and satellites will yield precise position, course and speed. However three-territory estimations are adequate, the fourth perception is fundamental for addressing clock synchronization blunder between beneficiary and satellite. Whichever the modem is utilized it works dependent on the NMEA 0183protocol. Essentially, a GPS beneficiary decides four factors: longitude, scope, tallness what's more, time. The information can be taken in to the regulator by utilizing UART convention.

#### > Temperature Sensor

Temperature sensor is utilized to detect temperature of medium. The LM35 arrangement are accuracy incorporated circuit temperature sensor, whose yield voltage is directly corresponding to the Celsius (Centigrade) temperature. The LM35 doesn't require any outside alignment or managing to give run of the mill correctnesses of  $\pm 1/4$  °C at room temperature and  $\pm 3/4$  °C over a full - 55 to +150 °C temperature range. Ease is guaranteed by managing and alignment at the wafer level. The LM35's low yield impedance, direct yield and exact natural adjustment make interfacing to peruse out or control hardware particularly simple. It very well may be utilized with single force supplies are with in addition to furthermore, less supplies.

#### > Gas Sensor

A gas sensor is a mechanical gadget that recognizes or faculties a signal, state of being and synthetic mixtures. Gas sensor is a subclass of substance sensor. Gas sensor estimates the grouping of gas in its area. Here we are utilizing MQ-6 gas sensor. It has high affectability to propane, butane, LPG and gaseous petrol. The touchy material of MQ-6 sensor is SnO2. It has lower conductivity in clean air. At the point when the objective ignitable gas exist, the sensors conductivity is higher alongside the gas fixation rising.

SR no.	Name of	Quantity	Cost/Qty (RS)	Total
	Components			
1	Contactors and coil	1 Nos	250	250/-
2	Over load relay	1 Nos	300	300/-
3	Main contact	1 Nos	250	250/-
4	Relay coil connection	1 Nos	200	200/-
5	Thermal overload relay	1 Nos	300	300/-
6	Pushing start button	1 Nos	150	150/-
7	Release start button	1 Nos	150	150/-
8	Pushing stop button	1 Nos	150	150/-
9	Fuse	3 Nos	70	210/-
				1960/-

#### T -44 Cost estimation of DOL starter



# Chapter 15.

# Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society.

(For Allocated village development, villager's happiness, comfortable and for enhancement of the village) (With the Smart village development Concept As <u>Per Your Idea And Village Visit, modern technology with innovation).</u> with doing small changes, Period, Amount Expenditure and Benefit –

a) <u>Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.</u>

b) If possible, List the sources of the funding available with the Village gram panchayat:

#### a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.

Sr.No	Design Name	Period	Amount Expenditure	Benefit
8.1.1	ATM	Within 1 Year	1,04,752	• ATM design to help people in cash requirement & people not have to go any other location for it.
8.1.2	Solid waste management plant	Immediately	2,69,760	• To reduce a solid waste in village and make village clean.
8.1.3	Amphitheatre	Long term	2,27,850.5	• People of village gather for group activities, event, festivals and use for social purpose.
8.1.4	Grocery Store	Immediately	3,28,593.2	• Grocery and food products easily available for all villagers in every situation.
8.1.5	Cybercafé	Immediately	1,94,142	• People can easily connected with internet.
8.1.6	Entrance Gate	Within 1 Year	1,66,226.6	•For better esthetic entrance view; Ease of use; Availability of good approach road; etc.
13.1.1	Rain water harvesting	Immediately	15,451	<ul> <li>Increase ground water level.</li> <li>Water can be used during Scarcity of water.</li> </ul>
13.1.2	Death & Birth register center	Within 1 Year	1,72,265	• Currently the villagers are using panchayat office as center & having a problem for small area so with this design it can be solved.



13.1.3	PHC center	Long term	16,36,500	• Easier access for a patient: When emergency occurs in village related health they easily access to PHC.
13.1.4	Super Market	Within 1 Year	2,56,327	<ul><li>Increase availability of Grocery products.</li><li>Increase facility of people.</li></ul>
13.1.5	Solar Street Light	Within 1 Year	24,500	• This technology can operate as a network with each light having the capability of performing on or off the network. Save the electricity.
13.1.6	Public Garden	Within 1 Year	4,05,185	<ul> <li>Provide fresh environment to village people.</li> <li>Children use playground to improve physical fitness.</li> </ul>
8.1.7	Automation street light	Within 1 Year	3,620.00	• This technology can operate as a network with each light having the capability of performing on or off the network. Save the electricity.
8.1.8	Smart Water Supply System	Immediately	49,000	• To save a water and make sure to do not waste large amount of water
8.1.9	Solar System	Immediately	1,89,000	• To use a renewable energy and save a electricity.
13.1.7	Electrical design in PHC	Long term	92,000	<ul> <li>People can easily use a PHC for their health and maintain.</li> <li>Also dr. can able to increase patient's health as soon as possible.</li> </ul>
13.1.8	Design of starter in agriculture	Immediately	1,21,000	• Farmers can easily use in underground sump for water
13.1.9	Electrical design for street light	Immediately	8380	• This technology can operate as a network with each light having the capability of performing on or off the network. Save the electricity

# b) If possible, list the sources of the funding available with the village gram panchayat

- Fourteenth Finance Commission Grant.
- Jilla Panchayat Sadasya Grant.
- Gram Panchayat Grant, etc.

# Chapter 16.

# **Survey By Interviewing With Talati And/Or Sarpanch:**

	SURVEY BY INTERVIEWING WITH TALAT	TANE	/OR SARPANCH
Vis	shwakarma Yojana: Phase VIII		
AL	LOCATED VILLAGE SURVEY		
	An approach towards "Rurbanisation for Vil	lage D	evelopment"
CH	ADTED 16		
СПА	ATTER-10		
Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	705	Hypercritterral, Cabour as
2	What are the chances of employment in village?	NO	and aret and
3	What are the special technical facilities in village?	105	and in 1999 2020 hes
4	Is any debt on village dwellers?	Mps	not the why surveyer
5	Are vinage people getting agricultural help?	YPS	
0	A to women heaving opportunity to work and income?	100	
0	Child airl advaction is approxiated in village?	Yes	
0	Easility of vessionation to shild is available in village?	des	in angenticidies [ Poli
9	A revillage people aware about child vaccination and done	JES	in an performent of them
10	to each and every child as per norms?	yes	
11	Women help line number information is provided to village people?	yes	
12	Is water scarcity in village? How many days per year?	NO	
13	Is village under any debt?	NO	
14	Is any serious issue due to debt from bank or any person happened in village?	NO	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	NO	a salar a strang a strange
16	Is any death of patient occurred due to unavailability of medical facility in village?	NO	
17	village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	-	
18	Is village improvement is observed in comparative scenario from past to present?	yes	many improved scenario
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	yes	very high in river a
20	Life Living standard of girls and women is appreciated and uplifted in village?	yes	- · · · · · · · · · · · · · · · · · · ·
Nod	al officer and students can add more questions. This is a s	ample. I	Having Minimum requireme
	Administration queries/Difficulties		0
	GTU VY Section	10	Znd
	Contact No - 079-23267588	della	ી સહમંત્રી
	Email ID: rurban@gtu.edu.in Eu 222421 vizileld	) 2121121	જથ ગ્રામ પંચાયત
	ની મોટી રાચણ જુથ ગાલ કરછ.	dl 9	Hisdl-528.


# Chapter 17.

# Irrigation / Agriculture Activites and Agro Industry, Altenate Technics And:

# \* Irrigation

# > WHAT IS IRRIGATION?

Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of crops.

# **IRRIGATION IN THE PAST**

- Farming was more focused on subsistence rather than selling products in the market.
- Labor intensive.
- Irrigated land used to be small.
- Highly dependent on weather.
- Inefficient.

# > Modern Irrigation

- More focus is now on selling the output.
- Machine intensive.
- More sophisticated.
- Rains are no longer the controlling force.

# **o** Different Type Of Irrigation

# • SURFACE IRRIGATION

In surface irrigation systems, the land is filled completely with water. In this way crops like rice are able to get ample amount of water.

# • METHODS OF SURFACE IRRIGATION

Controlled: Water is applied from the head ditch and guided by corrugations, furrows, borders, or ridges.

Uncontrolled- wild flooding.

- DISAVANTAGES-
  - Wastage of water
  - Soil erosion
  - Loss of minerals in soil
- DRIP IRRIGATION



(F-97 Surface Irrigation)

- Also known as trickle irrigation.
- Water is supplied at the roots of the plants, drop by drop.
- Most efficient and effective way of irrigation.
- Drip irrigation method can be either high tech computerized or labor intensive.



- Sprinklers
  - Water is piped through different locations in the field and is then distributed by high pressure sprinklers or guns.
  - Sprinklers are mostly installed on permanent risers.
  - Some sprinklers which rotate are called rotors.





- Center Pivot
  - Center pivot irrigation is a form of sprinkler irrigation.
- It consists of several segments of pipe which is joined together and is supported by trusses, mounted on wheeled towers with sprinklers positioned along it's length.
- It moves in a circular pattern and is fed with water from the pivot point at the center of the arc.



(F-99 Center Pivots)

- Disadvantages of sprinkler
  - Costly to install
  - Average cost is \$2682
  - Also, large number of sprinklers has to be installed in a field because area covered by a single sprinkler is not large.
  - Center pivot is also extremely costly.

# > Sub-Irrigation

- It has been used for many years where there is a lot of ground water available.
- It is a method of artificially raising the water table to allow the soil to be moistened from below the plants' root zone.
- Advantages are water and nutrient conservation, and labor-saving through lowered system maintenance and automation.
- It is similar to surface drip irrigation system.

Comparison				
TRADITIONAL METHOD OF	MODERN IRRIGATIONAL TECHNIQUE			
IRRIGATION	• Efficient because crops get correct			
<ul> <li>Inefficient as crops don't get water</li> </ul>	amount of water. The best example is drip			
properly.	irrigation system.			
• Very cheap because there is no	• Extremely costly. A lot of investment has			
installation cost.	to be made to get a proper irrigational			
• Labor intensive.	system.			
	• Machine intensive.			



- > Why is everyone using Modern Irrigational Techniques?
  - These days people prefer to use modern irrigational techniques because they are extremely efficient and effective.
  - Modern irrigational techniques are also pivotal in increasing the crop yield.
  - Also since these days farming is done with the help of fertilizers, crops need a certain amount of water to grow properly.

# > OUR VIEW ON USING MODERN IRRIGATIONAL TECHNIQUES

- According to me, modern irrigational techniques should be used and promoted because they save a lot of water.
- For example: drip irrigation, if done properly can save upto 95% of water.
- Also modern irrigational methods are important because of scarcity of water and increasing demand for food crops.
- Modern irrigational techniques are also cost effective, if done on a large scale.

# Agriculture Activities

# > What Is Agriculture?

Agriculture, also called farming or husbandry, is the cultivation of animals, plants, fungi, and other life forms for food, fiber, biofuel and other products used to sustain human life.

All humans depend on agriculture for food. Urban-industrial societies depend on the base of food surplus generated by farmers and herders. Without agriculture there could be no cities, universities, factories, or offices.

Agriculture: the principal enterprise of humankind through most of recorded history. Today remains the most important economic activity in the world. Employs 45 percent of the working population. In some parts of Asia and Africa, over 80 percent of labor force is engaged in agriculture

# > What is Modern Agriculture?

Modern agriculture is a term used to describe the wide type of production practices employed by American farmers. It makes use of hybrid seeds of selected variety of a single crop, technologically advanced equipment and lots of energy subsidies in the form of irrigation water, fertilizers and pesticides.

Modern Agriculture

- More than 90% of farmers today work using the most innovative practices and growing techniques to produce enough food, fuel and fiber for a growing world, while minimizing their environmental footprint at the same time.
- The term "modern agriculture" depicts their commitment to innovation, stewardship and meeting the global food challenge all at once there is nothing conventional about that.

# Traditional Agriculture

Perhaps the most important difference between the categories is the way farmers see themselves and their roles. Traditional farmers, for example, often say that they seek to work effectively with resources at hand. That is, they use the land, rainfall, seeds, tillage methods and power sources they have to produce what nature offers. Conventional processes are used to till the land, select and plant seeds, protect plants from competing plants and animals and gather the harvest. Surpluses are marketed through nearby outlets. Such producers frequently report only limited capacity to change these processes and some seek to avoid.



# > Why Modern Agriculture is Important?

By 2050, the world's population is expected to grow to nearly nine billion the equivalent of two more China's while the ratio of arable land to population continues to decrease.

The United Nations Food and Agriculture Organization predicts that global food production will double by 2050, and 70 percent of the world's additional food needs can be produced only by adapting new agricultural technologies.

In view of all these challenges, modern agriculture enables farmers to utilize new innovations, research and scientific advancements to produce safe, sustainable and affordable food.

The significant hunger and malnutrition that persist in many parts of the world would have been far worse had agricultural systems not grown and developed as they did.

More people the world over eat more and better because of modern agriculture. Increased production continues to enable steadily improving diets, reflecting increased availability of all foods, dietary diversity and access to high-protein food products.

#### > Types of Agriculture

- Peasant/Subsistence
- Commercial

Subsistence farming, or subsistence agriculture, is a mode of agriculture in which a plot of land produces only enough food to feed the family or small community working it.

SF – the provision of food by farmers only for their own family or the local community without any surplus.

Commercial farming - The production of crops for sale, crops intended for widespread distribution to wholesalers or retail outlets (e.g. supermarkets), and any non-food crops such as cotton and tobacco.

Includes livestock production and livestock grazing. Commercial agriculture does not include crops grown for household consumption (e.g backyard garden or from a vegetable garden or a few fruit trees.)

Occurs on a large, profit making scale. These farmers seek to maximize yields per hectare.

Major contrasts between "modern" and "smallholder" rice farming			
Modern Farming:	Smallholder farming:		
• Large / intermediate scale	• Small – variable scale		
Commercial	• Self sufficiency – surplus		
Mechanised	Mainly manual		
• External inputs (seeds, ag.chemicals)	• Local inputs (seeds, manure, compost, et c.)		
Capital intensive	Labour intensive		

# Modern Agricultural Revolutions

Technology allows much greater production (surplus) with less human labor, but has high social and environmental costs.

Metal plows, Reapers, Cotton Gin Tractors (Internal Combustion Engine), Combines, Chemical Pesticides/Fertilizers, Hybrid crops, The Green Revolution, Genetically modified crops.



#### Classifying Agricultural Regions

Mixed Crop and Livestock Farming, Dairy Farming, Grain Farming, Livestock Ranching, Mediterranean Agriculture, Truck Farming.

#### > Green House

A greenhouse (also called a glasshouse) is a building in which plants are grown with perfect climatic conditions. Used to overcome shortcomings in the growing qualities of a piece of land, such as a short growing season or poor light levels, and they can thereby improve food production in marginal environments.

#### **\*** Agro Industry

#### > Introduction

Agro-based industries are those industries which depend on agricultural products as raw materials . ex: cotton textile industries use cotton as raw material and then process them to make dresses.

#### Definition:

'Agro Industry' means units which add value to agricultural products, both food and non-food, by processing into products, which are marketable or usable or edible or by improving storability or by providing the link from farm to the market or part thereof.

#### **OBJECTIVES:**

To increase the value addition and reduce wastages, thereby increasing the income of farmers and delivering better quality products to consumers. To create rural employment and improve quality of life of rural people. To assist small-scale agro based units to remain competitive in global markets. To increase export of value added agri products.

Indian Scenario:

The Indian Agribusiness is about to reach USD 300 billion in 2015. The Food Processing Industry is estimated to be worth around USD 67 billion and expected to increase to USD 175 billion by 2025. The processed food sector has a potential of attracting USD 33 billion investment. About 6% of the total Indian produce is processed. There are over 25,000 registered units in the sector with investments of Rs.840 billion. India accounts for about 15.5% of the 890MMT of the total global vegetable production. India exported fruits and vegetables worth Rs.38.56 billion which comprises of fruits worth Rs.26.35 billion and vegetables worth Rs.12.21 billion. India has 52% cultivable land compared to 11% world average, India has 1.84 million sq.km of arable land, which is more than that in China, USA and Japan. India is among 15 leading exporters of agricultural products in the world. India's exports amounted to USD 23.2 billion with a 1.7% share of world trade in agriculture in 2010. Expected to rise to 5% by 2014.

#### $\circ$ Textiles

The textile industry in India occupies a unique position in our economy contributing to nearly a third of the country's export earnings. It is one of the oldest and most widespread industry in India. This industry varies in its scale of operation from handloom weavers in villages power loom units of moderate sizes to large mills employing hundreds of workers. This industry includes manufacturers, suppliers, wholesalers and exporters of Cotton Textiles, Handloom, and Woollen Textiles etc.

The textile industry in India has the vast potential for creation of employment opportunities. The number of textiles manufacturers, suppliers, wholesalers and textiles exporters in India has increased rapidly after independence. Today, handloom and cotton textiles exports in India is counted among the most important sectors.



# Importance of Textile Industry

Premier Industry of India

More than 2 crore of people - 40% of the country's labour force directly or indirectly depend on this industry.

India is the 3 rd largest cotton textile manufacturing country of the world after USA and UK.

India is the 3 rd largest exporter of cotton textiles after Japan and USA

#### • Woollen Industry

The Woollen Industry is one of the oldest textile industries in India. It was an important industry during old times. The first woollen mill was setup in Kanpur in 1876. Today the main centres are Punjab, Amritsar and Ludhiana. Maharashtra, UP and Gujarat also manufacture woollen products. The woollen industry is not so well developed as the cotton industry in India.

Requirements.

1. Animal Fibers: Raw materials consist of Wool from animal fiber. The animal fiber comes from sheep found in the states of Jammu and Kashmir, U.P, Punjab.

2. Chemicals: Chemicals for dyeing and coloring are manufactured in the large cities in these states.

3. Fresh water: Fresh water is available from the numerous mountain streams along the foothills of the northern mountains.

#### • Jute Industry

The second most important textile industry in India, Mainly exists in West Bengal, Kolkata is one of the most important centers of production, Andhra Pradesh another important producing state.

#### > CONCLUSION

Gujarat is a leading producer of various agricultural crops & agro industry within India as well as worldwide so there would be a Vast potential for production and export of banana, mango, okra, brinjal, Tomato also for cultivation of medicinal and aromatic plants which has shifting consumer's preference and develop infrastructure in South Gujarat. Small- and medium-scale agro-processing enterprises play a vital role in the national economic development of Gujarat and as well as of India.



# Chapter 18.

# Social Activities – Any Activates Planned By Students e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER:

As we know, we can do many things in Social Activities like Teaching & learning camp for uneducated people of village as well as for children. And also does awareness camp, in this situation of COVID-19.

We sought permission from the panchayat for social activities like awareness camps but some panchayat's authorized person not allow such a camps in view of this situation. They told to us we can't give permission for this type of activities.

So that we thought, in this situation of COVID, we do something different for awareness about vaccination, so we told to panchatay to create a whatsapp group for village people with help of some villagers and authorized person, and we shear a information about vaccination, location of center and etc. we help people in registration of vaccine and teach them, how to book their slot of vaccination.

So here, we share some screenshots of whatsapp group.





	ng	Ina	<u>I C</u>	opy		n ha	ard	bC	<u>)un</u>	d re	ep	ort):
					1			- ala	d Curry		octi	onnaire
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Village: Moti- Rayan		G	iram Pa	inchay	at: _	JUOTI	- Ing	Ju	<u></u>		arui	
Block:			Dist	rict:	KO	ich ch	in	1	1	non		07
State: <u>GUJa Rat</u>	1		_LSC	onstitu	uenc	y: <u>tot</u>	126	1	MOt! -	Rage	in	0+
1. Family Identity and Size								-		Ma	ale/	
of Household	3 bha	i	Has	ibha	u	Guelle	ui			Fei	male	M
SECC Survey ID:			Far	nily e	5	Ove 18	r 4	6 18	to 8	1 0n 6	der	-
2. Category & Entitlement D	etails (	Tick as	approj	oriate)								
Social o 0 o life	1. A	II Adul	ts dults			1	Yes	Kisa	n dit			
Category <sup>1</sup> SCBC Insurance	3, N	one			AADI	2.	No	Card	t t	res / WHO	-	
Poverty Status 1. \BPL Health	1. A 2. S	ll Adul ome A	ts dults		RSBY	1.	Yes	MGI Job	NREGS Card			
Year <sup>2</sup> : 2. APL Insurance	3. N	one	Antuo	dava	DDI	2.	No	Num	nber	an in the	far	vilv
PDS (If NFSA is implemented)	Anna	purna	Antyo	daya	Prior	ity (	Other	men	nber of	an SHG	? Yes	/No
2. Adults (above 18 years)												
Name		Age	Sex M/F/	Disabil Status	ity	Marital Status <sup>3</sup>	Educat Status	ion	Adhaar Card	Bank A/C	Soc Sec	ial urity
Ramila hen 11. Fred	lati	44	O F	Y/N N	10	malied	10th		(Y/N) 4	(Y/N)	Pen	sion <sup>5</sup>
Dill ya ben V. Gaether	u'	19	F	N		Not mild	Graduo	Wich	y			N
Vishal V. Bacheru	•	24	м	N		no t mu	Gredduc	the	y	y		N
2. Children from from 1						a the start	1	1	100		1	
Name -	up to .	Age	Sex	Disa	bility	Marital	Level o	f	Going t	o Curr	ent	Computer
and Walter at Standa			M/F/	O Y/N		Code*	Educati Code#	ion:	School /Colleg	Class	s I	literate
unilli u A DE :		15	E	1	1				(Y/N)			~
Maligra V. Ordelhand	1		F	1.	Perm			12.1	9	gr		ġ
and another the			- And		Gia	1. 1	20					
4. Children below 6 years	1				52.01	12						
Name		Age	Sex M/F/	Disab Yes/N	lility	Going	Going	De	-	Fully	M	other's
ention If Anly Others			0			School	AWC	Do	ne	nised	tin	me of
					2.11.	(Y/N)	Y/N	011	18-11	Y/N	Cł	nild's Birth
						2.46	and l					
						19 111	1	1				



#### SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5.	Hand	washing
----	------	---------

	Always		Som	Never	
After use of Toilet	Soap	Other	Soap	Other	
Before Eating	Soap	Other	Soap	Other	

#### 6. Use of Mosquito Net

Children: Yes / No Adults: Yes / No

#### 7. Do members take Regular Physical Exercise

	Yoga	Games	Other Exercises
Adults	Yes/No	Yes / No	Yes / No
Children	Yes / No-	Yes / No	Yes / No

#### 8. Consumption of Tobacco

	Smoking	Chewing
Adults	M	N
Children	N	N

#### 9. House & Homestead Data

Own House: Yes/	No	No. of Rooms: 3BHW		
Type: Kutcha / Sen	ni Pucca	a / Pucca V		
Toilet: Private / Co	mmuni	ty / Open Defecation		
Drainage linked to	House:	Covered / Open / None		
Waste Collection Door System Collec		Step / Common Point / No ction System		
Homestead Land: Yes / No		Kitchen Garden : Yes / No		
Compost Pit: Individual/ Group/ None		Biogas Plant: Individual/ Group/ Norre		

#### 10. Source of Water (Distance from source in KMs)

Source of Water	a di sana ang	Distance
Piped Water at Home	Yes/No	02
Community Water Tap	Yes / No	02
Hand Pump (Public / Priva	te) Yes / Nor	un manage
Open Well(Public / Private	e) Yes / No	ta ( tripes
Other (mention):	and the strength	Contractor

#### 11. Source of Lighting and Power

Electricity Connection to Household: Yes / No	
Lighting: Electricity/Kerosene/Solar Power	

# Mention if Any Other:

Cooking: LPG/Biogas/Kerosene/Wood/Electricity

#### Mention if Any Other:

If cooking in Chullah: Normal/ Smokeless

#### 12. Landholding (Acres)

1.	Total	5	2. Cultivable Area	5
3.	Irrigated Area	5	4. Uncultivat Area	ole _

# 13. Principal Occupations in the Household Livelihood Tick if applicable Farming on own Land ✓ Sharecropping /Farming Leased Land ✓ Animal Husbandry Pisciculture Fishing Skilled Wage Worker Unskilled Wage Worker Salaried Employment in Government Salaried Employment - Private Sector Weaving Other Artisan(mention) ✓

Other Trade & Business (mention) also other Business

#### 14. Migration Status

Does any member of the household migrate for Work: <u>Yes / No.</u> If Yes <u>Entire Year / Seasonal</u> Does anyone below 18 years migrate for work: Y/N

#### 15. Agriculture Inputs

Do you use Chemical Fertilisers	Yes/No
Do you use Chemical Insecticides	Yes/No
Do you use Chemical Weedicide	Yes/No-
Do you have Soil Health Card	Yes/No
Irrigation: None/ Canal/ Tank/ Bor	ewell/Other
Drip or Sprinkler Irrigation: Drip /S	prinkler / None

#### 16. Agricultural Produce in a normal year (Top 3)

Name	Unit	Quantity
Cotton	49	3000
Penuts	49	1800

#### 17. Livestock Numbers

Cows: 1	Bullocks: -	Calves:
Female	Male	Buffalo
Buffalo:	Buffalo:	Calves:
Goats/	Poultry/	
Sheep:	Ducks:	Pigs:
Any other: Ty	pe	No
Shelter for Live	estock: Pueca / Ku	itcha / None
Average Daily	Production of Mil	k/Litroch

#### 18. What games do Children Play

- Uabbadi

- chicult & some indoos gumes

19. Do children play musical instrument (mention)

Schedule Filled By: Principal Respondent: Date of Survey:



Г

. Ba	sic Information		
	a Gram Danaharata / a / i Danika )		
	a. Gram Panchayat: <u>MOEI - ROYUN</u>		
	b. Block:		
	c. District: <u>Kachchh</u>		
	d. State: GUJATAt		
	e. Lok Sabha Constituency: total :- 26 /	cti-Rayan:	01
	f. Number of Wards in the Gram Panchavati		0.1
	Number of Walds in the Grain Panenayat:		
	g. Number of Villages in the Gram Panchayat:	A state of the sta	
	h. Names of Villages:		and the second
	Moti - Ruyun		
	Service as a service of the service of the		
De	mographic Information	han I	- Denne
De	mographic Information mber of Total		Provingenter
De Nu Ho	mographic Information mber of Total useholds <u>JUUU</u> Population <u>И766</u> Male	2367	Female 2399
De Nu Ho	mographic Information mber of Total useholds <u>ゴルルム</u> Population <u>ル구66</u> Male HHs 구6  ST HHs ユバチ OBC	2367 HHs 3971	Female <u>2399</u> Other HHs
De Nu Ho SC	mographic Information mber of Total useholds <u>JUUU</u> Population <u>U766</u> Male HHs <u>768</u> ST HHs <u>117</u> OBC	<u>2367</u> HHs <u>3971</u>	Female <u>2399</u> Other HHs
De Nu Ho SC	mographic Information mber of Total useholds <u>JUUU</u> Population <u>U766</u> Male HHs <u>768</u> ST HHs <u>177</u> OBC cess to Infrastructure / Facilities / Services	<u>2367</u> HHs <u>3971</u>	Female <u>2399</u> Other HHs
De Nu Ho SC	mographic Information mber of Total useholds <u>ゴルルム</u> Population <u>ルギ66</u> Male HHs <u>768</u> ST HHs <u>127</u> OBC cess to Infrastructure / Facilities / Services Infrastructure Facilities / Services	2367 HHs_3971 Located within	Female <u>2399</u> Other HHs
De Nu Ho SC	mographic Information mber of Total useholds <u>ゴルルム</u> Population <u>ルブ66</u> Male HHs <u>ブ6</u> ST HHs <u>1ℓ</u> OBC cess to Infrastructure / Facilities / Services Infrastructure Facilities / Services	2367 HHs 3971 Located within the GP Yes (Y)/No (N)	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office
Dee Nu Hoo SCC Acc	mographic Information mber of Total useholds <u>ゴルルム</u> Population <u>ルギ66</u> Male HHs <u>768</u> ST HHs <u>127</u> OBC cess to Infrastructure / Facilities / Services Infrastructure Facilities / Services ANM/ Health Sub Centre	2367 HHs_3971 Located within the GP Yes (Y)/No (N) y	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office
Det Nu Ho SC Ac a. b.	mographic Information mber of Total useholds <u>JUUU</u> Population <u>U766</u> Male HHs <u>768</u> ST HHs <u>127</u> OBC cess to Infrastructure / Facilities / Services Infrastructure Facilities / Services ANM/ Health Sub Centre Nearest Primary Health Centre (PHC)	$\frac{2367}{\text{HHs} 3971}$ $\frac{\text{Located within the GP Yes}}{(Y)/\text{No}(N)}$ $\frac{y}{N}$ $N$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 k/M</u>
De Nu Hc SC Ac	mographic Information         mber of       Total         useholds       104       Population       1466       Male         HHs       168       ST HHs       127       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         ANM/ Health Sub Centre       Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)       Nearest Community Health Centre (CHC)	$\frac{2367}{\text{HHs}}$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 k/A</u> <u>03 k/A</u>
De Nu Hc SC Ac a. b. c. d.	mographic Information         mber of       Total         useholds       JUUU       Population       UF66       Male         HHs       F68       ST HHs       127       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         ANM/ Health Sub Centre       Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)       Nearest Post Office	$\frac{2367}{\text{HHs} 3971}$ $\frac{\text{Located within the GP Yes}}{(Y)/\text{No}(N)}$ $\frac{9}{3}$ $N$ $N$ $\frac{N}{3}$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 k/A</u> <u>03 k/A</u>
Det Nu Ho SC Ac a. b. c. d. e.	mographic Information         mber of       Total         useholds       JUUH       Population       UF66       Male         HHs       F67       ST HHs       177       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         Infrastructure Facilities / Services         ANM/ Health Sub Centre         Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)         Nearest Post Office         Nearest Bank Branch (Any)	$\frac{2367}{\text{HHs} 3971}$ $\frac{\text{Located within the GP Yes}}{(Y)/\text{No}(N)}$ $\frac{y}{V}$ $N$ $\frac{N}{Y}$ $\frac{N}{V}$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 kM</u> <u>03 UM</u>
Dee Nu Hc SC Ac a. b. c. d. e. f.	mographic Information         mber of       Total         useholds       104         Population       1466         HHs       127         OBC         cess to Infrastructure / Facilities / Services         Infrastructure Facilities / Services         ANM/ Health Sub Centre         Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)         Nearest Post Office         Nearest Bank Branch (Any)         Nearest Bank with CBS Facility	$\begin{array}{c} 2367\\ HHs 3871\\ \hline \\ HHs 3871\\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 k/A</u> <u>03 L/A</u>
Dee Nu Hc SC Ac a. b. c. d. e. f. g. b.	mographic Information         mber of       Total         useholds       JUUU       Population       UF66       Male         HHs       For       ST HHs       UT       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         Infrastructure Facilities / Services         ANM/ Health Sub Centre         Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)         Nearest Post Office         Nearest Bank Branch (Any)         Nearest Bank with CBS Facility         Nearest ATM	$\begin{array}{c} 2367\\ HHs 3971\\ \hline \\ HHs 3971\\ \hline \\ Located within the GP Yes (Y)/No (N)\\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 kM</u> <u>03 UM</u>
Dee Nu Ho SC Ac a. b. c. d. e. f. g. h.	mographic Information         mber of       Total         useholds       JUUH       Population       UF66       Male         HHs       F68       ST HHs       177       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         Infrastructure Facilities / Services         ANM/ Health Sub Centre         Nearest Primary Health Centre (PHC)         Nearest Community Health Centre (CHC)         Nearest Post Office         Nearest Bank with CBS Facility         Nearest ATM         Nearest Primary School	$\begin{array}{c} 2367\\ HHs 3971\\ \hline HHs 3971\\ \hline Located within the GP Yes (Y)/No (N)\\ \hline y\\ \hline N\\ \hline N\\ \hline y\\ \hline N\\ \hline N\\ \hline N\\ \hline N$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office 03 kM 03 UM
Det Nu Ho SC Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac	mographic Information mber of useholds $\exists u u u$ Population $u \forall \delta \delta$ MaleHHs $\exists u u u$ Population $u \forall \delta \delta$ MaleHHs $\exists \delta v$ ST HHs $\exists \ell \forall$ OBCcess to Infrastructure / Facilities / ServicesInfrastructure Facilities / ServicesANM/ Health Sub Centre Nearest Primary Health Centre (PHC) Nearest Post OfficeNearest Post Office Nearest Bank Branch (Any)Nearest Bank with CBS Facility Nearest ATM Nearest Primary School Nearest Middle School	$\begin{array}{c} 2367\\ HHs 3971\\ \hline HHs 3971\\ \hline \\ Located within the GP Yes (Y)/No (N) \\ \hline \\ y \\ \hline \\ N \\ \hline \\ y \\ \hline \\ N \\ \hline \\ N \\ \hline \\ y \\ \hline \\ N \\ \hline \\ y \\ \hline \\ y \\ \hline \\ y \\ \hline \\ y \\ \hline \end{array}$	Female <u>2399</u> Other HHs If located elsewhere (N), distance from the GP office <u>03 kA</u> <u>03 kA</u>
Dee Nu Hc SC Ac Ac a. b. c. d. e. f. g. h. i. j.	mographic Information         mber of       Total         useholds       JUUU       Population       UF66       Male         HHs       J68       ST HHs       117       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         Infrastructure Facilities / Services         ANM/ Health Sub Centre         Nearest Primary Health Centre (PHC)         Nearest Post Office         Nearest Bank Branch (Any)         Nearest Bank with CBS Facility         Nearest ATM         Nearest Primary School         Nearest Secondary School	$\begin{array}{c} 2367\\ HHs 3971\\ \hline \\ HHs 3971\\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Female $2399$ Other HHs       -         If located elsewhere       (N), distance from the GP office $03 \ k \ M$
Dee Nu Ho SC Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac Ac	mographic Information         mber of       Total         useholds       JUUU       Population       UF66       Male         HHs       J68       ST HHs       117       OBC         cess to Infrastructure / Facilities / Services       Infrastructure Facilities / Services         ANM/ Health Sub Centre       Nearest Primary Health Centre (PHC)         Nearest Post Office       Nearest Post Office         Nearest Bank Branch (Any)       Nearest Bank with CBS Facility         Nearest ATM       Nearest ATM         Nearest Middle School       Nearest Middle School         Nearest Higher Secondary School / +2 College       Nearest Higher Secondary School / +2 College	$\begin{array}{c} 2367\\ HHs 3971\\ \hline HHs 3971\\ \hline Located within the GP Yes (Y)/No (N)\\ \hline y\\ \hline N\\ \hline N\\ \hline y\\ \hline N\\ \hline \\ N\\ \hline \\ y\\ \hline \\ y\\ \hline \\ y\\ \hline \\ \\ \\ \\ \\ \\ \\ \\$	Female 2399 Other HHs If located elsewhere (N), distance from the GP office 03 kM 03 kM 03 4M
Det Nu Ho SC Ac a. b. c. d. e. f. g. h. i. j. k. 1.	mographic Information mber of useholds $\exists u u u$ Population $u \forall \delta \delta$ MaleHHs $\exists 6 \gamma$ ST HHs $\exists 17$ OBCcess to Infrastructure / Facilities / ServicesInfrastructure Facilities / ServicesANM/ Health Sub Centre Nearest Primary Health Centre (PHC) Nearest Community Health Centre (CHC)Nearest Post Office Nearest Bank with CBS Facility Nearest ATM Nearest Primary School Nearest Middle School Nearest Higher Secondary School / +2 College Nearest Graduate College	$   \begin{array}{c}     2367 \\     HHs 3971 \\   \end{array} $ $   \begin{array}{c}     Located within the GP Yes (Y)/No (N) \\     y \\     N \\     y \\     N \\     N \\     y \\     N \\     y \\     N \\     y \\     N \\     y \\     n \\ $	Female 2399 Other HHs If located elsewhere (N), distance from the GP office 03 kM 03 kM 03 UM



Saansad Adarsh Gram Yojan (Note: Please aggregate information)	(SAGY) Panchays om village level question	at Details S	urvey Questionnaire ever relevant)
			TC1

	Paracenter		lages atus'	(instars of	the C (Y)/I	P Yes No (N)	(N), distance the GP offic	e from e	
)	Agriculture Cred	it Cooperativ	ve Society	,		N			
,	Nearest Agro Ser	rvice Centre				N			
)	MSP based Gove	ernment Proc	curement (	Centre		N	0844		
1	Milk Cooperativ	e /Collectio	n Centre			y			
	Veterinary Care	Centre	3			N	OSUM		_
5	Ayurveda Centre					y			
	E – Seva Kendra					N			
ı	Bus Stop	ana la		101.07	1 10 10 10	4			
v	Railway Station		aniteged 1			N	59UN	1	_
w	Library					y			
x	Common Servic	e Centre	a service a la			3			
. N Ed . Nu . Nu Na	Number of Play Gr Aini Stadium : ucation, ICDS umber of Angan V umber of villages mes of such village	rounds in the Vo Yes Vadi Centres without Ang ges:	s(Y) /No ( s: <u>06</u> gan Wadi (	N) (Playgro	Pub ound with	equipment	Private	rangeme	nt)
. N Ed . Nu . Nu Na . Nu Na . S P N S	Jumber of Play G Aini Stadium :/ ucation, ICDS umber of Angan V umber of villages mes of such villag chools (Number) rimary Private: iddle Private: econdary Private:	Vadi Centres Wadi Centres without Ang ges: Primary Middle ( Seco Private:	Govt.: <u></u> Govt.: <u></u> Govt.: <u></u> Govt.: <u></u>	N) (Playgro	Pub nund with	equipment	Private	rangeme	nt)
. N Ed . Nu Na Na S P M S H	Aumber of Play G Aini Stadium : ucation, ICDS umber of Angan V umber of villages mes of such villag chools (Number) rimary Private: Aiddle Private: econdary Private: ligher Secondary	Vadi Centres Wadi Centres without Ang ges: Primary Middle ( Seco Private: tion System	Govt.: <u></u> Govt.: <u></u> Govt.: <u></u>	N) (Playgro	Pub nund with	equipment	Private	rangeme	nt)
· N Ed · Nu Na · S P N S H S H	Aumber of Play G Aini Stadium :/ ucation, ICDS umber of Angan W umber of villages mes of such villa; chools (Number) rimary Private: Aiddle Private: econdary Private: ligher Secondary . Public Distribu	Vadi Centres without Ang ges: Middle C Seco Private: tion System Private Contractor	s(Y) /No ( s: <u>O</u> C gan Wadi ( Govt.: <u>1</u> ondary Go High Women's SHG	N) (Playgro Centres vt.: er Secondar Gram Panchayat	Pub und with y Govt: _ Cooper ative	<i>No</i> Other         (Mention)	Private and sitting ar Location in GP (mention Location)	If outsid Location distance GP HQr	nt) e GP n & from s)
· N Ed . Nu Na Na Na S P M S H VI	Aumber of Play Gr Aini Stadium :/ ucation, ICDS umber of Angan V umber of villages mes of such village chools (Number) rimary Private: Aiddle Private: econdary Private: igher Secondary . Public Distribu Item Cereal (Rice/ Wheat/ Millets)	Vadi Centres without Ang ges: Primary Middle ( Seco Private: tion System Private Contractor	Govt.: <u></u> Govt.: <u></u> Govt.: <u></u> Maary Go <u></u> High	N) (Playgro Centres centres vt.: er Secondar Gram Panchayat	Pub nund with y Govt: Cooper ative	No equipment No Other (Mention) Gov7	Location in GP (mention Location)	If outsid Location distance GP HQr	nt) e GP n & from s)
. N Ed No No No No No No No No No No No No No	Aumber of Play Gr Aini Stadium :/ ucation, ICDS umber of Angan W umber of villages mes of such village mes of such village (hools (Number) rimary Private: Aiddle Private: econdary Private: diddle Private: Econdary Private: Cereal (Rice/ Wheat/ Millets) Kerosene	Vadi Centres without Ang ges: Primary Middle ( Seco Private: tion System Private Contractor	Govt.: <u>3</u> Govt.: <u>1</u> Govt.: <u>1</u> Modary Go High	N) (Playgro Centres vt.: er Secondar Gram Panchayat	Pub und with y Govt: Cooper ative	No equipment No Other (Mention) Gov7	Private and sitting ar Location in GP (mention Location)	If outsid Location distance GP HQr	nt) e GP n & fron rs)



	Paramet	er	V S	er differe Villages Status <sup>1</sup>	Names	ies & Serv s of Villag	es Co	overed	Names of Vill	lages n
a.	Piped Water St Coverage to Vi	apply illages	Cov y Not	ered Covered	Mot	í- RaYa	n	(billion)	Covere	ed
b.	Hand Pump Co in Villages:	overage	Cov y Not	ered Covered	yloi	ti - Ray	en	inny taring 10	(3-14 <i>A</i> /e	
c.	Coverage unde Covered Drain	r s:	Cove 2 Not	ered J Covered	Moti	- RUYU	n			
d.	Coverage unde Drains:	r Open	Cove	ered Covered	ically han	dic appeal y lage		115		
e.	Villages with Household Electricity Connection (Numbers)		Conn Y Not Conn	nected	Moti	- RCIFEN	h			
	II. Land and Irr Private Land	rigation Area in Acres	1	Commo	on Land	Area in Acres		Irrigati	on Structure	No.
a.	Cultivable	478	d.	Pasture	/ Grazing	-	g.	Check I	Dam	1
b.	Irrigated Land	N78	e.	Forests/	ons	10	h.	Wells/E	Bore Wells	3
c.	Un-irrigated	-	f.	Other C	ommon	1271	i	Tanks /	Ponds	3



IX. I	Parameters relating	to Households & Institutions		Number
			11 1 1111 1	Number
a)	Number of eligible	e Households for pension (old	age, widow, disability)	
b)	Number of House	holds receiving pension (old ag	ge, widow, disability)	
c)	Number of eligible	e Households who are not rece	iving pension	
d)	Number of House	holds eligible for Ration Card		ALL
e)	Number of eligible	e HHs having ration cards	Dias Vaiana)	
f)	Number of househ	nolds covered under RSBY (Ra	ishtriya Swasthya Bima Yojana)	-
g)	Number of HHs c	overed under AABY (Aam Aa	dmi Bima Yojana)	1.
h)	Number of active	Job Card holders under MGN	REGA	-
i)	Number of Job Ca	ard holders who completed 100	days of work during 2013-14	-
j)	Number of shops	selling alcohol		100
k)	Number of BPL f	amilies		140
1)	Number of landle	ss households		198
m)	Number of IAY b	eneficiaries		-
n)	Number of FRA <sup>2</sup>	beneficiaries		-
0)	Number of Comn	nunity Sanitary Complexes		~
p)	Number of House	cholds headed by single wome	1	10
(p)	Number of House	cholds headed by physically ha	ndicapped persons	8
r)	Total number of I	Persons with Disability in the	village	-
s)	Number of SHGs	a contraction and	tale cover Female	
t)	Number of active	SHGs	PC SHE ST EL Coher H	-
u)	Number of SHG	Federations		-
v)	Number of Youth	n Clubs		-
w)	Number of Bhara	at Nirman Volunteers		-
Nar	ne and Signature of	Surveyor and Respondent'	Yon (()that) from the vill	in kina
Gad	Thavi DHIREN J.		NUMBER	
Jade	g Ja vish Uhaisinh	R alle Aug Comme		
Zall	a indhajtsihn veyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	12 - 04 - 20 Date of Surve
2-1		તાલાટી સહ માટી રાયણ જુથ ક વિદ્યુવે કાર્યોક્સ	રો મંત્રી કરી મોટી IIH પંચાયત સોટી ર Referention of Forest Rights) Act, 200	લપ્રસાધ્ય રાયણ જુથ ગ્રાગ ાયણ, તા. માંડલ 6



- aste information		
a. Village: Moti Rayen		
b. Ward Number:		
c. Gram Panchavat: Mats - Pritan		
d Plack		
u. Diock.		
e. District: <u>UCCh Chh</u>		
f. State: <u>GUJaxeet</u>		1
g. Lok Sabha Constituency: <u>totu - 26 [</u> ,	ucti-Rayah = 0	- Kimili
h. Number of Habitations / Hamlets in the Gran	n Panchayat:	
i. Names of Habitations / Hamlets:	TAN INS	
Demographic Information         Number of       Total         Households       ZUNH         SC HHs       76 %         ST HHs       124	Male <u>2367</u> OBC HHs <u>3f71</u>	Female <u>2399</u> Other HHs
Demographic Information         Number of       Total         Households       1044         Population       4766         SC HHs       768       ST HHs       124         I. Access to Infrastructure/Amenities etc.	Male <u>2367</u> OBC HHs <u>3f71</u>	Female <u>2399</u> Other HHs
Demographic Information         Number of       Total         Households       JUNH         Population       U786         SC HHs       768         SC HHs       768         ST HHs       127         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services	Male <u>2367</u> OBC HHs <u>3871</u> Located in the Village Yes (Y)/No(N)	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village
Demographic Information         Number of       Total         Households       ZUWH       Population       U786         SC HHs       768       ST HHs       124         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School	Male $2367$ OBC HHs $3871$ Located in the Village Yes (Y)/No(N) $\Im$	Female <u>2399</u> Other HHs If located elsewherr (N), distance in km from the village
Demographic Information         Number of       Total         Households       Dopulation         Museholds       Dopulation         SC HHs       76 %         SC HHs       76 %         ST HHs       12 <sup>4</sup> I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School         b.       Nearest Middle School	Male $2367$ OBC HHs $3871$ Located in the Village Yes (Y)/No(N) 9 9	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village
Demographic Information         Number of       Total         Households       JUNH       Population       U756         SC HHs       768       ST HHs       124         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School	Male $2367$ OBC HHs $3f71$ Located in the Village Yes (Y)/No(N) 3 4 9 4 9	Female <u>23 99</u> Other HHs If located elsewherr (N), distance in km from the village
Demographic Information         Number of       Total         Households       Demographic Information         SC HHs       Total         SC HHs       T6 %         ST HHs       124         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School         d.       Kisan Seva Kendra	Male $2367$ OBC HHs $3871$ Located in the Village Yes (Y)/No(N) $\Im$ $\Im$ $\Im$ $\chi$ $\chi$	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village OS UM
Demographic Information         Number of       Total         Households       Dopulation       U7 & 6         SC HHs       76 & ST HHs       127         I. Access to Infrastructure/Amenities etc.       I.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School         d.       Kisan Seva Kendra         e.       Milk Cooperative / Collection Centre	Male $2367$ OBC HHs $3871$ Located in the Village Yes (Y)/No(N) 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village 08 U/M
Demographic Information         Number of       Total         Households       ZUUU       Population       U7 %6         SC HHs       76 %       ST HHs       124         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School         d.       Kisan Seva Kendra         e.       Milk Cooperative /Collection Centre         g.       Health Sub Centre	Male $2367$ OBC HHs $3871$ Conception of the $3871$ December $3971$ December	Female 2399 Other HHs If located elsewhere (N), distance in km from the village O & UM
Demographic Information         Number of       Total         Households       Depulation       U766         SC HHs       768       ST HHs       127         I. Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure/Amenities etc.         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School         d.       Kisan Seva Kendra         e.       Milk Cooperative /Collection Centre         g.       Health Sub Centre         h.       Bank	Male $2367$ OBC HHs $3771$ Conception $3771$ Village $23771$ Village $237711$ Village $237711$ Village $237711$ Village $237711$ Village $237711$ Village $237711$ Village $2377111$ Village $237711111111111111111111111111111111111$	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village OS UM
Demographic Information         Number of       Total         Households       Dopulation       U7 &          SC HHs       76 & ST HHs       127         I. Access to Infrastructure/Amenities etc.       I.         i.       Access to Infrastructure/Amenities etc.         a.       Nearest Primary School         b.       Nearest Middle School         c.       Nearest Secondary School         d.       Kisan Seva Kendra         e.       Milk Cooperative /Collection Centre         g.       Health Sub Centre         h.       Bank         i.       ATM	Male $2367$ OBC HHs $3871$ OBC HHs $3871$ Constraints $2871$ DBC HHs $3871$ DBC HHS $38711$ DBC	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village O & UM O & UM
Demographic Information         Number of       Total         Households       Dopulation       U7 %6         SC HHs       76 %       ST HHs       124         Access to Infrastructure/Amenities etc.       I.       Access to Infrastructure/Amenities etc.         i.       Access to Infrastructure / Facilities / Services       I.         a.       Nearest Primary School       Description         b.       Nearest Middle School       C.         c.       Nearest Secondary School       Milk Cooperative /Collection Centre         g.       Health Sub Centre       Health Sub Centre         h.       Bank       I.         j.       Bus Stop       Stop	Male $2367$ OBC HHs $3871$ OBC HHs $3871$ Concern and the Village Yes (Y)/No(N) Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Female <u>2399</u> Other HHs If located elsewhere (N), distance in km from the village O & UM O & UM O & UM O & UM



	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
1	Library	3	
m	Common Service Centre	N	084M Mandui
n	Veterinary Care Centre	N	OS UM Marily
ii. Ro a. H If 3 r	ad Connectivity labitations connected by All-weather Roads nention the name of the habitations where not a	vailable:	(1-All 2-None 3-Some,
iii. D a.Pip If 3	rinking Water Facilities ed Water Supply Coverage to Habitations: mention the name of the habitations not cover	1(1-All 2-N ed:	one 3-Some)
b.Ha If :	nd Pump Coverage in Habitations: 3 mention the name of the habitations not cover	(1-All 2-No	one 3-Some)
iv. C	Coverage of Habitations under Waste Manage	ement System	
a. C If	overage under Covered Drains: $2$ (1- 3 mention the name of the habitations not cover	All 2-None 3-	Some)
b. C If c. C If	Toverage under Open Drains: $\_\_\(1-All$ 3 mention the name of the habitations not cove Coverage under Doorstep Waste Collection: ( $[-All]$ f 3 mention the name of the habitations not cove	2-None 3-Some) ered:	ome)
7 <b>. Co</b> a. C I	<b>verage of Habitations under Electrification</b> overage under Household Connections: (1-All/ f 3 mention the name of the habitations not cove	2-None 3-Some ered:	2)
b.Co I	overage under Street Lighting: $All(1-All/2-N)$ f 3 mention the name of the habitations not cover	lone 3-Some) ered:	
	ports Facilities in the Village umber of Play Grounds in the Village (minimur	m size 200 square m	eters):
vi. S a.N b.M	imi Stadiumi res(1) nie (2)		
vi. S a.N b.M	ducation, ICDS		
vi. S a.N b.M vii. E a. N	ducation, ICDS		onderst references enforce) as the
vi. S a.N b.M vii. E a. N c. S	ducation, ICDS         Jumber of Anganwadi Centres:         Schools (Number)		anders releations enformes rest
vi. S a.N b.M vii. E a. N c. S	Init Standin res(1), res(2)         ducation, ICDS         Jumber of Anganwadi Centres:		anderst nikomost erfolitiker men sett
vi. S a.N b.M vii. E a. N c. S	Init Stadium res(1), res(2)         Iducation, ICDS         Number of Anganwadi Centres:		anders nicomos ententi la tra net
vi. S a.N b.M vii. E a. N c. S l l	Init Standin res(1), res (2)         Schools (Number)         Primary Private: Primary Govt.:         Middle Private: Middle Govt.:         Secondary Private: Secondary Govt.:	1	
vi. S a.N b.M vii. E a. N c. S	Init Standini Point Control (1) (100 (20)         Schools (Number)         Primary Private: Primary Govt.:		



SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category	Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
Land	478 Aches	d.	Pasture / Grazing Land	-	g.	Check Dam	7
0. Intigated Land	U7P	e.	Forests/ Plnatations	10	h.	Wells/Bore Wells	3
c. Un-irrigated Land	-	f.	Other Common Land	1271	I	Tanks /Ponds	3

ix.	Entitlement Related Parameters	
1	Number of active Job Card holders under MGNREGA	
2	Number of active Job Card holders who have completed 100 days of work	-
3	Number of shops selling alcohol	-
4	Number of BPL families	140
5	Number of landless households	198
6	Number of IAY beneficiaries	-
7	Number of FRA beneficiaries	-
8	Number of common sanitation complexes	-
9	Number of SHGs	-
10	Number of active SHGs	-
11	Existence of SHG Federation in the Village (Yes / No)	-
12	Number of Youth Clubs	0
13	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

		A STATE OF A	
Gudhani DHIREN J.			
Jadeja Vish VRajsihh			
zala Indrasit sinh			
	PRI Respondent (Preferably a ward member from a ward	Official Respondent (Preferably seniormost	12 - 04 - 2021
Surveyor	covered under the Village)	Gram Panchayat)	Date of Survey

3

OP ઉપ સરપંચ શ્રી મોટી રાયણ જુથ ગ્રામ પંચાયત મોટી રાયણ, તા. માંડવી-કચ્છ.

ત્તારી સહ્મત્રી મોટી રાયણ જુથ ગ્રામ પંચાયત તા માંડવી-કચ્છ,



# Chapter 20.

# TDO-DDO-Collector email sending Soft copy attachment in the report:

Gmail	dhiren gadhavi <mrkaviraj90@gmail.com></mrkaviraj90@gmail.com>
/ISHWAKARMA YOJANA: PHASE VII illage development "	I, an approach towards " Rurbanisation for
hiren gadhavi «mrkaviraj90@gmail.com»	Mon, May 31, 2021 at 4:50 PM
Draft To: ddo-kut@gujarat.gov.in, tdo.mandvi@gmail.co Do: Vadgama Nilesh <vadgama.vgi@gmail.com>, Visav salaindrajitsinh143@gmail.com</vadgama.vgi@gmail.com>	m rraj sirih Jadeja <visavraljadeja10@gmail.com>,</visavraljadeja10@gmail.com>
Respected sir,	
We are students of veerayatan institute of engineerin We are writing this mail to get support from you and in We are take part in VISHWAKARIMA YOJANA: PHAS devotement	g, studying civit & electrical engineering in B.E. 8th semester. Iform you about our last year project. 3E VIII, an approach towards "Rurbanisation for village
In this project our allocated village is MOTI-RAYAN (n village, & our allocated village. By surveying we know village. As per our surveying we prepared some sust village.	nandvi-kutch),first of all, we do a survey of smart village, ideal v about what facilities are needed for an ideal village & smart ainable design with their cost estimation for development of the
In this project we are discussing some modern techni smart transport system, concept of smart village, abor designs.	ques of development in agriculture, irrigation, agro industry, ut MOTI-RAYAN village, study area, methodology & solution with
Here we are attaching our project's soft copy.	
prepared by DHIREN J. GADHAVI (B.E.), CIVIL ENGINEERING VISHVRAJSINH D. JADEJA (B.E.) CIVIL ENGINEER INDRAJITSINH A. ZALA (B.E.) ELECTRICAL ENGIN	UNG EERING
NODAL OFFICER - MR. NILESH J. VADGAMA PROJECT GUIDE - MR. HARDIK RADIA	
THANK YOU, your faithful students.	
- pdf3. 8th11Moti-Rayan Vishwakarma Yojana I	Phase VIII Report 3 FINAL pdf
16006K	



# <u>Chapter 21.</u> <u>Comprehensive report for the entire village:</u>

We have visited the ideal village Kera and that visit helped us to know about the type of infrastructure needed by the village. With help of techno-economic survey and gap analysis and also studying / surveying our ideal village Kera , we were able to broadly define requirements of development for people of Moti-Rayan village.

In the Moti-Rayan village, the basic requirements like death & birth register centerl, any recreational area, etc. were not existing. By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area which will in turn reduce pressure on cities.

For development of moti-rayan village we make some suitable designs for villagers use within mind of sustainability.

Sr.No.	Village Name	Discipline	Part-I	Part-II
1.	Moti- Rayan	Civil	Solid waste management plant	Rain Water Harvesting
			ATM	Death & birth ragistar Center
			Amphitheater	PHC center
			Cybercafe	Public Garden
			Grocery store	Super Market
			Entrance Gate	Solar Street Lights
		Electrical	Automatic street light	Electrical design in PHC
			Smart water supply system	Design of starter in agriculture
			Solar system	Electrical design for street light

# (T-45 summary of designs)

The village Moti-Rayan has Various Infrastructure facilities, but there are not adequate. So there is needs to providing various infrastructure facility. Also providing changes in the inadequate facilities. The various facilities described in the observation should be provide for the villagers on the sustainable planning base. Due to availability of all type infrastructure facilities with employment for villagers the migration of peoplecan be easily prevent.

In the coming years the work in the field of EQRD (EARTHQUAKE RESISTANT DESIGNS) is very important to have safe structures which can take the effect of earthquake with less damage to the society.

Now days the construction technology and equipment's becomes very advanced. The advanced construction techniques such as under water construction, trenchless technology and many new innovative materials used in advanced construction techniques and equipment's to speed up the construction of any building works. So that we will discuss about few techniques and materials used in that.



#### Good things about village

There are many good things in village like proper road network, primary school, anganvadis, good panchayat office, humble people, and many more. By surveying we see that there was a good and clean approach road and streets. And sarpanch ji and atalati ji is always helped us, they are very supportive. when we went there first and talk about this project, they appreciate us and say we will help you as much as possible.

And when we talk about, we want to do some social activities in village and shear our whatsapp group idea they helped us in implement this situation.

#### Bad things about village

When we visited Moti-Rayan village for allocated village survey we must see that, a approach road of village was clean but some area of village are very dirty and a waste of village drop there, it decrease and this make the view of the village worse.

By viewing this type of view we decide to design a solid waste management plant. And make clean and fresh atmosphere for village.



The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make a real difference.

Students who want to work towards preservation of rural soul of country can do many things for our own good and environment. By implanting given design proposals, we can say that all the missing amenities are provided will stop the migration of rural people towards the urban area. This can cause reduce the load on urban areas as well as pollution in both sector can be minimized gradually.









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DATE 11/12/2020
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VishwakarmaYojna
Scale 1:50

Village: Moti-Rayan District: Kutch







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Vishwakarma Yojana: Phase VIII







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Vishwakarma Yojana: Phase VIII

Village: Moti-Rayan District: Kutch







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Vishwakarma Yojana: Phase VIII

Village: Moti-Rayan District: Kutch







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Vishwakarma Yojana: Phase VIII







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(plan of public gradern)



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