DETAILED PROJECT REPORT

ON

VISHWAKARMA YOJANA: VIII
AN APPROACH TOWARDS RURBANISATION
Kunariya Village
Kachchh District

PREPARED BY

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GOVERNMENT ENGINEERING COLLEGE
Bhuj, Kachchh Gujarat

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad– 382424
Gujarat

YEAR: 2020-21

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CERTIFICATE

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

Detailed Project Report for,

VILLAGE - KUNARIYA
DISTRICT- KACHCHH

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.

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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Date of Report Submission:	
Principal Name and Signature:	**Prof. (Dr.) B. N. Suthar**
VY-Nodal Officer Name and Signature:	**Prof. Jay Brahmkhatri**
Internal(Evaluator) Guide Name and Signature:	**Prof. Gautam Bhatt**
College Name:	**Government Engineering College, Bhuj**
College Stamp:	

ABSTRACT

Gujarat Technological University is allotted important and prestigious project of Vishwakarma Yojana by the Govt. of Gujarat through Commissioner ate of Technical Education for the year 2012-13. Also it is proposed to frame "Vishwakarma Yojana" to provide the benefit of real world experience and simultaneously apply technical knowledge in the development of rural infrastructure planning & management by students of GTU. The contribution and the hard work by GTU students has made this project going on a smooth sail and indeed will be a great success.

About 68.84% of India's population, or 833.1 million Indians, live in its 236,004 villages. More than 85% of these villages are in the plains or on the Deccan plateau. The average village has 200-250 households, and occupies area of almost 5 sq. km. Most of this is agricultural land and it is typical to find all the houses in one or two clusters. Villages hence are spaced around 2-3 km apart, and spread out in each direction from the market towns. The market centers are hence typically spaced 30-40 km apart. Such centers serve a catchment of around 250-300 villages in a radius of almost 20 km. As the population and the economy grow, several large villages are continuously morphing to towns and market centers. Around 65% of the State's population lives in rural areas. People in the rural area should have the same quality of living as is being enjoyed by the one living in sub urban and urban areas.

Here by, we are allocated the Kunariya village of Kachchh District. This village is almost 20 km. north from the Bhuj Taluka touching the state highway connecting Bhuj and White Rann of Kachchh.

Here, local language of Kunariya is Gujarati and Kutchi. According to census 2011, the population of this village was 3521 having 1817 male population and 1704 female population. Area of this village is approx. 5563 hector having 3674 hectors of agricultural land. There is no facility of any supermarkets, street lights, secondary schools, hospitals, libraries and many more.

Our main aim is to develop this village and to make itself reliant and it should not be dependent on any other village for its basic requirement. Also as a result, the migration rate will decrease.

ACKNOWLEDGEMENT

We are highly indented to **Gujarat Technological University**, Ahmadabad for providing us such opportunity to work under Vishwakarma Yojana to get real work experience and applying our technical knowledge in the development of Villages.

We wish to express our deep sense of gratitude to **Prof. (Dr.)Navin Sheth**, **Hon'ble Vice Chancellor, Gujarat Technological University-Ahmadabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N.Kher**, **Registrar and Gujarat Technological University-Ahmedabad** for giving us complete support.

We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

We express our sincere thanks to **DDO, TDO, Sarpanch, Talati and staff members of Ahmadabad** District for providing us with requisite data whenever we approached them. Especially our thanks are to all villagers and stake holders for their support during Survey.

We are also thankful to our **Prof**. (**Dr.) B. N. Suthar sir principal**, faculties of our colleges for their encouragement and support to complete this project work.

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,

Mr. Jay Brahmkhatri Sir and Mr. Gautam Bhatt Sir of college Government Engineering College, Bhuj for their invaluable guidance, constant inspiration and active involvement in our project work.

We are also thankful to all the experts who provided us their valuable guidance during the work. We express our sincere thanks to, **Dr. Jayesh Deshkar, Hon'ble Director of Vishwakarma Yojana project and Principal, V.V.P Engineering College and Core Committee member of Vishwakarma Yojana projectProf(Dr.)Jigar Sevalia**,Professor, SCET, Surat, **Prof.K.L.Timani,** Associate Professor,VGEC, **Prof.Rena Shukla**,Associate Professor, LD Engineering College, **Prof.Y.B.Bhavsar,**Associate Professor,VGEC,**Prof.Jagruti Shah**, Assistant Professor, BVM Engineering College for providing us technical knowledge of this project work.

We are also thankful to **Ms. Darshana Chauhan, Vishwakarma Yojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

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Chapter 1
Ideal village visit Madhapar Kachchh Gujarat

1.1 Background & Study Area Location

Village-Madhapar
District-Kachchh
State-Gujarat
Pin-370020

Coordinates- 23.230127, 69.710821
Area-43.67 Sq. Km
Elevation (Altitude) - 105.156 m
Spoken Languages: Gujarati, Kutchi

Mistris of kachchh established 18 villages in kutch. Madhapar was one of them. The village is named after the name of Madhav Kanji Solanki who came to madhapar from village Dhaneti around the year 1473-1474. He was the 3rd successor of the Solanki Dynasty " Hemraj Hardas". They moved from the Halar area to the village Dhaneti and then to Madhapar. This area of madhapar is known as Junavaas(Old residence). These solanki or Kshatriyas were later known as Mistris due to their main occupations. They developed a lot; the temples, infrastructures and erection of other architects of kutch.

Madhapar is a town, with such a large population, some 3-4 Kms from the Bhuj City in the District Kachchh. It is the wealthiest town in the whole of South Asia with an avg. GDP of $1,32,000 per person. There are two large lakes in the village. There are numerous temples, with old and modern styles including Mahadev temple, Momai mora temple, Swaminarayan temple, Yaksh or Jakh Bautera temple.

Economic activity practiced here is mainly agriculture. Mostly, the agricultural products like corn, mangoes, sugarcane etc. are supplied to Mumbai. Mainly, the residents, resides and work abroad in UK, US and Canada, but they save & invest their money in India, that have made

Madhapar one of the richest villages ... the bank deposits of $ 200 crore. It is also considered as the barometer of NRI deposits. Also there are many national and international banks in a single village which makes it unique.

1.2 Concept: Ideal Village:

Concept of an Ideal Village is a village with a Self-Sustaining and independent income producing projects, Independent electrification system generated from non-fuel based devices, clean water facilities for drinking and irrigation purpose, affordable quality housings, primary and secondary schools, Medical facilities for citizens and animals both, proper sanitation system, Information Centre, bank, police station, retail outlet for household and agriculture needs, phone facility and connecting roads to nearby villages and towns.

1.2.1 Objectives

1. To provide global means to local needs
2. To use the potential of IT to maximize the benefits for the rural community
3. Analysis of the villages on various socio-economic parameters at a micro as well as macro level; improving the literacy rate of the villages by reducing the dropout rate
4. Maximizing the Employment Potential by providing the profiles of rural youth to the potential employers in India and abroad; improving the economic conditions of the Semi-skilled and Un-skilled labor by publishing their availability status on the Internet; providing updated information and databanks to the Government for better analysis and individual profiling.
5. Web-based Career Counseling for the rural community by providing information on various courses; providing databases on demand to the manufacturing organizations dealing in Agro-based products and implements like Tractors, Manures, and Fertilizers etc. to set up a Global Rural Development Grid (GRDG) by sharing information, ideas and solutions

1.2.2 Example / Live Case studies of ideal village of India

Dharnai, a small village with almost 2400 population is located near BodhGaya in Jehanabad district of Bihar. It didn't have any access to electricity. But few years ago, the villagers took it to their own hands and changed their fate forever. As if no one would take the charge, we just have to take it in our hands and work at our best. With the help of "Green peace", the village installed solar-powered micro-grid, which provides electricity to more than 450 households and 50 commercials all day long. The entire project cost was almost 3 crores, making Dharnai village, the India's first first fully and successfully solar powered village.

1.2.3The Idea of a model/Smart Village

In Smart villages, access to sustainable energy services is very important for development enabling the provision of good education , better health facilities, regular power supply, access to clean water, sanitation and nutrition, the growth of productive enterprise to increase the income, enhanced security, gender equality and democratic engagement. Unfortunately it is a fact that, in the world today, 1.3 billion people remain without access to electricity.

1.2.4 Ancient History Civil/ Electrical concept about Indian Village and other Countries Perspective about village and its new Development.

Punsari village is located in Sabarkantha district of Gujarat, India. Punsari is considered as India's one of the smartest villages. The village is located 80km away from the capital Gandhinagar. Punsari is about 20 km far from Parvati Hills. The village has the Panchayat system. The village extent is over 65 km. The land for agriculture is about 6 hectors. Also the non farming activity being practiced is dairy and cattle rearing. The village have undergone a great transformation under the panchayat system. There has been use of advanced technology in primary and secondary education. This village has wifi connection all over kept for everyone. Efforts are being made for the empowerment of women and also increasing the security in Punsari. Some of the facilities provided by Panchayat includes mineral water supply, sewage & drainage project, a healthcare centre, bank facilities and toll-free complaint reception service also. Also, recently, the village received the award of being the best Gram Panchayat in Gujarat. The village's model has been appreciated by the delegates of Nairobi and they are keen to replicate this model in Kenyan villages also. Hence this village sets the best example of the smart village and the technological development as compared to the other villages in India.

1.3 Detail study (Socio economic, physical, demographic and infrastructure details) of Ideal village / Smart Village with photograph

Economic

Madhapar is the wealthiest town in the whole of South Asia with an avg. GDP of $1,32,000 per person. Economic activity practiced here is mainly agriculture. Mostly, the agricultural products like corn, mangoes, sugarcane etc. are supplied to Mumbai.

Mainly, the residents, resides and work abroad in UK, US and Canada, but they save & invest their money in India, that have made madhapar one of the richest villages ... the bank deposits of $ 200 crore. It is also considered as the barometer of NRI deposits. Also there are many national and international banks in a single village which makes it unique.

Physical/Demographic Details

Coordinates- 23.230127, 69.710821 , Area-43.67 Sq. Km ,Elevation (Altitude)- 105.156 m

Infrastructure Details

. There are two large lakes in the village. There are numerous temples, with old and modern styles including Mahadev temple, Momai mora temple, Swaminarayan temple, Yaksh or Jakh Bautera temple. This is the village with inbuilt facility of rain water harvesting in almost all the houses. Mainly all the roads are of RCC is really the appreciable facility.

1.4 SWOT analysis of Ideal village / Smart Village

Strength

- Street lights
- Regular Electric Supply
- Water Tank
- Drainage Facility
- Transport Facility
- Best Housing Condition
- Banking Facility
- Primary and Secondary Schools
- Road Facility

Weakness

- Solar Street lights
- Roof Top Solar Generation
- Generation through Renewable
- Best Vegetable Market

Opportunities

- Solar Street Lights
- Water storage facilities
- Exporting Agricultural Products directly to foreign Countries

Threats

- Polluted
- Stray Cattles
- Depletion of ground water
- Less Greenery
- Design Concept

1.5 Future prospects of Development of the Ideal village / Smart Village

Future Prospects are to install solar, biogas or any other renewable energy sources as per availability of sources in village and more suitable source for the particular area. Also, the main aim of the village must be to make it environmentally sustainable.

- Automatic Solar Street lights
- Waste water treatment plant
- Bio Gas Plant
- Blood Bank
- Water Meter

1.6 Benefits of the visits of Ideal village / Smart Village

- To meet the villagers
- To meet the authorities
- To know about new initiatives and development plans
- To know identify the problems of the people

1.7 Electrical / Civil aspects required in Ideal village / Smart Village

- Generation of energy through renewable sources
- Waste Water disposal system

Chapter 2
ABOUT VILLAGE Literature Review– (Civil & Electrical Concept)

2.1 Introduction: Urban & Rural village concept

Urban village concept also caved urbanism was initially started in united state with smart growing ideas.

There are two types of urbanization:

1. Expanding the present cities or urban body by joining the nearby villages.
2. By independently increasing the population of the existing rural bodies.

Rural villages are just less developed villages or under developing villages having more or less population with inadequate or low facilities. Hence we have to develop it either by combining it with the neighbor town or city and to provide all the facility from the same. And the another way is to make it stand alone in all the facilities developed inside that village and also can be more developed than city. The development is only possible in the large population villages.

So, to convert such villages into the developed village is termed as "Urban Village". According to the census of 2011, of India, 833.1 million Indians (almost 68.84% of Indian Population) live in 640,867 different villages. From this, almost 236,004 villages have a population less than 500, so there is a possibility to merge nearby villages if geographical conditions are satisfied a, in order to focus on their development.

While there are 3976 villages having population more than 10,000, which can be developed independently with a concept of urban village or even can be merged with nearby cities to make the development easier. India is a huge country with such a large number of villages. Also India is a developing nation. So it is impossible to make India a developed nation without developing these rural areas. Also there are 18618 villages in Gujarat. Hence it is very important to develop these rural areas. We can develop it by two predefined methods; either by merging with the nearby city or by developing it independently.

Name	Population
City	50000 to 100000
Great City	100000 and over
Super City	More than 300000
Metropolis	1000000 and above
Mega Polis	5000000 and above

2.2 Importance of the Rural development

Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation.

Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.

The primitive task is to decrease the famine roughly about 70 percent of the rural population, implement sufficient and healthy food. Later, serve fair equipment of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication.

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

- By the Numbers in the US, the Census Bureau has classified a rural area as a town with less than 1,000 people per 2.6 sq. km and surrounding areas with less than 500 people per 2. Sq. km.
- A rural area is an open piece of land that has few homes or other buildings, and not very much population. A rural areas population density is very low. Many people live in a city, or urban area. Their homes and businesses are located very close to one another.
- In a rural are a, there are fewer people, and their homes and businesses are located far away from one another.

- Wildlife is more frequently found in rural areas than in cities because of the absence of people and buildings. In fact, rural areas are often called the country because residents can see and interact with the countries native wildlife.

- Agriculture is the primary industry in most rural areas. Most people live or work on farms or ranches. Hamlets, villages, towns, and other small settlements are in or surrounded by rural areas.

2.4 Scenario: Rural / Urban village of India population Growth

- As per Official Census, Population of Indian population have reached 121 Crore in 2011, which is increase of 17% from the earlier figure of 103 Crore of 2001. However, the population growth rate has been decreased but the actual population continues to rise. As per the estimates, it is being expected that India will be the most populous country by 2025 overtaking China.

- Population Census Data of Gujarat shows that the total Population of Gujarat is 6.03 Crore which is approximately 4.99% of total Indian Population. Literacy rate has seen an upward trend and is 79.31% as per 2011. Of that, male literacy is 87.23% while the female literacy is at 70.73%.

- Urban Population of Gujarat is 42.6%, which was 37.4% in 2001. Rural population in the state in 2011 was 57.4% which fall down from 62.6% in 2001.

- Ahmedabad is the most populated District in the State, with about 7.20 million people; 11.94% from 2001, followed by Surat with 6.07 million people, up 10.07%.

2.5 Scenario: Rural / Urban village of Gujarat as per Census 2011 and latest

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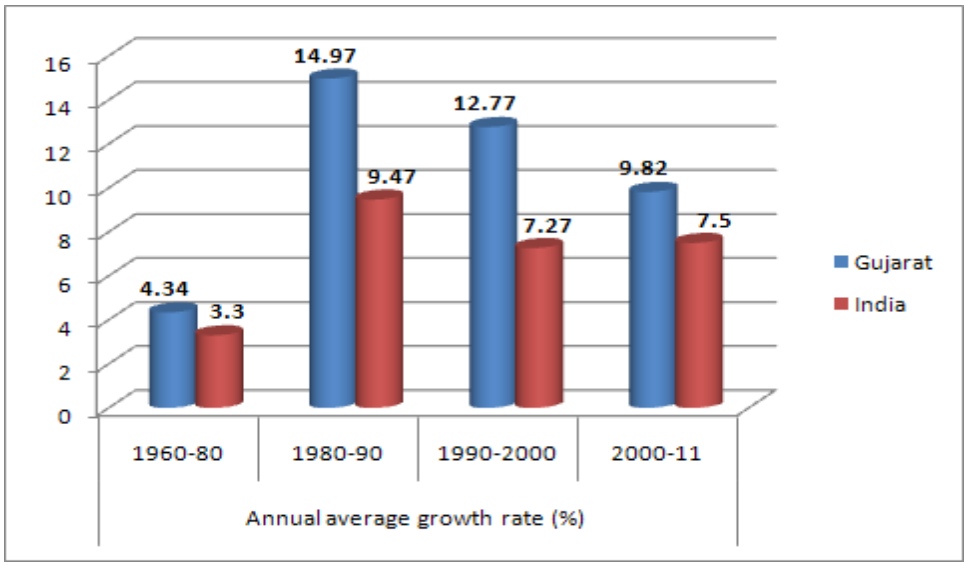


2.6 Rural Development Issues - Concerns – Measures

Education.

Education is an empowering right and one of the most powerful tools by which economically and socially marginalized children and adults can lift themselves out of poverty.

Empowering Girls.

When a girl has the opportunity to be educated and healthy, not only does she benefit, society as a whole benefits.

Environment.

Environmental is the major issue in rural area as well as urban area. Now a days peoples and governments are very well aware and taking the necessary steps toward sustainable cities.

Gender Discrimination.

Despite the fact that women in developing countries provide nearly 70 percent of the agricultural labour.

Health.

In 2016, there were almost 36.7 million people living with HIV/AIDS. Worldwide, 1.8 million

people became newly infected with HIV. This is the scenario of current society.

Hunger.

About 795 million people suffering from chronic hunger, 98 percent live in the developing world. Unlike famines that receive emergency-aid, chronic hunger is a silent, invisible, day-after-day condition

Poverty.

Poverty, food prices and hunger are inextricably linked. Poverty causes hunger. Not every poor person is hungry, but almost all hungry people are poor.

Measures:

- Rural development can be defined as "integrated development of the area an people through optimum development and utilization of local resources-physical, biological and human and by bringing about necessary institutional, structural, and attitudinal changes of rural public."
- Many Programs / Plans such as IRDP, DDP, DPAP, ITDP, NREP, SFDA, MFAL and TRYSEM etc. have been developed and implemented for raising socio-economic status of the rural people.
- Policy for developing uplifting the lifestyle of the farmers.
- Policy of rural industrial development - integration of farming and industries, farmer's Industrial co-operatives and industrial enterprises.
- Modernization of rural society and cultural policies and planning for transfer of loyalty and values from traditional technology to modem technology.

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

Economic, physical, and social infrastructures are inter-related components for a holistic and sustainable community development. Good and adequate social infrastructure is the key to achieve progressive communities. Social infrastructure can be defined as a system that creates a social safety net through the provision of health, education, public services and recreation.

The social infrastructure deals with the following aspects:

1. Health-care Facilities
2. Education Facilities
3. Socio-Cultural Facilities
4. Recreational Facilities & Open Spaces
5. Distributive Services
6. Miscellaneous Facilities.
7. Other Public-Semi-Public Facilities

i. Police , ii. Fire & Emergency Services , iii. Communication

2.8 Ancient / Existing Electrical concept study as a Literature Review for village development

- Rural electrification is the process of bringing electrical power to rural areas and remote areas. Rural communities are suffering from great market failures as the national grids fall short of their demand for electricity.

- GRID is an Indian start-up aimed at facilitating sustainable economic and social development through low cost energy solutions in rural areas. Outside of systems, GRID has utilized solar energy to solve a many of the issues that plague rural communities.

- GRID's filtration plant is able to provide much amount of clean water per day which helps to alleviate this issue and reduce the spread of water-borne illness. Additionally, the ease of distribution has reduced the amount of time spent collecting water, allowing for more time on productive tasks and a reduction in time poverty. Finally, GRID employs locals in the community to run the plants day to day operations. From the ground up, GRID's business model fosters the development of rural communities and they plan to scale their operations across India.

2.9 Other Projects / Schemes of Gujarat / Indian Government

1. **Bharat Nirman Yojana:**

It was launched in 2005 for building infrastructure and basic amenities in rural areas. It comprises of six components—

- Rural housing,
- Irrigation,

- Drinking water,
- Rural roads,
- Electricity
- Rural telephone.

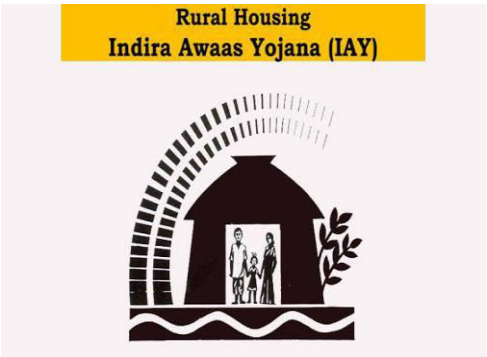
2. Pradhanmantri Adarsh Gram Sadak Yojana (PMAGSY):

- Rural connectivity is one of major goals of Bharat Nirman.
- About 6 lakh villages located in plain, hilly, desert, tribal pocket etc.
- Due to the improper planning some village having four roads for connectivity and some village not having any single road.

PRADHAN MANTRI
GRAM SADAK YOJANA

3. Indira Awaas Yojna:

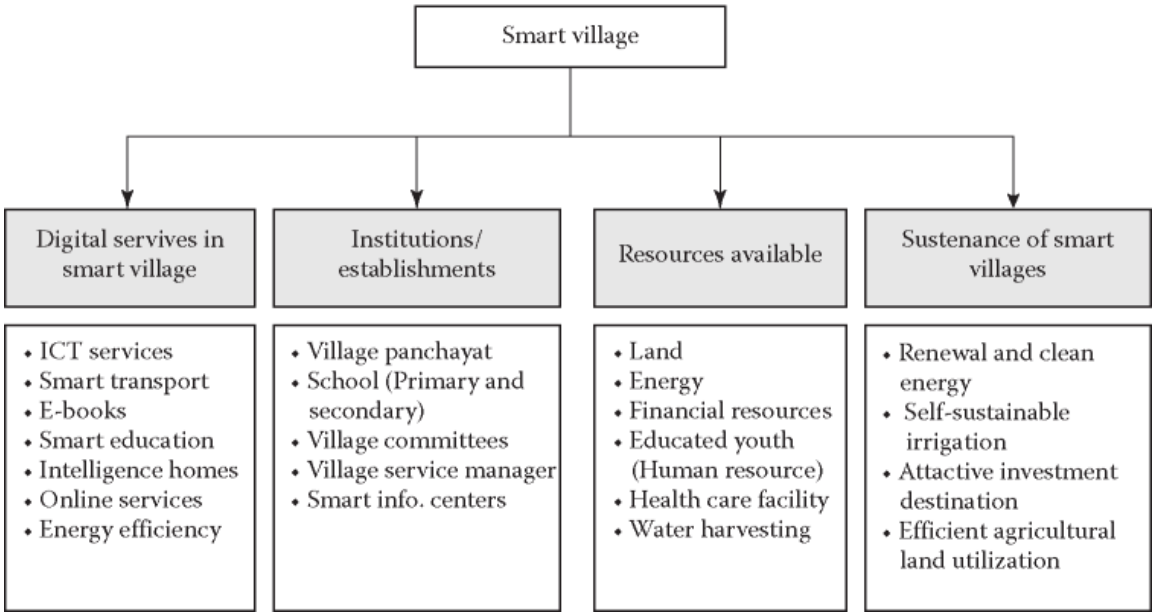
- The Indira Awaas Yojana is a public housing scheme that was introduced by the government in 1985, as a sub-scheme of the Rural Landless Employment Guarantee Program (RLEGP).
- This program aims to construct houses for free bonded laborers and individuals falling under the SC/ ST category. From 1994, the scheme also included others also to be benefited from this scheme.
- In 1996, the Indira Awaas Yojana has become an independent scheme undertaken by the Ministry of Rural Development. The focus of this scheme has broadened to include eradication of rural poverty and providing rural people with various development programs



Chapter 3
Smart Village Concept Idea and its Visit (Civil & Electrical Concept)

3.1Introduction: Concepts, Definitions and Practices

Definition: In Smart Villages, access to sustainable energy services is very important for development which enables the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhanced security, gender equality and democratic engagement.



3.2 Vision-Goals, Standards and Performance Measurement Indicators

Smart Cities Standards:-

- Effective governance and efficient delivery of services.
- International and Local targets, benchmarking and planning.
- Informed decision making and policy formulation.
- Leverage for funding and recognition in international entities.
- Transparency and open data for investment attractiveness.

- A reliable foundation for use of big data and the information explosion to assist cities in building core knowledge for city decision-making, and enable comparative insight.
- Evaluate the impact of infrastructure projects on the overall performance of a city.

Smart Cities Performance Measurement Indicators:-

- Electricity infrastructure.
- Uses of renewable sources like bio gas, solar etc.
- Smart primary health care 24 * 7.
- Metal road and streets.
- Smart primary and secondary education.
- Solar energy plant to preserve electricity at the village level itself.
- Proper sanitation, disposal of rain water.
- Hygienic drinking water and R.O. system.
- Connectivity through internet, Wi-Fi mobile tower.
- Availability of Banks, ATMs, post offices etc.
- Area for solid waste disposal and liquid waste disposal.

3.3 Technological Options

- Renewable power generation: As due to lack of power, there should be a power generating plant, generating power through renewable sources like solar plants, hydro power generation, wind turbines, etc.
- Waste water disposal system: Due to the lack of usable water, there should be a water disposal plant, which purifies the waste water for household usage.
- Automatic Street Lights: There should be automatic street lights having LDR sensors for power saving with solar panels at top reducing the load on Grid.

3.4 Road Map and Safe Guards

GNEP SAFEGUARDS TECHNOLOGY ROAD MAP

One of the initial tasks of the safeguards campaign GNEP (Global Nuclear Energy Partnership) was to perform safeguards enhancing study, in order to the development of a roadmap approach and identify the candidate technologies for both, advancement of the near term of current state-of-the-art and provide the foundational R&D required for revolutionary advancements.. A great need and its corresponding requirements initialize the starting point. For example, there is a need of direct measurement of Pu in spent fuel while the primary requirement is to measure the amount of Pu with an uncertainty lower than it is achievable with today's indirect methods i.e. approximately 5% on Pu mass. Also, in most of the cases, the need of road mapping is qualitatively clear, but assigning it, the quantitative requirements, is difficult. As for example, GNEP facility designs are still under development and systems analysis tools elaborates the concept of how instruments and methods interact in safeguards approach are being developed.

Once needs and the primary requirements are being identified, further the team processed the input from technologists at seven D.O.E national laboratories and various universities to create a list of technologies that may offer a solution to that need; some near-term and some that can be explored much more. In this spent fuel as say example, two of the particular technologies were neutron multiplicity combined with neutron albedo, and the lead "slowing down spectroscopy" technique. As a team, the defining potential for each particular technology was identified, as compared to competing and a baseline technology from today. In order to give an objective picture for all methods, key research questions that need to be addressed were also included.

3.5 Issues & Challenges

- **Education.**

Education is an empowering right and one of the most powerful tools by which economically and socially marginalized children and adults can lift themselves out of poverty.

- **Environment.**

Environmental is the major issue in rural area as well as urban area. Now a days, people and governments are very well aware and taking the necessary steps toward sustainable cities.

- **Health.**

In 2016, there were almost 36.7 million people living with HIV/AIDS. Worldwide, 1.8 million people became newly infected with HIV. This is the scenario of current society.

- **Hunger.**

About 795 million people suffering from chronic hunger, 98 percent live in the developing world. Unlike famines that receive emergency-aid, chronic hunger is a silent, invisible, day-after-day condition

- **Poverty.**

Poverty, food prices and hunger are interlinked. Poverty causes hunger. Not all poor people are hungry, but almost all hungry people are poor

3.6 Smart Infrastructure - Intelligent Traffic Management

Here, we will briefly discuss about Intelligent Traffic Management System.

Design Objectives

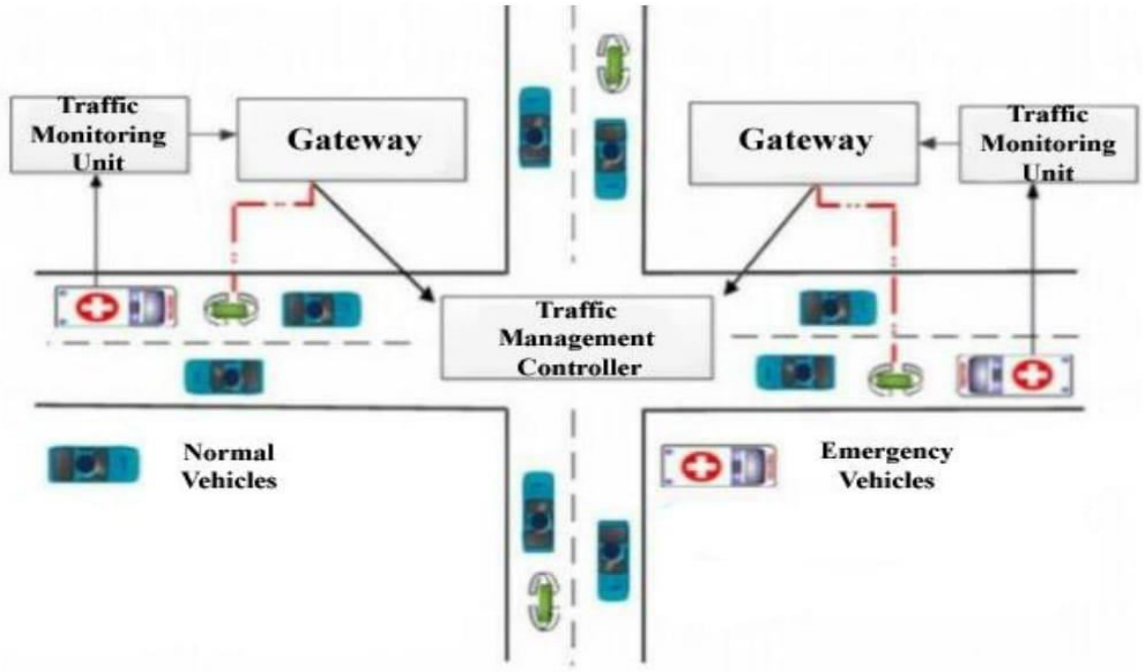
- Traffic Monitoring: It can be considered as one of the main part of a smart village. It allows the local authorities to monitor the flow of traffic pertaining to a particular area, route or street.

- Pollution Avoidance: Due to the increasing traffic, the pollution also increases which is very hazardous to nature and environment.

- Route Optimization: It is observed that the shortest route doesn't work well in terms of total travel time, fuel consumption and waiting time. Hence it is very important to optimize the path or route during travelling.

- Accident Detection: Due to the overcrowding and due to great traffic, the accidents also increases which is very hazardous. Hence in order to reduce the accidents and to protect the lives of individuals, it is very necessary to avoid it.

- Jamming: Prevention of traffic jams and decrease in average waiting time are the two most important need of an efficient traffic management system and is really very important in this fast developing world.



3.7 Cyber Security or any other concept

Cyber security is very important for managing technologies, processes and practices designed to protect networks, computers, programs and data from attack, damage or unauthorized access. In a computing context, security includes both cyber security and physical security.

It is important because government, military, corporate, financial, and medical organizations collect, process, and store unprecedented amounts of data on computers and other devices.

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

- Retrofitting will introduce planning in an existing built-up area to achieve smart village/city objectives, in order to make it more efficient and reliable. In retrofitting, an area consisting of more than 500 acres which will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services there and their vision, the cities will prepare a strategy to proceed to our aim. Although, the existing structures are largely to remain intact, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed to retrofitted smart city.

- **Redevelopment** will effect a replacement of the existing environment and enable co-creation of a new layout with better infrastructure using mixed land use. Redevelopment enhances an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with the citizens. For an instance, a new layout plan for the identified area will be prepared with mixed land-use, higher FSI and high ground coverage.

- **Greenfield** development will introduce the most Smart Solutions in a previously vacant areas (more than 250 acres) using new and innovative planning, plan financing and plan implementation tools with provision for affordable housing, especially for the poor. Greenfield developments hence are needed around cities in order to address the requirements of the expanding population.

3.9 Strategic Options for Fast Development

The strategic components for Smart Cities are the city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) initiative in which Smart Solutions are applied covering larger parts of the village.

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

Supply of water resource in India was limited to the major cities within the widespread process of urbanization. After the independence, health standards in rural areas declined, which made the post-independence Government to take initiatives to improve the rural drinking water and sanitation facilities. In current time, most important aim of the government is to ensure safe and pure water supply to the rural areas. The first step was made by launching Accelerated Rural Water Supply Programme (ARWSP) in 1972-73. Between the years 1972-1986, the main aim of ARWSP was to ensure the supply of safe water to rural areas. By the time ARWSP was renamed as Rajiv Gandhi National Drinking Water Mission in 1991-92 with more stress on rural water supply accompanied with management of drinking water and community planning. Five essential factors were kept in focus:

- Sustainability of water supply - adequacy
- Convenience - Indigenous water purification technologies;
- Affordability & equity - portability

These technologies can improve and enhance the drinking water quality of small rural as well as an urban area. It makes use of the Pressure Driven Membrane Process. These are very much suitable for all capacity units e.g. they are often adaptable from household level unit as well as at community level unit to the large scale unit. Water purification technologies also make use of the solar energy and nuclear energy.

- **Unique Multi Stage Biological Treatment Solution:**

Multi Stage Biological Treatment Solution (MSBT) can be implemented on existing Standard Temperature and Pressure which is not able to process Sewage to the needed efficiency. MSBT can be implemented by keeping modular or container on the banks of rivers, on Drains which

could discharge waste water to the river. It can also be implanted in societies of small urban areas and housing complex for better water management system. Some great Benefits of MSBT are: No Odour problem, no surplus of organic sludge, as well as Drastic reduction in electrical Power usage which also reduces operating costs and No need for return sludge pumping.

- **Environment friendly Plasma technologies:**

Solid waste needs more amount of land for dumping or landfill sites which are rarely or not available in urban areas. Destruction or burning of solid waste pollutes the environment if the incinerators are not designed or operated in proper manner. Thermal Plasma Technology is an ideal way suited for waste treatment. Through plasma technology toxic and hazardous compounds are broken down to elemental constituents in present of high temperature ; Inorganic substance or materials are converted to Vitrified Mass; and Organic materials are Gasified and are converted to flue gases (H2 & CO) and Lower hydrocarbon gases when operated at low temperature (500˚C to 6000˚C). Disposal of dead animals is also being thought of using plasma pyrolysis.

3.11 Initiatives in village development by local self-government

Solved the challenges of the dirt and waste materials, as earlier the village seemed to be very dirty due to the dirt everywhere, but this problem is being solved by the local gram panchayat. In order to solve this problem and to reduce the spread of disease, there is door-to-door service of tractor which carries all these waste.

Most of the roads are RCC, as in order to remove the problems of rain and dust. Street lights are also present in almost every part of the village. There is also a great vegetable market developed by the gram panchayat.

3.12 Smart Initiatives by District Municipal Corporation

3.13 Any Projects contributed working by Government / NGO / Other Digital Country concept.

There is a NGO working here namely Akshaypatra. Earlier Midday Meal was not appropriate in

all the primary schools. But now Akshaypatra Foundation decided to distribute the appropriate Midday Meal in all the primary schools. Presently Akshaypatra Foundation fulfills the food to 25,000 students. They can feed upto 50,000 students with the staff of almost 140.

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

Biomass: W2W (waste to wealth)

Having determined that the oil palm industry's waste biomass can be refined into high value "green chemicals," Malaysia has in sight a major potential economic windfall from massive plantations covering almost 15% of the nation. Introduced to the country as an ornamental plant in 1870, oil palms today cover roughly 5 million hectares (19,000 sq mi) of Malaysia. The reddish pulp of the plant's fruit is used to make a vegetable oil widely used worldwide in cooking, as well as in an enormous range of consumer products from toothpaste to lipstick.

Typically today, some 40% of the fibers and shells of empty fresh fruit bunches is left. Thanks to new technologies, is a potential national economic bonus amounting to billions of dollars each year, creating thousands of jobs in the bargain. International experts estimate that the potential from processing 20% of Malaysia's 80 million metric tons of annual oil palm biomass could generate an economic windfall in green chemicals and products valued at almost $30 billion per year by 2025. Prime Minister Najib created “MYBiomass”- a special-purpose organization dedicated to making the nation as a market leader in high value green chemicals, in 2011 on the advice of the GSIAC.

And an agreement signed last year between “MYBiomass's” shareholders -- MIGHT, Sime Darby Berhad and Felda Global Ventures Holdings Berhad -- confirms the commitment of Malaysia's largest plantation companies in this initiative. The green chemical industry today worldwide is estimated at $2.8 billion, seen rising to about $100 billion in 2020. MYBiomass has done extensive feasibility studies, factoring in fertilizer replacement costs and evaluating alternative potential uses of the biomass as energy feedstock.

The cost of constructing a bio-refinery to produce green chemicals in Malaysia ranges between US $80 million and $300 million, depending on such factors the size, technology and location.

3.15 Electrical concept (Design Ideal and Prototype model)

Solar Roof Top System.

In India, by 2012, there were 500,000 SHS and 700,000 solar lanterns distributed across the country. These systems includes a standalone electricity systems that include a set of solar PV arrays, a battery, an inverter and various end use equipment such as fluorescent lighting.

- **Reliability:**

Solar roof top system are designed to provide reliable electricity for a set load, so there is a lower likelihood of a power shortage and resulting in the reduction of load. However, to ensure that the power demanded does not goes beyond the generation capacity, households must be familiar with the capacity of the system in order for not compromising its reliability. The reliability and power quality of a roof top system can be negatively affected by the low quality of its individual components as well as sub-optimal operations and maintenance.

- **Price and Cost:**

The cost of installing a solar home system varies depending on the load to be installed and size of solar panel module. Small solar panels that are able to power a few light bulbs, some fans, and a television set have an aggregate cost of around Rs. 45,000, while larger systems like a 2-3 kW solar home system can cost between Rs. 120,000 to Rs. 180,000. A typical unit cost of generation is Rs. 37/kWh. Efficiency of the components of this system, such as the batteries and inverter, improves with the capacity of the system. As the efficiency is higher with larger capacity modules, larger modules will have a lower unit cost of generation and unit cost of storage.

Chapter 4. about KUNARIYA

4.1 Introduction

4.1.1 Introduction about Kunariya

Here by, we are allocated the Kunariya village of Kachchh District. This village is almost 20 km. north from the Bhuj Taluka touching the state highway connecting Bhuj and White Rann of Kachchh.

Here, local language of Kunariya is Gujarati and Kutchi. According to census 2011, the population of this village was 3521 having 1817 male population and 1704 female population.

Area of this village is approx. 5563 hector having 3674 hectors of agricultural land. There is no facility of any supermarkets, street lights, secondary schools, hospitals, libraries and many more.

4.1.2 Justification/ need of the study

Study of any village has their own importance. Villages have given great encouragement to the growth of rural society. After independence, plan are being made and realized that unless Indian villages were properly studied, no real progress could be made. As most of the Indian population resides in villages, it is very important to develop villages and to rurbanize the villages, only then India can move towards development.

Scholars now began to pay more and more attention to village studies.

- Village studies help in planning rural reconstruction.
- Village studies provide useful information to other disciplines.
- Village studies provide useful knowledge about Indian social reality

4.1.3 Study Area (Broadly define)

Kunariya is the small village with almost population of 4000 with very small residential land. It is almost 20 km from the main centre Bhuj. This village is still not fully developed in order to become self reliant for it basic needs and requirements. There is a primary school, public toilet, a panchayat, bus station, a water tank and few more facilities.

4.1.4 Objectives of the study

- Basic Socio-cultural Infrastructure – Community hall, Public library, recreation facilities, Health care facilities, public baths, public latrines, etc should be the priority focus and be provided.
- Basic Sustainable Infrastructure – Rainwater harvesting system, solid waste management system, solar street light facilities, toilet should be provided and to make sure the proper availability of facilities to village people.
- To promote integrated development of such rural areas with the provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.

4.1.5 Scope of the Study

From this project, we analyzed and came to know certain difficulties in routine life of the villagers due to the lack of technologies. From this we came to know that we can implement new technologies in the villages and can increase the living standard and the developing scale of the nation. As it will also be helpful to the Government, in order to analyze the existing situations, problems and further possible modifications and development as proposed by us.

4.1.6 Methodology Frame Work for development of your village

Vishwakarma Project phase VIII

Village Allocation

Primary Survey

Survey and Analysis of Ideal and Smart Villages

Data Collection

Gap Analysis

Sustainable Planning Proposals

4.1.7 Available Methodology for development related to Electrical

-Analysis of the present condition
-Meeting the officials
-Meeting the villagers
-Identifying the problems
-Finding the solution

4.2Kunariya Study Area Profile

4.2.1 Study Area Location with brief History land use details

- **Name of the village**: Kunariya
- **State**: Gujarat
- **Taluka**: Bhuj
- **Language Spoken**: Gujarati, Kutchi
- **District**: Kachchh
- **Coordinates**: 23.399913, 69.725325

4.2.2 Base Location map, Land Map, Gram Tal Map

4.2.3 Physical & Demographical Growth

It is located 18 km north from District headquarters Bhuj. As per the recent stats, Kunariya village also has a gram panchayat. The total geographical area of village is 5563 hectares. Local Language at Kunariya is Gujarati. As per Census 2011, total population over here is 3521 and number of houses are 751. Female Population is 1704 and male population is 1817.

4.2.4 Economic generation profile / Banks

.....Nil.....

4.2.5 Actual Problem faced by Villagers and smart solution

No Street Lights

In the whole village, there is no street lights. Hence as the sun goes down, the village becomes dark.

No better Road Facilities

Overhead Lines

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

Certain festivals and activities are being followed here.

4.2.7 Migration Reasons / Trends

Due to lack of the basic needs and absence of source of the income .

4.3. Data Collection Kunariya Photograph/Graphs/Charts/Table)

4.3.1 Describe Methods for data collection

Following are the ways in which we collected the date and information about the village Kunariya:

- By Techno Economic Survey
- By analyzing the present condition
- From other High Heads
- By the visit of Kunariya
- From Sarpanch
- From villagers

4.3.2 Primary details of survey details

Population of village	**3521**
No. of males in village	**1817**
No. of females in village	**1704**
Total no. of households	**751**
Approx. total area	**5563 hect.**
Agricultural area	**3674 hect.**
Residential area	**62 hect.**
Remaining area	**1827 hect.**
Major Occupation	**Agriculture**

4.3.3 Average size of the House - Geo-Tagging of House

The size of house is almost 40 x 25 feet.

4.3.4 No of Human being in One House

Averagely, there are almost 5-7 members in one house.

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

Not all basic essentials are available in the village, hence there is always a great need of out sourcing most of the marterial.

4.3.6 Geographical Detail

Area of village	**5563 hect.**
Agricultural Area	**3674 hect.**
Residential Area	**62 hect.**
Other	**1827 hect.**
Nearby Town	**Bhuj**
Distance from nearby town	**18 km**
Coordinates	**23.399913 69.725325.**
Connected Through Road	**NH 341**

4.3.7Demographical Detail - Caste Wise Population Details / Which ID proof using by villagers

Scheduled Caste - 11-20%

Scheduled Tribes – Less than 5%

4.3.8 Occupational Detail - Occupation wise Details / Majority business

Main occupation practiced here is agriculture and cattle rearing.

Hence the majority business is agricultural products like cotton, castor, jowar, etc.

4.3.9Agricultural Details / Organic Farming / Fishery

Agriculture: Major Occupation

Main Crops : **(1)Castor**

(2) Cotton

(3) Jowar.

4.3.10Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses

------Nil------

4.3.11Tourism development available in the village for attracting the tourist

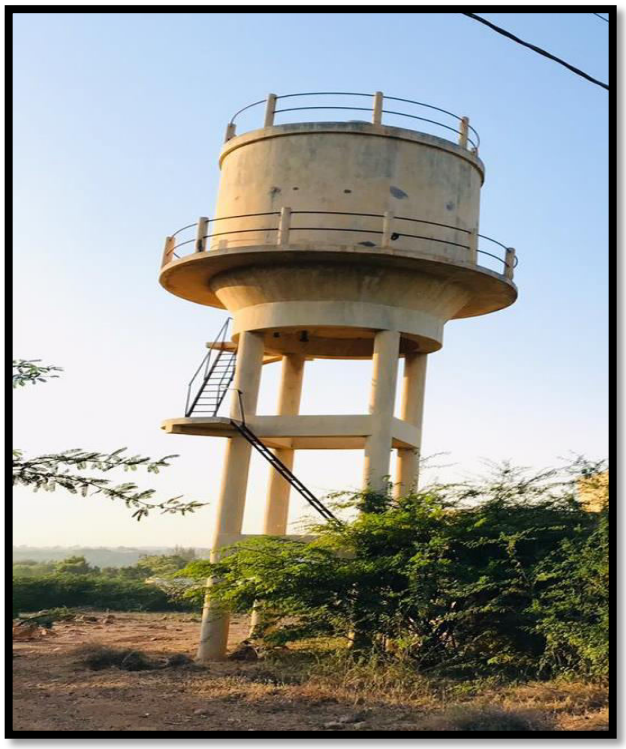
There is a ground, where Lagaan Movie was being shoot, the place where Aamir khan and other actors had shoot a film.

4.4 Infrastructure Details (With Exiting Village Photograph)

4.4.1 Drinking Water / Water Management Facilities

Overhead water tank: Capacity- 4.5 lakh Litres

Underground Sump: Capacity- 1.5 lakh Litres



4.4.2 Drainage Network / Sanitation Facilities

Drainage Facility Available: Length 7 km

4.4.3 Transportation & Road Network

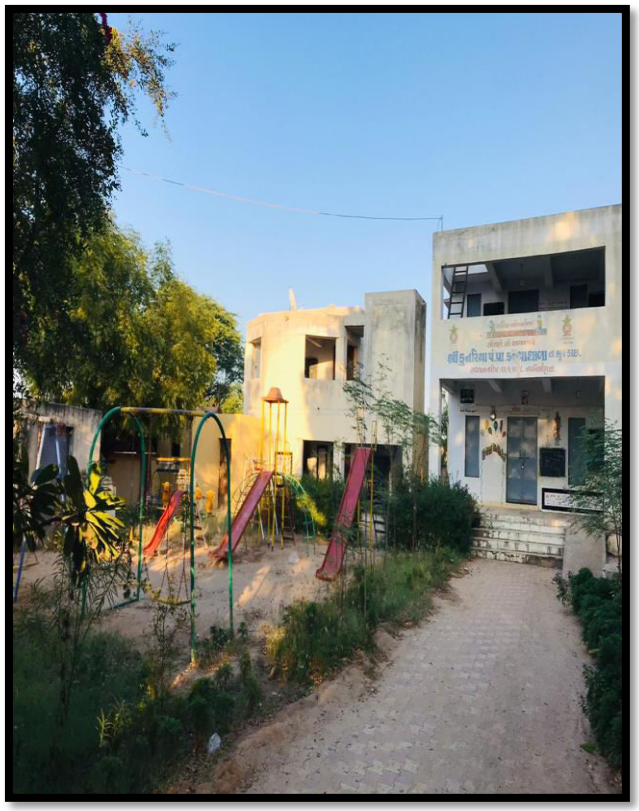
The village's main road is connected with NH 341. The connecting road and main road are Bitumen's Road and the internal streets are RCC and Kutchha Road.

4.4.4 Housing condition

Maximum houses in this village are kuttcha having ratio of kuttcha to pucca is approx. 7:3.

4.4.5 Social Infrastructure Facilities, Health , Education , Community Hall , Library

- No Public Library in the village.
- No Public Garden in the village.
- No pond or lake in the village.
- No general markets or any super stores
- Good community Hall in the village.
- No proper health facilities.
- Government Primary School.




શ્રી કુનરીયા જુથ ગ્રામ પંચાયત

4.4.6 Existing Condition of Public Buildings & Maintenance of existing Public Infrastructures

Gram panchayat is presently in better condition.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

As the village is not so developed, no such facilities are available here.

4.4.8 Sports Activity as Gram Panchayat

Many a times, Gram panchayat is organizing such activities.

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

No such facilities are available here.

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

No such facilities are available here.

4.4.11 any other details

4.5 Electrical Concept

4.5.1 Renewable energy source planning particularly for villages

No such plannings are here to satisfy the power requirement by renewable sources. There are even no Street lights in the village.

4.5.2 Irrigation Facilities

Main source of irrigation is tubewells or borewells consuming much power from the grid. This supply is given 8 hours a day in shifts, being uninterrupted except faulty conditions.

4.5.3 Electricity Facilities with Area

No such major problems in supplying electricity by PGVCL. There are some minor problems due to overloads or some temporary abnormalities in the Transformers.

4.6Existing Institution like - Village Administration – Detail Profile

4.6.1 Bachat Mandali

Not Available.

4.6.2 Dudh Mandali

Not Available.

4.6.3 Mahila forum

Mahila Mandal Commission is good.

4.6.4 Plantation for the Air Pollution

As the village is too small, there is no much amount of pollution in this village, even then certain trees are being planted by the Panchayat and the villagers.

4.6.5 Rain Water Harvesting - Waste Water Recycling

Not Available. As we have proposed it in the designs further.

4.6.6 Agricultural Development

No.

4.6.7 Any Other.

no

Chapter 5
Technical Options with Case Studies
(FOR ANY ONE TOPIC, Take a new concept design, prototype model with actual costing)

Concept (Civil)

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 11th 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 12th 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 CO2 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: • Planning, design and specifications based on performance and service life • Construction Practices • Material Conservation and Selection • Demolition and recycling • 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 CO2 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.

5.1.2 Soil Liquefaction :

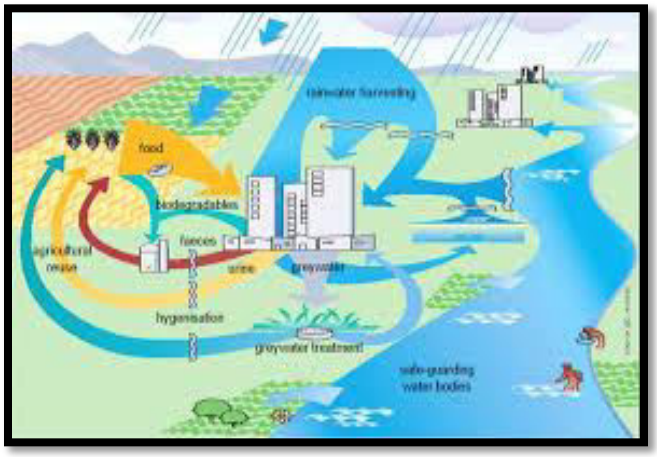
Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid.

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.

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 :

Transport infrastructure consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals. Transport is vital to the well-functioning of

economic activities and a key to ensuring social well-being 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 Columbi aUniversity. 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.

3) Electrochemical methods use current and an external anode to protect the reinforcement, even when the chloride ion concentration is above the corrosion threshold.

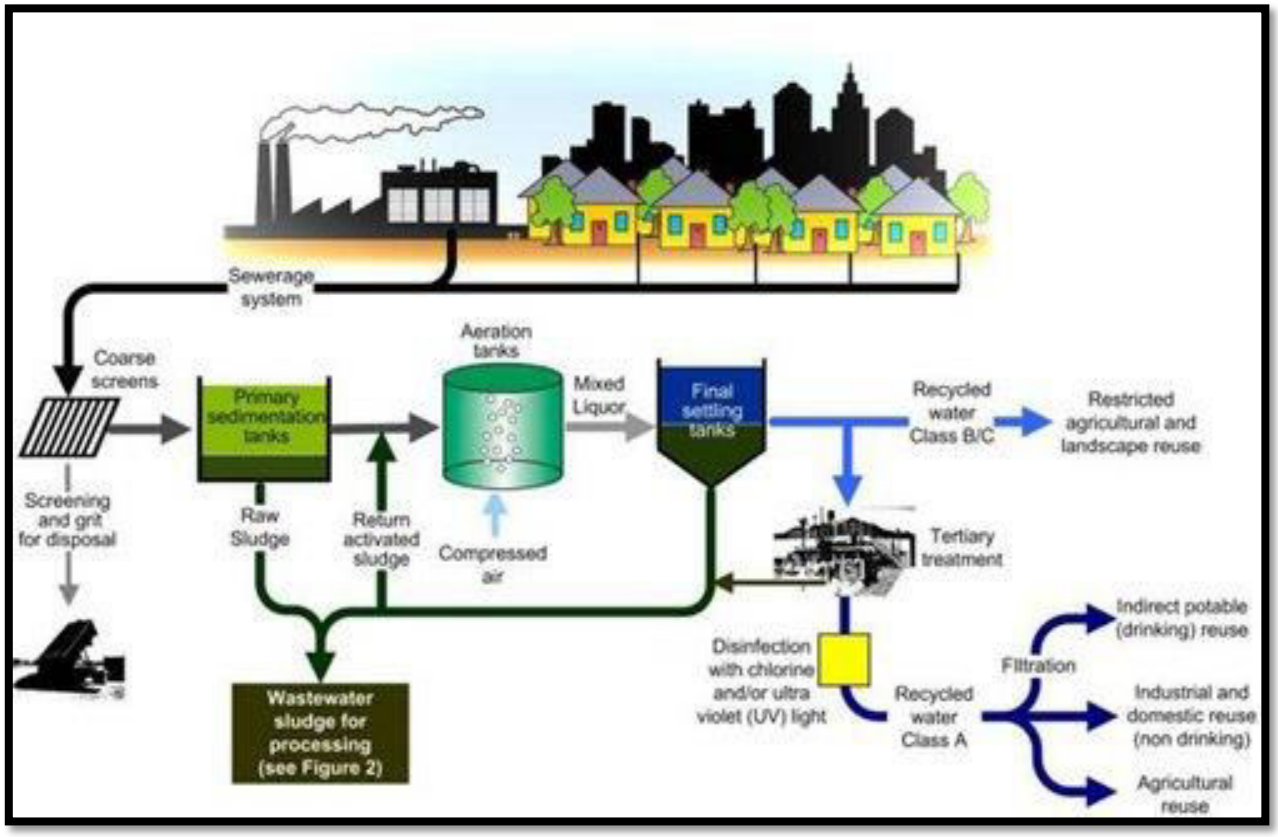
4) Corrosion inhibitors offer protection by raising the threshold chloride concentration level, by reducing the permeability of the concrete, or by doing both

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 (storm water) 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).



Repair of cracks in building and building Tilt/Rehabilitation techniques.

- **Structural cracks**

  1) Due to incorrect design

  2) Faulty construction

  3) Overloading

- **Non Structural cracks**

1) **Moisture changes**: Shrinkage effect depends on the water content, cement, concrete and aggregates.
2) **Thermal movement**: Concrete made in hot weather needs more water for the same work ability and therefore results in more shrinkage.
3) **Elastic deformation**
4) **Creep**: Building items such as concrete and brick work when subjected to a sustained load not only undergo elastic strain but also develop gradual and slow time dependent deformation known as creep or plastic strain.
5) **Chemical reaction**: Certain chemical reactions in building materials results in the appreciable change and in volume of resulting products and internal stresses are set up which may result in outward thrust and formation of cracks.
6) **Foundation movement and settlement of soil**: Buildings on expansion clays are extremely crack prone.
7) **Vegetation**: Large trees growing in the vicinity of buildings cause damage in all type of soil conditions. If the soil is shrinkable clay, then the cracking is severe.

Cracks can occur mainly:

1. When stress in the RC-member exceeds flexural strength of concrete.
2. Due to Creep (long term effect of the Dead Load).
3. Due to Shrinkage (as moisture evaporates, members try to shrinks with respect to the volume, hence resulting into the cracks).
4. Due to the effect of temperature.

5. Poor quality control and improper curing at casting level.

Prevention of cracks in the concrete structure:

A. To Prevent Cracks Due to Moisture Movement

1. Select the material having small moisture movement e.g. bricks, lime stones, marble etc.
2. Plan for low amount of cement content, large size of aggregates and less content of water.
3. Porous aggregates prone for high shrinkage.
4. Plan for offsets in walls for length of more than 600 mm.
5. Use of composite cement-lime mortar of 1:1:6 mix or weaker for plastering work.

B. To prevent Cracks Due to Thermal Movement

1. Dark colored and rough textured materials on the exterior have lower reflectivity and react more for the thermal expansions. Plan for the layer of adequate thickness for good reflective surface over concrete roof slabs to minimize these cracks.
2. Slip joint should be introduced between slab and its supporting wall or some length from the supporting wall or the slab should bare only on part width of the wall.
3. Mortar for the parapet masonry should be 1cement: 1 lime: 6 sand.
4. Construction of masonry over the slabs should be differed as much as possible (at least 1 month) so that concrete undergoes some drying shrinkage prior to the construction of the parapet.

C. To Prevent Cracks Due to Elastic Deformations

1) When large spans cannot be avoided, deflection of slabs or beams could be reduced by increasing depth of slabs and beams so as to increase their stiffness.

2) Adoption of bearing arrangement and provision of a groove in the plaster at the junction of wall and ceiling will be of some help in filling the cracks.

3) Allow appropriate time lag between the work of wall masonry and fixing tiles.

- **Cost Estimation:**

Repair Crack Work:

Sr. No	Description	Qua-ntity	Unit	Rate	Total Amt.
1	Repair crack in slab beam & column of structure. With v – groove of **25 mm breath & 12 mm depth** use Dr. fixit chemical (crake filler)	125	Runn-ing (M)	350	43750
2	Repair RCC floor in crack with chemical DR fixit URD	825	Runn-ing (M)	200	165000

- **Used Material**

Dr. Fixit chemical(950 running meter)/6 runnig meter per KG	160kg x (360/kg) = 57600/-
Required cement ultra	10 bags
Sand	0.25 cubic meter

Labour:- 950 running meter / 60 running meter per person = 16 labour

5.2 Concept (Electrical)

5.2.1 Programmable load shedding

The main aim of this work is to build a microcontroller based device the on/off a power supply whenever there is excess load on the system.

This project is required for load shedding time management which is used when the electricity demand exceeds the supply and there comes a need for manually switching ON/OFF the electrical devices in time. However the purpose of the system is to eliminates the manual operation by automatically switching the load ON/OFF.

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 entering the time. A 7-sement display is interfaced to the microcontroller to display time.

Advantages:

1. Prevents overloading and damage of the power generators

2. Prevents instability and system collapse of the electrical generation and distribution systems

3. Ensures that consumers or parts of the network have power as opposed to a total blackout.

4. The planned schedules ensure that available capacity is shared fairly and each consumer gets power at one time or another.

5. It serves as a warning to the utility hence forcing them to increase capacity, and efficiency so as to meet the demand.

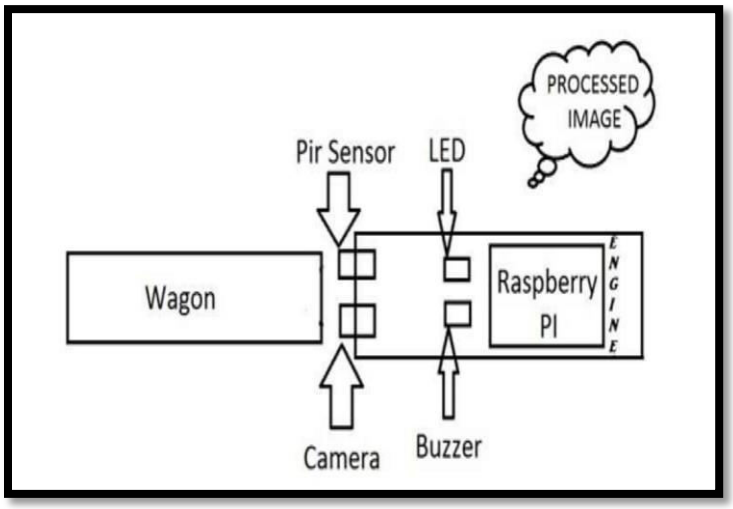
5.2.2 Railway Security System using IoT

There are many cases reported for coal mines thief near the rural areas when the train halts for some time. This has affected a lot in the Indian railways economy. So here is a new technique for

Indian railways to remotely monitor the system.

The proposed model has a motion detection sensor which detects the motion of the object which performs skin detection and then sends the image to the railway server using IoT.

So that immediately an action can be taken to avoid coal thief.



Hardware and software

- **Hardware**

The Components used are microcontroller Raspberry pi 3b, PIR sensor, Camera module2, led, buzzer and power supply for Raspberry pi.

(i) Raspberry pi 3b

It is a device where all the processing of information takes place. It is used to process the PIR sensor data, perform the skin detection algorithm and is a communication device that sends images to the railway server in anomalies. The microcontroller Raspberry pi used in the project is shown in Figure.

SoC: Broadcom BCM2837

CPU: 4× ARM Cortex-A53, 1.2GHz

GPU: Broadcom Video Core IV

RAM: 1GB LPDDR2 (900 MHz)

Networking: 10/100 Ethernet, 2.4GHz 802.11n wireless

Bluetooth: Bluetooth 4.1 Classic, Bluetooth Low Energy

Storage: micro SD GPIO: 40-pin header, populated

(ii)PIR Sensor (SB0061)

It is a module used to detect the motion of the object.

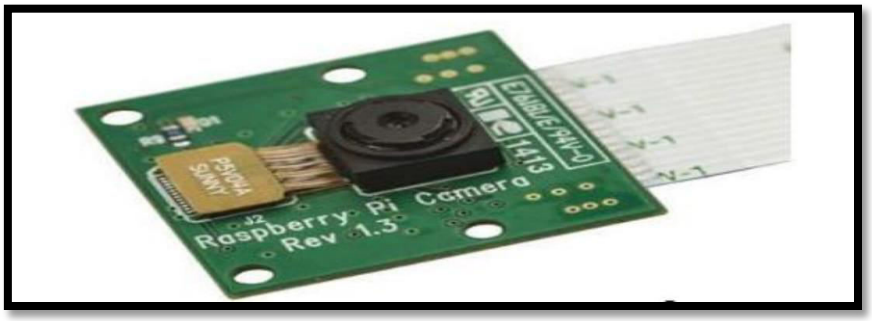
The Sensor specifications is given below

Compact size: 28 x 38 mm Supply current: DC 5v-20v

Current drain: <50uA Voltage Output: High/Low signal: 3.3V

(iii) Camera module

This module is used to captures the live video with a resolution of 5MP as shown in Figure



(iv) Software and detection algorithm

The PIR sensor and skin detection algorithm is performed in python idle Node red graphical tool of IBM blue mix is used for sending the images to the railway node and images are also uploaded to drop box.

Algorithm

Step 1: The PIR sensor is mounted on the railway wagon along with the pi camera.

Step 2: The PIR sensor detects the motion of the object. It can be anything like leaves, trees, animals, etc.

Step 3: As the motion is detected by the PIR camera starts the live streaming.

Step 4: After this the camera's live video is given as input to the skin detection algorithm. The human skin is detected.

Step 5: Then the image of the thief is sent to the railway node using IOT (Node Red) and images are also uploaded in drop box.

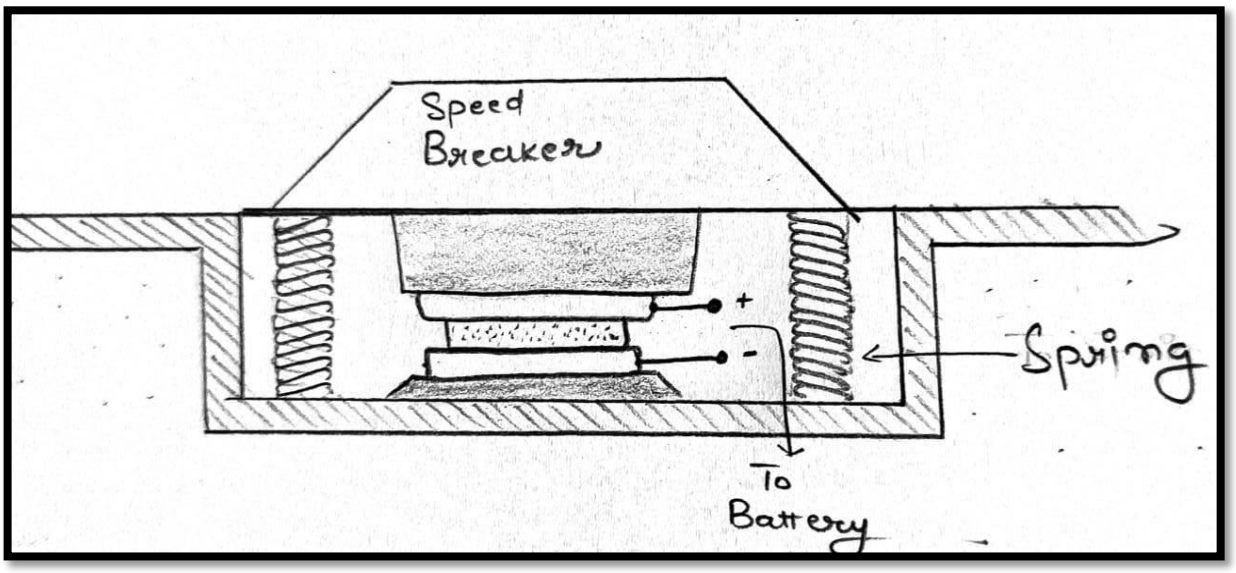
5.2.3 Management through Energy Harvesting Concept:

Energy harvesting is the process of capturing energy and converting it to electricity from the surroundings. It is hence also known as energy scavenging or ambient power technology. The energy generated here can either be used immediately or can be stored for the future use. Energy harvesting works by utilizing small amount of ambient energy, which is dissipated and hence mostly wasted in the form of heat, vibration, pressure, strain, light, etc. Energy harvesting is still in a initial stage of maturity. It is by no means to be utilized primarily. However, it does hold tremendous power when it comes to the low power electronic devices. With the rapidly expanding IoT market, this is the best and massive potential being generated and stored.

- **Piezoelectric Speed Breakers and Foot Paths**

We can use piezoelectric materials under speed breakers and under foot paths, which can generate much amount of ambient energy. Hence, if any vehicle passes from the speed breaker, the speed breaker will move downward, under which there will be number of piezoelectric sensors, which will generate much amount of energy. To store the energy, a battery can be set at side which can further be used.

Prototype Diagram:



Cost Estimation:

Components	Price
Piezoelectric Material	Rs. 1000(Depends on the No.s)
Speed Breaker	Rs. 1500 x 6mtr = Rs. 9000
Battery(150 Ah)	Rs. 16,000
Connecting Wires	Rs. 1000 (Avg.)
Miscellaneous	Rs. 5000

5.2.4 Moisture Monitoring System

The invention is applicable to the software field, and provides soil moisture monitoring system and method based on a sensor network. The system comprises a plurality of soil moisture monitoring nodes and a sink node. The method comprises the following steps that: the sink node sends a summary data packet acquisition request to the soil moisture monitoring nodes; the soil moisture monitoring nodes report summary data packets to the sink node; and the sink node generates current reliability factors of the soil moisture monitoring nodes by using a soil moisture monitoring node reliability factor generation model, soil moisture monitoring node numbers, soil moisture monitoring data packet forwarding rate, soil moisture monitoring data packet sending duration and received signal strength, sends a location coordinate acquisition request to unreliable soil moisture monitoring nodes if the current reliability factor is less than a preset threshold, receives location coordinates, sends a notification data packet to a preset terminal, and notifies the data packet to carry the soil moisture monitoring node numbers and the location coordinates. Through adoption of the soil moisture monitoring system and method, the repairing efficiency of the soil moisture monitoring nodes is increased.

5.2.5Home Automation Sensors.

There are probably thousands of such sensors out there that can be a part of this list. Since this is an introduction towards smart home technology, we will keep it brief. We will break down IoT sensors for home automation by their sensing capabilities:

-Temperature sensors	-Lux sensors	-Water level sensors
-Air composition sensors		-Video cameras for surveillance
-Sound sensors	-Pressure sensors	-Humidity sensors
-Infrared sensors	-Vibrations sensors	-Ultrasonic sensors

Depending upon what you need you may use one or many of these to build a truly smart home IoT product. Let's have a look at some of the most commonly used home automation sensors. Rebuilding consumer expectations, home automation has been projected to target wide array applications for the new digital consumer.

While there are some protocols that clearly offer much more than others, but it is always important to start from your smart home development needs and then move towards narrowing down the solutions.

The commonly preferred protocols are Bluetooth low energy, Z-wave, Zigbee, and Thread.

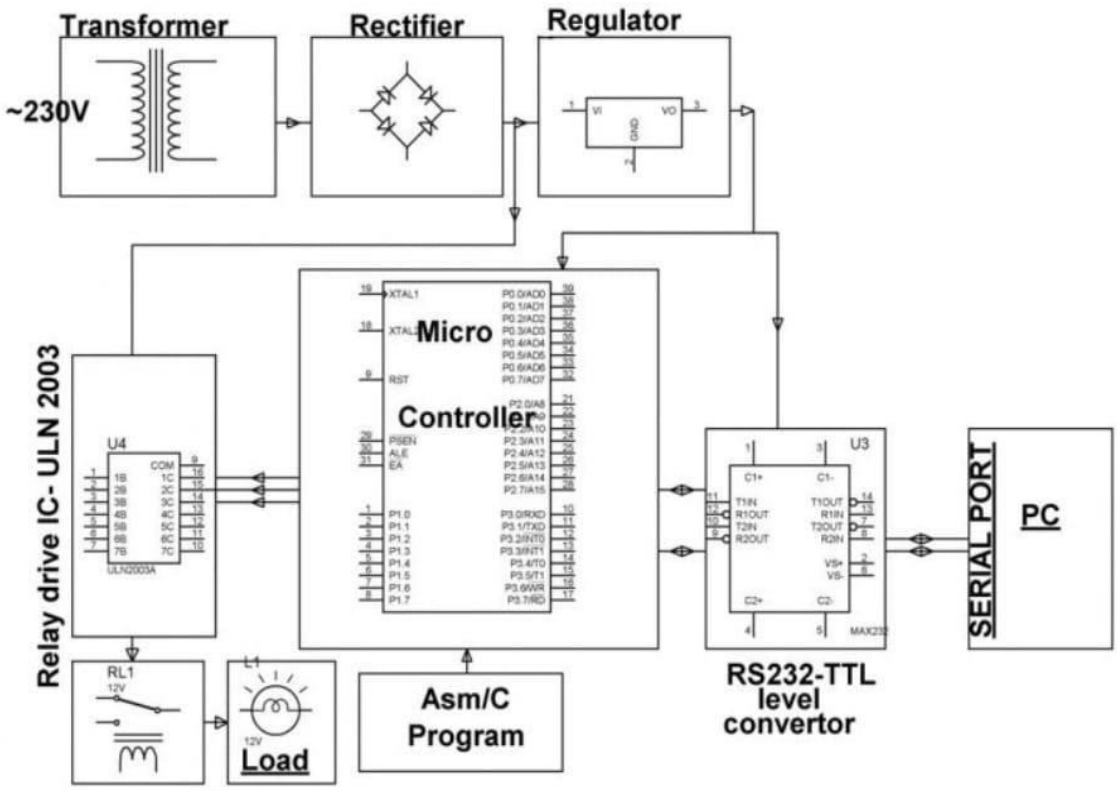
5.2.6 PC based electrical load control

The PC based electrical load control system can be built with 8051 series Microcontroller, Level Shifter IC, DB Connector, Relays, Relay Driver, Transformer, Diodes, Capacitors, Resistors, LED, Crystal, Lamps, Keil compiler and Language: Embedded C or Assembly.

The main goal of this project is to control the electrical load through a PC (personal computer). For example, lighting in the theatre can be controlled form the PC for superior stage management.

At present, they are physically controlled which makes it complex to organize the lighting with the particular scene. By employing this system, one can manage the electrical load ON/OFF by just being seated at one place using a PC.

This system is incorporated with the electrical loads and also associated to the PC where centralized control takes place. It uses an MAX 232 protocol from the microcontroller to communicate with the PC.



To switch the appliances, we employ Hyper Terminal on personal computer. Once the connection is established with the PC, then the system begins working. The 8051 family microcontroller is used in this project.

Further, this project can be improved by implementing a GUI based control board on the PC with suitable embedded system software. The power control can also be integrated using power electronics devices.

5.2.7Electrical parameters measurement

The importance of mutual inductance parameters test Mutual inductance parameters hazards on the grid are the following:

Since the mutual inductance voltage generating excessive negative sequence current, when the negative sequence current exceeds 5% of the positive sequence current, it will cause the transformer, Motors and other equipment are from overheating in the system.

When the zero-sequence current exceeds a certain value, in the neutral point ungrounded system, certain sensitive protection devices may malfunction.

If adjacent lines occurs a ground fault, because the zero sequence mutual impact of line longitudinal zero sequence direction protection disoperation.

Effect of reactive power compensation configuration causes system power factor miscalculation.

Off line test mutual parameters theory

(1) Mutual parameters test theory

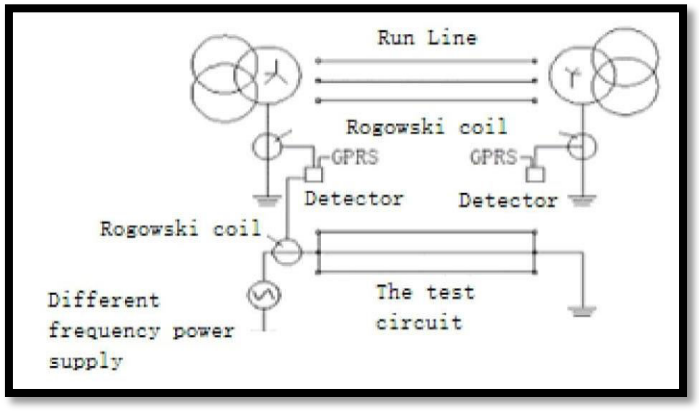
In one line leads to a certain amount of alternating current around the wire be associated a certain amount of alternating magnetic flux immediately, so that exposure to the magnetic field induces a certain value voltage of another line, that the induced voltage. The induced voltage can be measured by the instrument. If the AC current is used in different frequency, (different frequency is not sinusoidal of 50HZ frequency) can overcome a powerful amount of interference frequency AC line operation carried around.

(2) The basic principle of inter-frequency measurement

In line measuring input terminal is different from the power frequency of 50 Hz test power in the frequency domain directly isolated frequency interference signals and useful-frequency test signals, aim to eliminate frequency interference effects. When measuring, the first measuring device to the measuring line interference on the line frequency and amplitude, to determine the maximum amplitude of frequency interference; then set the test frequency (40 ~ 60Hz), through variable frequency power supply to generated the measuring the voltage of setting frequency to the line under test; the last signal acquisition and analog and digital filtering, after Fourier transform can be obtained different frequency parameters obtained after conversion of 50 Hz power frequency parameters.

On line mutual inductance parameter measuring methods

Neutral to run the line at both ends of the connection of 220kV transformer windings are at the ground state as an example.



First, test connection, as shown in above Figure.

Second, under conditions of complete security measures, did not live to complete the test wiring line and testing equipment, ready to apply zero-sequence to be tested no live line different frequency current;

Third, in the conditions of safety measures completely, neutral running line connected at both ends of the high voltage winding of the transformer bushing ground deflectors into terminating the Rogowski coil and connected to the test device;

Fourth, the test device input run line related technical parameters (including operational line voltage supplying current transformer impedance parameters, line impedance parameters, etc.);

Fifth, check the uncharged grounding line inspection test device to ground confirm both good, demoliting affect output test equipment and temporary grounding wire input;

Sixth, to not live line filled with a predetermined amount (including the current frequency and size) of different frequency excitation current;

Seventh, the test apparatus according to the mutual inductance value of zero Different frequency current is applied and Rogowski coil current measurement taken automatically calculate these two lines of sequence.

Test the mutual inductance parameters of the device technical indicators

Testing equipment main technical indicators:

(1) Test equipment inside the power-frequency power supply, the amount of frequency interference (electrostatic induction voltage 20kV, electromagnetic zero-sequence induction current 50A) to continue its normal output-frequency (45Hz) 50A test current, ensure waveform distortion in 1 %, the output frequency stability of 0.2% or less, in the range of 40-300HZ can be arbitrarily selected frequency, it is selected discrete <0.1% frequency measurement data, the total content of the non-selected frequency <0.5%.

(2) Ensure that the set of measurement apparatus to work in the amount of frequency interference (electrostatic induction voltage 20kV, electromagnetic zero-sequence induction current 50A), the amount of interference with a detectable amount of 20: 1 under conditions of different frequency measuring accuracy no less than 0.5 %.

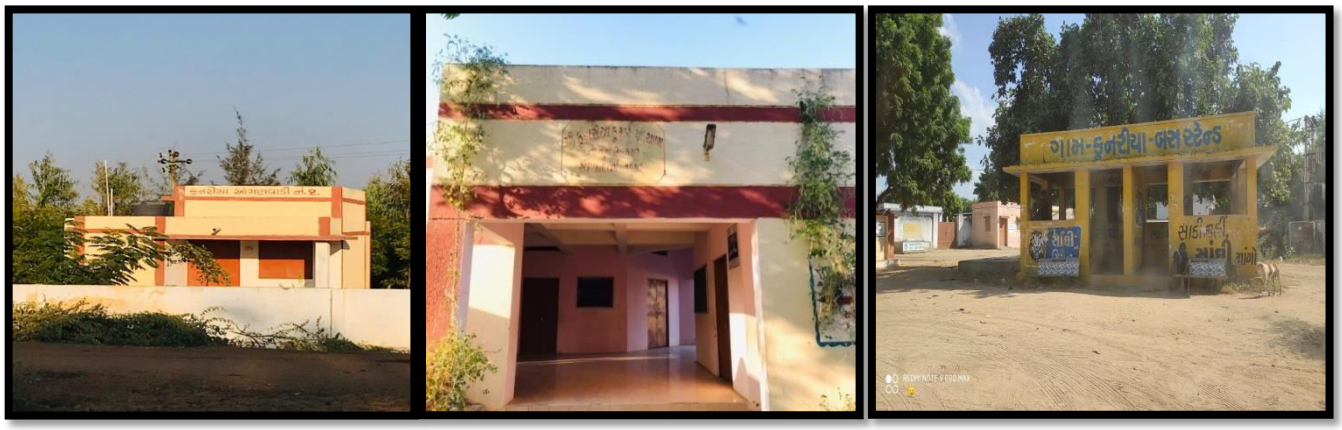
Chapter 6

Swatchh Bharat Abhiyan (Clean India)

6.1 Swatchhta needed in allocated village -Existing Situation with photograph

Regarding Swatchh Bharat Abhiyan, best work is done by the authorities in this village. Each corner is very neat and clean. No such activities are being needed in order to make it clean. Schools, public toilets, streets, etc are clean to their best.

6.2 Guidelines - Implementation in allocated village with Photograph



6.3 Activities Done by Students for allocated village with Photograph

Due to the present condition of Covid 19, no such activities are being fulfilled by us. Even the condition of the village is best, i.e. it was very clean.

Chapter 7.
Village condition due to Covid-19

7.1 Taken steps in allocated village related to existing situation with photograph

Sanitization is done regularly with specific intervals in order to make it free from Corona Virus.

7.2 Activities Done by Students for allocated village Clean with Photograph

Due to the excellent work done by the present authorities, there is no need to do such activities here.

7.3 Any other steps taken by the students / villagers

As this Panchayat did most awakening activities during such a pandemic situation, following is the report made by Mrs. Shefali Gupta on the activities done during COVID-19 by the respected authorities and the villagers of that village.

INSPIRING PANCHAYATS IN THE WAKE OF COVID – 19

KUNARIYA VILLAGE

How ordinary citizens empowered countryside

COVID – 19, with its unique circumstances, continues to leave a large impact on the world. Navigating this requires a proactive and practical approach that is carried out keeping the recipients in mind. The idea of a Gram Panchayat, under the Panchayat Raj system gives leaders such as Suresh Chhanga (Sarpanch, Kunariya Gram Panchayat) exactly this opportunity .

For starters, raising awareness around the virus itself took priority through many innovative methods. For example, a rangoli was made to involve children in the process and get critical information regarding preventive methods and practices out to the general public, such as making social distancing and stay at home orders more comprehensive.

According to the Sarpanch of the Gram Panchayat, there was a gradual release of information over the total lockdown period from the government; and so between the first 21 days of the first lockdown, the Panchayat received several notices and guidelines from both the state and central governments.

The first precautionary method, for protecting both oneself and others from contracting the virus continues to be face masks and the frequent sanitization of hands and surroundings.

Since the government was unable to widely provide these to the residents, the panchayat distributed both masks and sanitizers, funded by donations and aid from several Non Government Organizations, donations, trusts and the panchayat's own funds.

And as market s for the entire world was interrupted, the country's economy experienced the worst fall on record.

According to Economic Times,

"India's April-June quarter GDP contracted by a massive 23.9 per cent year-on-year (YoY), the first GDP contraction in more than 40 years. As per the National Statistical Office (NSO), gross value added (GVA) came in at -22.8 per cent."

This also resulted from a tremendous fall in the job market, in both the formal and informal sectors. Hence, the struggle was evident in terms of 'rozgari' for the people, and the first few weeks were the most painful. Once more clarity could be found, the practice of demanding work began in association with the Panchayat via MGNREGA by April 15. Out of the 40 Lakh rupees the village raised through their participation in the MGNREGA scheme, 69% is claimed to have been deposited in women's accounts over the last six months of 2020.

The Public Distribution System was adjusted to fit the people's needs while also keeping the pandemic in mind. For this, the ration shop was opened for residents ward-wise. For example, the morning two hours were reserved for those living in a particular ward number, while maintaining strict social distancing and the enforcement of face masks being worn by all. Accordingly, on the 29th of March, 87 households were given free essentials from the Panchayat's side, such that they would last for 15-20 day s at least. A similar scheme was announced by the Central Government in April, following which grain and essentials arrived at Kunariya and 264 household received provisions, free of cost.

A household survey, undertaken by the Panchayat was in process. It was completely managed and run by 5 women volunteers of the village, running thrice through the months of lockdown by starting in March and ending on October 20th. Adapting to the new circumstances, the survey became another means to distribute know-how regarding the pandemic, the virus, and preventive methods, this time from a reliable source to again, mainly to the women of the house.

For education to slowly reintegrate itself into students' lives, the panchayat felt the need to create a child-friendly environment, to subsequently deal with the psychological effect of the lockdown on children. The idea was to start to think of getting children away from the shadow of the impending financial burden that their parents' may be facing, or the frustration of being stuck inside their houses for so long.

A COVID response team had been formed for similar issues, and included members from their Gram Panchayat Development Plan (GPDP) preparation team, with 6 out of 11.

As an initiative to broaden learning beyond textbooks, children were encouraged to learn their family's traditional art forms and catch a glimpse of rural technology, from the making and playing of musical instruments, copper bells, crafts to detailed handiwork!

It was found that 18 girls from the village were eligible for promotion to senior secondary higher education, i.e. from class 8th to 9th. All families of these girls were contacted and persuaded to enroll their pupils for pursuing their studies, and almost all of them had done so by the month of August. In the region of Kutch, the condition of higher education is far from satisfactory. Out of 73,000 students eligible to be enrolled in higher education, only 52,000-53,000 actually do.

There exists a noticeably big gap which the government has been trying to approach through home learning, television lessons and other platforms, but the problem is whether the attendees have a smart phone or television in the first place, which is the root problem when choosing a platform for them to engage in.

The Panchayat struggled with restricting people's movement, especially in the beginning. Eventually, order was developed through community participation and cooperation.

The Sarpanch remarks on the predicted second wave of infections,

"The understanding of the public regarding Corona virus and its situation will take a little time as people are exposed to many different sources, such as phones, television, community word, etc. A lot can happen now, we have learned from the past.

In March, we were just thinking that something like this exists. We may have heard about it once or twice, but we had not faced it ourselves, such as Ebola/Zika Virus. This one we have faced, so now we know that if a lockdown is being announced, what we have to do for the people, which things are those that will be necessary for us to have in handy, how to take care of the elderly - especially since we have the data on patients of non- communicable diseases already, it

will help in covering up for them as well. We were not able to do this before, but will be able to do it now onward.

As for the economy, there are many things that we were getting from outside that we can produce for ourselves in the village, and so employment will be generated.

And so, even if a second wave is coming, the harm that the first wave has done will be much greater as compared to what will happen in the future - especially in terms of reducing risks!"

Chapter 8.

Sustainable Design Planning

Proposal Design Part- I

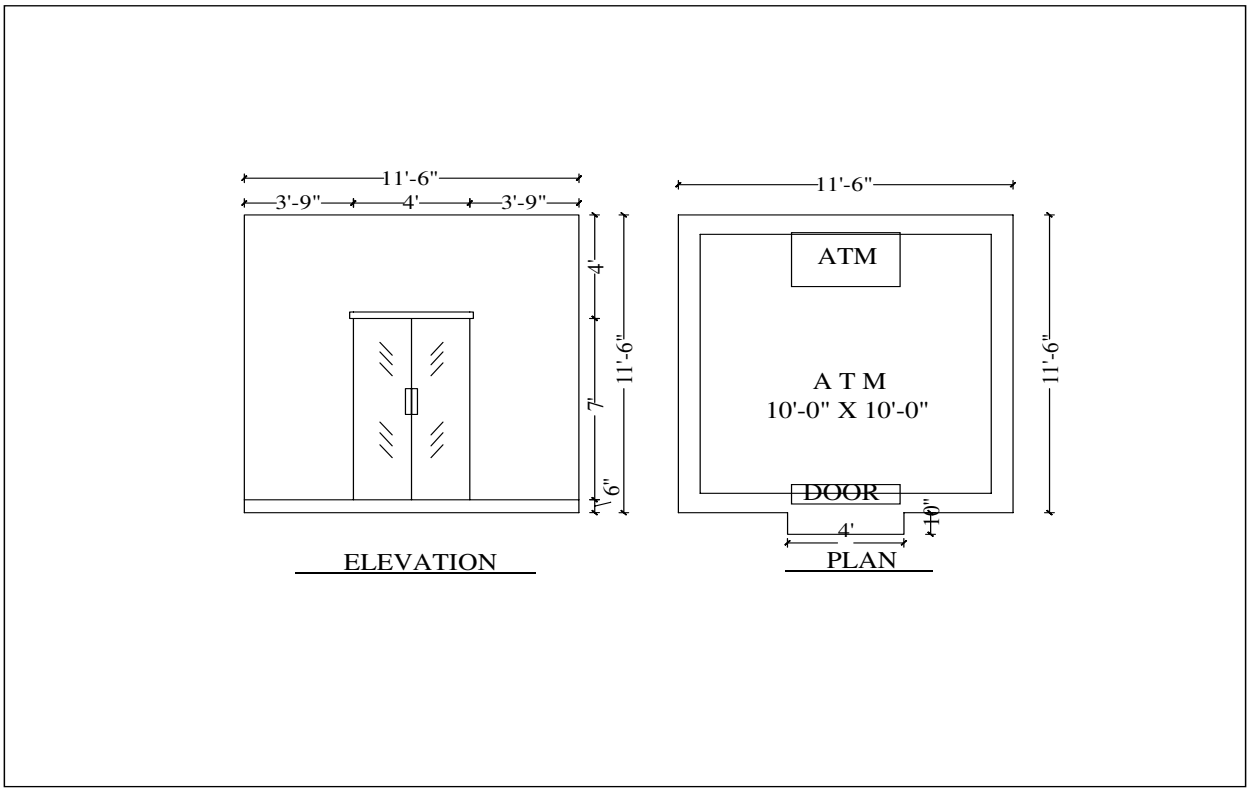
8.1Design Proposals

8.1.1 Sustainable Design (Civil)

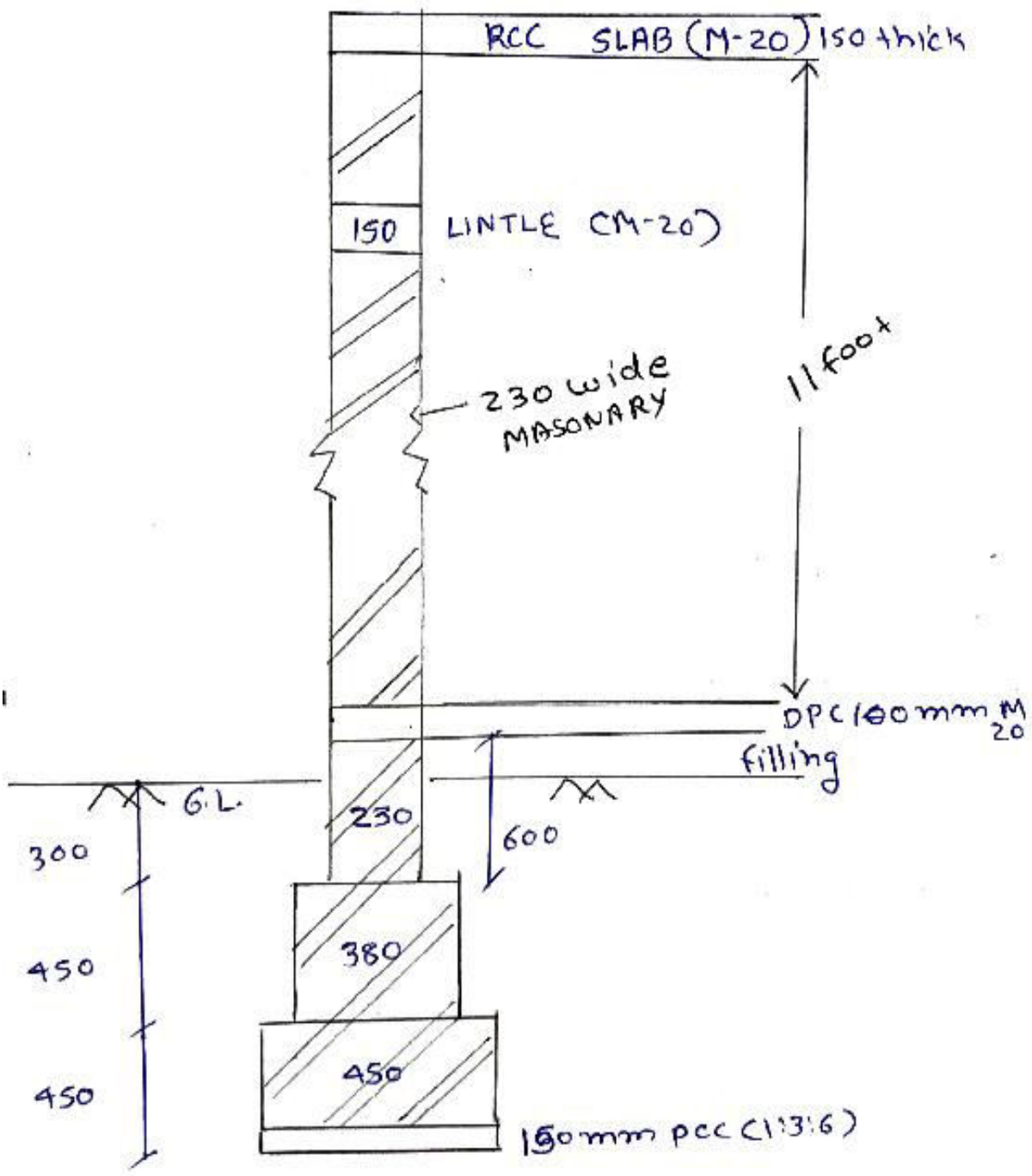
ATM

As there is no bank in the village due to the population, hereby we are proposing the design of an Automatic Teller Machine Room(ATM room) in order to perform the transactions like Cash withdrawal, deposits, fund transfer, account information and inquiries at any time without the direct interaction with the bank.

*** Autocad plan & elevation**



Section of ATM



DESIGN BY SKETCHUP FOR ATM

WORK ABSTRACT SHEET

NAME OF WORK : Construction of New ATM ROOM

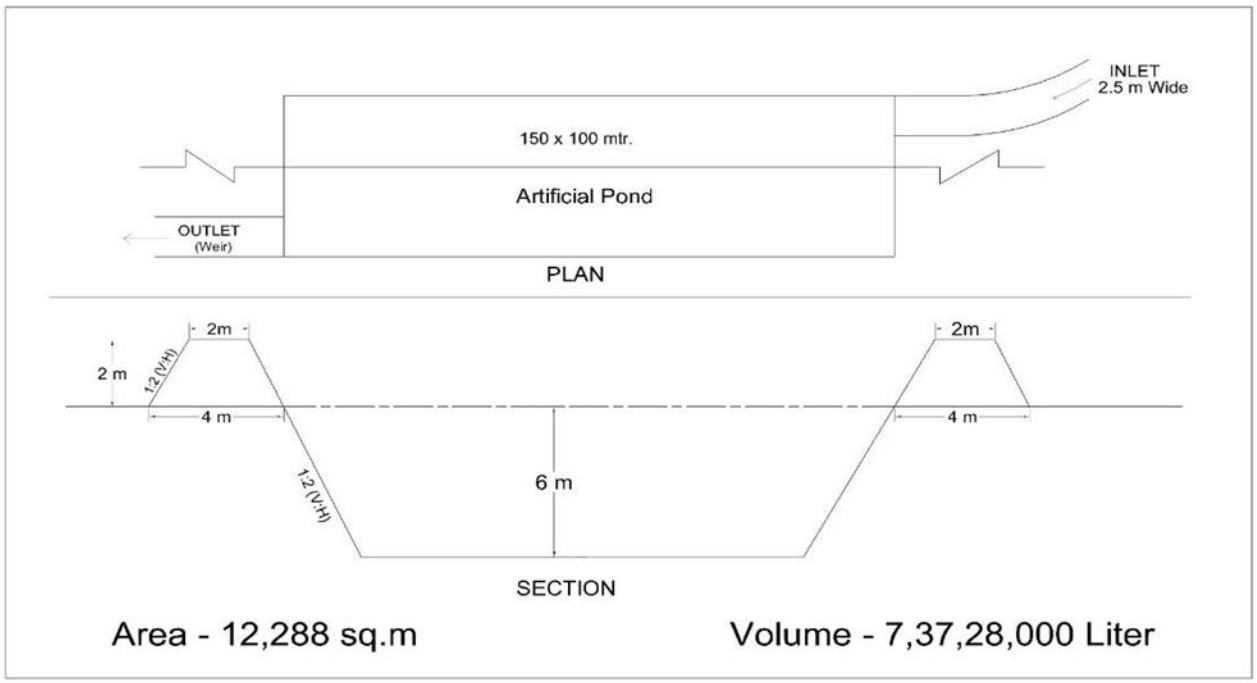
S.NO	DISCRIPTION	NO	L	B	D	QTY	UNIT
1	Excavation in all type of soil upto 1.5 m depth	1 * 2	3.5	0.45	1.35	4.25	
		1 * 2	3.5	0.45	1.35	4.25	
						8.51	**M^3**
2	PCC 1:3:6	2 * 2	3.5	0.45	0.15	0.94	
		1.00	3.05	3.05	0.10	0.93	
						1.87	**M^3**
3	1st class brick masonary in cm 1:6	4.00	3.5	0.45	0.45	2.84	
		4.00	3.5	0.23	0.60	1.93	
	upto plinth	4.00	3.5	0.38	0.45	2.39	
						7.16	**M^3**
4	DPC M-20 (100 mm)	2.00	3.05	0.23	0.10	0.14	
		2.00	3.5	0.23	0.10	0.16	
						0.30	**M^3**
5	good quality murrm filling in plinth	1.00	3.05	3.05	0.30	2.79	
						2.79	**M^3**
6	1st class brick masonary for superstructure dedcuctin	2.00	3.05	0.23	3.30	4.62	**M^2**
		2.00	3.5	0.23	3.30	5.31	
		1.00	1.2	0.23	2.10	(-)0.57	
						9.36	**M^2**
7	RCC slab 150mm thick M-20	1.00	3.5	3.50	0.15	2.10	**M3**
						2.10	
8	wooden pannel door	1.00	1.2		2.01	**2.52**	**M^2**
9	internal plaster	1.00	2 (6.1)		3.30	40.26	
	slab	1.00	3.05		3.05	9.30	
	deduction door	0.5 x 1	1.2		2.10	(-)2.52	
						47.04	**M^2**
10	External plaster	1.00	2 (6.1)		3.50	49.00	
	deduction	0.50	1.2		2.00	(-)2.52	
						46.48	**M^2**
11	floor tiles	1.00	3.05	3.05		**9.30**	**M^2**
12	steel in slab & DPC 1%	1.00	200			**200.00**	**kg**

WORK ESTIMATE					
NAME OF WORK : Construction of New ATM ROOM					
S.NO	**DISCRIPTION**	**QTY**	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	8.50	M^3	158.00	1343.00
2	PCC 1:3:6	1.87	M^3	3800.00	7106.00
3	brick masonary 1st class upto pl	7.20	M^3	5200.00	37440.00
4	DPC M-20	0.30	M^3	7800.00	2340.00
5	murrom filing	2.79	M^3	300.00	837.00
6	massonary super - structure	9.36	M^3	5800.00	54288.00
7	RCC m-20 150 mm thick	1.83	M^2	10000.00	18300.00
8	wooden pannel door	2.52	M^2	8050.00	20286.00
9	12 mm internal plaster	47.09	M^2	280.00	13185.20
10	external plaster 20mm	46.48	M^2	360.00	16732.80
11	floor tiles	9.30	M^2	1200.00	11160.00
12	steel	200.00	kg	65.00	13000.00
13	electric work 3 % of total cost				5880.54
				TOTAL	**201898.54**
Amount in words: Two Lac one thousand eight hundred ninty eight and fifty four paisa only					

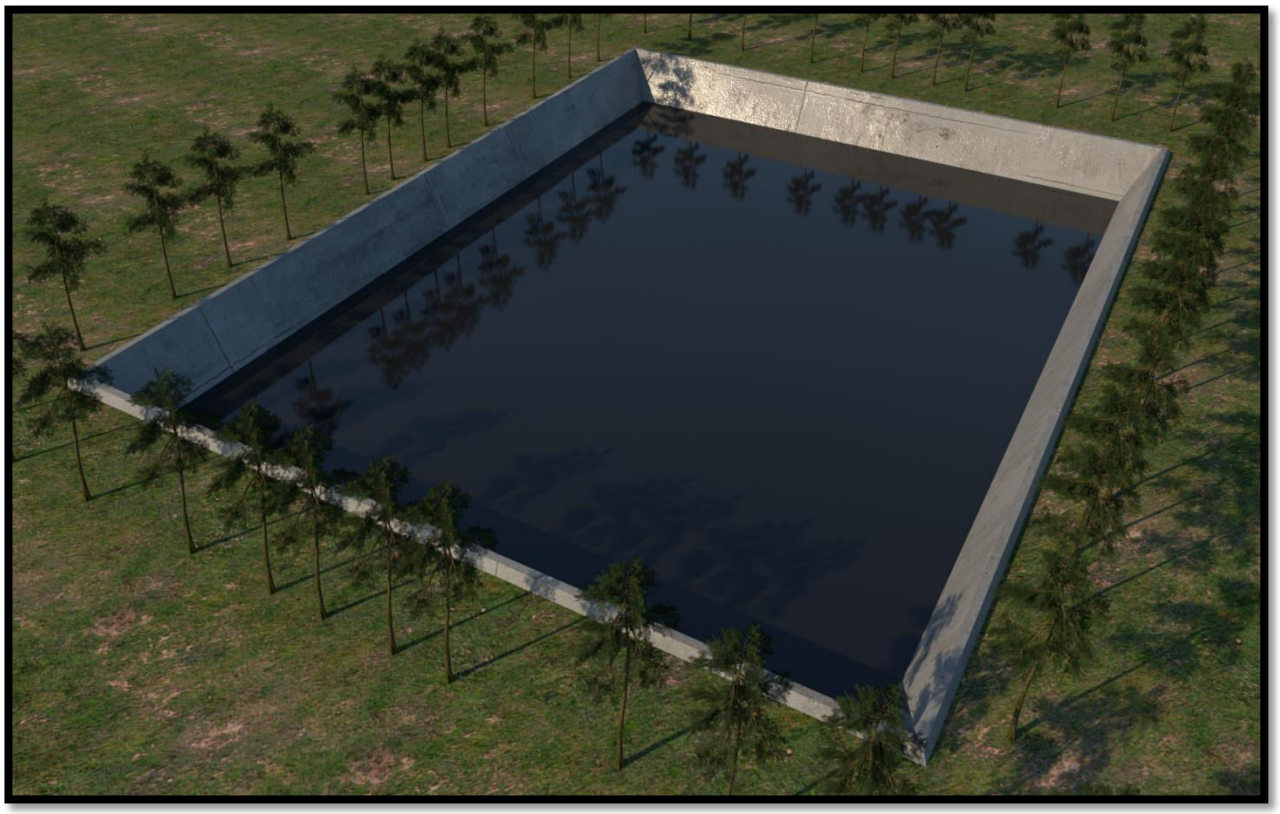
8.1.2 Physical design (Civil)

Artificial Pond

As in kachchh there is always the lack of water due to desert. Hence there is always a grear requirement to store the rain water and to utilize it later. So in order to reduce the irregularity of water durin drought, it is very important to have a pond or lake to fullfil the requirement of the water to the villagers for household, drinking and irrigation. So here is the design of an artificial pond to make the water available for certain undesirable conditions.

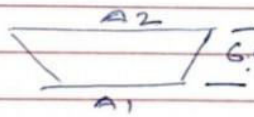
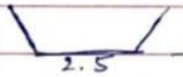


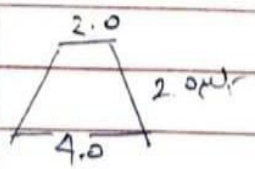
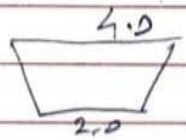
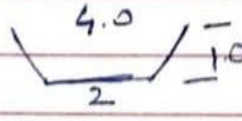
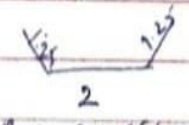
(DESIGN BY SKETCHUP FOR ARTIFICIAL POND)



Hand Calculation:

Name of Work : Construction of Pond

No.	DISCRIPTION	NO	L	B	D	QTY
1	Excavation for Pond					
	A-1					
	150 x 100 = 15000 m^2					
	A-2					
	150 - 9.0 - 9.0 = 132					
	100 - 9.0 - 9.0 = 82					
	132 x 82 = 10824 m^2					
						
	$V = h/3 (A_1 + A_2 + \sqrt{A_1 A_2})$					
	$= 6.0/3 (15000 + 10824 + \sqrt{15000 \times 10824})$					
	$= 6.0/3 (15000 + 10824 + 12742.05)$					
	$= 6/3 (38566.05)$					
	$= 77132.10\ m^3$					77132.00 m^3
*	Deduction for Inlet					
						
	$h = 1.5$					
	$A_1 = 2.5 \times 4 = 10$					
	$A_2 = 4.5 \times 4 = 18$					
	$1.5/3 (10 + 18 + \sqrt{10 \times 18}) = 20.70\ m^3$					(-) 20.70 m^3
						77111.30 m^3
2	Filling for side Bank of Pond					

No.	DISCRIPTION	NO	L	B	D	QTY
						
	$A_1 = 150 \times 2 = 300$					
	$A_2 = 150 \times 4.0 = 600$					
	$V = \frac{1}{3}(A_1 + A_2 + \sqrt{A_1 A_2})$	2	882.84 m^3			1765.68
	$\frac{2.0}{3}(300+600+\sqrt{300\times600})$					
	$= 882.84 m^3$					
	 L = 100-2-2 = 96.0					
	$A_1 = 100 \times 4.0 = 400$					
	$A_2 = 96 \times 2.0 = 192$	2	579.41 m^3			1158.82
	$\frac{2.0}{3}(400+192+\sqrt{400\times192})$					
	$= 579.41 m^3$					
	Deduction for Wier					
		1	6.12 m^3			6.12 m^3
	$A = 4 \times 3 \times 1 = 12 m^3$					2912.50 m
3	RCC for Wier bed & sides	1	4.0	0.20	4.5	3.60 m^3
						
	$B = 2 + 2(1.25) = 4.5m$					

Calculation for pond area :-

V:H (1:2)

A = (150 X 100) + (126 X 76)

=15000 + 9576 = 24576 / 2

= 12288 m²

Volume: - 12288 m² X 6 m depth

= 73,788 m3

= 73,788 x 1000

= 7, 37,88000 liters……

Work Abstract

NAME OF WORK : Construction of Pond							
S.NO	DISCRIPTION	NO	L	B	D	QTY	UNIT
1	Excavation for Pond	1.00				77132.00	M^3
	(-) Deduction for Inlet	1.00				20.70	
						77152.70	
2	Filling for Side Bank of Pond	2.00	882.84			1765.68	
		2.00	579.41			1158.82	
	(-) Deduction of Viear	1.00	12			12.00	
						2912.50	M^3
3	RCC for Viear Bed and Sides	1.00	4	0.20	4.50	**3.60**	M^3

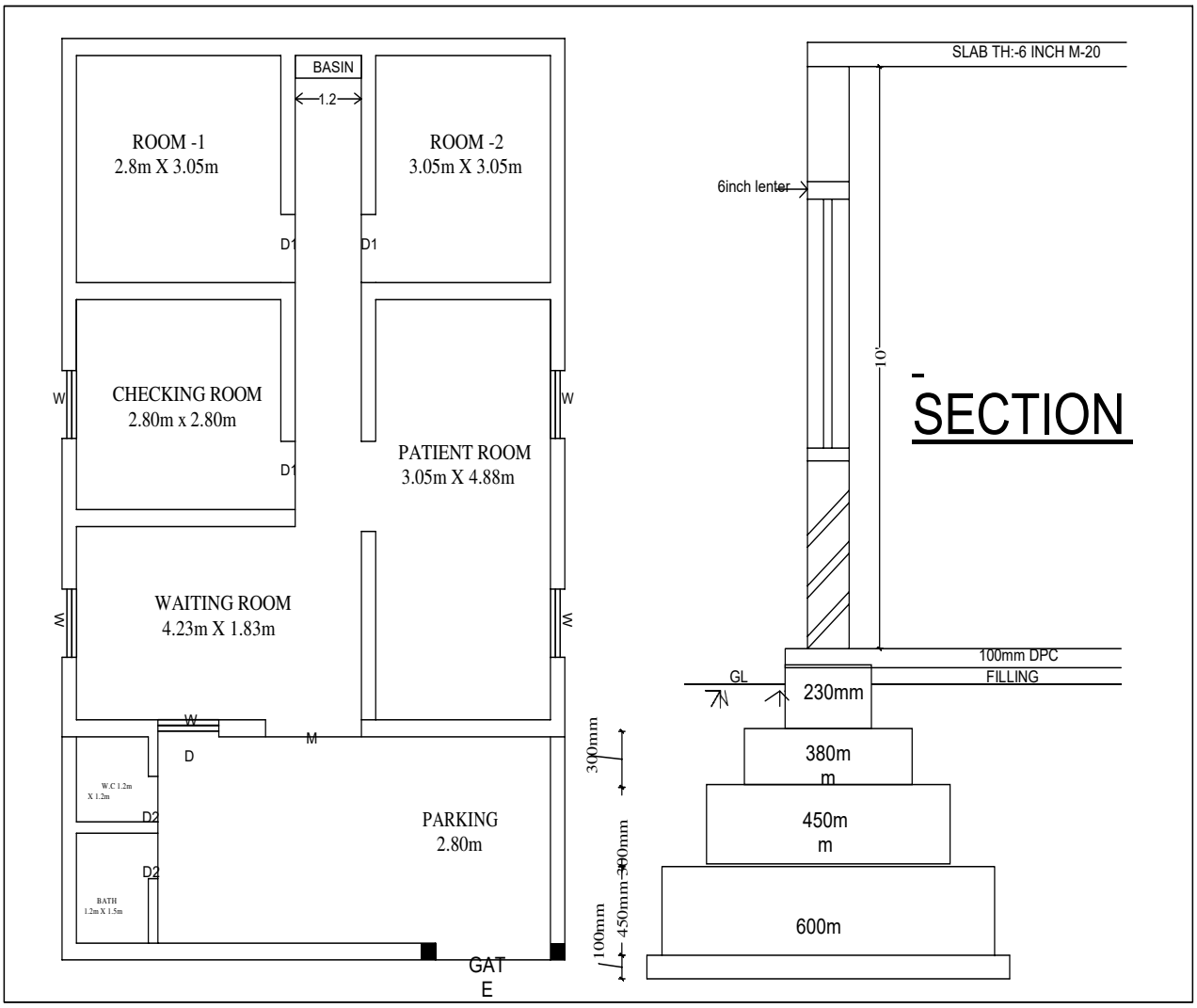
Cost Estimation:

NAME OF WORK : Construction of Pond					
S.NO	DISCRIPTION	QTY	UNIT	RATE	TOTAL AMOUNT
1	Excavation for Pond and Transportation	77132.00	M^3	158.00	12186856.00
2	Filling at Side Bank	2912.50	M^3	94.50	275231.25
3	RCC for Viewer Side of Pond	3.60	M^3	10500.00	37800.00
				TOTAL	12499887.25
Amount in words: One Crore Twenty Four Lac Ninety Nine Thousand Eigth Hundred Eigty Seven Rupee and Twenty Five Thousand					

8.1.3 Social design (Civil)

PHC centre

Primary health care (PHC) is essential **health** care made universally accessible to individuals and acceptable to them, through full participation and at a cost the **community** and country can afford. It is an approach to health beyond the traditional health care system that focuses on health equity-producing social policy. Primary health-care (PHC) has basic essential elements and objectives that help to attain better health services for all.



Hand Calculation:

①

Name of Client :

Name of Work : P.H.C Center

No.	DISCRIPTION	NO	L	B	D	QTY
1.	Excavation for wall	2	9.36	0.60	1.45	16.28
	L.W = 8.16 + 0.6 + 0.6 = 9.36	2	6.06	0.60	1.45	10.54
	S.W = 7.76 - 0.6 - 0.6 = 6.06	1	7.19	0.60	1.45	6.75
	8.16 + 0.23 - 1.2 = 7.19	1	6.33	0.60	1.45	5.50
	3.05 + 2.82 + 0.23 + 0.23	3	1.85	0.60	1.45	4.82
	3.05 - 0.6 - 0.6					
	Compound wall	1	7.76	0.60	0.75	3.49
		2	2.20	0.60	0.75	1.32
						48.86 M^3
2.	PCC 1:3:6	2	9.36	0.60	0.10	1.12
	foundation	2	6.06	0.60	0.10	0.72
		1	7.19	0.60	0.10	0.73
		1	6.33	0.60	0.10	0.38
		3	1.85	0.60	0.10	0.33
		1	7.76	0.60	0.10	0.46
		2	2.20	0.60	0.10	0.26
						3.67 M^3
3.	Brick Masonary for upto plinth level.	2	9.36	0.60	0.45	5.05
		2	6.06	0.60	0.45	3.27
		1	7.19	0.60	0.45	1.94
		1	6.33	0.60	0.45	1.71
		3	1.85	0.60	0.45	1.40
		1	7.76	0.60	0.45	2.09
		2	0.2	0.60	0.45	1.19

(2)

Name of Client :

Name of Work :

No.	DISCRIPTION	NO	L	B	D	QTY
	2th step	2	9.06	0.45	0.3	2.44
		2	5.76	0.45	0.3	1.55
		1	6.90	0.45	0.3	0.93
		1	6.33	0.45	0.3	0.81
		3	1.55	0.45	0.3	0.62
	32th step	2	8.92	0.38	0.3	2.03
		2	5.60	0.38	0.3	1.27
		1	6.76	0.38	0.3	0.76
		1	5.80	0.38	0.3	0.66
		3	1.40	0.38	0.3	0.47
		2	7.76	0.23	0.45	1.60
		3	8.62	0.23	0.45	2.67
		2	2.80	0.23	0.45	0.58
		1	6.10	0.23	0.45	0.63
						33.76m3
(4)	D.P.C 100mm &	2x2	7.51	0.23	0.1	0.69
	lintle	2x3	8.62	0.23	0.1	1.19
		2x2	2.80	0.23	0.1	0.25
	GATE	1x1	7.51	0.23	0.1	0.17
		1x3	2.80	0.23	0.1	0.19
						2.49m3
(5)	filling	1	2.8	3.05	0.3	2.56
		1	2.8	2.82	0.3	2.36
		1	3.05	3.05	0.3	2.79
		1	3.05	4.88	0.3	4.46

(3)

Name of Client :

Name of Work :

No.	DISCRIPTION	NO	L	B	D	QTY
		1	1.2	6.1	0.3	2.19
		1	4.23	1.83	0.3	2.32
		1	1.2	2.80	03	1.00
						17.68 m^3
(6)	PCC for 1:3:6	1	2.8	3.05	0.1	0.54
		1	2.8	2.82	0.1	0.78
		1	3.05	2.05	0.1	0.93
		1	3.05	4.88	0.1	1.48
		1	1.2	6.1	0.1	0.75
		1	4.23	1.83	0.1	0.77
		1	1.2	2.8	0.1	0.33
						5.76 M^3
(7)	Tiles					
	$\frac{5.76\ m^3}{0.1} = 57.6$					57.60 m^2
(8)	Masonary for	2	7.76	0.23	3.05	10.88
	super-structure	3	8.62	0.23	3.05	18.14
	1st class Brick.	2	2.8	0.23	3.05	3.92
		1	0.10	0.23	3.05	4.27
	D1	3	0.9	0.23	2.10	1.3
	MD	1	1.2	0.23	2.10	0.57
	W	5	1.2	0.23	1.2	1.65
	V	2	0.6	0.23	0.45	0.12
						33.57 M^3

Name of Client :

Name of Work :

No.	DISCRIPTION	NO	L	B	D	QTY
9.	R.C.C slab & chajja	1	7.97	0.62	0.12	8.24
	Toilet	1	3.0	1.36	0.12	0.46
	window	5	1.5	0.45	0.10	0.33
						9.03 m^3
(10)	plaster (12mm)	1	2(7.8 + 3.05)		3.05	21.40
		1	2(7.8 + 3.05)		3.05	20.00
		1	2(3.05 + 3.05)		3.05	21.65
		1	2(3.05 + 4.88)		3.05	32.81
		1	2(4.2 + 1.93)		3.05	15.39
		1	8.16	–	3.05	24.88
		1	6.10	–	3.05	18.60
	slab	1	2.8	3.05	–	8.54
		1	2.8	2.82	–	7.89
		1	4.23	1.83	–	7.74
		1	3.05	3.05	–	9.30
		1	3.05	4.88	–	14.88
		1	6.10	1.2	–	~~14.60~~ 7.32
	Toilet	1	2.8			3.36
		1	2(1.2 + 2.8)	2.10	–	7.44
		1	2(1.2 + 1.5)	2.10	–	7.50
	Deduction D & W					
	D1	1/2 x 3	0.9	–	2.10	(-) 2.83
	MD	1/2 x 5	1.2	–	2.10	(-) 1.26
	W	5 x 1/2	1.2	–	1.2	(-) 3.60
	V	7 x 1/2	0.6	–	0.45	(-) 0.27
						224.10 m^2

④

Name of Client :

Name of Work :

No.	DISCRIPTION	NO	L	B	D	QTY
11	External plaster					
	H = 3.05 + 0.45 = 3.50	2	8.62	–	3.5	60.34
		2	8.82	–	3.5	61.74
		2 x 1	2.8	–	3.5	13.72
		1	1.40	–	3.5	3.43
	Deduction D1	1/2 x 3	0.9	–	2.10	(-) 2.83
	MD	1/2 x 1	1.2	–	2.10	(-) 0.26
	W	5 x 1/2	1.2	–	2.10	(-) 3.60
	V	2 x 1/2	0.60	–	2.10	(-) 0.27
						131.27 m²
12	Wooden Door & window					
	D1	3	0.9	–	2.10	2.83
	MD	1	1.2	–	2.10	1.26
	W	5	1.2	–	2.10	3.60
	V	2	0.60	–	0.45	0.27
						7.96 M²
13	Steel 9.03 + 2.49 = 11.52 m³					
	1.25 % of = 0.144 x m³ x 7854		= 1130.97		say	1131 kg
						1131 kg
14	Colour for internal & External	Same as per Item No 10 & 11				
			355.37 m²			355.37 m²
15	Main Gate M.5	1	L.5 (1.8 x 1.5)			1 NO

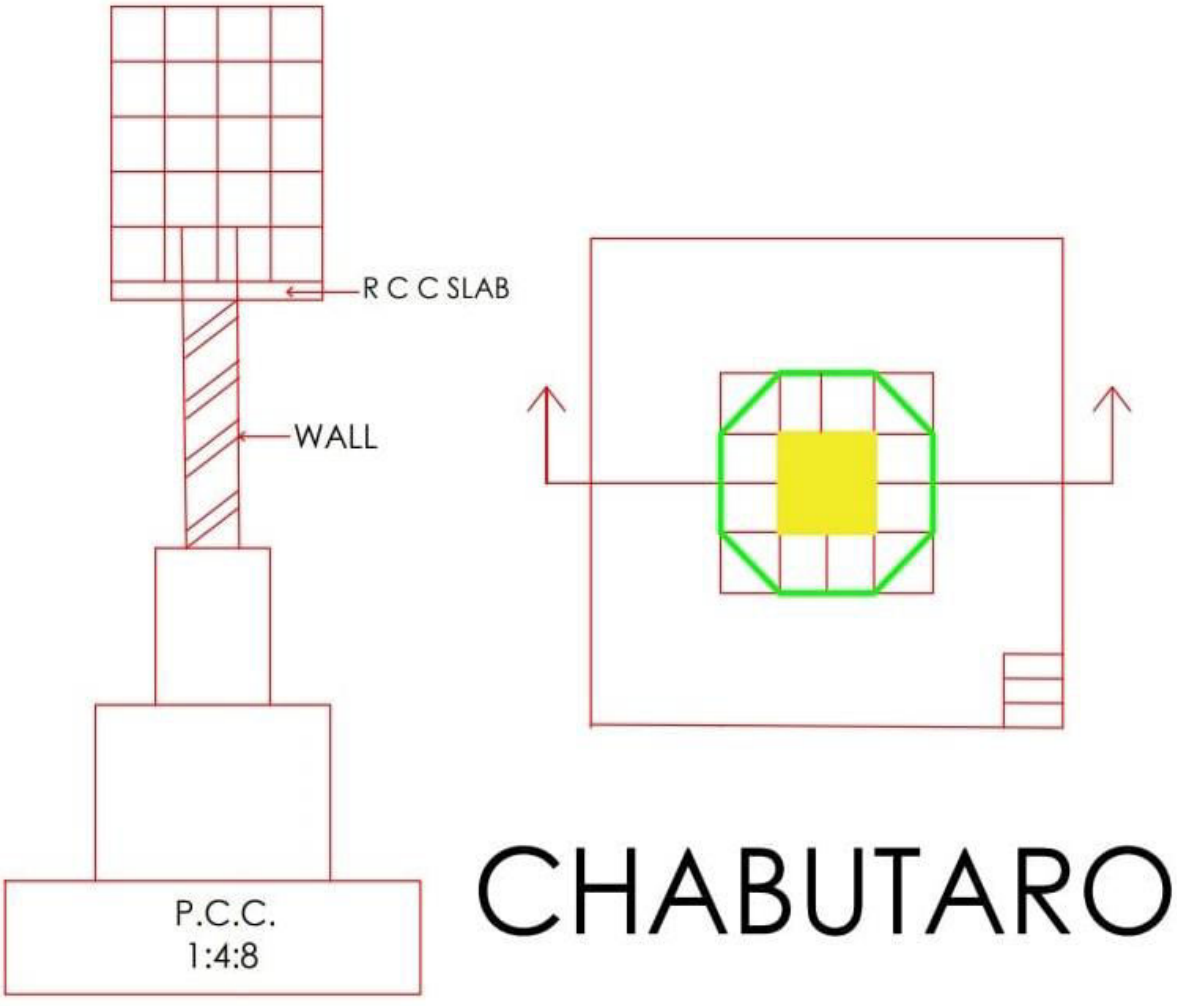
Abstract Sheet:

WORK ESTIMATE					
NAME OF WORK : Construction of PHC center					
S.NO	**DISCRIPTION**	**QTY**	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	48.86	M^3	158.00	7719.88
2	PCC 1:3:6	3.67	M^3	3800.00	13946.00
3	brick masonary 1st class upto pl	33.76	M^3	5200.00	175552.00
4	DPC M-20	2.49	M^3	7800.00	19422.00
5	murrom filing	17.68	M^3	300.00	5304.00
6	pcc 1:3:6 for floor	5.76	M^3	3800.00	21888.00
7	floor tiles	57.60	M^2	1200.00	69120.00
8	massonary super – structure	33.57	M^3	5800.00	194706.00
9	RCC slab m-20 150 mm thick	9.03	M^3	10000.00	90300.00
10	12 mm internal plaster	224.10	M^2	280.00	62748.00
11	external plaster 20mm	131.27	M^2	360.00	47257.20
12	wooden door & window	7.96	M^2	8050.00	64078.00
13	steel	1131.00	kg	65.00	73515.00
14	colour of wall external & internl	355.37	M^2	250.00	88842.50
15	M.S. main gate	1.00	no	12000.00	12000.00
16	electric & plumbing 4% of total cost				37845.00
				TOTAL	**984243.58**
Amount in words: nine Lac eighty four thousand fourty two hundred fourty three and fifty eight paisa only					

8.1.4 Socio-Cultural design (Civil)

Pigeon-hole-tower (Chabutro) : -

Chabutra is a structure mostly found in India. They are a tower-like structure with octagonal or pentagonal shaped enclosures at the top. In the upper enclosure are several holes, wherein birds can make their nests. In Gujarat these are constructed at the entrances villages,



TOP VIEW & SECTION OF CHABUTARO

(DESIGN BY SKETCHUP FOR Pigeon-hole-tower (Chabutro)

Work Estimate

NAME OF WORK : Construction of New Chabutara							
S.NO	DISCRIPTION	NO	L	B	D	QTY	UNIT
1	Excavation and Filling	1 * 2	8	0.65	0.70	7.28	
		1 * 2	7.35	0.65	0.70	6.69	
						13.97	M^3
2	PCC 1:3:6	2.00	8	0.65	0.10	1.04	
		2.00	7.35	0.65	0.10	0.96	
		1.00	1.5	1.50	0.10	0.23	
						2.22	M^3
3	R.R. Mass in CM 1:6	2.00	8	0.45	0.60	4.32	
		2.00	7.55	0.45	0.60	4.08	
						8.40	M^3
4	Black Mass.	2.00	8	0.20	0.30	0.96	
		2.00	7.8	0.20	0.30	0.94	
						1.90	M^3
5	RCC For Middle Coluom & Footing with Steel	1.00	1.5	1.50	0.30	0.68	
		1.00	0.75	0.75	0.30	0.17	
		1.00	0.6	0.60	1.80	0.65	
		1.00	1.8	1.80	0.13	0.41	
						1.90	M^3
6	Fenciy Grill	1x4	8		1.50	**48.00**	M^2
7	Flooning Tiles	1.00	8		8.00	**64.00**	M^2
8	Plaster	1x4	8		0.80	25.60	
		1.00	2(0.00+0.60)		1.90	4.56	
						30.16	M^2
9	Chabutra(pre-cast)	1.00				1.00	No.

Cost Estimation:

NAME OF WORK : Construction of New Chabutara					
S.NO	**DISCRIPTION**	**QTY**	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	13.96	M^3	158.00	2205.68
2	PCC 1:3:6	2.21	M^3	3800.00	8398.00
3	R.R. Mass in CM 1:6	8.39	M^3	2050.00	17199.50
4	Black Mass.	1.89	M^3	4000.00	7560.00
5	RCC for Middle Column and Footing with steel	1.89	M^3	10500.00	19845.00
6	GI Fencing with Pipe and Pre Cast grill	960.00	Kg	85.00	81600.00
7	Flooring Tiles	64.00	M^2	960.00	61440.00
8	Plaster	25.60	M^2	245.00	6272.00
9	Chabutara Pre Cast	1.00	No	45000.00	45000.00
				TOTAL	**249520.18**
Amount in words: Two Lac Fourty Nine Thousand Five Hundred Twenty Rupee and Eighteen Paise					

8.1.5 Smart Village Design (Civil)

Rainwater Harvesting:

Components

- Roof (catchment area)
- Pipes and gutters (conveyance system)
- Tank with a secure cover (storage)
- Overflow pipe
- First flush system (method to let the first flow of dirty water off the roof bypass the storage tank)
- Tap or pump to access water (distribution system)
- Draining area to prevent puddles near tank and to drain tank of dirty water at bottom

Materials

- Catchment area

- Hard roof of tile or corrugated metal (no lead paint)

- Conveyance System

- Gutters to catch rainwater, such as 22-gauge galvanized mild steel sheeting or large bamboo
- Galvanized wire or wood (to attach gutter to roof)
- Pipes to carry water from gutters to tank (PVC works well with the First Flush System)

- Storage

- Holding tank: polypropylene, metal drums or ferrocement
- Tanks should be fully enclosed to prevent contamination
- Tanks should be easy to access to clean out

- First Flush System

- Screens for end of gutters and downpipes to prevent debris from entering tank
- Extra PVC with a stopper and small hole on the end
- A small tank/container with a stopper (optional)
- A rubber ball (optional)
- An alternate First Flush System could contain a large box or container with screens and layered gravel, sand, charcoal and pea gravel for filtering debris and pollutants.

Building a roof water harvesting system

The steps below are meant as a general overview of building a rainwater harvesting system. Please consult with a local organization that can help build a system that meets the needs of the home, school or community center where it will be used.

1. Make sure you have a hard roof that has not been finished with lead paint. Roofs without branches overhead are best to prevent excess debris and animal nesting.

2. Purchase or build a tank approximately 5,000L to 20,000L in size. Be sure the tank has a tap for accessing the water collected and a small, screened pipe outlet at the top of the tank to allow overflow water to leave the tank (called the overflow pipe).

3. Make a gutter around the eaves of the roof. You can make a gutter out of 22-gauge galvanized metal sheeting, large semi-circular plastic pipes or large bamboo cut lengthwise.

- For metal sheeting, bend the metal sheeting into a V in a clamp. To strengthen the edges, bend them in a 90-degree clamp then hammer flat.

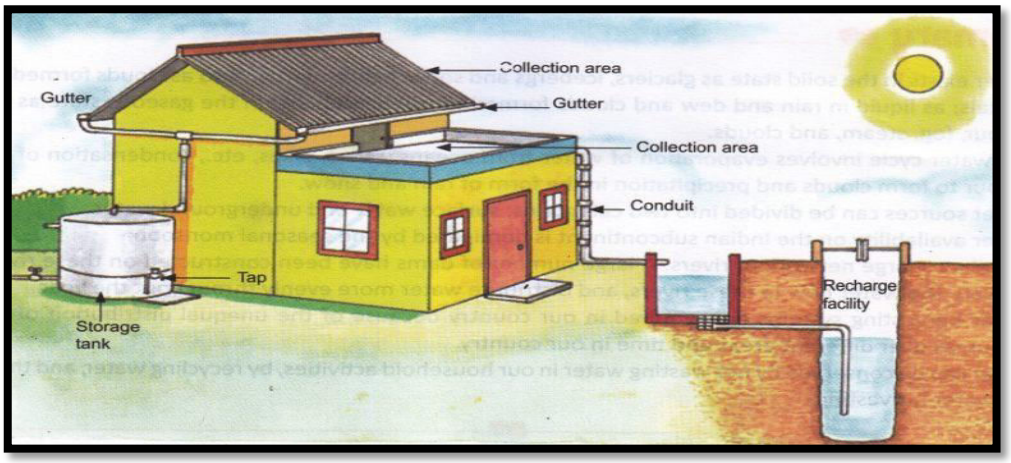
4. Attach the gutter to roof using either galvanized wire thread through the metal and roof, wood triangle supports attached to the building or plastic pipe supports. Wires or supports should be spaced regularly and evenly across the roof. Be sure that the gutter is angled downward so that the flow of water runs toward the storage tank.

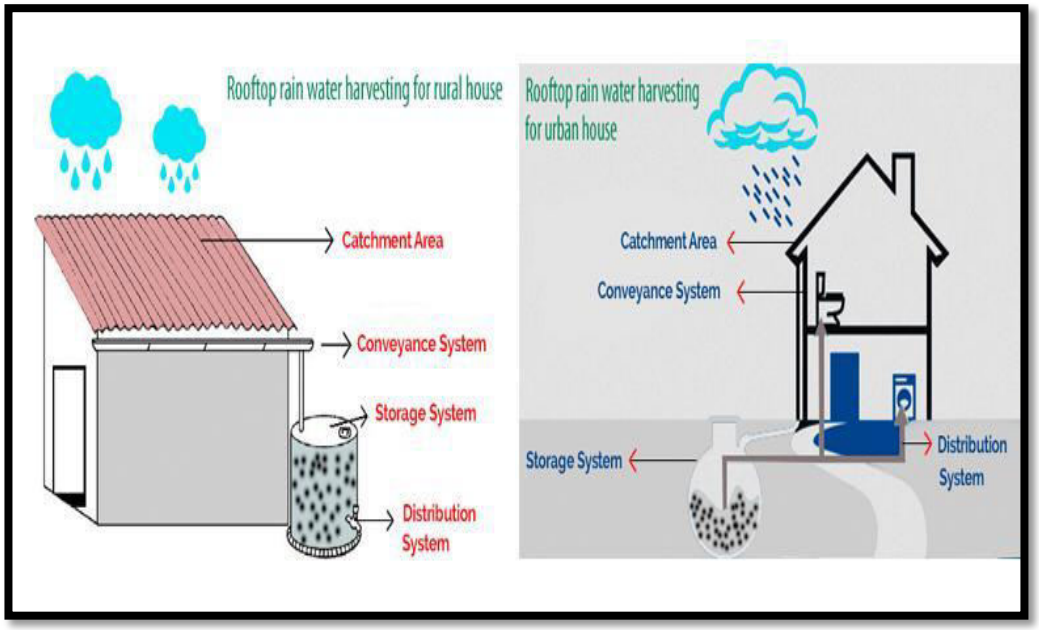
5. Attach a downpipe directly to the end of the gutter. The pipe may be of PVC or metal. You may either cut a hole toward the end of the gutter for the downpipe or attach it to the end of the gutter. The down pipe should attach tightly to prevent additional contamination from entering the downpipe. Use caulking or a tar compound to seal the downpipe connection.

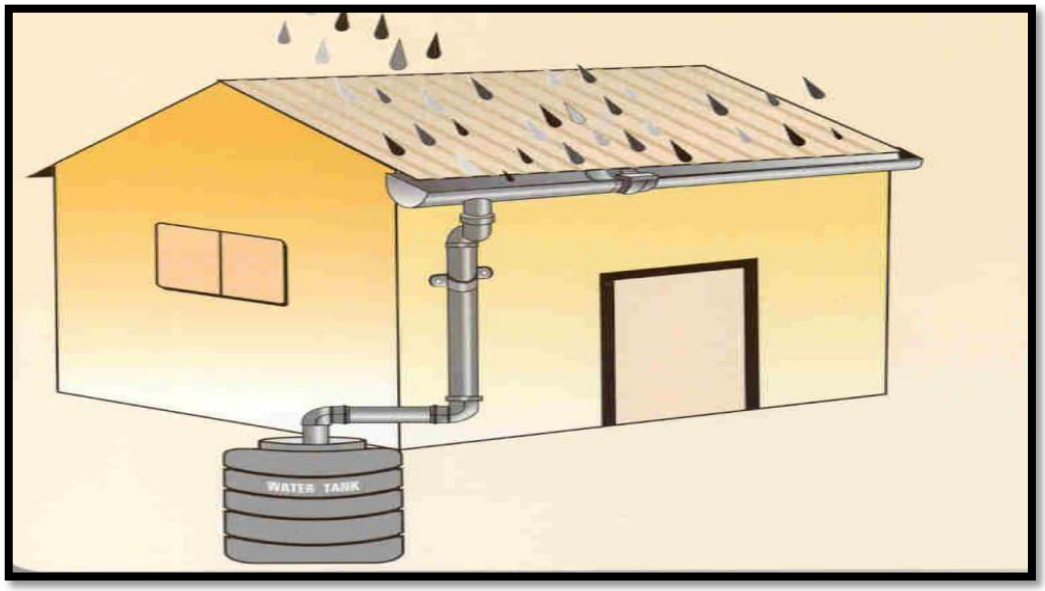
6. Fix a screen to the entrance of the downpipe to prevent leaves and debris from entering the downpipe. The screen should be large enough to allow water to flow freely but small enough to block leaves and debris.

7. How you connect the downpipes to the tank will depend on which method of First Flush System you choose to employ.

8. The tank will need to have some way to retrieve water such as a tap or pump.





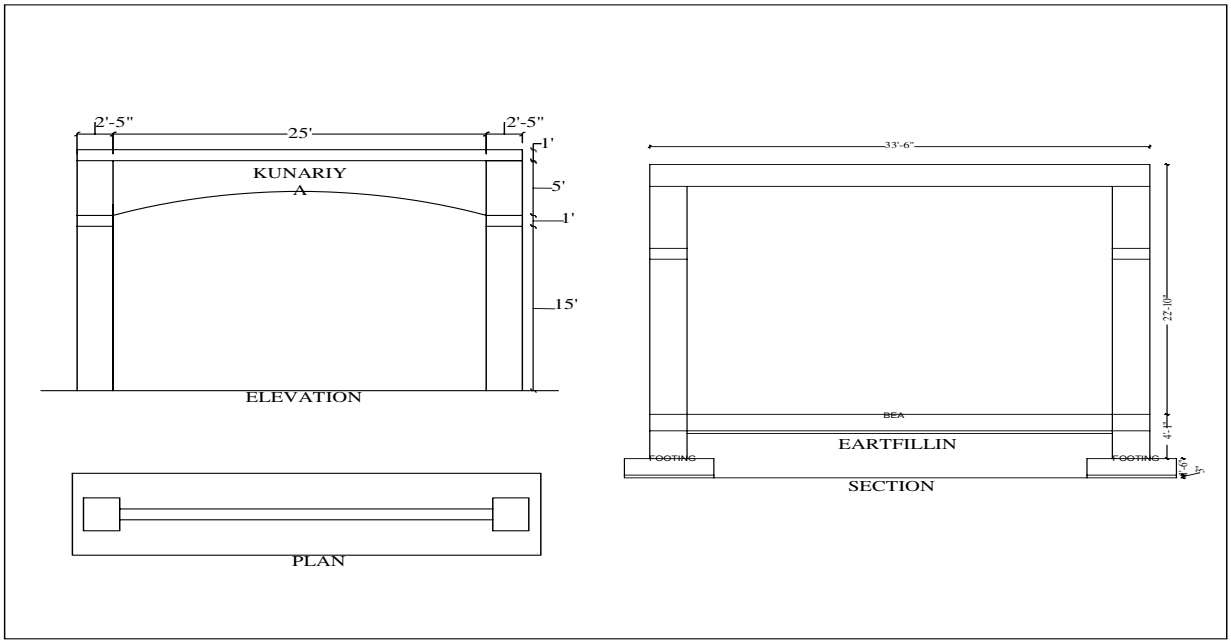


	Capacity of rooftop water harvesting system in Litres				
	5000	6000	7000	9000	10000
Total Cost In Rupees	12,430	12,975	13,970	14,380	15,800

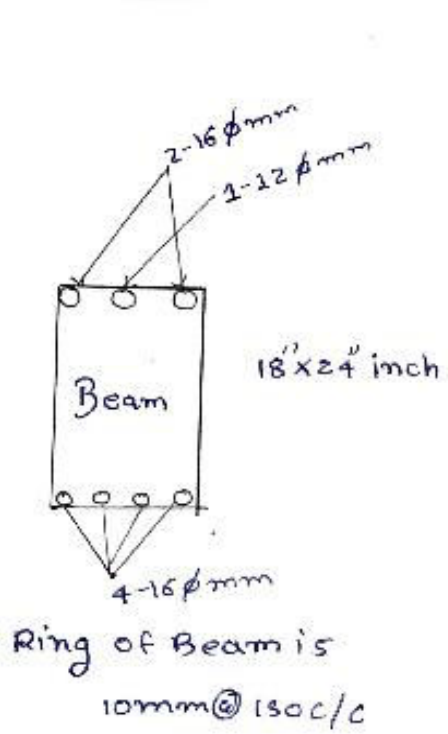
Material	Unit	Cost (Rs.)
Excavation in soil	cu. m.	90
Excavation in rock	cu. m.	150
Brick with cement Mortar(1:6)	cu. m.	1400
Plain Cement Concrete (1:3:6)	cu. m.	1500
Reinforced cement concrete (1:2:4) cu. m. 4700 Including steel bars, shuttering, etc.	cu. m.	4700
PVC piping for rainwater pipes - 110mm diameter - 20mm diameter	 Meters Meters	 165 275
Making borehole in meters 165.00 Soft soil(with 150 mm diameter PVC casting	Meters	180

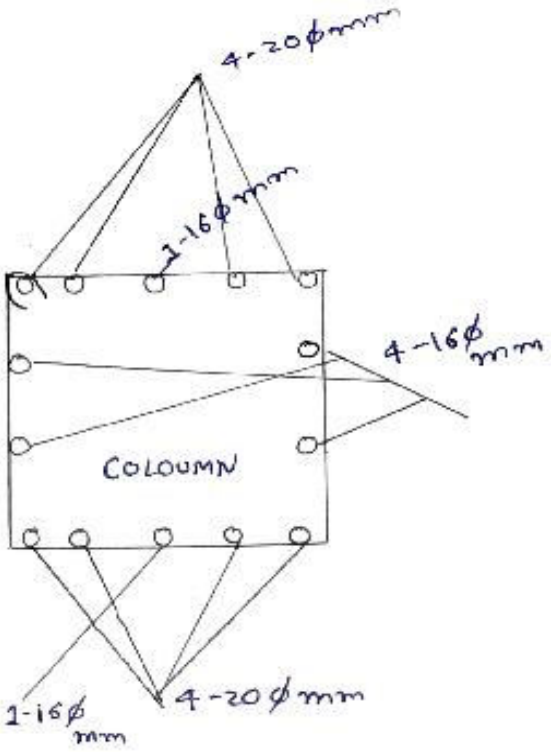
8.1.6 Heritage Village Design (Civil)

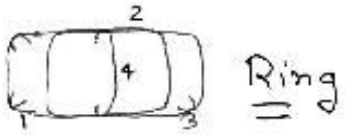
Village entrance gate

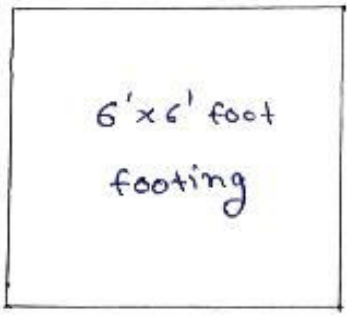


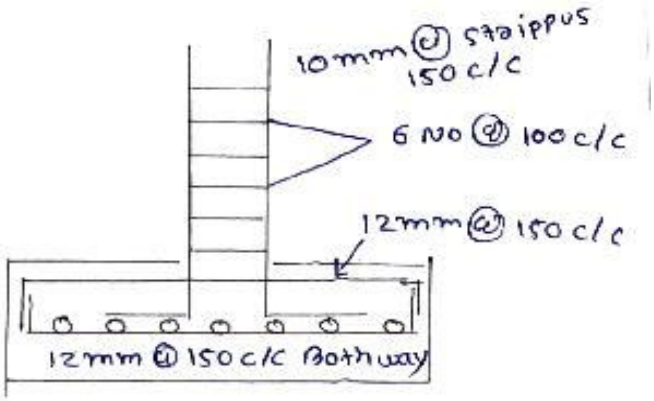
Hand Calculation for Column and Beam:



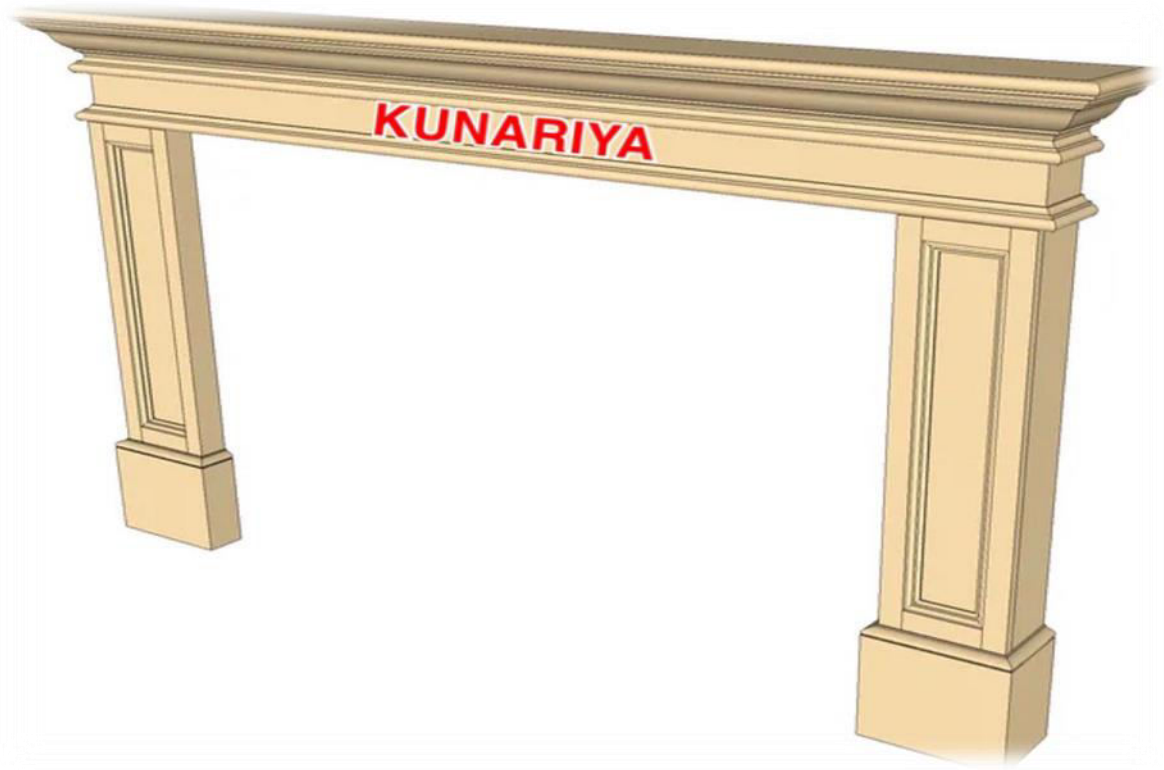








Elevation of Entrance Gate



WORK ABSTRACT SHEET							
NAME OF WORK : VILLAGE ENTRANCE GATE							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	EXCAVATION &FILLING	1 * 2	1.8	1.80	0.80	5.18	
						5.18	**M^3**
2	PCC 1:3:6	2.00	1.8	1.80	0.35	2.27	
						2.27	**M^3**
3	RCC M-20	2.00	1.8	1.80	0.75	4.86	
	(1:1/5:3) FOOTING & PLINTH BEAM						
	PLINTH BEAM	1.00	7.65	0.30	0.45	1.03	
	DOGLA	2.00	0.75	0.60	0.30	0.27	
						6.16	**M^3**
4	RCC M-25 FOR COLOUMN & BEAM	2.00	0.75	0.60	6.70	6.03	
		1.00	7.62	0.45	0.60	2.06	
		1.00	7.62	0.15	0.85 (AVR.)	0.95	
						9.03	**M^3**
5	STEEL	1.00	1.5			1.50	**M.T.**
						1.50	**M^3**
8	PLASTER	AVRAGE				75.00	**M^2**

WORK ESTIMATE					
NAME OF WORK : VILLAGE ENTERANCE GATE					
S.NO	**DISCRIPTION**	**QTY**	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	5.18	M^3	158.00	818.44
2	PCC 1:3:6	2.26	M^3	3800.00	8588.00
3	RCC M-20 PLINTH DOGLA FOOTING	8.39	M^3	8200.00	68798.00
4	RCC M-25 COLOUMN BEAM PARDI	1.89	M^3	10500.00	19845.00
5	STEEL	1.89	M.T	75000.00	141750.00
6	PLASTER	75.00	M^2	400.00	30000.00
7	75X75X6 CORNER ANGLE	115.00	KG	100.00	11500.00
				TOTAL	**281299.44**
Amount in words: Two Lac eighty one thousand two hundred ninety nine & forty four paisa only					

8.1.7 Electrical Design 1

Solar Based Independent Street Lights

- **Components :**

1. Solar PV Array
2. Battery (Storage Device)
3. Control Circuit
4. Pole
5. Low power consuming LED street lights
6. LDR sensor

- Solar street lights are best possible option to avoid hectic view of the wires running all sides away. Even causes the low power loss & very low consumption of power resulting in the conservation of energy.

Key Points:

- A solar panel should be set in the direction such that maximum power can be obtained.
- In order to operate only single LED, we can even use PV arrays with low power ratings and even low rating batteries in order to reduce the initial and maintained cost.
- A control circuit is needed to operate & regulate the battery charging time & operating time of LED.
- A design in order to reduce the load on the main grid & to harvest the energy in order to operate the street lights of the village.
- Solar panels will charge the battery for specific time in order to avoid over charging.
- We can also use light detecting sensors in order to automatically operate the lights.
- Another design may also be preferred in order to reduce its size and to keep it at some remote areas.

Specifications:

Height Of Pole: 15 foot

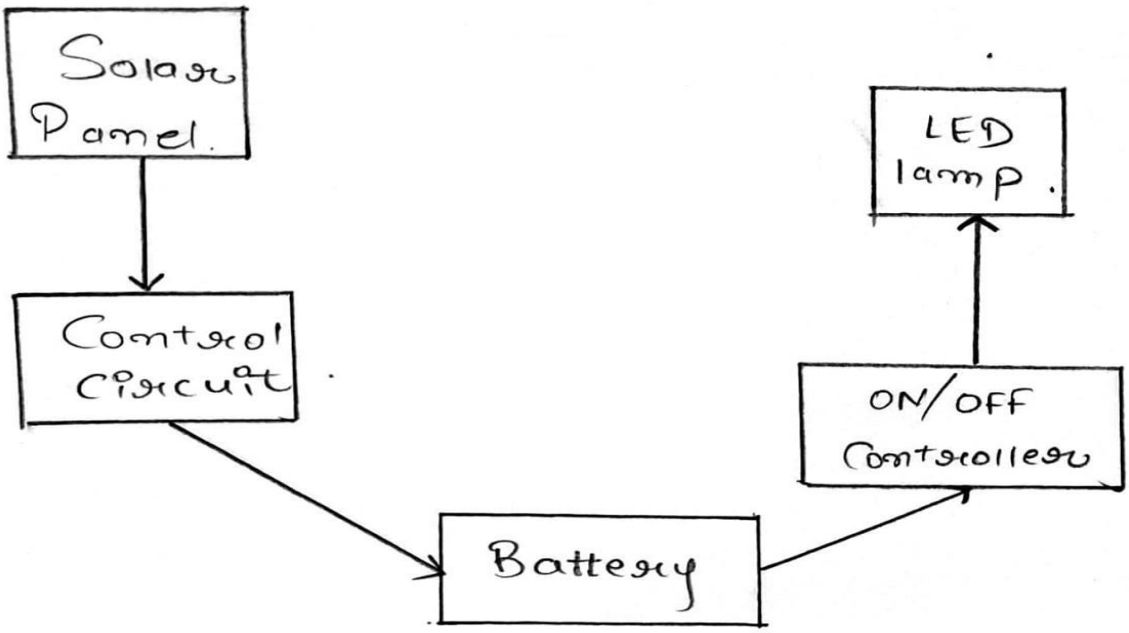
Spacing Between Poles: 200 foot

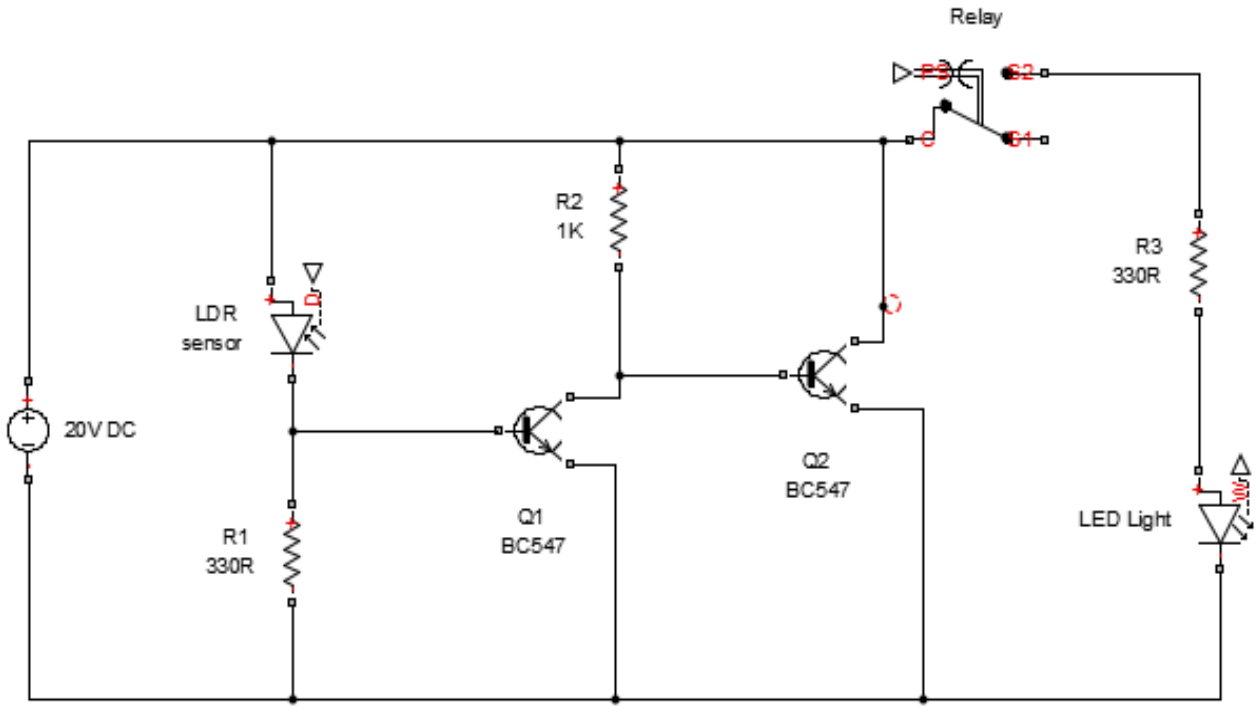
Streetlights per kilometer: 16 No.s

Cost estimation: (Per Street Light)

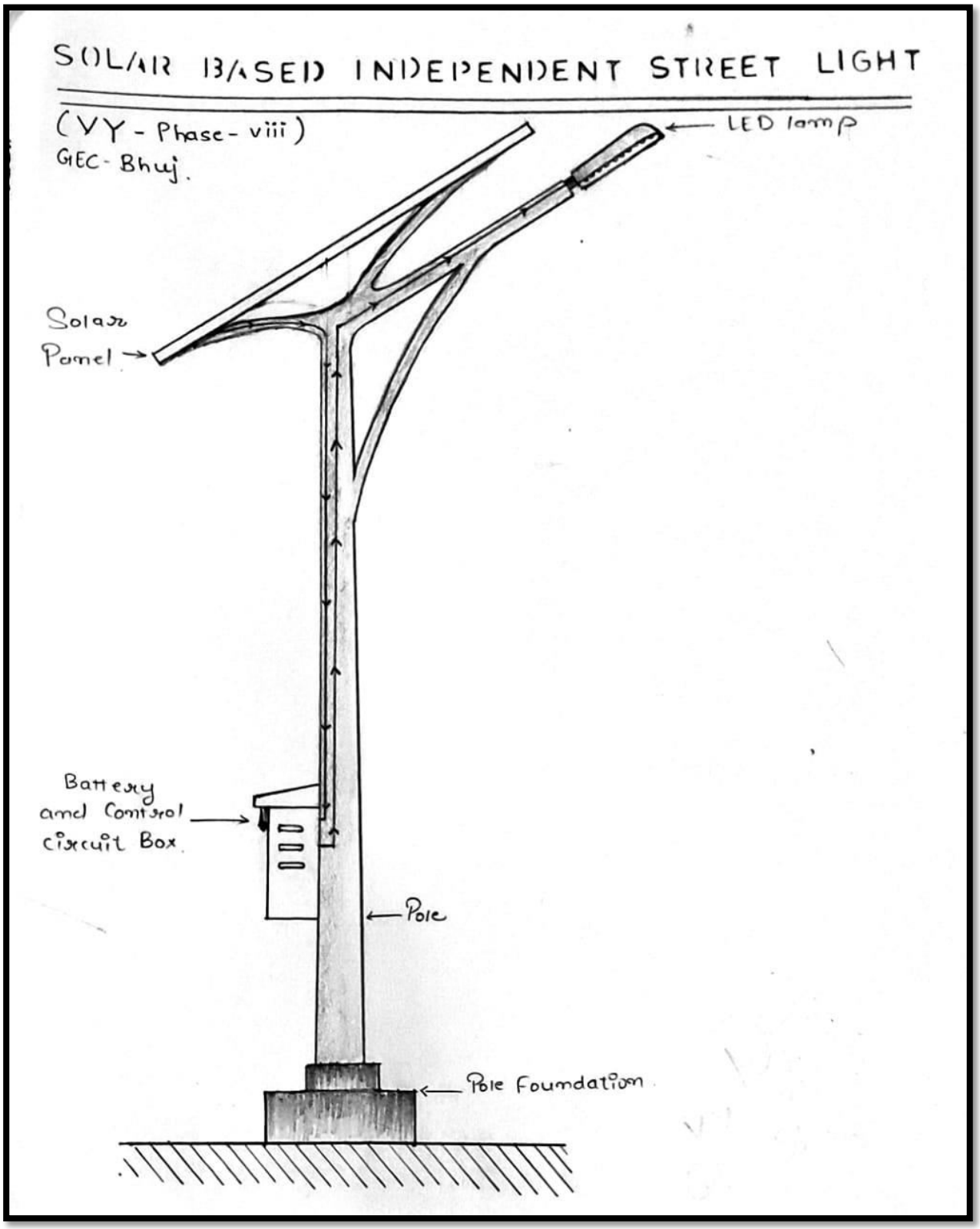
Equipment	**Price**
Solar Panel(50 W,12 V)	Rs. 3000/-
Battery (12 V, 17Ah)	Rs. 3000/-
Control circuit	Rs. 1500/ (Avg. inc. all components)
LED light(IP65) (2400)	Rs. 1000/-
Pole and mountings	Rs. 8000/-
Miscellaneous	Rs. 1500/-
Total(Per Street Light)	Rs. 18,000/-

Note: Here is the costing of one street light and 16 street lights are required per kilometer.





Control circuit for Automatic Street Light
Vishwakarma phase (viii) GEC Bhuj


SOLAR BASED INDEPENDENT STREET LIGHT
(VY - Phase - viii)
GEC - Bhuj.
LED lamp
Solar Panel
Battery and Control circuit Box
Pole
Pole Foundation

8.1.8 Electrical Design 2

Underground Wiring:

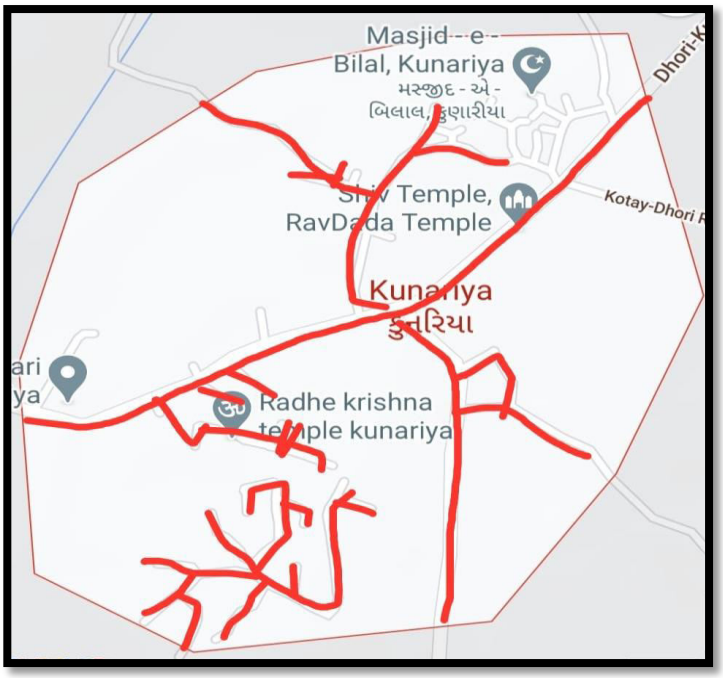
Note: Here is the design for underground wiring for the 440V, 3-phase distribution system, to be inserted by the respective distribution company with certain junction box to take connections for single phase consumers as well as three phase consumers to remove the hectic view of the numerous overhead lines.

Components:

-Cables -Junction Box -Connecting terminals

-Parameter measuring terminals

-Pits for maintenance



Brief:

Types of underground cables

- Low tension (upto 1 kV)
- High Tension(upto 11Kv)
- Super Tension(22-33Kv)
- Extra high Tension(33-66Kv)
- Extra super voltage(upto 132Kv)

Key Points:

A pit can be made on the sides of the road or under footpath in which these cables can be inserted.

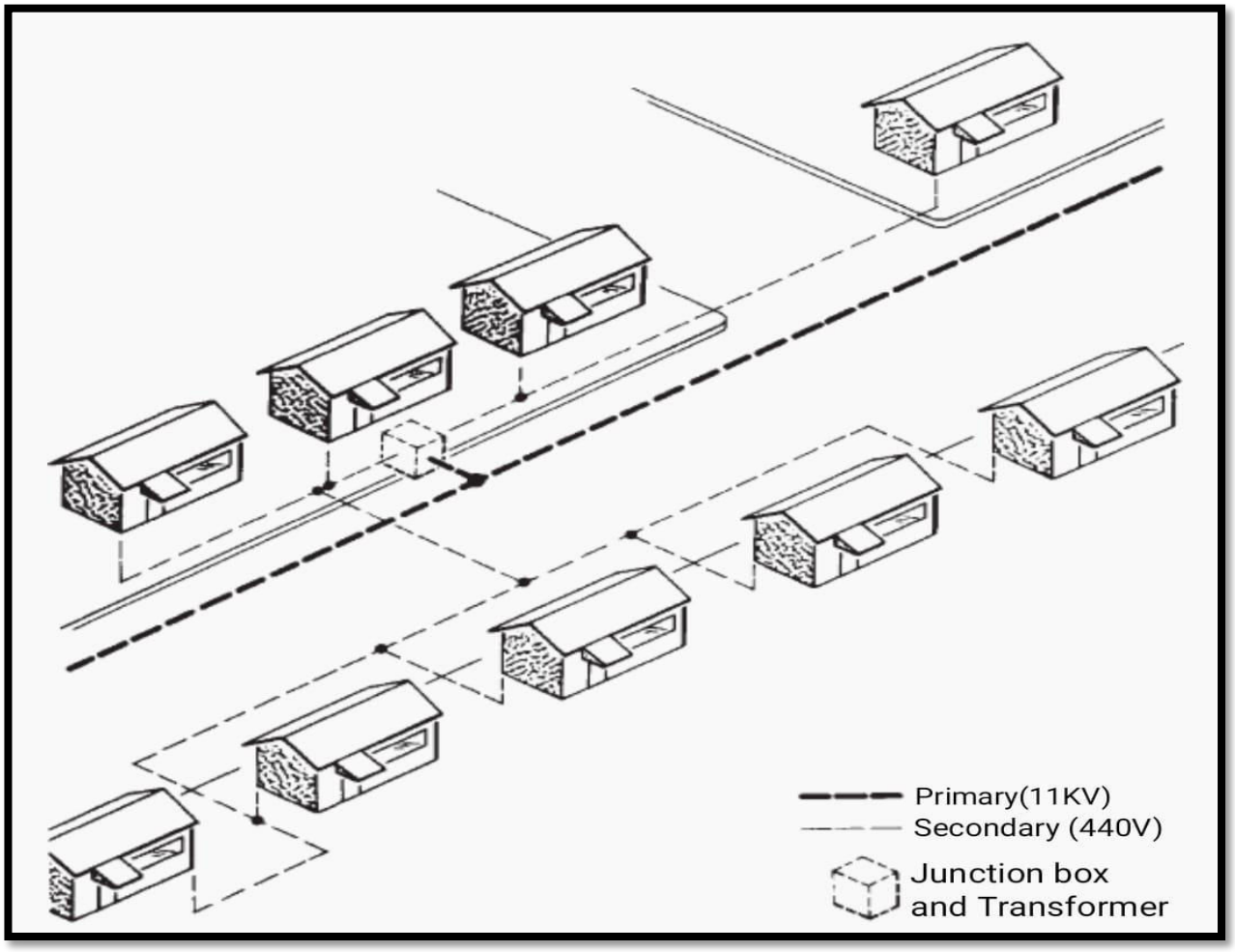
At regular intervals, a junction box is set, which can be used for connections to mains and for any repairing or maintenance work.

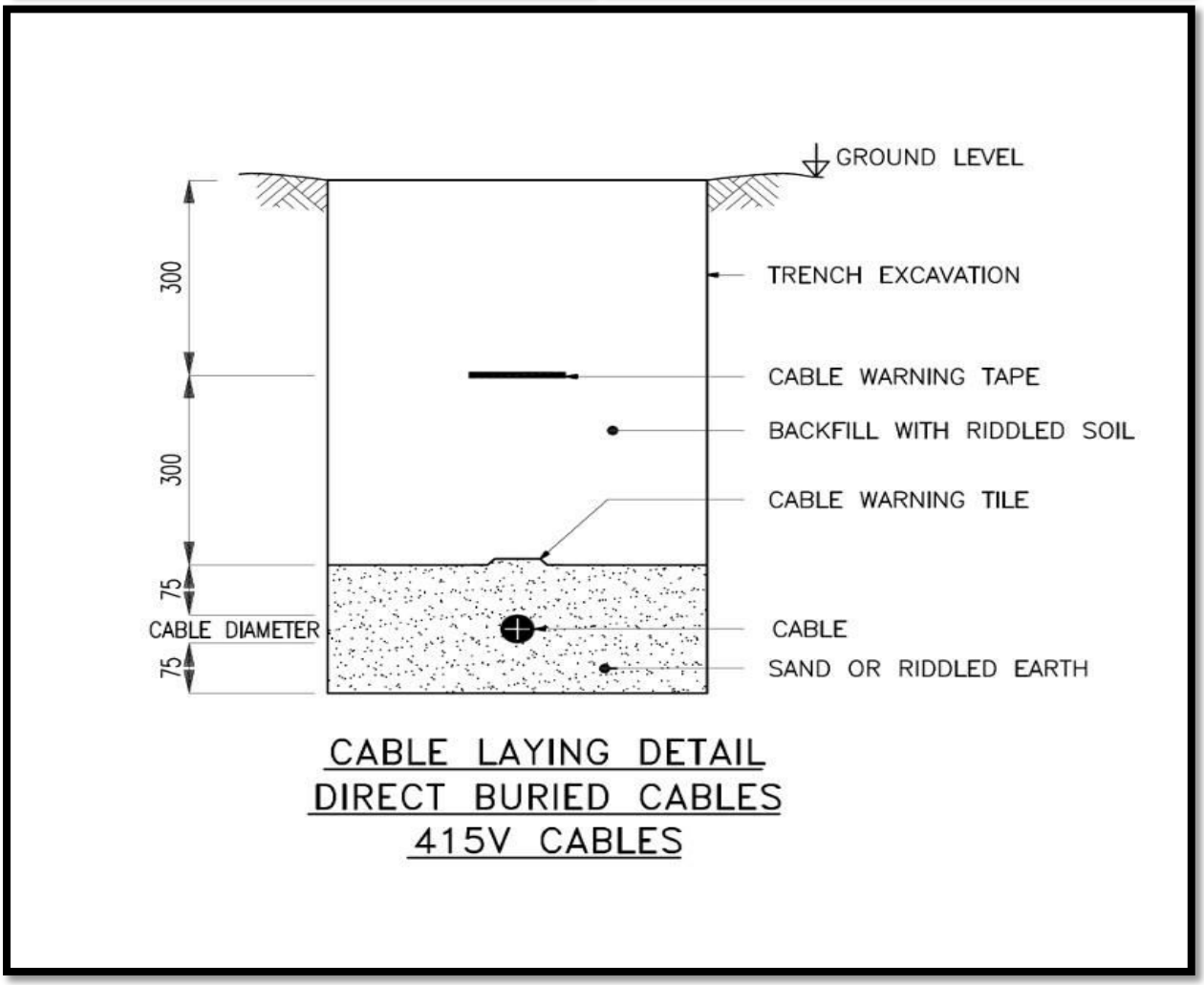
Size of this cables vary based on the Rating of the flow of power.

Further details of the terminals and junction box are shown below.

Advantages:

- Less transmission loss
- We can observe emergency power loads
- Lower maintenance cost
- Safe to use as human or animal contact is minimum
- Emits less electric field and can be engineered to emit fewer magnetic fields
- Avoids chances of illegal connections.





CABLE LAYING DETAIL
DIRECT BURIED CABLES
415V CABLES

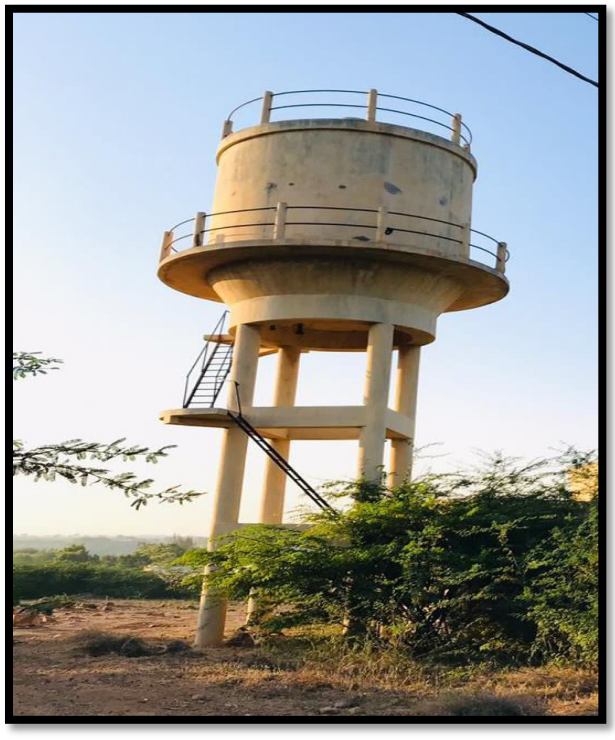
Cost: 8 lakh/km

The cost includes the cost of

- Cables(for 440V and 11KV)
- Soil Excavation and Digging a pit
- Earthing
- Connection Box
- Insulation
- Testing and commissioning
- Protective Devices
- Dismantling of existing HT/LT Overhead Power lines
- Miscellaneous

8.1.9 Electrical Design 3

Auto Motor Controller with Water Level Indicator for Overhead Tank



Note:

Here is the design of the Auto motor controller with water level indicator for the main overhead tankof Kunariya village of capacity 4.5 lakh litres and almost 10 meters high in order to reduce the wastage of water. It can also be designed further for the main underground tank of this village.

Components

-Connecting Rods

-Protecting and installing chamber

-Resistors

-Transistor

-Indicating Lights

-Battery

-Solar Panel

-Charging Circuit

-Relay

Key Points

In order to save the wastage of water, we are hereby proposing a design of automatically turning off the motor when the overhead tank is filled completely with water level indicator.

Following is the circuit diagram for the Auto turn off with level indicator. There is a Buzzer and relay on the last terminal in order to shut the motor down automatically.

In addition to this, the indicating lights are also inserted to check the level of the water any time. Full operation works on the solar feed power, hence there is no increase of load on the grid and no further operating charges once installed.

Specifications

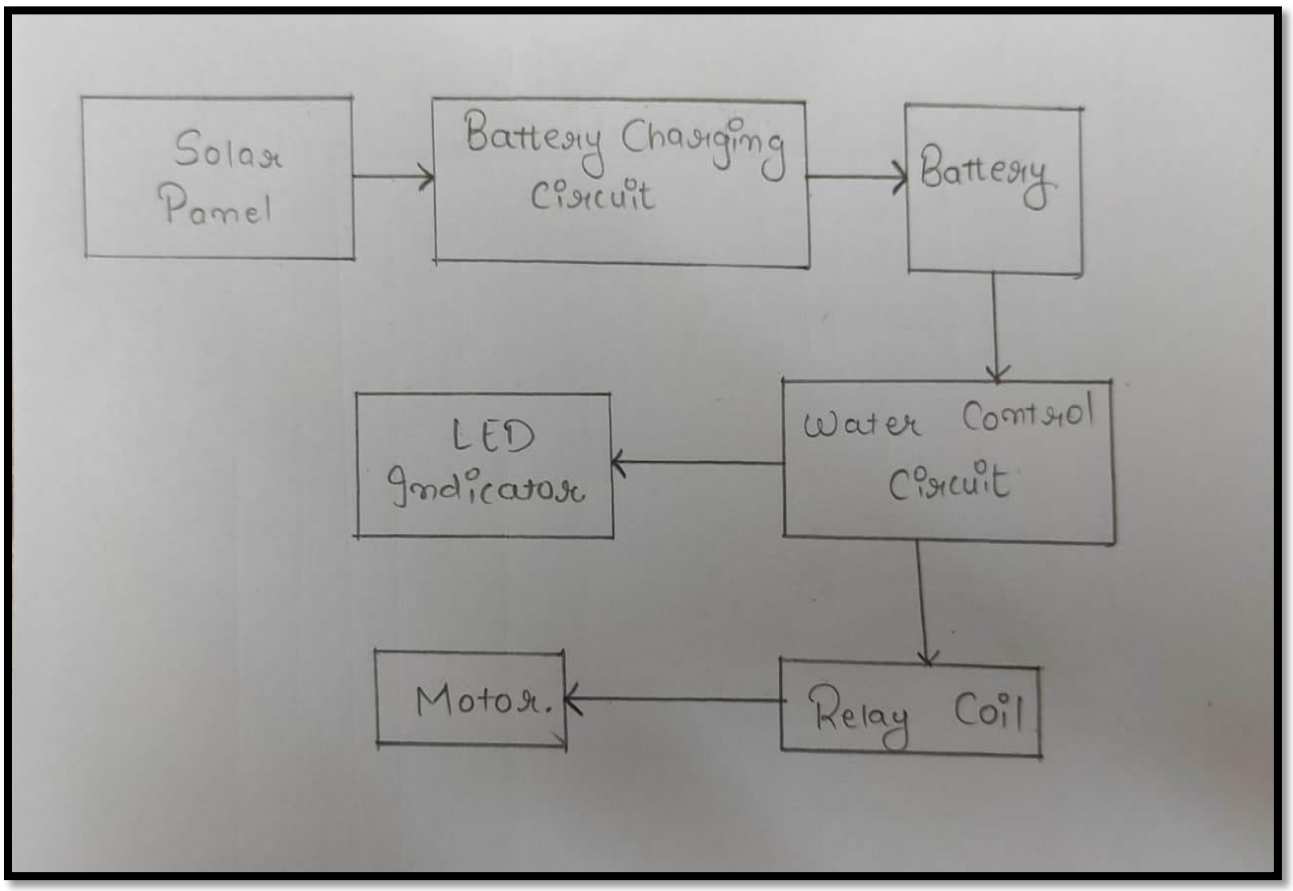
Tank Capacity: 4.5 lakh litres

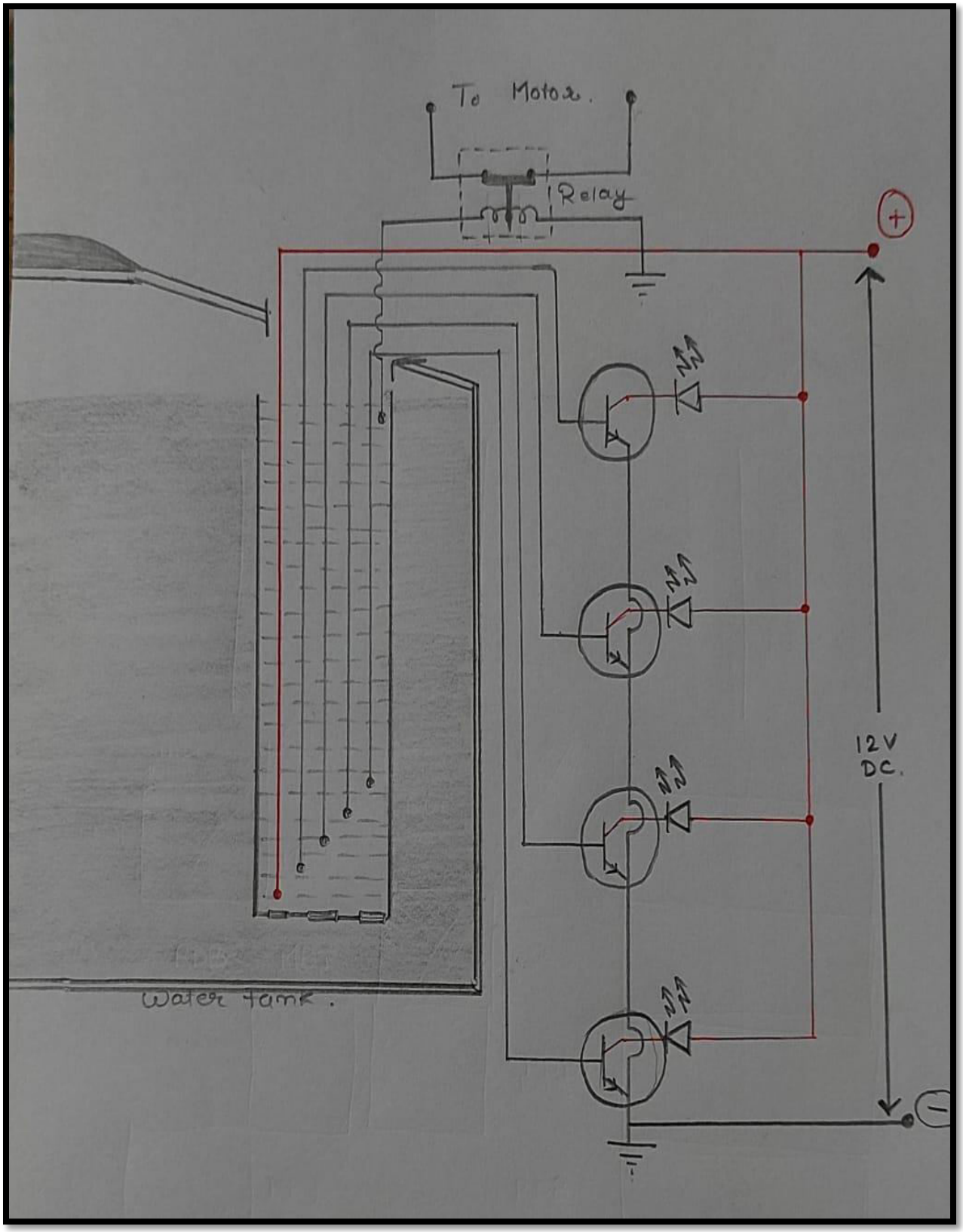
Height of tank: 10 meters

Number of indicators:10 (1 indication for completely filled and one for fully empty)

Cost Estimation

Equipment	**Average cost**
Inserting Rod(PVC pipe + wires)	Rs. 2500/-
Electronic Devices	Rs. 1000/-
Indicating Lights(As Required)	Rs. 1000/-
Relay	Rs. 500/-
Battery (12 V, 17Ah)	Rs. 3000/-
Solar Panels(50 W,12 V)	Rs. 2500/-
Charging Circuit	Rs. 1000/- (Avg.)
Miscellaneous	Rs. 2000/-
Total	Rs. 13500/-




To Motor.
Relay
+
12V
DC.
-
Water tank.

8.2Reason for Students Recommending this Design

1. In order to utilize the sewage of the villagers.
2. In order to store the water of rain and the water from other natural sources.
3. As to improve the health conditions of the villagers.
4. To maintain the environmental conditions and wildlife.
5. To utilize the water of rain in household work.
6. To make people aware about Kunariya.
7. In order to lighten the streets of the village and to decrease the difficulties faced by villagers.
8. In order to remove the hectic view and to reduce the frequency of faults occurring due to natural conditions.
9. In order to save water and provide better and regular water supply facilities.

8.3About designs Suggestions / Benefit of the villagers

1. To fulfill the requirement of the water for household work.
2. To fulfill the need of drinking water and for agriculture.
3. The villagers will don't have to go to the nearby town for treatment.
4. For maintaining the wildlife.
5. In order to maintain the need of water.
6. For elders and visitors/tourists.
7. It will allow the children, girls and all the citizens to be fear free while travelling at night.
8. Will be safe for villagers, wildlife and birds and will improve the view of the village.
9. It will save water increasing the regularity of the water supply.

Chapter 9.
Proposing designs for Future Development of the Village for the PART-II Design

- The study is aimed to know the basic scenario of village through techno economic survey and gap analysis form.
- Our design proposal shows that we are will provide economical services and facilities to the villagers.
- Our aim is to work according to the new upcoming town planning scheme in Kunariya village.
- We would like to bring each possible facility like easy transportation, economically affordable electricity (using renewable energy), adequate water supply, Public infrastructures, medical facilities, Higher education Facility, etc.
- Our very next plan is to propose other mentioned design to the higher officials and to get approval to execute our design.
- Also we would like to make villagers know how these designs will be beneficial and will help them.

Following are the more proposed designs

1. Post office
2. Bank building for better financial transaction facilities
3. Library
4. Temple
5. Community Hall
6. Public Toilet Block
7. Power Generation using Vertical Axis wind Turbines on highways and roadsides
8. GSM based Electricity Tariff (billing) system
9. Solar based irrigation system in farms

Chapter 10.
Conclusion of the Entire Village Activities of the Project

From this village activity, we learnt certain things and learnt to interact with the high heads i.e. Sarpanch, Talatis etc of this village and certain other villages.

From this, we became aware of the present conditions and challenges of the certain villages of India. Particularly, we became aware of the common and very important problems related to mostly all the villages of the country.

We visited 3 villages, viz. the allocated village, smart village and ideal village. Then by comparing certain facilities. Here, we have given certain design proposals for the future development of the village that can become very helpful. We have given certain civil aspects and designs as well as certain electrical challenges and the proposed solutions and other development plant for the better enhancement and development of this village.

The community hall, gram panchayat and primary school facilities are best but there is a need of secondary and higher secondary schools. There is a lack of an ATM machine, precisely a bank, public health centre, a better and sustainable facility of potable and drinking water, better electricity facilities, road facilities, street light facility, etc.

Hence the above proposed designs will be very helpful in the development and betterment of the villagers, which will accelerate the lifestyle of the villagers.

chapter11.
References referred for this project

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- http://censusindia.gov.in/
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- www.censusindia.gov.in
- www.google.com
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- https://www.amazon.in
- https://www.loomsolar.in
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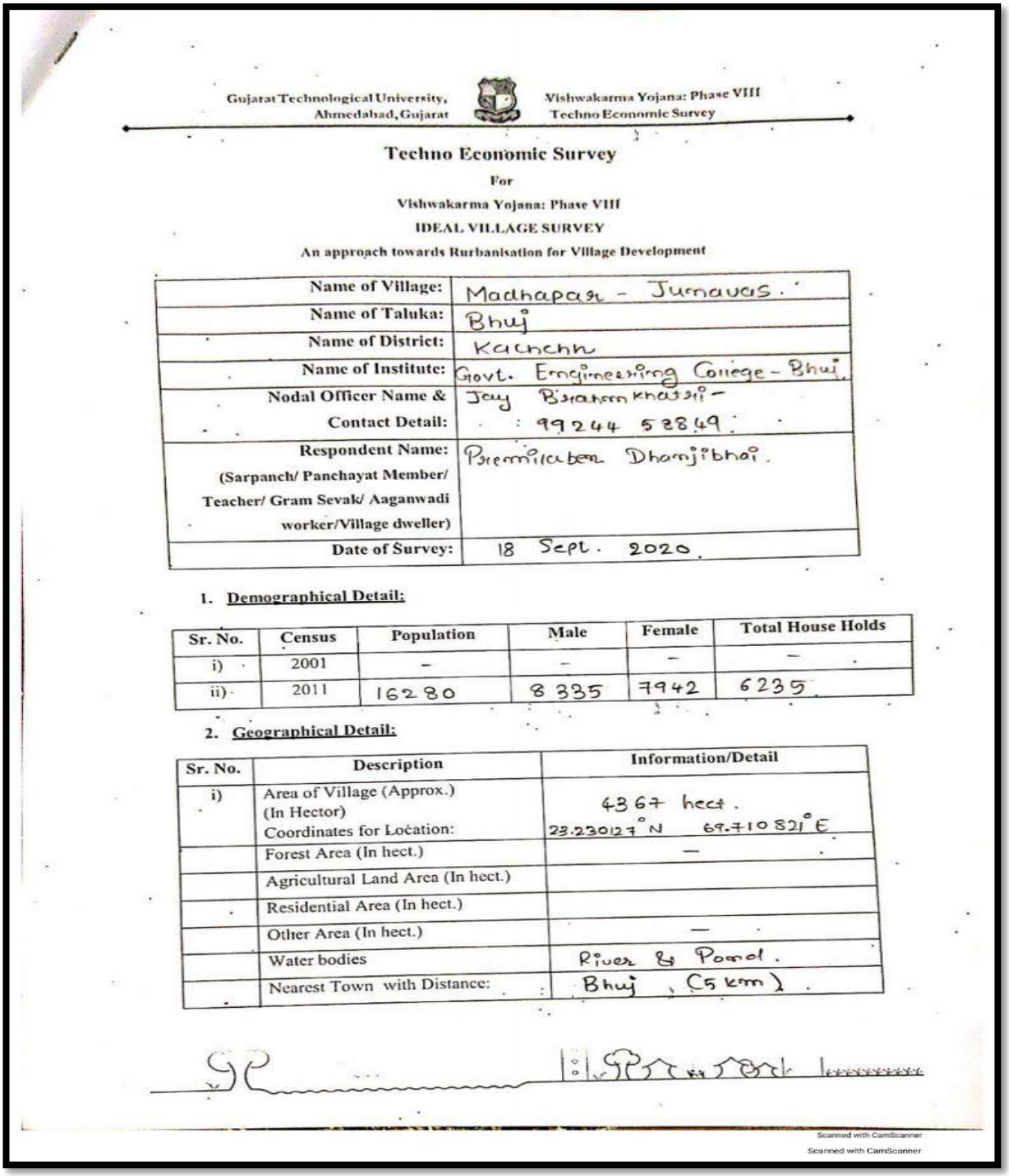
- www.census2011.com
- www.villageinfo.in
- www.villagemaps.in
- http://smartvillages.org/
- AboutCivil.org.
- ASCE- The American Society of Civil Engineers. ...
- NPTEL. ...
- Civil Digital. ...
- The Constructor. ...
- Engineering Civil. ...
- The Construction Innovation Forum (CIF) ...
- Institution of Civil Engineers. ...

Chapter 12.
Annexure attachment

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



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Madhapar - Jumavas.
Name of Taluka:	Bhuj
Name of District:	Kachchh
Name of Institute:	Govt. Engineering College - Bhuj.
Nodal Officer Name & Contact Detail:	Jay Bhavesh Khatri - : 99244 58849.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Premilaben Dhanjibhai.
Date of Survey:	18 Sept. 2020.

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	–	–	–	–
ii)	2011	16280	8335	7942	6235

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector)	4367 hect.
	Coordinates for Location:	23.230127° N 69.710821° E
	Forest Area (In hect.)	–
	Agricultural Land Area (In hect.)	
	Residential Area (In hect.)	
	Other Area (In hect.)	–
	Water bodies	River & Pond.
	Nearest Town with Distance:	Bhuj (5 km)

Scanned with CamScanner

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

3. Occupational Details:

Name of Three Major Occupation groups in Village	1. farmers 2. Bussiness. 3. Labours

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Yes	✓	–	–
	• RO Water				
	• Well (Covered/ Uncovered)	No	–	–	
	• Hand pumps	No	–	–	–
	• Tube well/ Borehole	Yes	–	✓	–
	• River/ Canal/ Spring/ Lake/ Pond	Yes	✓	–	–
	Suggestions if any:				
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 30,000 Ltrs.	Yes	–	–
	Underground Sump	Capacity:	Yes	–	
	Suggestions if any:				
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓	–	–
	Suggestions if any:				
D.	**Type of Drainage**				
	Closed/ Open	Closed	✓	–	–
	If Open than Pucca / Kutchcha	–	–	–	–
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	No	–	–	–
	Suggestions if any:	—			

Scanned with CamScanner

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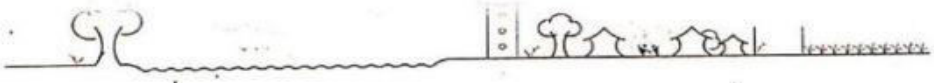
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

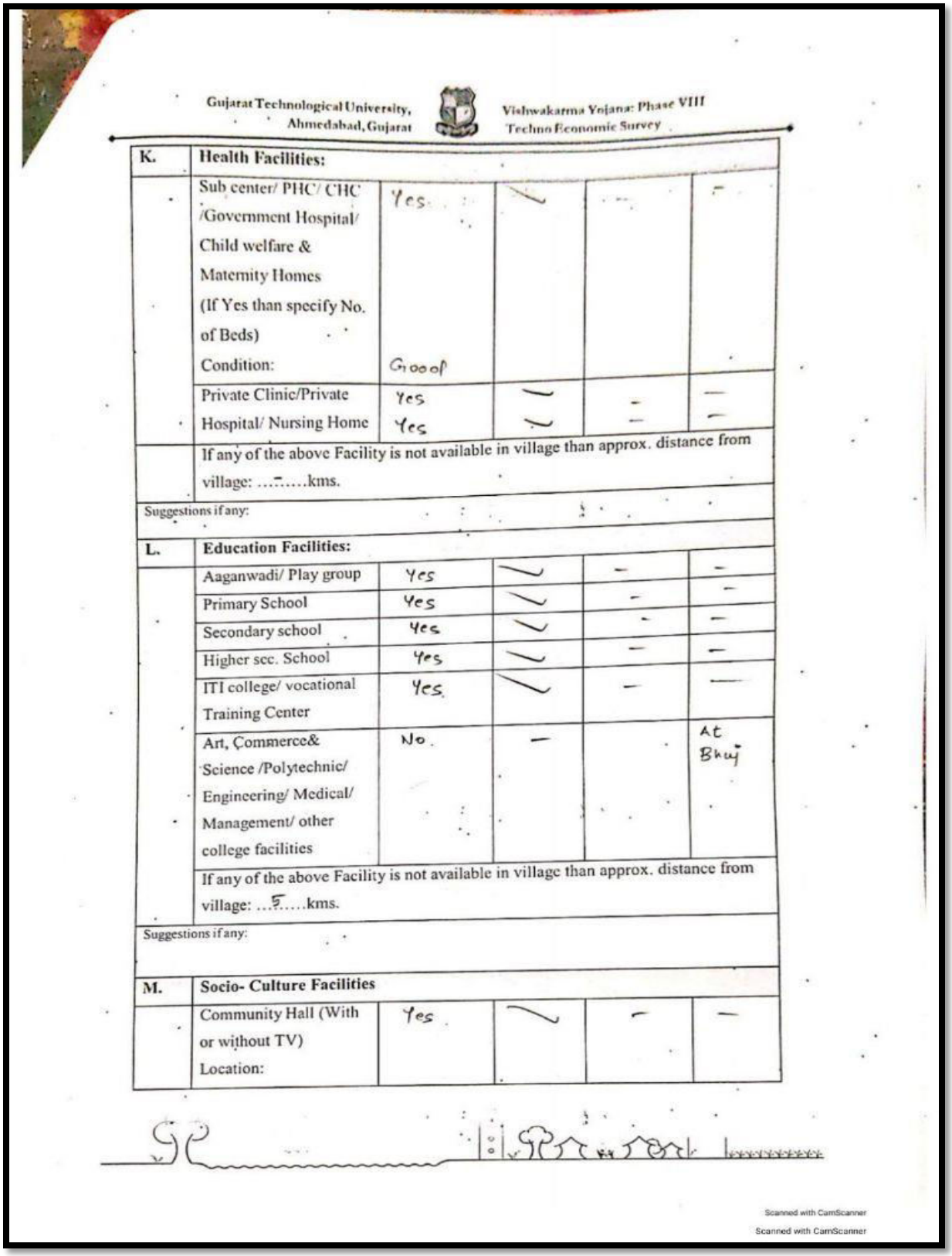
E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	-	-	-
	Main road	Yes	-	-	-
	Internal streets	Yes	-	-	-
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes (NH)	-	-	-
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No.	-	-	-
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓	-	-
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	✓	-	-
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. (24 hrs)	✓	-	PGVCL
	Power supply for Domestic Use	Govt. (24 hrs)	✓	-	PGVCL 6954 Conn.
	Power supply for Agricultural Use	Yes	✓	-	PGVCL
	Power supply for Commercial Use	Yes	✓	-	PGVCL 2200
	Road/ Street Lights	Yes	✓		Gram Panchayat 140 Connection



	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓	–	PGVCL
	Renewable Energy Source Facilities (Y/ N)	Yes	–	–	–
	LED Facilities	Yes	–	–	few nos..
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	–	✓	5
	Location Condition	Center Good.	–	–	–
	Community Toilet (With bath/ without bath facilities)	Yes	–	–	with Bath
	Solid & liquid waste Disposal system available	Yes	–	–	–
	Any facility for Waste collection from road	Yes	–	–	–
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Yes	✓	–	Tube well
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca,	–	–	–

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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Techno Economic Survey

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes Good	✓	-	-
	Private Clinic/Private Hospital/ Nursing Home	Yes Yes	✓ ✓	- -	- -
	If any of the above Facility is not available in village than approx. distance from village: ....-.....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓	-	-
	Primary School	Yes	✓	-	-
	Secondary school	Yes	✓	-	-
	Higher sec. School	Yes	✓	-	-
	ITI college/ vocational Training Center	Yes	✓	-	-
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No.	-		At Bhuj
	If any of the above Facility is not available in village than approx. distance from village: ....5.....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Yes	✓	-	-

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	Condition:	Good.	–	–	–
	Public Library (With daily newspaper supply: Y/N).	Yes	✓	–	2 No.s
	Location:		–	–	(At Bhuj)
	Condition:		–	–	
	Public Garden	Yes	✓	–	–
	Location:	In Village	–	–	–
	Condition:	Good.	–	–	–
	Village Pond	Yes	–	✓	–
	Location:	In Village	–	–	–
	Condition:	Good.	–	–	–
	Recreation Center	–	–	–	–
	Location:				
	Condition:				
	Cinema/ Video Hall	Yes.	✓	–	–
	Location:	In Village			
	Condition:	Good.			
	Assembly Polling Station	Yes.	✓	–	–
	Location:				
	Condition:				
	Birth & Death Registration Office	Yes	✓	–	–
	Location:				
	Condition:				

If any of the above Facility is not available in village than approx. distance from village: ..2.....kms.

Suggestions if any:

N.	Other Facilities				
	Post-office	Yes.	✓	–	–
	Telecommunication Network/ STD booth	Yes	–	–	–

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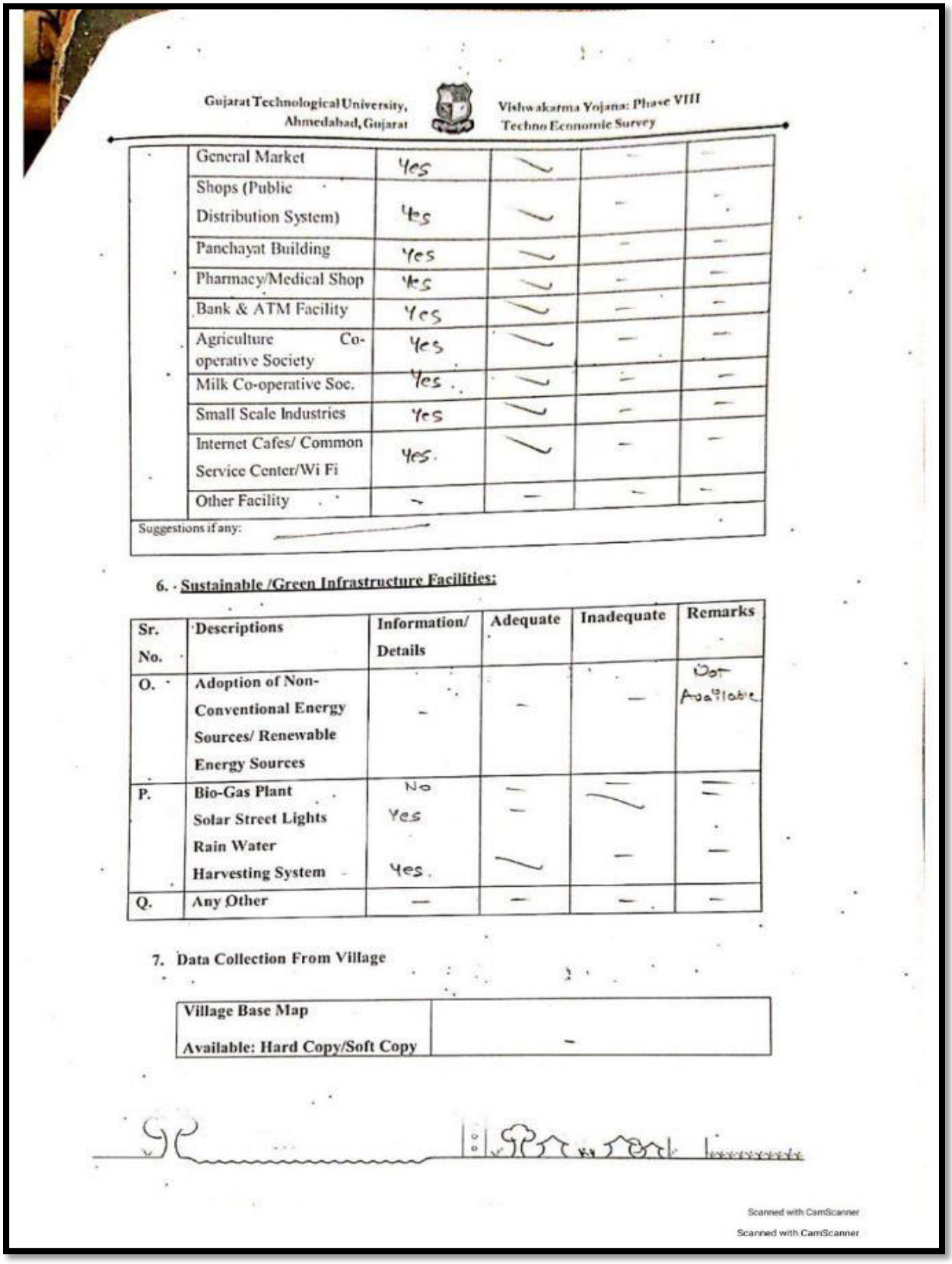

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	General Market	Yes	✓	–	–
	Shops (Public Distribution System)	Yes	✓	–	–
	Panchayat Building	Yes	✓	–	–
	Pharmacy/Medical Shop	Yes	✓	–	–
	Bank & ATM Facility	Yes	✓	–	–
	Agriculture Co-operative Society	Yes	✓	–	–
	Milk Co-operative Soc.	Yes	✓	–	–
	Small Scale Industries	Yes	✓	–	–
	Internet Cafes/ Common Service Center/Wi Fi	Yes.	✓	–	–
	Other Facility	–	–	–	–

Suggestions if any: ——

6. · **Sustainable /Green Infrastructure Facilities:**

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
O.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	–	–	–	Not Available
P.	Bio-Gas Plant	No	–	✓	–
	Solar Street Lights	Yes	–		
	Rain Water Harvesting System	Yes.	✓	–	–
Q.	Any Other	–	–	–	–

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	–

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Vishwakarma Yojana: Phase VI
Techno Economic Survey

Recent Projects going on for Development of Village	Yes
Any NGO working for village development	Yes

8. 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)	RO maintance, & new plant set up.	—
2.	Additional Information/ Requirement	—	—
	Richest village of India.	—	—
	—	—	—

9. Smart Village Proposal Design

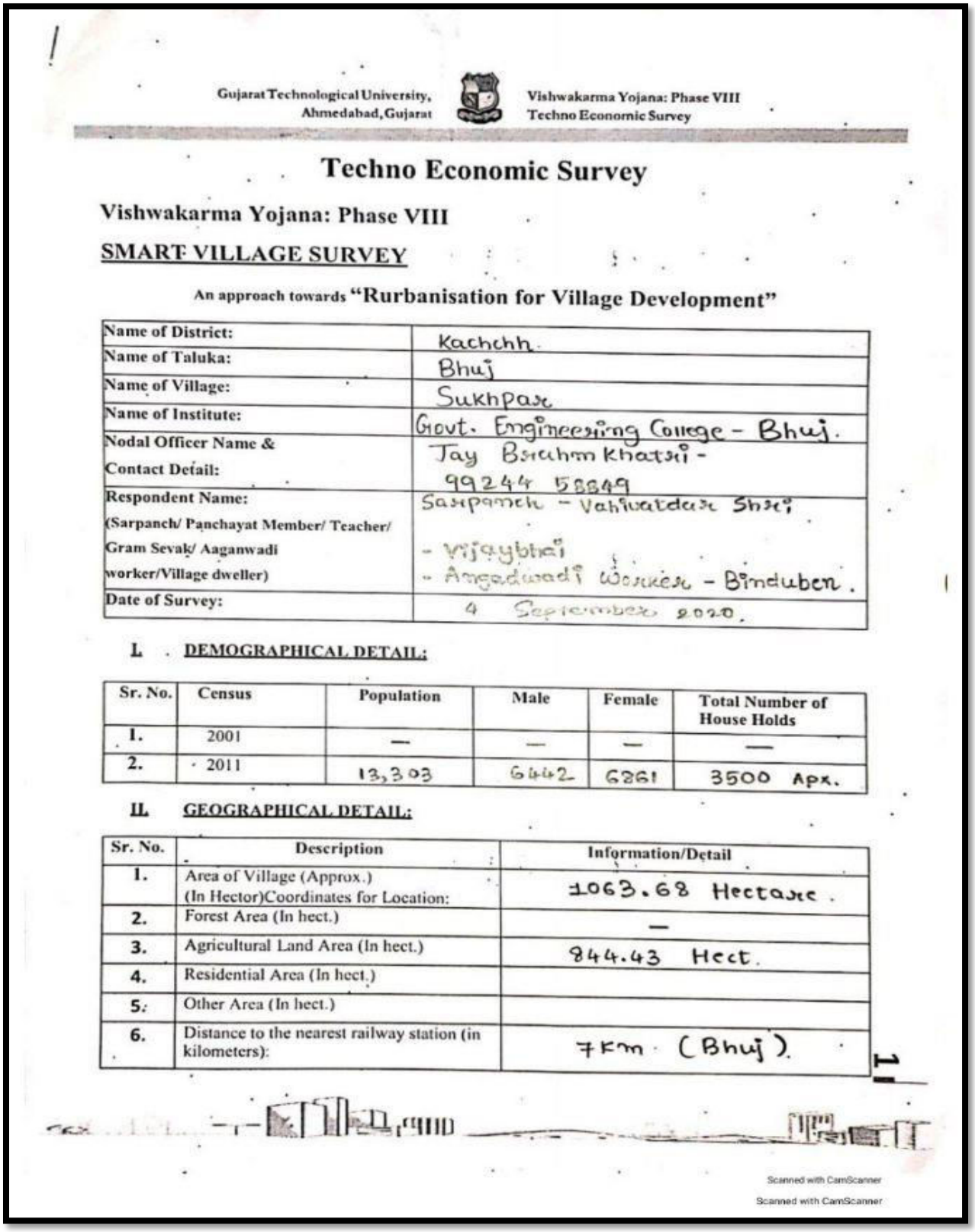
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	—	—	—

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

તલાટી-કમ-મંત્રી
શ્રી માધાપર જુનાવાસ ગ્રામ પંચાયત
તા. ભુજ-કચ્છ.
9/3/2022

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



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

An approach towards **"Rurbanisation for Village Development"**

Name of District:	Kachchh.
Name of Taluka:	Bhuj
Name of Village:	Sukhpar
Name of Institute:	Govt. Engineering College - Bhuj.
Nodal Officer Name & Contact Detail:	Jay Brahm Khatri - 99244 58849
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch - Vahivatdar Shri - Vijaybhai - Angadwadi Worker - Binduben.
Date of Survey:	4 September 2020.

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	—	—	—	—
2.	2011	13,303	6442	6861	3500 Apx.

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1063.68 Hectare.
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	844.43 Hect.
4.	Residential Area (In hect.)	
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	7Km (Bhuj).

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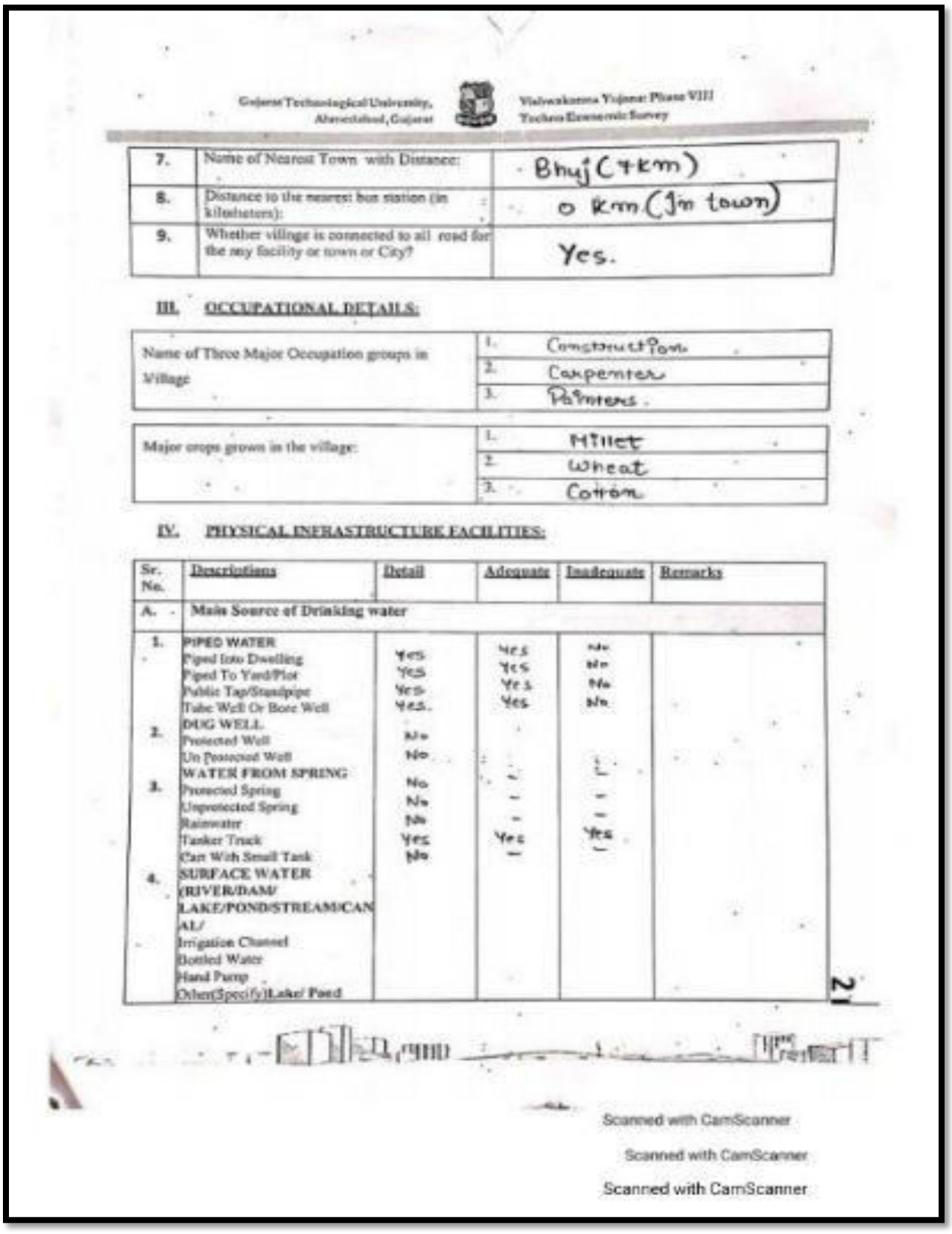

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7.	Name of Nearest Town with Distance:	Bhuj (7km)
8.	Distance to the nearest bus station (in kilometers):	0 km (In town)
9.	Whether village is connected to all road for the any facility or town or City?	Yes.

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Construction
	2.	Carpenter
	3.	Painters.
Major crops grown in the village:	1.	Millet
	2.	Wheat
	3.	Cotton

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER**				
	Piped Into Dwelling	Yes	Yes	No	
	Piped To Yard/Plot	Yes	Yes	No	
	Public Tap/Standpipe	Yes	Yes	No	
	Tube Well Or Bore Well	Yes.	Yes	No	
2.	**DUG WELL**				
	Protected Well	No	-	-	
	Un Protected Well	No	-	-	
3.	**WATER FROM SPRING**				
	Protected Spring	No	-	-	
	Unprotected Spring	No	-	-	
	Rainwater	No	-	-	
	Tanker Truck	Yes	Yes	Yes	
	Cart With Small Tank	No	-	-	
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**				
	Irrigation Channel				
	Bottled Water				
	Hand Pump				
	Other(Specify)Lake/ Pond				

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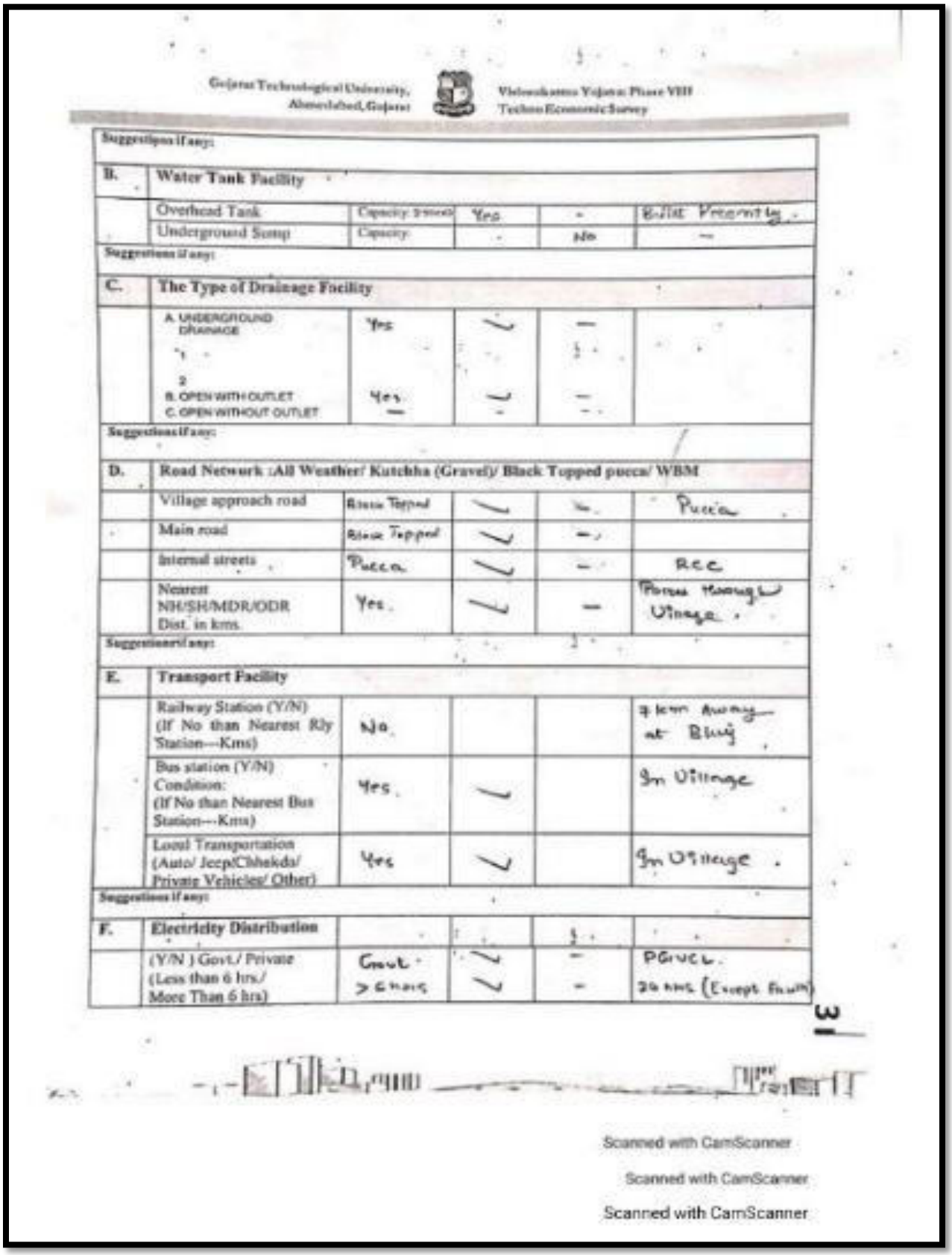

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: [illegible]	Yes	-	Bore Present
	Underground Sump	Capacity:	-	No	-
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE	Yes	✓	-	
	1				
	2				
	B. OPEN WITH OUTLET	Yes	✓	-	
	C. OPEN WITHOUT OUTLET	-	-	-	
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Black Topped	✓	-	Pucca
	Main road	Black Topped	✓	-	
	Internal streets	Pucca	✓	-	Rcc
	Nearest NH/SH/MDR/ODR Dist. in kms	Yes	✓	-	Pucca through Village.
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No			7 km Away at Bhuj
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		In Village
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	✓		In Village.
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. >6 hours	✓ ✓	- -	PGVCL. 24 hrs (Except Rain)

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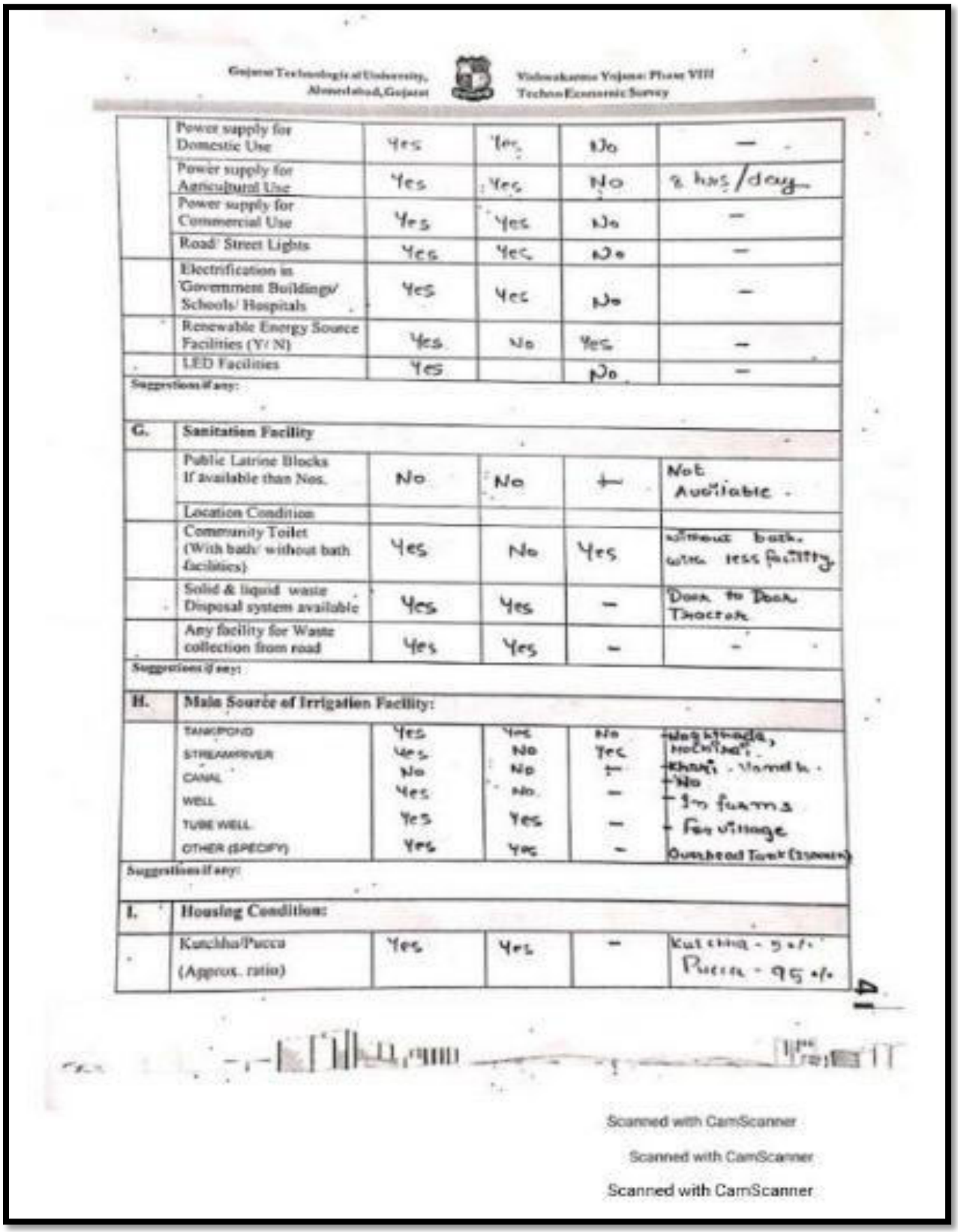

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	Power supply for Domestic Use	Yes	Yes	No	—
	Power supply for Agricultural Use	Yes	Yes	No	8 hrs/day
	Power supply for Commercial Use	Yes	Yes	No	—
	Road/ Street Lights	Yes	Yes	No	—
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	Yes	No	—
	Renewable Energy Source Facilities (Y/ N)	Yes	No	Yes	—
	LED Facilities	Yes		No	—
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No	No	—	Not Available.
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	Yes	No	Yes	without bath. with less facility
	Solid & liquid waste Disposal system available	Yes	Yes	—	Door to Door Tractor
	Any facility for Waste collection from road	Yes	Yes	—	-
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND	Yes	Yes	No	- Washing, machine
	STREAM/RIVER	Yes	No	Yes	- Khari. Nimak.
	CANAL	No	No	—	- No
	WELL	Yes	No	—	- In farms
	TUBE WELL	Yes	Yes	—	- For village
	OTHER (SPECIFY)	Yes	Yes	—	Overhead Tank (Tower)
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Yes	Yes	—	Kutchha - 5 %. Pucca - 95 %.

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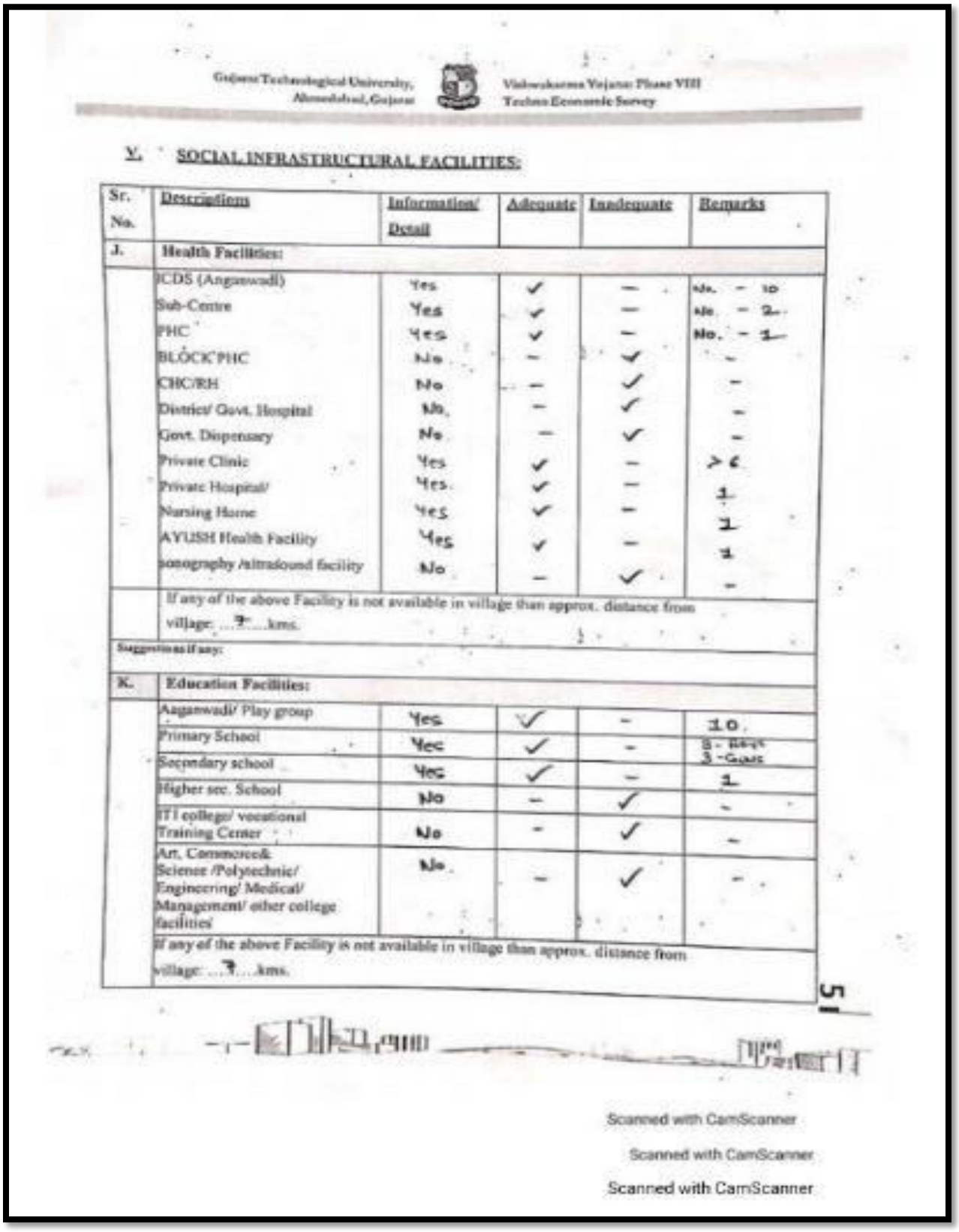

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	✓	–	No. – 10
	Sub-Centre	Yes	✓	–	No. – 2
	PHC	Yes	✓	–	No. – 1
	BLOCK PHC	No	–	✓	–
	CHC/RH	No	–	✓	–
	District/ Govt. Hospital	No	–	✓	–
	Govt. Dispensary	No	–	✓	–
	Private Clinic	Yes	✓	–	> 6
	Private Hospital/	Yes	✓	–	1
	Nursing Home	Yes	✓	–	2
	AYUSH Health Facility	Yes	✓	–	1
	sonography /ultrasound facility	No	–	✓	–
	If any of the above Facility is not available in village than approx. distance from village: ...3... kms.				
	Suggestion as if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓	–	10
	Primary School	Yes	✓	–	8 - Govt 3 - Govt
	Secondary school	Yes	✓	–	1
	Higher sec. School	No	–	✓	–
	ITI college/ vocational Training Center	No	–	✓	–
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No	–	✓	–
	If any of the above Facility is not available in village than approx. distance from village: ...3... kms.				

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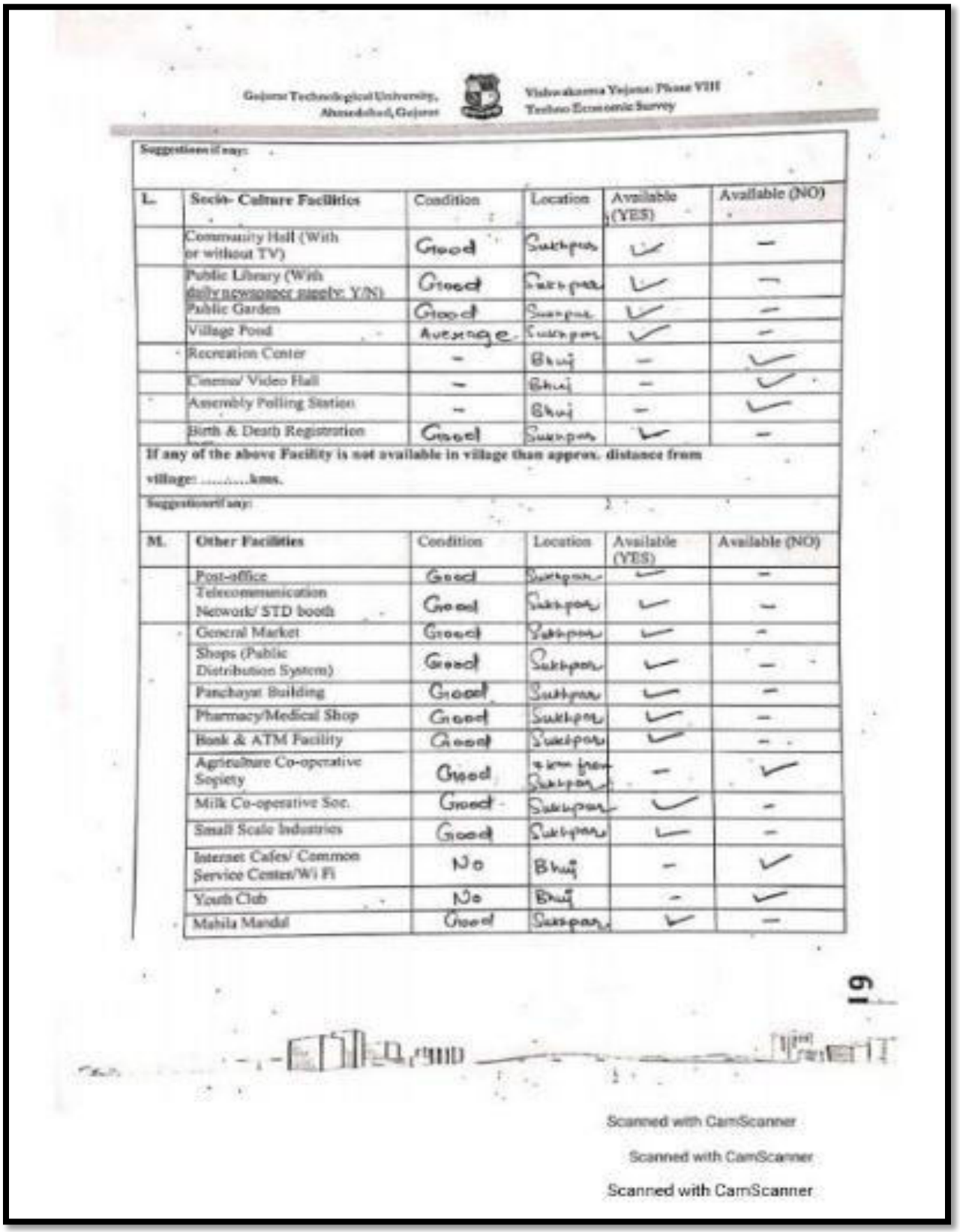

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Vishwakarma Yojana: Phase VIII
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Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Good	Sukhpar	✓	–
	Public Library (With daily newspaper supply: Y/N)	Good	Sukhpar	✓	–
	Public Garden	Good	Sukhpar	✓	–
	Village Pond	Average	Sukhpar	✓	–
	Recreation Center	–	Bhuj	–	✓
	Cinema/ Video Hall	–	Bhuj	–	✓
	Assembly Polling Station	–	Bhuj	–	✓
	Birth & Death Registration	Good	Sukhpar	✓	–

If any of the above Facility is not available in village than approx. distance from village: .....kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Good	Sukhpar	✓	–
	Telecommunication Network/ STD booth	Good	Sukhpar	✓	–
	General Market	Good	Sukhpar	✓	–
	Shops (Public Distribution System)	Good	Sukhpar	✓	–
	Panchayat Building	Good	Sukhpar	✓	–
	Pharmacy/Medical Shop	Good	Sukhpar	✓	–
	Bank & ATM Facility	Good	Sukhpar	✓	–
	Agriculture Co-operative Society	Good	4 km from Sukhpar	–	✓
	Milk Co-operative Soc.	Good	Sukhpar	✓	–
	Small Scale Industries	Good	Sukhpar	✓	–
	Internet Cafes/ Common Service Center/Wi Fi	No	Bhuj	–	✓
	Youth Club	No	Bhuj	–	✓
	Mahila Mandal	Good	Sukhpar	✓	–

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Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	No No No No No	Bhuj Bhuj Bhuj Bhuj Bhuj	– – – – –	✓ ✓ ✓ ✓ ✓
	Other Facility				

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?	Good	Sumpar	✓	–
	2. Are there any beneficieries in the village from the following programme?	Good	Sumpar	✓	–
	3. Janani Suraksha Yojana	No	–	–	✓
	4. Kishori Shakti Yojana	Good	Sumpar	✓	–
	5. Balika Samriddhi Yojana	Good	Sumpar	✓	–
	6. Mid-day Meal Programme	Good	Sumpar	✓	–
	7. Intergrated Child Development Scheme (ICDS)	No	–	–	✓
	8. Mahila Mandal Protsahan Yojana (MMPY)	Good	Sumpar	✓	–
	9. National Food for work Programme (NFFWP)	No	–	–	✓
	10. National Social Assistance Programme	No	–	–	✓
	11. Sanitation Programme (SP)	No		–	✓
	12. Rajiv Gandhi National Drinking Water Mission	No		–	✓
	13. Swarnjayanti Gram Swarozgar Yojana	Good	Sumpar	✓	–
	14. Minimum Needs Programme (MNP)	No		–	✓
	15. National Rural Employment Programme	No		–	✓
	16. Employee Guarantee Scheme (EGS)	No		–	✓
	17. Prime Minister Rojgar Yojana (PMRY)	Good	Sumpar	✓	–
	18. Jawahar Rozgar Yojana (JRY)	No		–	✓
	19. Indira Awas Yojna (IAY)	Good	Sumpar	✓	–
	20. Samagra Awas Yojana (SAY)	No		–	✓
	21. Sanjay Gandhi Niradhar Yojana (SGNY)	No		–	✓
	22. Jawahar Gram Samridhi Yojana (JGSY)	No		–	✓
	23. Other (SPECIFY)	–	–	–	–

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Gujarat Technological University, Ahmedabad, Gujarat — Vishwakarma Yojana: Phase VIII — Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Not Available	—	✓	—
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Not Available	— — —	✓ ✓ ✓	— — (illegible)
3.	Any Other.				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes	✓	—	—
2.	Recent Projects going on for Development of Village	UBA	✓	—	(illegible)
3.	Any NGO working for village development	Yes.	✓	—	(illegible)
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	 Yes No Yes No No No —	 ✓ — ✓ — — — —	 — ✓ — ✓ ✓ ✓ —	 Frequently — — — — — —

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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Techno Economic Survey

1.	Repair & Maintenance of Existing Public Infrastructure facilities.		
	School Building	Yes	
	Health Center	Yes	
	Panchayat Building	Yes	
	Public Toilets & any other	Yes	
2.	Additional Information/ Requirement	ના છે?	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	- - -	- - -

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	No	-

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

વધારી સચિવ મંત્રી
(પંચાયત)
શ્રી મુખ્યમંત્રી ગ્રામ પંચાયત

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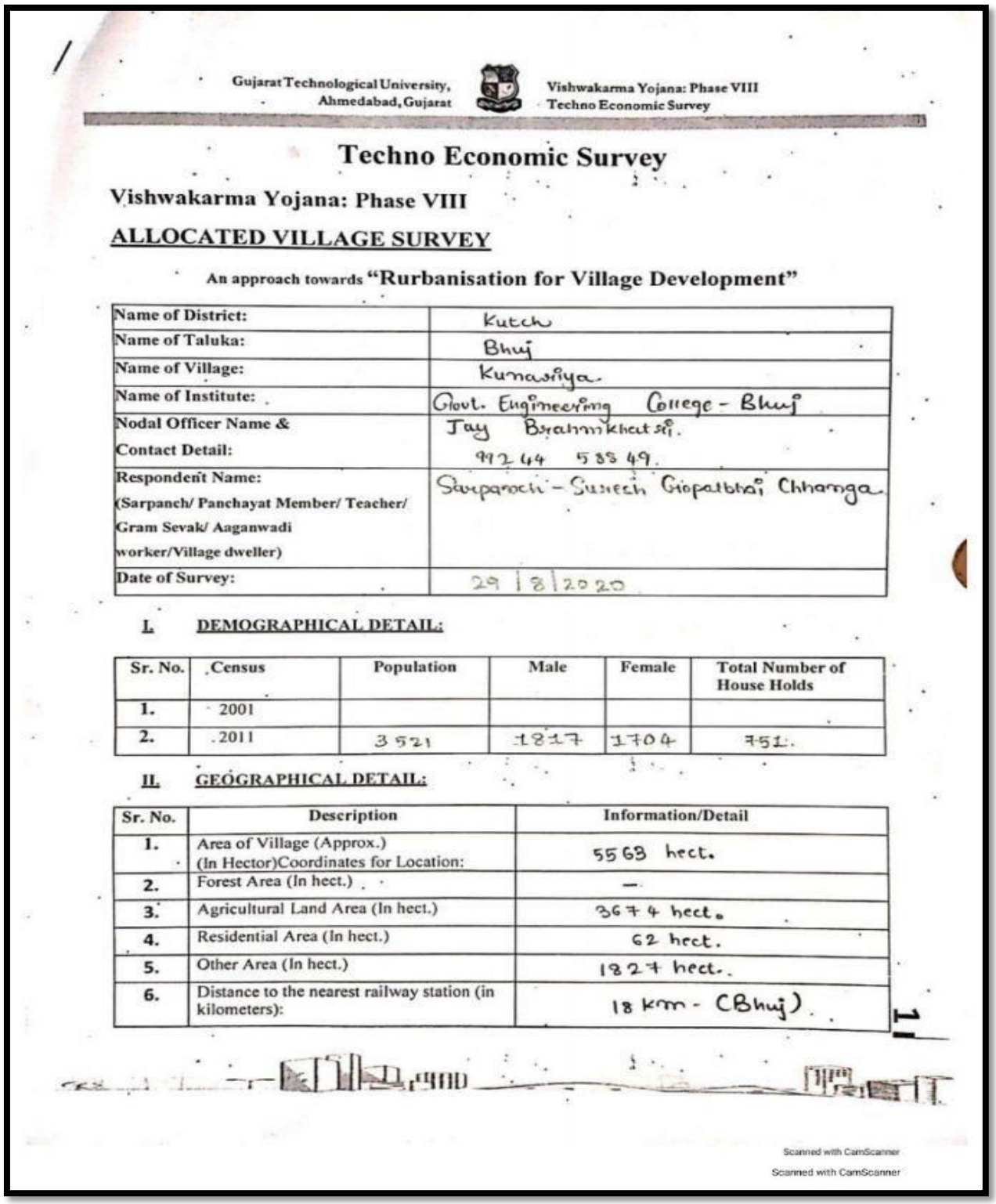
12.3 Survey form of Allocated Village Scanned copy attachment in the report for Part-I



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Vishwakarma 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:	Kutch
Name of Taluka:	Bhuj
Name of Village:	Kunariya.
Name of Institute:	Govt. Engineering College - Bhuj
Nodal Officer Name & Contact Detail:	Jay Brahmkhatri. 99264 58849.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch - Suresh Gopalbhai Chhanga
Date of Survey:	29/8/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	3521	1817	1704	751.

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	5563 hect.
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	3674 hect.
4.	Residential Area (In hect.)	62 hect.
5.	Other Area (In hect.)	1827 hect.
6.	Distance to the nearest railway station (in kilometers):	18 km - (Bhuj)

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7.	Name of Nearest Town with Distance:	Bhuj - 18 km
8.	Distance to the nearest bus station (in kilometers):	Bhuj - 18 km
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. Agriculture 2. Animal Husbandry 3.

Major crops grown in the village:	1. Castor 2. Cotton 3. Grass - Jowar.

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER**				
	Piped Into Dwelling	Yes	Yes	-	-
	Piped To Yard/Plot	No	-	-	Not Available
	Public Tap/Standpipe	No	-	-	Not Available
	Tube Well Or Bore Well	No	-	-	Not Available.
2.	**DUG WELL**				
	Protected Well	No	-	-	Not Available
	Un Protected Well	No	-	-	Not Available.
3.	**WATER FROM SPRING**				
	Protected Spring	No	-	-	-
	Unprotected Spring	No	-	-	-
	Rainwater	No	-	-	-
	Tanker Truck	No	-	-	-
	Cart With Small Tank	No	-	-	-
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**		-	-	-
	Irrigation Channel	No	-	-	-
	Bottled Water	No	-	-	-
	Hand Pump	No	-	-	-

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	Other(Specify)Lake/ Pond	No.	-	-	-
Suggestions if any: Area is day with scarce water					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: →	-	✓	4.5 lakh ltrs.
	Underground Sump	Capacity: →	-	✓	1.5 lakh ltrs.
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	Yes	-	-	7 km.
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road			✓	
	Main road			✓	
	Internal streets		✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	8km.			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No	-	-	18km (Bhuj)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No	-	-	18 km (Bhuj)
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	No	Yes	-
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes.	Yes	-	24 hrs. (Except Faults)

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	Power supply for Domestic Use	Yes	Yes	-	24 hrs.
	Power supply for Agricultural Use	Yes	-	Yes	8 hrs.
	Power supply for Commercial Use	Yes	Yes	-	24 hrs.
	Road/ Street Lights	No			Not Available
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	-	-	-
	Renewable Energy Source Facilities (Y/ N)	Yes	-	Yes	In few houses (owned).
	LED Facilities	Yes	-	Yes	-
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	-	Yes.	8
	Location Condition	-	-	-	-
	Community Toilet (With bath/ without bath facilities)	Yes	-	Yes	three - with bath
	Solid & liquid waste Disposal system available	Yes	-	Yes	-
	Any facility for Waste collection from road	Yes	Yes	-	-
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND	No	-	-	-
	STREAM/RIVER	No	-	-	-
	CANAL	No	-	-	-
	WELL	No	-	-	-
	TUBE WELL	Yes	Yes	-	83 bore wells
	OTHER (SPECIFY)	No	-	-	-
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Max. Kutchha	-	Yes.	7:3 (Approx)

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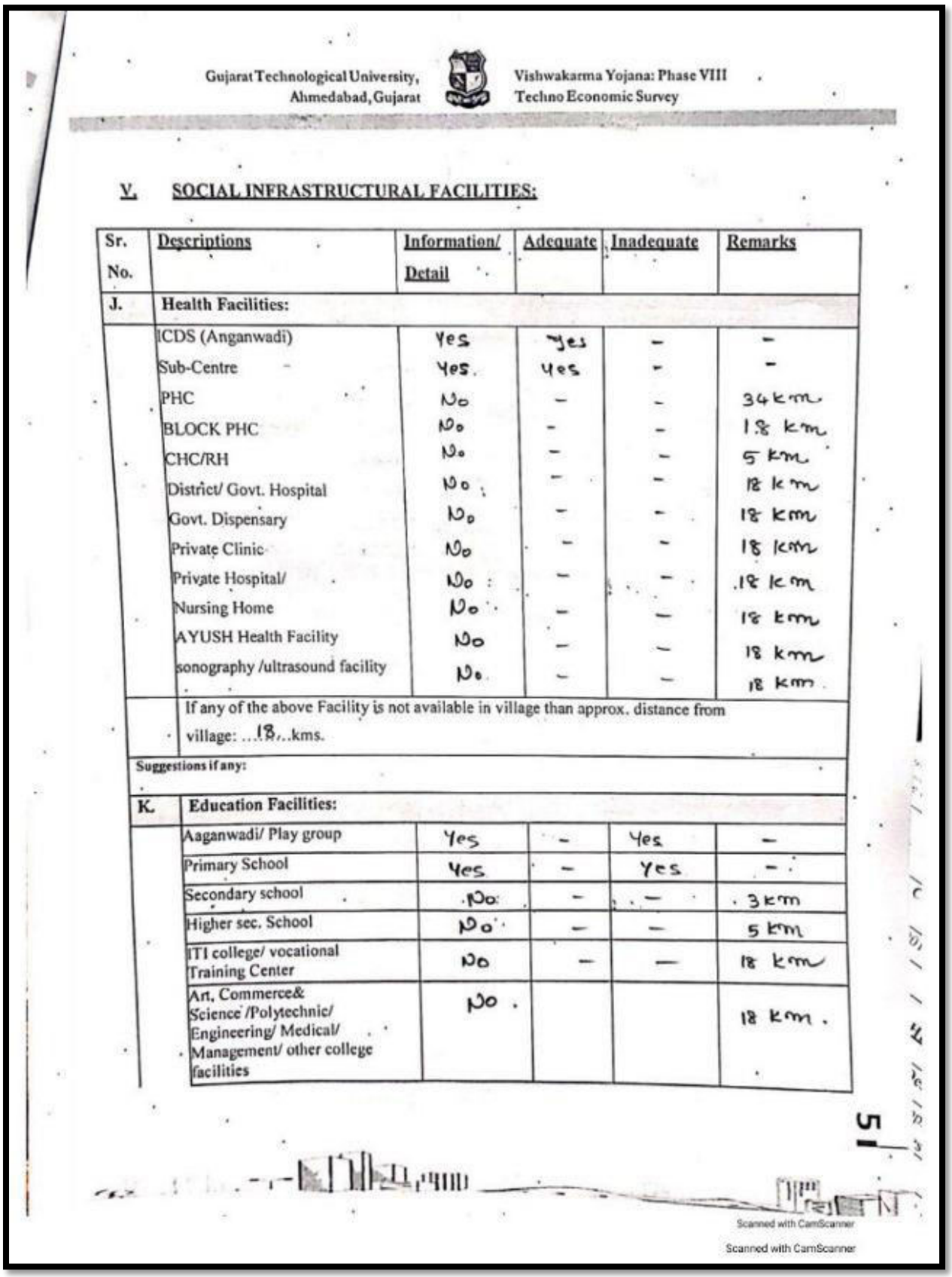

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	Yes	-	-
	Sub-Centre	Yes.	Yes	-	-
	PHC	No	-	-	34 km
	BLOCK PHC	No	-	-	18 km
	CHC/RH	No	-	-	5 km
	District/ Govt. Hospital	No	-	-	18 km
	Govt. Dispensary	No	-	-	18 km
	Private Clinic	No	-	-	18 km
	Private Hospital/	No	-	-	18 km
	Nursing Home	No	-	-	18 km
	AYUSH Health Facility	No	-	-	18 km
	sonography /ultrasound facility	No	-	-	18 km
	If any of the above Facility is not available in village than approx. distance from village: ...18...kms.				
	Suggestions if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	-	Yes	-
	Primary School	Yes	-	Yes	-
	Secondary school	No	-	-	3 km
	Higher sec. School	No	-	-	5 km
	ITI college/ vocational Training Center	No	-	-	18 km
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			18 km.

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If any of the above Facility is not available in village than approx. distance from village: 12....kms.

Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Good	Kunariya	Yes.	-
	Public Library (With daily newspaper supply: Y/N)	-	Bhuj	-	No.
	Public Garden	Average	Kunariya	-	-
	Village Pond	-	Bhuj	Yes	No
	Recreation Center	-	Bhuj	-	No
	Cinema/ Video Hall	-	Bhuj	-	No
	Assembly Polling Station	Good	Kunariya	Yes.	-
	Birth & Death Registration Office	Good.	Kunariya	Yes.	-

If any of the above Facility is not available in village than approx. distance from village: ...12...kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Avg.	Kunariya	~	-
	Telecommunication Network/ STD booth	-		-	No.
	General Market	-			No.
	Shops (Public Distribution System)	Avg.	Kunariya	~	-
	Panchayat Building	Avg.	Kunariya	~	
	Pharmacy/Medical Shop	-		-	No.
	Bank & ATM Facility	Good.	Kunariya	~	-
	Agriculture Co-operative Society	Avg	Kunariya	~	-
	Milk Co-operative Soc.	Good	Kunariya	~	-
	Small Scale Industries	-		-	No.
	Internet Cafes/ Common Service Center/Wi Fi	-		-	No.
	Youth Club	Avg	Kunariya	~	-
	Mahila Mandal	Good	Kunariya	~	-

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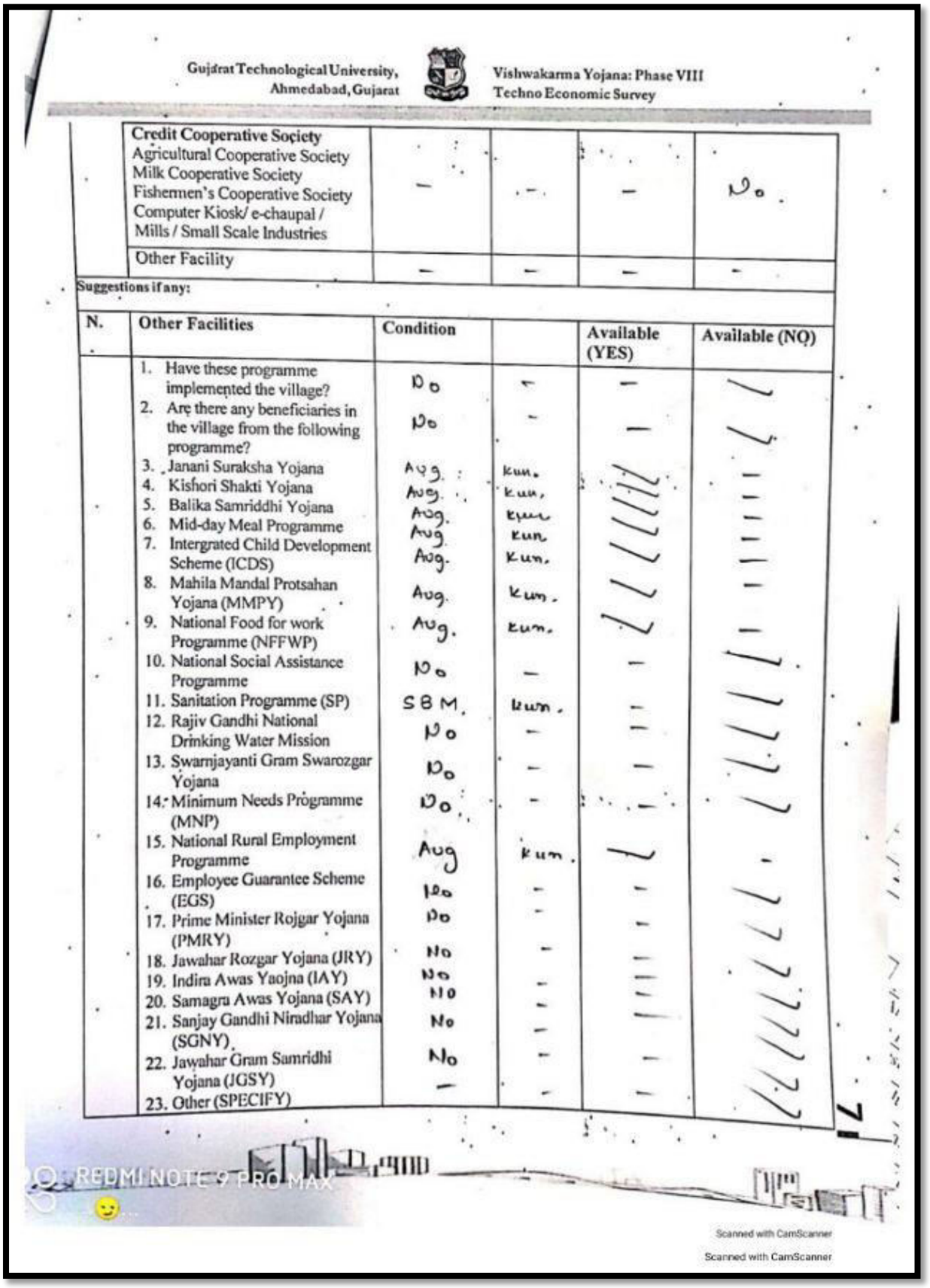

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	-	-	-	No
	Other Facility	-	-	-	-

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?	No	-	-	
	2. Are there any beneficiaries in the village from the following programme?	No	-	-	
	3. Janani Suraksha Yojana	Aug.	kun.		
	4. Kishori Shakti Yojana	Aug.	kun.		
	5. Balika Samriddhi Yojana	Aug.	kun.		
	6. Mid-day Meal Programme	Aug.	kun.		
	7. Intergrated Child Development Scheme (ICDS)	Aug.	kun.		
	8. Mahila Mandal Protsahan Yojana (MMPY)	Aug.	kun.		
	9. National Food for work Programme (NFFWP)	Aug.	kun.		
	10. National Social Assistance Programme	No	-	-	
	11. Sanitation Programme (SP)	SBM.	kun.		
	12. Rajiv Gandhi National Drinking Water Mission	No	-	-	
	13. Swarnjayanti Gram Swarozgar Yojana	No	-	-	
	14. Minimum Needs Programme (MNP)	No	-	-	
	15. National Rural Employment Programme	Aug	kun.		
	16. Employee Guarantee Scheme (EGS)	No	-	-	
	17. Prime Minister Rojgar Yojana (PMRY)	No	-	-	
	18. Jawahar Rozgar Yojana (JRY)	No	-	-	
	19. Indira Awas Yaojna (IAY)	No	-	-	
	20. Samagra Awas Yojana (SAY)	No	-	-	
	21. Sanjay Gandhi Niradhar Yojana (SGNY)	No	-	-	
	22. Jawahar Gram Samridhi Yojana (JGSY)	No	-	-	
	23. Other (SPECIFY)	-	-	-	

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	-	-	-	-
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	-	-	-	-
3.	Any Other	-	-	-	-

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes	Yes	-	-
2.	Recent Projects going on for Development of Village	Yes	-	-	GPDP MGNREGA
3.	Any NGO working for village development	Yes	✓	-	-
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	 Yes. Yes. Yes Yes. - - -	 - - - - - - -	 - - - - - - -	 Frequency - - Frequency - - -

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VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities,	Yes	-
	School Building	Yes	-
	Health Center	Yes	-
	Panchayat Building	Yes	-
	Public Toilets & any other	Yes	-
2.	Additional Information/ Requirement	-	-
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Yes	Every Month 3 times for COVID-19.

IX. Smart Village / Heritage Details

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

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

સરપંચ શ્રી
કુનરીયા (ગ.) ગ્રામ પંચાયત
તા. ભુજ-કચ્છ.

12.4 Gap Analysis of the Allocated Village

12.4 Gap Analysis of the Allocated Village					
Village Facilities	**Planning Commission/ UDPFI Norms**	**Village Name:**			
		Population:			
		Existing	**Required as per Norms**	**Smart Vilage / Cities / Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	2	1	10	9
Primary School	Each Per 2500 population	1	1	1	-
Secondary School	Per 7,500 population	1	0	1	1
Higher Secondary School	Per 15,000 Population	1	0	0	-
College	Per 125,000 Population	1	0	0	-
Tech. Training Institute	Per 100000 Population	1	0	0	-
Agriculture Research Centre	Per 100000 Population	1	0	0	-
Skill Development Center	Per 100000 Population	1	0	0	-
Health Facility					
Govt. /Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	0	1	1
Primary Health & Child Health Center	Per 20,000 population	2	0	-	-
Child Welfare and	Per 10,000	1	0	1	1

Maternity Home	population				
Multispecialty Hospital	Per 100000 Population	2	0	0	-
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	1/50 family	-	-	-
Physical Infrastructure Facilities					
Transportation		**Adequate / Inadequate**	Inadequate	Adequate	required
Pucca Village Approach Road	Each village	1	1	1	-
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	1	0	1	1
Drinking Water (Minimum 70 lpcd)		**Adequate / Inadequate**	inadq.	yes	Req.
Over Head Tank	1/3 of Total Demand		inadq.	yes	Req.
U/G Sump	2/3 of Total Demand		inadq.	yes	Req.
Drainage Network - Open		**Adequate / Inadequate**	-	-	-
Drainage Network - Cover			yes	yes	-
Waste Management System		**Adequate / Inadequate**	-	-	req.
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	2	1	1	-
community hall and Public Library	Per 15000 Population	2	0	1	1
Cremation Ground	Per 20,000 population	1`	1	1	-
Post Office	Per 10,000 population	1	0	1	1
Gram Panchayat Building	Each	1	1	1	-

	individual/group panchayat				
APMC	Per 100000 Population	1	-	-	-
Fire Station	Per 100000 Population	1	-	-	-
Public Garden	Per village	1	1	1	-
Police post	Per 40,000Population	2	-	-	-
Shopping Mall					
Electrical Design					
Electricity Network		**Adequate / Inadequate**			
Domestic			yes	yes	-
Agricultural			No	Yes	Req.
Any Smart Village Facility					
Technology	-	-	-	-	-

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

Sr. No.	Village	Discipline	Part 1	Part 2
1	Kunariya	Civil	ATM room	Post office
			Artificial Pond	Bank Building
			Public Health Centre	Library
			Chabutro	Temple
			Rain Water Harvesting	Public Toilet
			Village Entrance Gate	Community Hall
		Electrical	Solar based Independent Street Lights	Vertical Axis Wind Turbine
			Underground Wiring	GSM based electricity tariff system
			Auto motor Controller With water level indicator	Solar Based Irrigation System

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

All the design sheets are given in the particular chapter 8 and 13.

12.7 Summary of Good Photographs

Ideal Village: Madhapar

Allocated Village: Kunariya


બિલાલ, કુણારીયા
Shiv Temple,
RavDada Temple
Kunariya
Radhe krishna
temple kunariya
રાધે કિષ્ના
ટેમ્પલ કુણારીયા
કૈલાશ ફાર્મ હાઉસ


શ્રી કુનરીયા જુથ ગ્રામ પંચાયત


શ્રી કુનરીયા પંચાયત પ્રાથમિક શાળા


કુનરીયા આંગણવાડી નં.૧


શ્રી કુનરીયા પંચાયત પ્રાથમિક શાળા







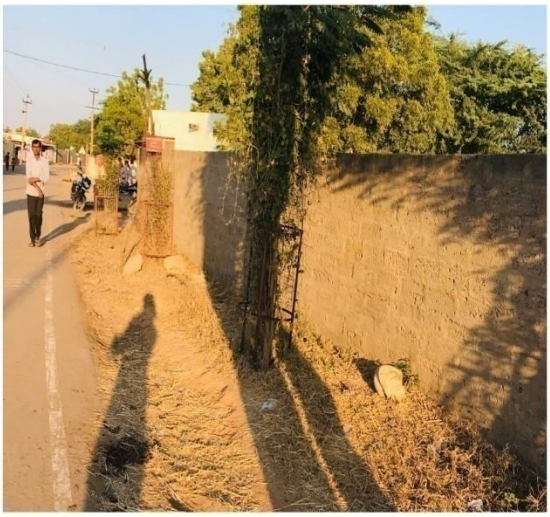
KUNARIYA


શૌચાલયનો
નિયમિત ઉપયોગ
રાખે જન જનને નિરોગી
ડી. આર. ડી. એ. કચ્છ, કુનરીયા - તા. ભુજ.

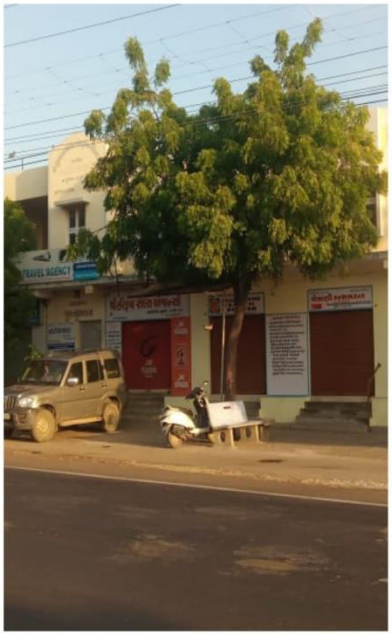

બાળક, વડીલ
અને યુવાન,
શૌચાલય આપે
બધાને કામ
ડી. આર. ડી. એ. કચ્છ, કુનરીયા - તા. ભુજ.


મુખ્યમંત્રી ગ્રામ સડક યોજના
ગુજરાત સરકાર


કુનરીયા



Smart Village: Sukhpar



12.8 Village Interaction with sarpanch with the photograph

As per the guidelines of the Government and Gujarat Technological University, VY section informed all the teams of Vishwakarma Yojana to prepare the work planning in the allocated village for the effective implementation of Vishwakarma Yojana. Under this guideline Student's team presented the village development plan of village & benefits at Kunariya village.

Her is the report with the interaction with sarpanch of Kunariya village, Mr. Suresh Chhanga sir and proposed the follaowing designs after analyzing the present conditions and situation of the village.

Designs being proposed in Part 1 for Kunariya village:

- ATM room
- Artificial Pond
- Public Health Centre
- Chabutro
- Rain Water Harvesting
- Village Entrance Gate
- Solar Based Independent Street Lights
- Underground Wiring
- Auto motor Controller with Water level indicator

12.9 Sarpanch Letter giving information about the village development

GOVERNMENT ENGINEERING COLLEGE-BHUJ KACHCHH

VISHWAKARMA YOJANA PHASE – VIII

Village: Kunariya

District: Kachchh

SUBJECT: In order to approve the design proposals of Kunariya Village.

As per the guidelines of Gujarat Technological University, under Vishwakarma Yojana, Phase VIII; we, the students of Government Engineering College- Bhuj are allocated Kunariya village in order to analyze and propose a development plan of the same. Hence as the outcome of this project, we have prepared this report and proposed the following development plan/ design proposals in part 1:

Proposed designs in Part 1 for Kunariya village:

- ATM room
- Artificial Pond
- Public Health Centre
- Chabutro
- Rain Water Harvesting
- Village Entrance Gate
- Solar Based Independent Street Lights
- Underground Wiring
- Auto motor Controller with Water Level Indicator

So kindly accept our design proposals, given here under the given project.

Thank you.

(Sarpanch's Approval)

Mr. Suresh G. Chhanga

(Sarpanch of Kunariya village)

13.From the Chapter- 9 here are 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

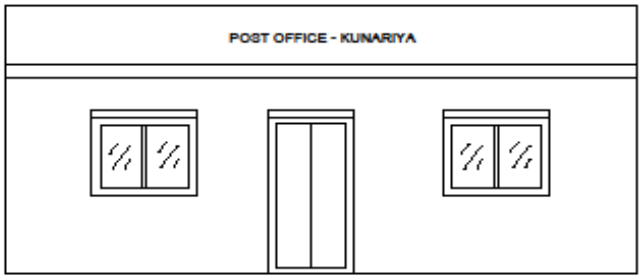
13.1.1 Post Office

A post office is the public facility. It provides mail services, including accepting of letters, parcels, providing post office boxes, & selling postage stamps, packaging, and stationery. Post offices may also offer some additional services, which can vary by the country.

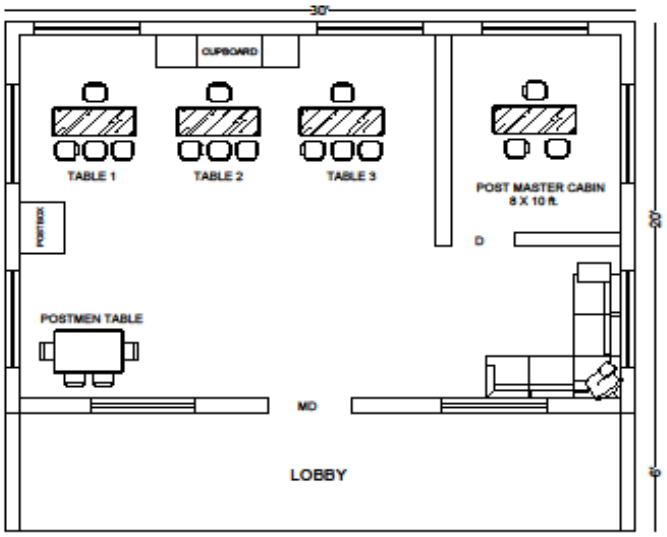
The advent of the postal codes and the post office, postal systems would route items to a specific post office for the receipt or delivery. As there is a great need of the post office in the village, we are proposing this design.

Post office in Kunariya: Sketchup view

AutoCAD Elevation Plan And Section of Post office

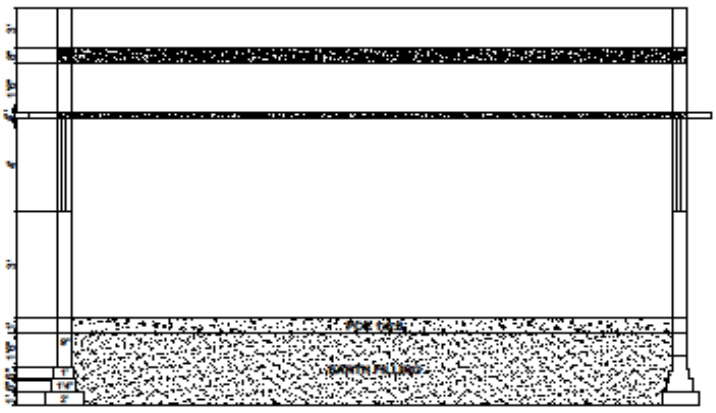


ELEVATION



	DIMENSION
MD	4 X 7 ft.
D	3 X 7 ft.
W	5 X 4 ft.

PLAN



SECTION

Work Estimate

Estimate							
NAME OF WORK : post office							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Excavation in all type of soil upto 1.5 m depth	2	9. 15	0.75	1.50	20.58	
		2	7.9	0.60	1.50	14.22	
		1	5.4	0.60	1.00	3.24	
						38.04	**M3**
2	PCC 1:3:6	2	9. 15	0.75	0.10	1.37	
		2.00	7.90	0.75	0.10	1.19	
		1.00	5.40	0.75	0.10	0.41	
	floor	1.00	9.15	13.40	0.10	12.26	
						15.22	**M3**
3	R.R masonary in cm 1:6	2.00	9. 15	0.60	0.60	6.58	
		2.00	7.9	0.60	0.60	5.68	
		1.00	5.4	0.60	0.60	1.94	
		2.00	9.2	0.45	0.70	5.79	
		2.00	7.9	0.45	0.70	4.97	
		1.00	5.4	0.45	0.70	1.70	
						26.66	**M3**
4	DPC M-20 (100 mm) & lenter	4.00	9. 15	0.45	0.10	1.64	
		4.00	7.9	0.45	0.10	1.42	
		1.00	5.4	0.45	0.10	0.24	
						3.30	**M3**

5	good quality murrm filling in plinth	1.00	8.70	7.45	0.60	38.88	
						38.88	**M3**
6	1st class brick masonary for superstructure	2.00	9. 15	0.23	2.70	11.36	
		2.00	7.9	0.23	2.70	9.81	
		1.00	5.4	0.23	2.70	3.35	
	parapet wall	1.00	30.0	0.23	0.90	6.21	
	deduction (window)	9.00	1.2	1.52	0.23	(-) 3.77	
	door	2	0.9	2.1	0.23	(-)0.86	
						26.10	**M3**
7	RCC slab 150mm thick M-20	1.00	9. 15	7.90	0.15	10.84	
						10.84	**M3**
8	wooden pannel door & window	1.00				**20.13**	**M2**
9	internal plaster	1.00	8.7	7.45		64.81	
		1.00	9.15	1.8		16.47	
	other wall 3 times of slab	3.00	64.81			194.43	
						275.71	**M2**
10	External plaster	1.00	34.1		4.55	155.15	
	deduction	1.00				(-)4.63	
						150.52	**M2**
11	floor tiles	1.00	9. 15	7.90		72.28	
						72.28	**M2**
12	steel in slab & DPC 1%	1.00					
	14.14 * 1% = 0.14* 7854 =1100 kg					**1100.00**	**kg**

Abstract Sheet:

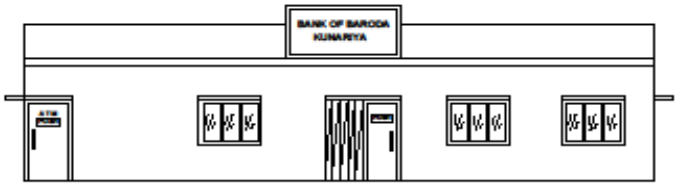
NAME OF WORK : Construction of post office					
S.NO	**DISCRIPTION**	QTY	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	38.04	M^3	158.00	6004.00
2	PCC 1:3:6	15.22	M^3	3800.00	57836.00
3	R.R. Mass in CM 1:6	26.66	M^3	2050.00	54653.00
4	DPC M-20 (100 mm) & lenter	3.30	M^3	7800.00	25740.00
5	good quality murrm filling in plinth	38.88	M^3	380.00	14774.40
6	1st class brick masonary for superstructure	26.10	M^3	6200.00	161820.00
7	RCC slab 150mm thick M-20	10.84	M^4	10500.00	113820.00
8	wooden pannel door & window	20.13	M^2	11000.00	221430.00
9	internal plaster	275.71	M^2	280.00	77198.80
10	External plaster	120.52	M^3	360.00	43387.20
11	floor tiles	72.28	M^2	1250.00	90350.00
12	steel in slab & DPC 1%	1100.00	kg	70.00	77000.00
13	colour & plumbing, electric etc. (10% of total cost)				94401.34
				TOTAL	**1038414.74**

13.1.2 Bank Building for Better Financial Transaction Facilities

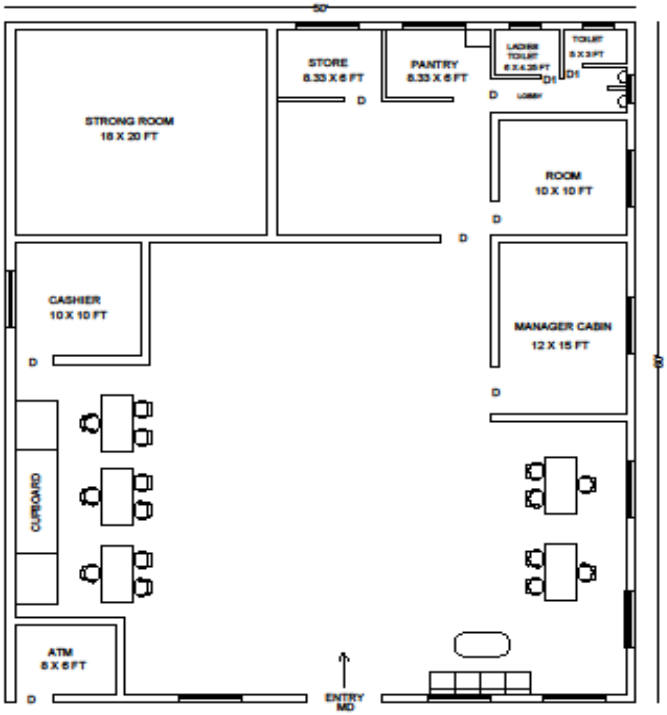
For the better development of the village, a bank with all the facilities is very important in order to increase the living standard of the villagers. As to perform big transactions, to take loans for the villagers and farmers, to store there valuables and documents in the lockers, opening and operating their account and many more. This will reduce the transportation to Bhuj to perform such activities which will save their time and money.

Bank Building in Kunariya Village: Sketchup View

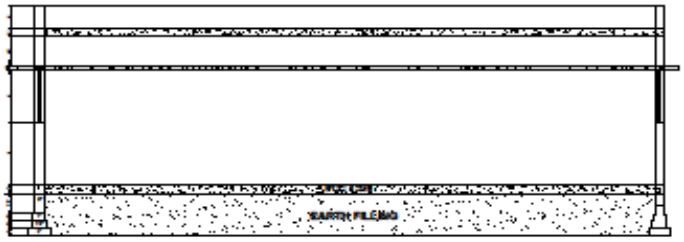
AutoCAD Elevation, Plan and Section



ELEVATION



PLAN



SECTION

Work Estimate

NAME OF WORK : Bank							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Excavation in all type of soil upto 1.5 m depth	2 * 2	15.3	0.75	1.50	68.62	
		2	18.3	0.75	1.50	41.17	
		1	16.8	0.75	1.50	18.9	
						128.69	**M3**
2	PCC 1:3:6	2 * 2	15.3	0.75	0.10	16.15	
		2.00	18.30	0.75	0.10	2.40	
	floor	1.00	15.30	18.30	0.10	27.99	
		1.00	16.80	0.75	0.10	1.26	
						47.80	**M3**
3	R.R masonary in cm 1:6	4.00	15.3	0.60	0.60	22.03	
		2.00	18.3	0.60	0.60	13.17	
	upto plinth	1.00	16.8	0.60	0.60	6.05	
		4.00	15.3	0.45	0.70	18.93	
		2.00	18.3	0.45	0.70	11.52	
		1.00	16.8	0.45	0.70	5.29	
						76.99	**M3**
4	DPC M-20 (100 mm) & lenter	8.00	15.30	0.45	0.10	5.50	
		4.00	18.3	0.45	0.10	3.30	
		2.00	16.8	0.45	0.10	1.50	

						10.30	**M3**
5	good quality murrm filling in plinth	1.00	18.30	15.30	0.60	167.99	
						167.99	**M3**
6	1st class brick masonary for superstructure	4.00	15.30	0.23	2.70	38.00	
		2.00	18.3	0.23	2.70	19.47	
		1.00	16.8	0.23	2.70	10.43	
	deduction (window)	13.00	1.2	1.52	0.23	(-) 5.45	
	door	10	0.9	2.1	0.23	(-)4.34	
						58.11	**M3**
7	RCC slab 150mm thick M-20	1.00	18.3	15.30	0.15	41.99	
						41.99	**M3**
8	wooden pannel door & window	1.00				**42.56**	**M2**
9	internal plaster	1.00	18.3	15.3		279.99	
	other wall 3 times of slab	3.00	279.99			839.97	
						1119.96	M2
10	External plaster	1.00	67		4.55	304.85	
	deduction	1.00				(-)42.56	
						262.29	**M2**
11	floor tiles	1.00	18.30	15.30		**279.99**	**M2**
12	steel in slab & DPC 1%	1.00					**kg**
	52.29 * 1% = 0.52 * 7854 =4084 kg					**4084.00**	

Abstract Sheet:

NAME OF WORK : Construction of Bank					
S.NO	**DISCRIPTION**	QTY	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	128.69	M^3	158.00	20333.02
2	PCC 1:3:6	47.80	M^3	3800.00	181640.00
3	R.R. Mass in CM 1:6	76.99	M^3	2050.00	157829.50
4	DPC M-20 (100 mm) & lenter	10.30	M^3	7800.00	80340.00
5	good quality murrm filling in plinth	167.99	M^3	380.00	63836.20
6	1st class brick masonary for superstructure	58.11	M^3	6200.00	360282.00
7	RCC slab 150mm thick M-20	41.99	M^4	10500.00	440895.00
8	wooden pannel door & window	42.56	M^2	11000.00	468160.00
9	internal plaster	1119.96	M^2	280.00	313588.80
10	External plaster	262.29	M^3	360.00	94424.40
11	floor tiles	279.99	M^2	1250.00	349987.50
12	steel in slab & DPC 1%	4084.00	kg	70.00	285880.00
13	colour & plumbing, electric etc. (10% of total cost)				281719.64
				TOTAL	**3098916.06**

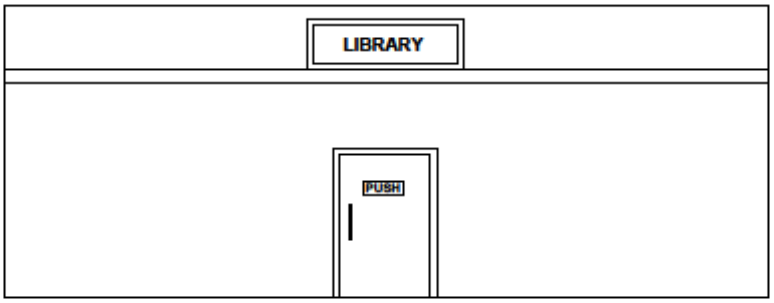
13.1.4 Library

Library is a place where a student, child, young or an old aged person can have a stay for while and can get knowledge. So it is very important to have a better library in the village for the litrary development of the villagers. It can be constructed near gram panchayat which could in the center of the village.

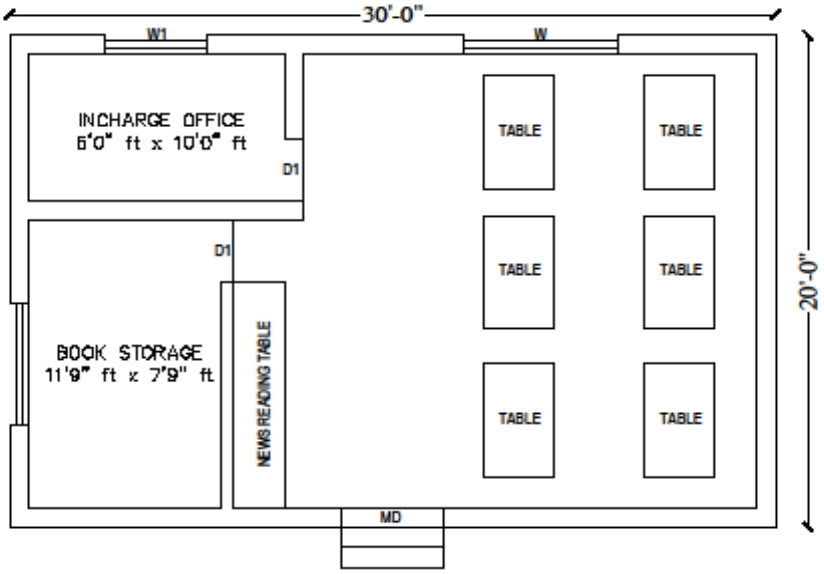
So here is the design with the cost estimation of the building of library, AutoCAD plan and the design sheet which once costructed can be very useful to each individual living in the village including students, elders etc.

Library in Kunariya Village: Sketchup View

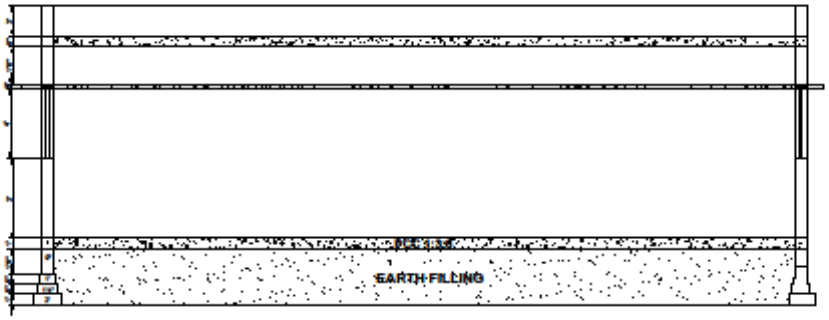
AutoCAD Elevation, Plan and Section



ELEVATION



PLAN



SECTION

Work Estimation

NAME OF WORK : Library							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Excavation in all type of soil upto 1.5 m depth	2	9.1	0.75	1.50	20.47	
		3	6.1	0.75	1.50	20.58	
		1	3.0	0.75	1.50	3.375	
						44.425	**M3**
2	PCC 1:3:6	2	9.1	0.75	0.10	1.37	
		3.00	6.10	0.75	0.10	1.38	
	floor	1.00	8.25	5.20	0.10	4.29	
		1.00	3.00	0.75	0.10	0.23	
						7.26	**M3**
3	R.R masonary in cm 1:6	2.00	9.1	0.60	0.60	6.55	
		3.00	6.1	0.60	0.60	6.58	
	upto plinth	1.00	3.0	0.60	0.60	1.08	
		2.00	9.1	0.45	0.70	5.73	
		3.00	6.1	0.45	0.70	5.76	
		1.00	3.0	0.45	0.70	0.95	
						26.65	**M3**
4	DPC M-20 (100 mm) & lenter	4.00	9.10	0.45	0.10	1.64	
		6.00	6.1	0.45	0.10	1.65	
		2.00	3.0	0.45	0.10	0.27	
						3.56	**M3**

5	good quality murrm filling in plinth	1.00	8.25	5.20	0.60	25.74	
						25.74	**M3**
6	1st class brick masonary for superstructure	2.00	9.10	0.23	2.70	11.30	
		3.00	6.1	0.23	2.70	11.36	
		1.00	3.0	0.23	2.70	1.836	
	deduction (window)	3.00	1.2	1.52	0.23	(-) 1.25	
	door	3	0.9	2.1	0.23	(-)1.30	
						21.94	**M3**
7	RCC slab 150mm thick M-20	1.00	9.1	6.10	0.15	8.32	
						8.32	**M3**
8	wooden pannel door & window	1.00				**11.08**	**M2**
9	internal plaster	1.00	8.69	5.65		49.09	
	other wall 3 times of slab	3.00	49.09			147.29	
						196.38	**M2**
10	External plaster	1.00	30.48		4.55	138.68	
	deduction	1.00				(-)11.08	
						127.60	**M2**
11	floor tiles	1.00	9.10	6.10		**55.51**	**M2**
12	steel in slab & DPC 1%	1.00					
	11.88 * 1% = 0.12 * 7854 =933.05 kg					**933.00**	**kg**

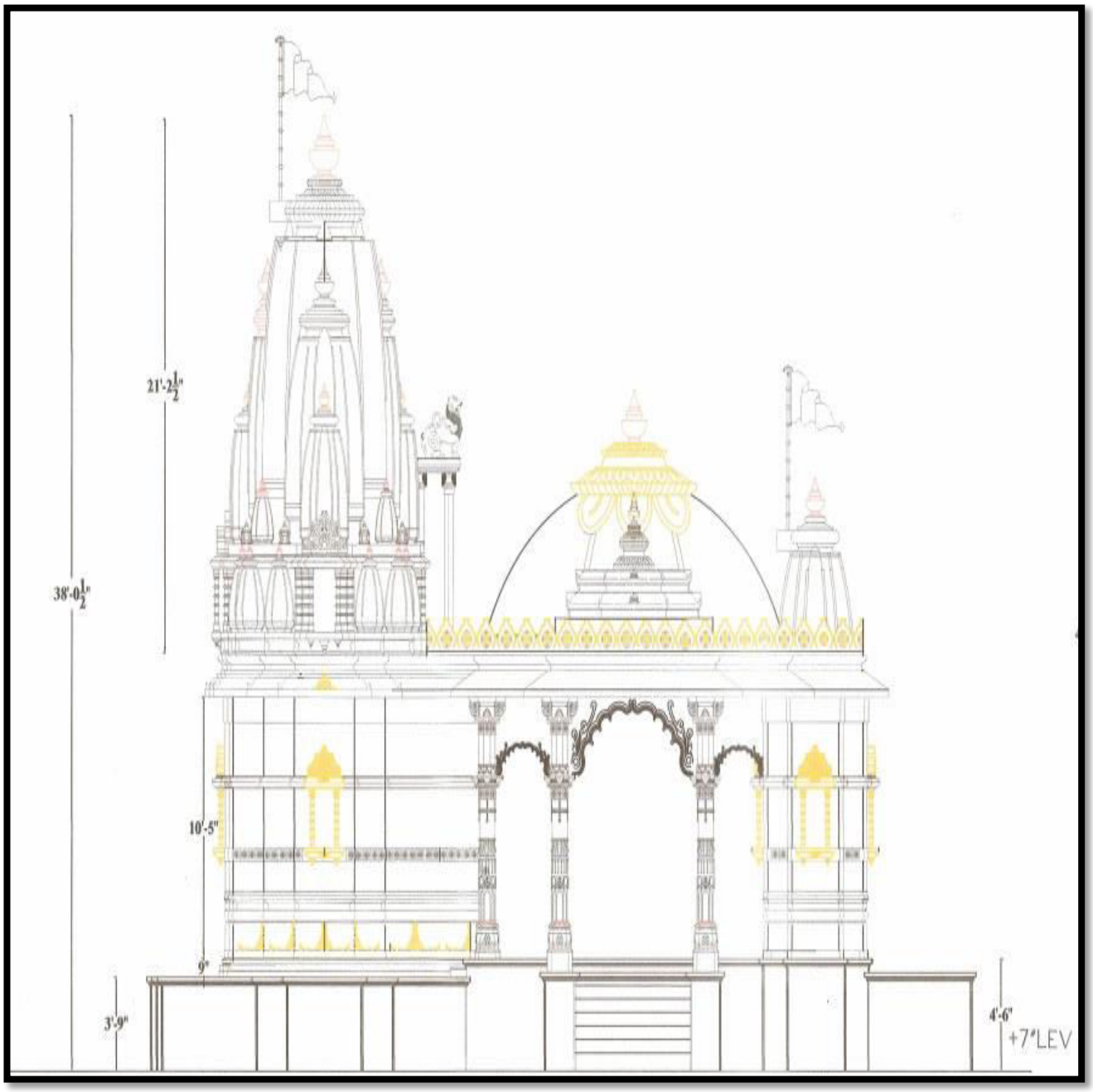
Abstract Sheet

NAME OF WORK : Construction of Library					
S.NO	**DISCRIPTION**	QTY	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	44.42	M^3	158.00	7018.36
2	PCC 1:3:6	7.26	M^3	3800.00	27588.00
3	R.R. Mass in CM 1:6	26.65	M^3	2050.00	54632.50
4	DPC M-20 (100 mm) & lenter	3.56	M^3	7800.00	27768.00
5	good quality murrm filling in plinth	25.74	M^3	380.00	9781.20
6	1st class brick masonary for superstructure	21.94	M^3	6200.00	136028.00
7	RCC slab 150mm thick M-20	8.32	M^4	10500.00	87360.00
8	wooden pannel door & window	11.08	M^2	11000.00	121880.00
9	internal plaster	196.38	M^2	280.00	54986.40
10	External plaster	127.60	M^3	360.00	45936.00
11	floor tiles	55.51	M^2	1250.00	69387.50
12	steel in slab & DPC 1%	933.00	kg	70.00	65310.00
13	colour & plumbing, electric etc. (10% of total cost)				70767.59
				TOTAL	**778443.55**

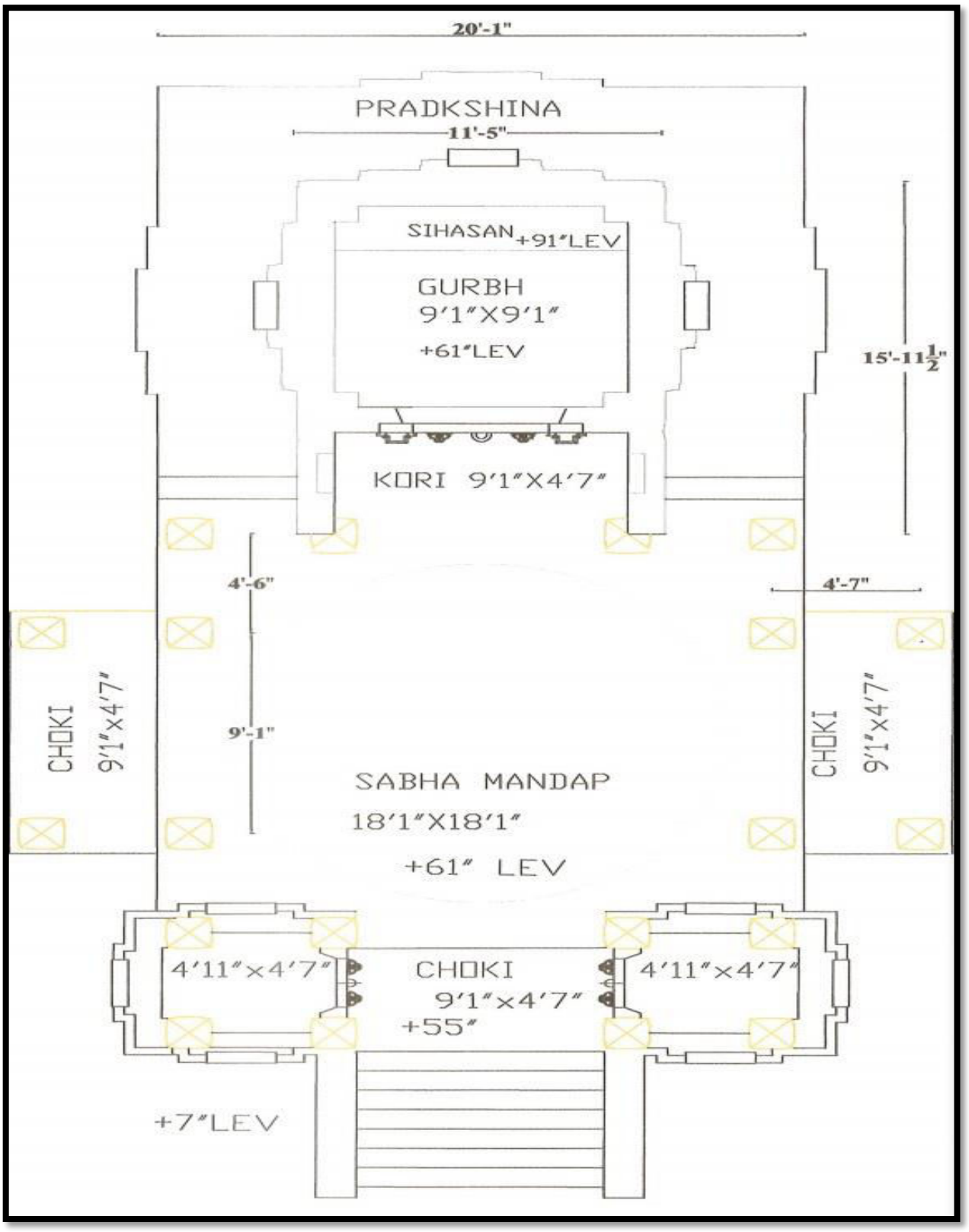
13.1.5 Temple

This temple will become the historical place of this village. This temple is being planned at the centre of the village (Kunariya-Bhuj).This will be the best place to worship and celebrate various functions.

Temple Elevation- Side View:



Top View Temple Plan



Work Estimation

Estimate							
NAME OF WORK : CONSTRUCTION OF NEW MANDIR							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Temple upto plinth	1	12	5.51		66.12	**M3**
						66.12	
2	above plinth	1	3.6	4.5		16.2	
		1	5.5	5.5		30.25	
						46.45	**M3**
3	Big shikhar (concrete - 6.70m height)	1				**1**	**NO**
4	Big dom of mandir 4.5 m round	1				**1**	**NO**
5	Small shikhar	4				**4**	**NO**

Abstract Sheet

NAME OF WORK : Construction of New mandir					
S.NO	**DISCRIPTION**	**QTY**	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Temple upto plinth	66.12	M2	16000.00	1057920.00
2	above plinth	46.45	M2	3800.00	786250.00
3	Big shikhar concrete	1.00	NO	551000.00	551000.00
4	Big dom (4.5 m round)	1.00	NO	650000.00	650000.00
5	Small shikhar	4.00	NO	111000.00	444000.00
				TOTAL	**3489170.00**

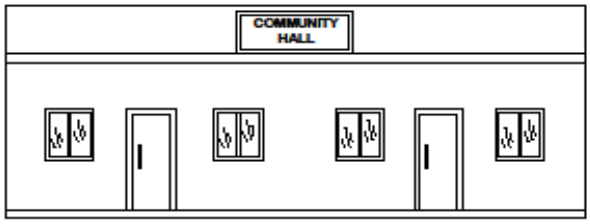
13.1.6 Community Hall

Here is the design of the community hall for Kunariya village. As there is community hall in the village, but it is necessary to have a community hall in a good condition with all the better and advanced facilities.

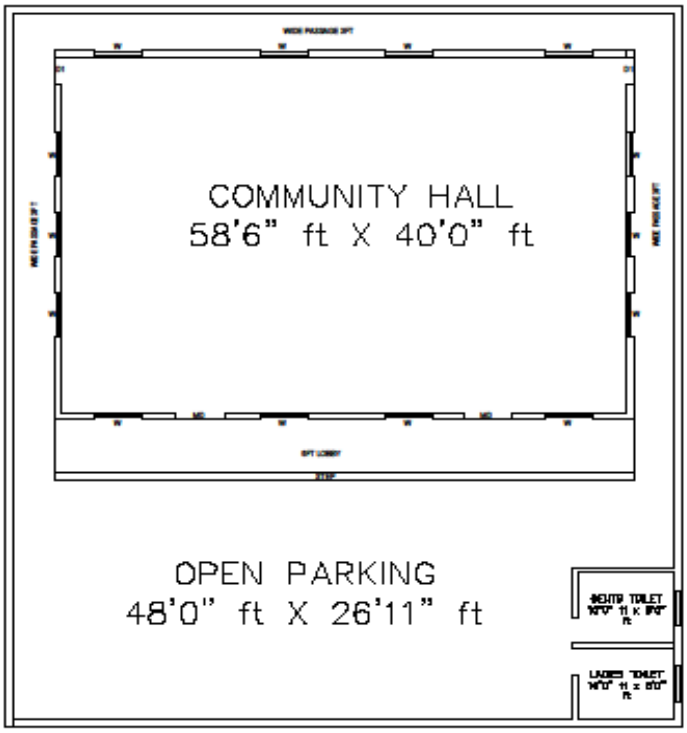
A better community hall is necessary for carrying out various activities like seminars, social and cultural functions, shows and other entertainment and knowledge related programs and many more which would be directly benificial to the villagers and their lifestyle. During elections, it can also be used as the election booth and the safe place to store the essentials.

Community Hall in Kunariya Village: Sketchup View

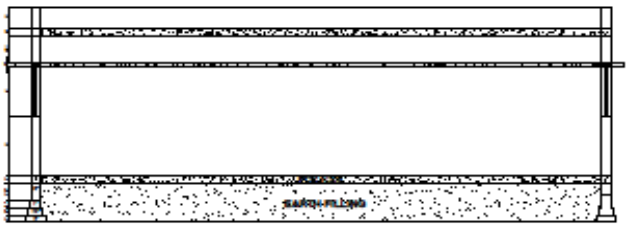
AutoCAD Elevation, Plan and Section



ELEVATION



PLAN



SECTION

Work Estimation

NAME OF WORK : community hall							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Excavation in all type of soil upto 1.5 m depth	2	18.3	0.75	1.50	41.17	
		2	14.0	0.75	1.50	31.5	
		1	13.4	0.60	1.00	8.04	
						80.71	**M3**
2	PCC 1:3:6	2	18.3	0.75	0.10	2.75	
		2.00	14.00	0.75	0.10	2.10	
		1.00	13.40	0.45	0.10	0.60	
	floor	1.00	17.83	14.02	0.10	24.99	
		1.00	6.00	2.40	0.10	1.44	
						31.88	**M3**
3	R.R masonary in cm 1:6	2.00	18.3	0.60	0.60	13.17	
		2.00	14.0	0.60	0.60	10.08	
		1.00	13.4	0.60	0.30	2.41	
		2.00	18.3	0.45	0.70	11.52	
		2.00	14.0	0.45	0.70	8.82	
		1.00	13.4	0.45	0.70	4.22	
4	DPC M-20 (100 mm) & lenter	4.00	18.30	0.45	0.10	3.29	
		4.00	14.0	0.45	0.10	2.52	
		2.00	13.4	0.45	0.10	1.21	
						7.02	**M3**
5	good quality murrm filling in plinth	1.00	17.83	14.02	0.60	149.98	
		1.00	6.00	2.40	0.45	6.48	
						156.46	**M3**
6	1st class brick masonary for superstructure	4.00	18.30	0.23	2.70	45.45	

		2.00	14.0	0.23	2.70	17.38	
		1.00	13.4	0.23	2.70	8.32	
	deduction (window)	14.00	1.2	1.52	0.23	(-) 5.87	
	door	4	0.9	2.1	0.23	(-)1.73	
						63.55	**M3**
7	RCC slab 150mm thick M-20	1.00	18.3	14.00	0.15	38.43	
		1.00	6.0	2.40	0.15	2.16	
						40.59	**M3**
8	wooden pannel door & window	1.00				**33.04**	**M2**
9	internal plaster	1.00	18.3	14		256.20	
	other wall 3 times of slab	3.00	256.20			768.60	
						1024.80	**M2**
10	External plaster	1.00	64		4.55	293.93	
	deduction	1.00				(-)33.04	
						260.89	**M2**
11	floor tiles	1.00	17.83	14.02		249.97	
		1.00	6.00	2.40		14.40	
	wall tiles	2.00	10.80		2.4	51.84	
						316.21	**M2**
12	steel in slab & DPC 1%	1.00					
	47.61 * 1% = 0.47 * 7854 =3691.38 kg					**3691.38**	**kg**

Abstract Sheet

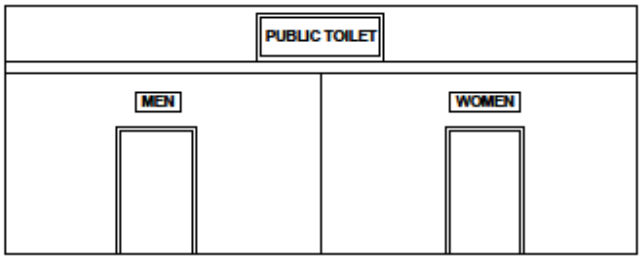
NAME OF WORK : Construction of community hall					
S.NO	**DISCRIPTION**	QTY	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	80.71	M^3	158.00	12752.18
2	PCC 1:3:6	31.88	M^3	3800.00	121144.00
3	R.R. Mass in CM 1:6	50.22	M^3	2050.00	102951.00
4	DPC M-20 (100 mm) & lenter	7.02	M^3	7800.00	54756.00
5	good quality murrm filling in plinth	156.46	M^3	380.00	59454.80
6	1st class brick masonary for superstructure	63.55	M^3	6200.00	394010.00
7	RCC slab 150mm thick M-20	40.59	M^4	10500.00	426195.00
8	wooden pannel door & window	33.04	M^2	11000.00	363440.00
9	internal plaster	1024.80	M^2	280.00	286720.00
10	External plaster	260.89	M^3	360.00	93600.00
11	floor tiles	316.21	M^2	1250.00	395262.50
12	steel in slab & DPC 1%	3691.38	kg	70.00	258396.60
13	colour & plumbing, electric etc. (10% of total cost)				256868.20
				TOTAL	**2825550.28**

13.1.7 Public Toilet

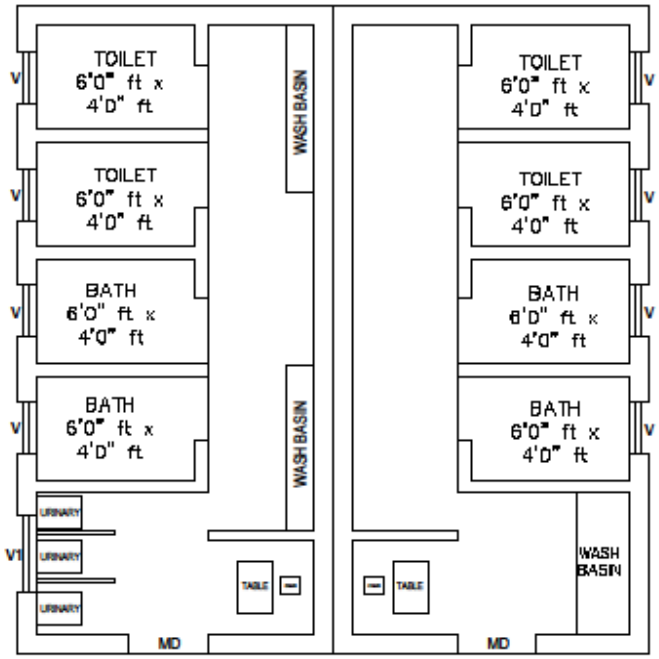
Here is shown the present condition of the public toilet of Kunariya village. So from this, it seems very necessary to renovate or rebuild the public toilet in the Kunariya Village.

Public Toilet Of Kunariya Sketchup View

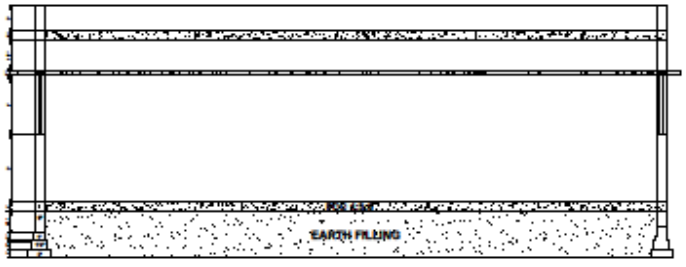
AutoCAD Elevation, Plan and Section



ELEVATION



PLAN



SECTION

Work Estimation

NAME OF WORK : public toilet							
S.NO	**DISCRIPTION**	**NO**	**L**	**B**	**D**	**QTY**	**UNIT**
1	Excavation in all type of soil upto 1.5 m depth	3	7.6	0.75	1.50	25.65	
		2	7.3	0.75	1.50	16.42	
		2	7.5	0.60	0.75	6.75	
						48.82	**M3**
2	PCC 1:3:6	3	7.6	0.75	0.10	1.71	
		2.00	7.30	0.75	0.10	1.10	
		2.00	7.50	0.45	0.10	0.68	
	floor	1.00	7.60	7.30	0.10	5.55	
						9.04	**M3**
3	R.R masonary in cm 1:6	3.00	7.6	0.60	0.60	8.20	
		2.00	7.3	0.60	0.60	5.25	
		2.00	7.5	0.60	0.30	2.70	
		3.00	7.6	0.45	0.70	7.18	
		2.00	7.3	0.45	0.70	4.59	
		2.00	7.5	0.45	0.45	3.03	
						30.95	**M3**
4	DPC M-20 (100 mm) & lenter	6.00	7.60	0.45	0.10	3.29	
		4.00	7.3	0.45	0.10	2.52	
		4.00	7.5	0.45	0.10	1.21	
		8*2 = 16	1.8	0.30	0.10	0.86	
						7.88	**M3**
5	good quality murrm filling in plinth	1.00	7.60	7.30	0.60	33.28	
						33.28	**M3**

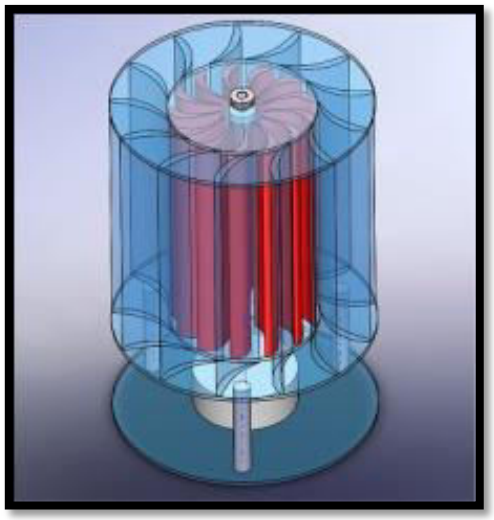
6	1st class brick masonary for superstructure	3.00	7.60	0.23	2.70	14.15	
		2.00	7.3	0.23	2.70	9.06	
		2.00	7.5	0.23	2.70	9.31	
		8.00	1.8	0.10	2.70	3.88	
	deduction (ventilation)	8.00	0.6	0.23	0.45	(-) 0.49	
	main door	2.00	1.0	0.23	2.10	(-)0.96	
	door	8	0.75	0.1	2.1	(-)1.26	
						33.69	**M3**
7	RCC slab 150mm thick M-20	1.00	7.6	7.10	0.15	8.09	
						8.09	**M3**
8	wooden pannel door & window	1.00				**18.90**	**M2**
9	internal plaster	1.00	7.6	7.3		55.48	
	other wall 3 times of slab	3.00	55.48			166.44	
						221.92	**M2**
10	External plaster	1.00	29.86		4.55	135.86	
	deduction	1.00				(-)18.90	
						116.96	**M2**
11	floor tiles	1.00	7.60	7.30		55.48	
	wall tiles	8.00	6.00		3	51.84	
		1.00	2.40		2.1	5.04	
						112.36	**M2**
12	steel in slab & DPC 1%	1.00					
	18.97* 1% = 0.15 * 7854 =1178 kg					**1178.00**	**kg**

Abstract Sheet

NAME OF WORK : Construction of Public Toilet					
S.NO	**DISCRIPTION**	QTY	**UNIT**	**RATE**	**TOTAL AMOUNT**
1	Excavation and Filling	48.82	M^3	158.00	7713.56
2	PCC 1:3:6	9.04	M^3	3800.00	34352.00
3	R.R. Mass in CM 1:6	30.95	M^3	2050.00	63447.50
4	DPC M-20 (100 mm) & lenter	7.88	M^3	7800.00	61464.00
5	good quality murrm filling in plinth	33.28	M^3	380.00	12646.40
6	1st class brick masonary for superstructure	33.69	M^3	6200.00	208878.00
7	RCC slab 150mm thick M-20	8.09	M^4	10500.00	84945.00
8	wooden pannel door & window	18.90	M^2	11000.00	207900.00
9	internal plaster	221.92	M^2	280.00	62137.60
10	External plaster	116.96	M^3	360.00	42105.60
11	floor tiles	112.36	M^2	1250.00	140450.00
12	steel in slab & DPC 1%	1178.00	kg	70.00	82460.00
13	colour & plumbing, electric etc. (12% of total cost)				121019.95
				TOTAL	**1129519.61**

13.1.8 Power Generation using Vertical Axis wind Turbines on highways and roadsides

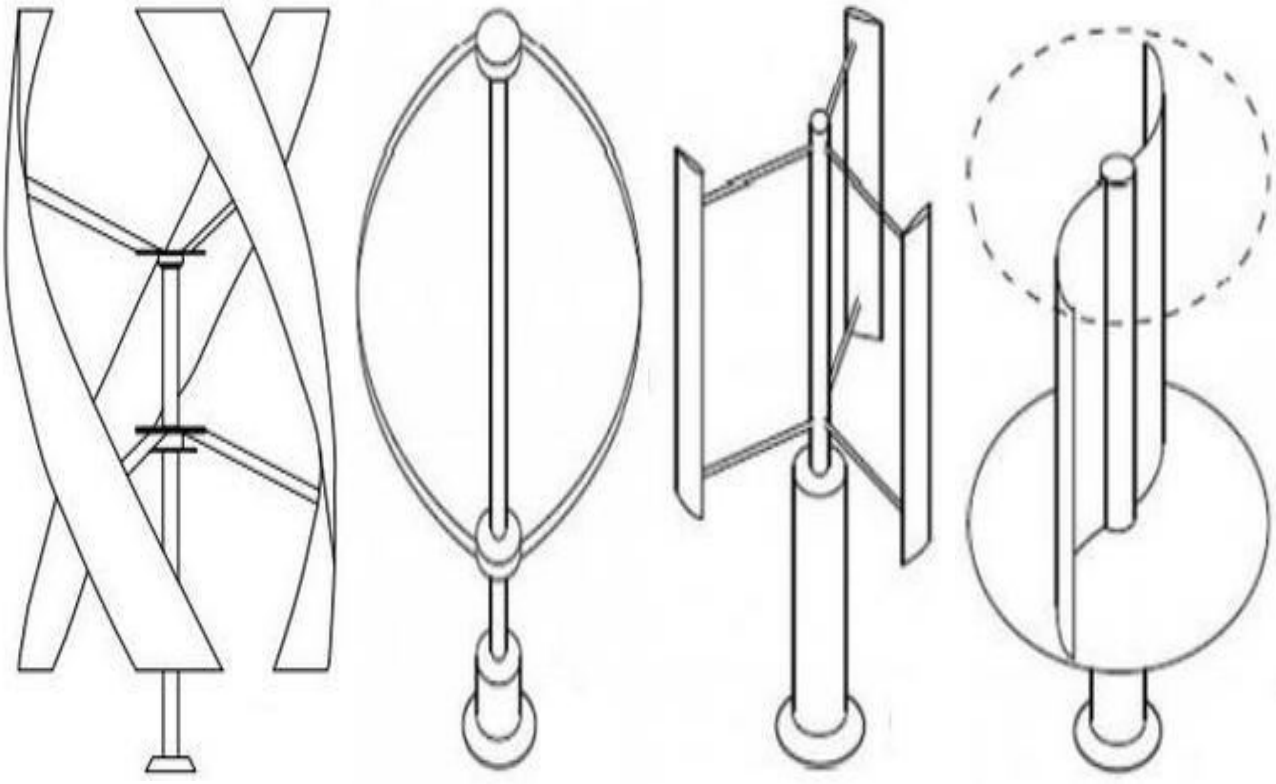
Introduction



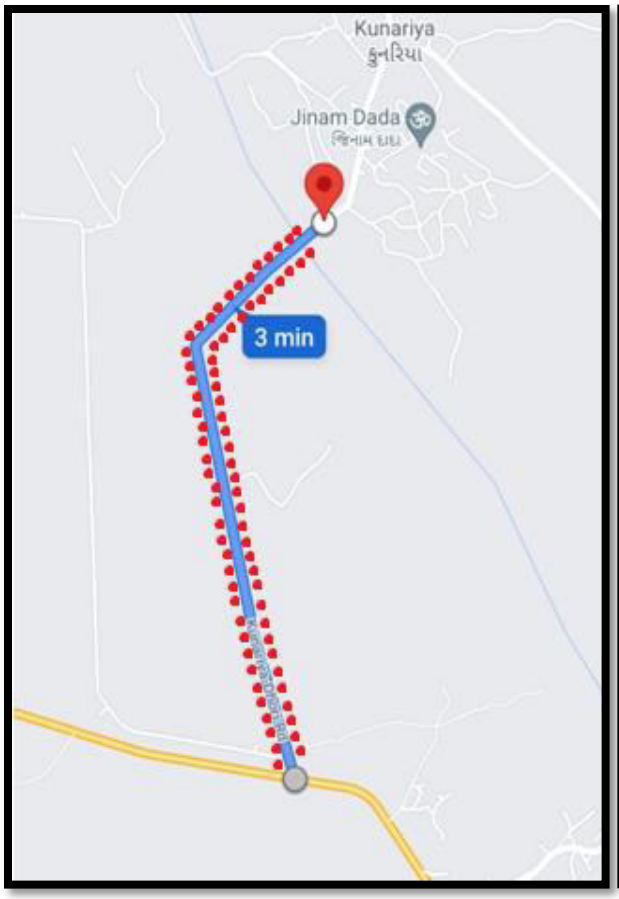
A vertical-axis wind turbine - VAWT is a type of wind turbine in which the main rotor shaft is set transverse to the direction of wind but not necessarily vertical and the main components are located at the base of the turbine, may be kept underground. So this arrangement allows the generator, gearbox and other components, located close to the ground, enabling service and repair. As there is no need of pointing VAWTs in the direction of wind, it removes the need for wind-sensing and orientation mechanisms which reduce the cost to a greater extent.

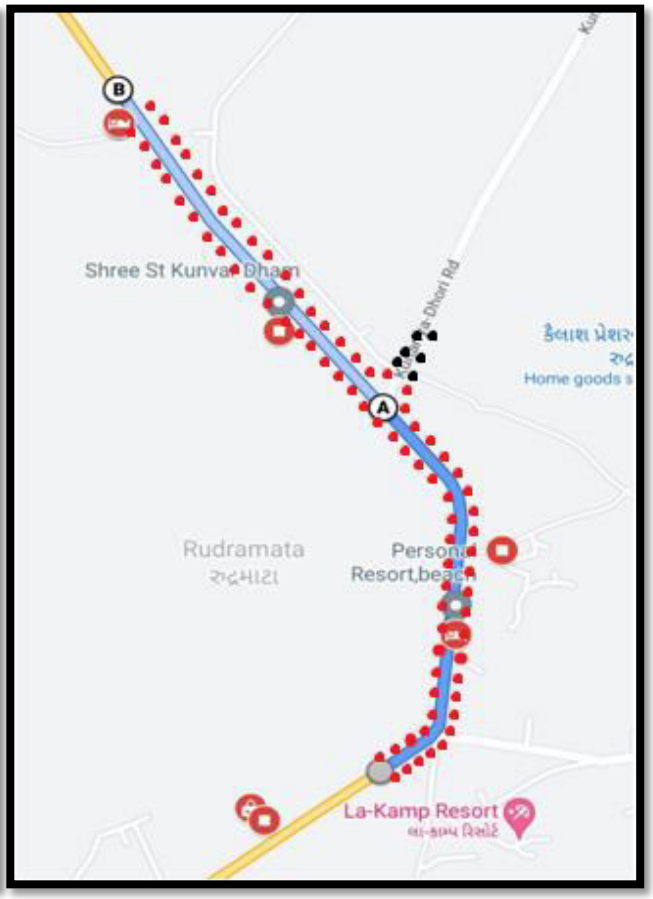
Types of VAWTs:

Savonius **Darrieus** **H-Darrieus** **Helix shaped**



So, here in the village, on the buildings with high altitude, on the way from the village to the highway and 1km on both the sides of the highway; we can install such VAWTs. The power generated can be converted to the AC and can be supplied in the grid, which will reduce the load on the grid. As this village hve a great opportunty for the generation of power with the wind energy. The way from the highway to Kunariya is 2.4 km long, so we can install the VAWTs there and along 1-1 km around the way. In the below figure, the red dot shows tyhe site, where we can install VAWTs. First figure shows the way coming out from Kunariya village to the highway and the second figure shows the way around the main entrance, 1-1 km on both the sides where we can istall VAWTs.





Advantages over Horizontal Axis Wind Turbine(HAWTs) and some disadvantages:

- **Advantages**

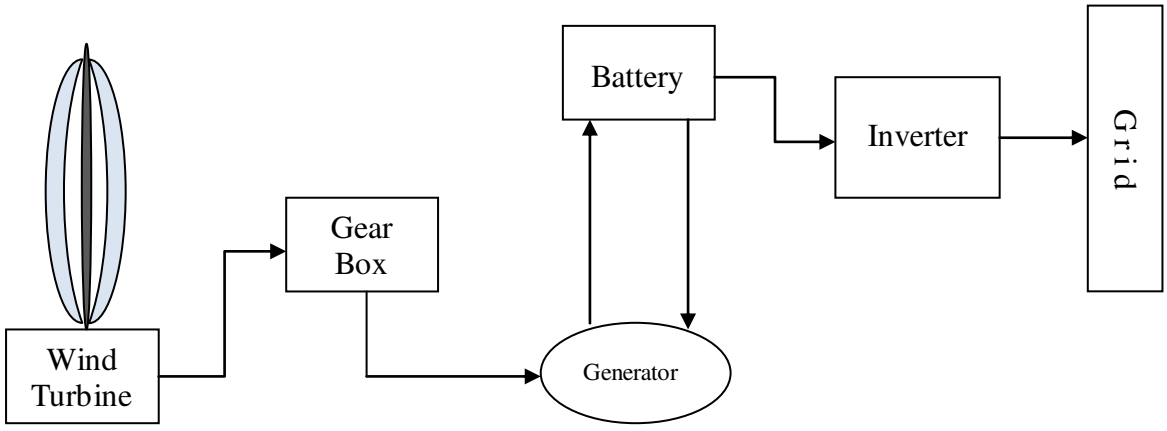
- Strong supporting tower in not needed as all the components including gear bor, generator etc. are placed on the ground.
- Low production cost compared to the horizontal axis wind turbines.

- As there is no need of pointing turbine in wind direction to be efficient so drive.
- Easy installation as compared to HAWTs.
- Easy to transport from one place to other.
- Low maintenance cost.
- They can be installed in rural areas and on the highways.
- Low risk for the humans and birds because blades moves at relatively lower speeds.
- They are particularly suitable for the areas with extreme weather conditions, like in the mountains where they can supply electricity to mountain huts.

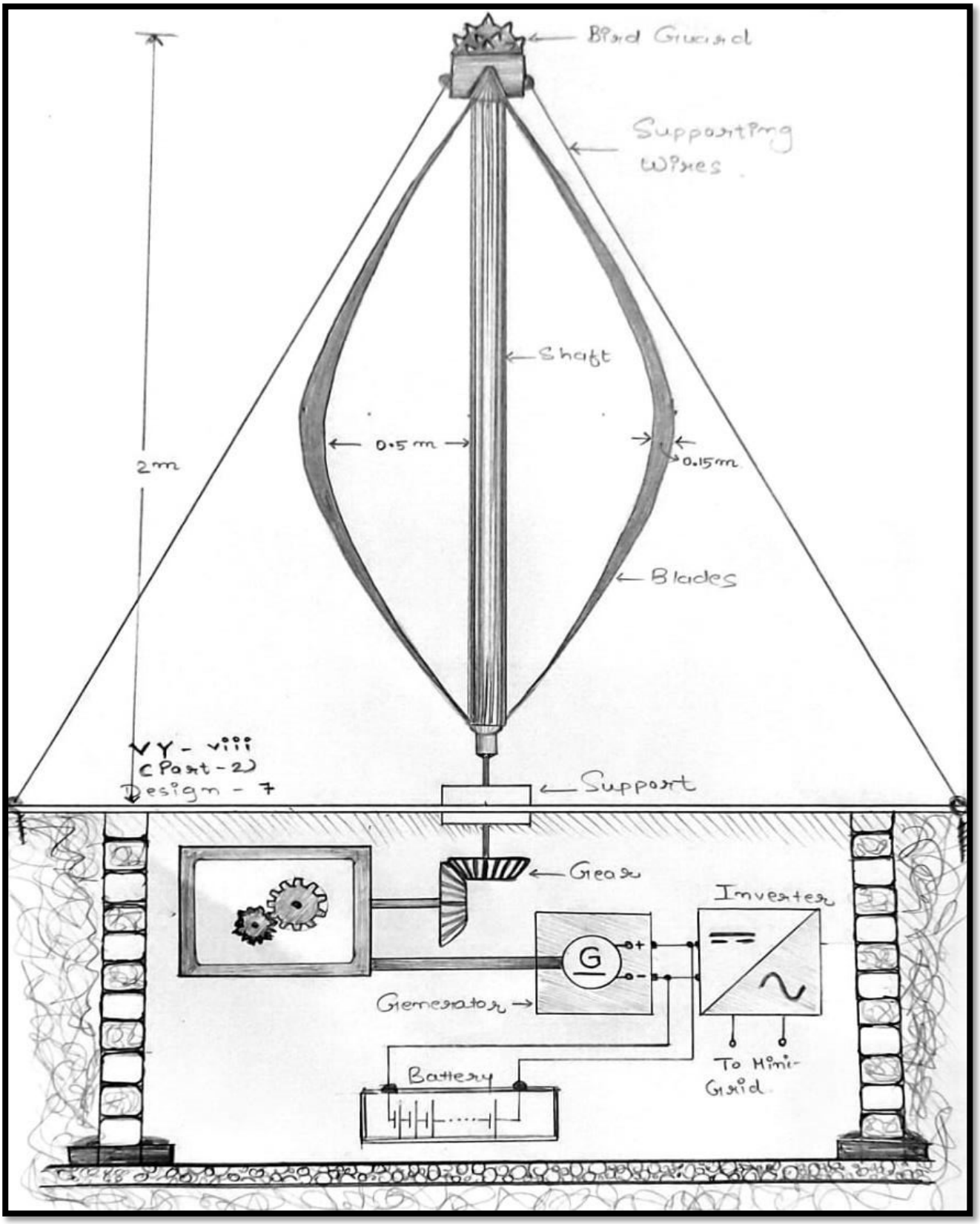
- **Disadvantages:**

- As only one blade of the wind turbine works at a time, the efficiency is very low compared to HAWTS.
- They need an initial push to start; this initial push to make the blades start spinning on their own may be started by a small motor.
- Compared to the horizontal axis wind turbines, they are very less efficient because of the additional drag created when the blades rotate.
- They have relative high vibration as the air flow near the ground creates turbulent flow.
- Due to the vibration, bearing wear increases that results in the increase of maintenance costs.
- VAWTs may need guy wires to hold it up (guy wires are impractical and heavy in farm areas).

Block Diagram



Design(Sketch) of the System:



Materials Being Used for each model with Cost Estimation

Equipments	Cost
Turbine structure	10,000
Mounting Structure	2000
Gear box	6000
DC Generator(48V DC)	6000
Smarten Inverter(48 V DC to 220V AC)	35000
Li ion 24 V 14 Ah Battery	8500*2 = 17000
Connecting pins/ plugs	1000
Wires for connections	1000
Labour per day per installation	2000
Miscellaneous	4000
Total	**84,000/-**

- **As, above we mentioned to install such VAWTs on the road side and on the Highways near the main entrance almost 50 meters apart, hence we can install averagely 160 VAWTs in the whole site.**
- **Hence the price of the one installation is almost 84,000/- rupees. So for installing 160 VAWTs, the total cost of the project will be 13,440,000/- rupees.**

13.1.9 GSM based Electricity Tariff (billing) system

Introduction

Electricity plays a vital role in growth of our country. Even though power production corporations focusing highly on generation, transmission and distribution, they are meeting power loss due to illegal consumption of electrical power from the transmission lines by the consumers. Power theft has become a great challenge to the electricity board. The dailies report says that Electricity Board suffers a total loss of 8 % in revenue due to power theft every year, which has to be controlled. There are many cases of power theft and indicates it to the Electricity board through GSM network. It also deals about the remote monitoring of an energy meter in the proposed system.

Traditional System

- Traditional meter reading is done by the human operator, this require a more number of labor operator and long working hour to achieve the complete area data reading and billing.
- Due to the increase in the development of residential building and commercial building the meter reading task increases which require more number of human operators.
- It should be clear that such methods are very time consuming and does not satisfy the business requirements for the power company, in addition to the large number of errors incorporated in the reading process. This type of systems cannot provide transparency.
- In existing system either an electronic energy meter or an electro-mechanical meter is fixed in the premise for measuring the usage.
- The meters currently in use are only capable of recording kWh units. The kWh units used then still have to be recorded by meter readers monthly, on foot.
- The recorded data need to be processed by a meter reading company. For processing the meter reading, company needs to firstly link each recorded power usage datum to an account holder and then determine the amount owed by means of the specific tariff in use.

Proposed System

- The present power usage reading is made manually by moving to the consumer locations. This requires large number of labor operators and long working hours to accomplish the task.

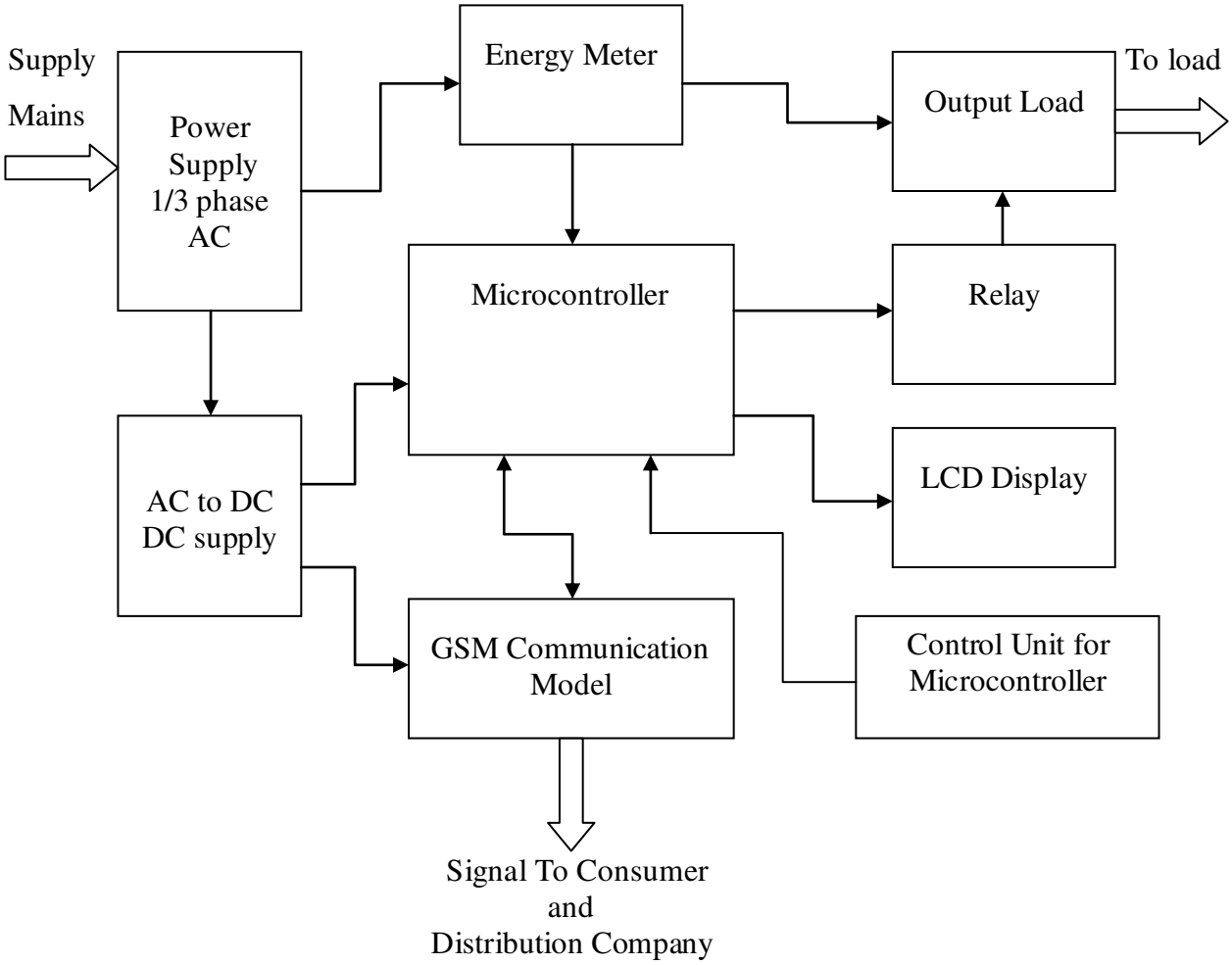
- Manual billing is sometimes restricted and delayed by bad weather conditions. The printed billing also has the tendency of getting lost.
- Over the last few years, Smart (Prepaid) Energy Meter has been proposed as an innovative solution aimed at facilitating affordability and reducing the cost of utilities.
- This mechanism, essentially, requires the users to pay for the electricity before its consumption. In this way, consumers hold credit and then use the electricity until the credit is exhausted. If the available credit is exhausted then the electricity supply is cut-off by a relay.
- Readings made by human operators are prone to errors. This project addresses the above mentioned problems.
- The development of GSM infrastructure in past two decades made meter reading system wireless. The GSM infrastructure, which has national wide coverage, can be used to request and retrieve power consumption notification over individual houses and flats.
- Apart from making readings using GSM communication, billing system is needed to be made prepaid to avoid unnecessary usage of power.
- During such a pandemic, it is very difficult and risky to go door to door and give the bills, hence it is very helpful in such situations also.

Materials Used

- Microcontroller
- Global System For Mobile Communication (GSM)
- Energy Meter
- Relay
- Step Down Transformer
- Rectifier Unit
- Filter Circuit
- LCD Display
- Enclosing Box

Block Diagram:

Here is the block diagram of the GSM based electric tariff system showing all its components incuding the connections of the system starting from the supply mains to the output, which is the load to be connected to the mains. This system is useful for both single phase as well as three phase connection consumers.



Working:

- The proposed model has the PIC microcontroller as Central Processing Unit.
- The whole system is interfaced with PIC microcontroller.
- The GSM modem is serially connected with the controller which is the major communication module between User and provider.
- The GSM uses its own network for the transfer of information. Special coding in embedded c is used for programming PIC microcontroller using programmer Hardware along with MP-LAB IDE software.
- The relay acts as switching device to cut off and restore power supply. The LCD is interfaced to microcontroller using parallel port connection.
- In this project the Microcontroller based system continuously records the readings and the live meter reading can be sent to the Electricity department on request.

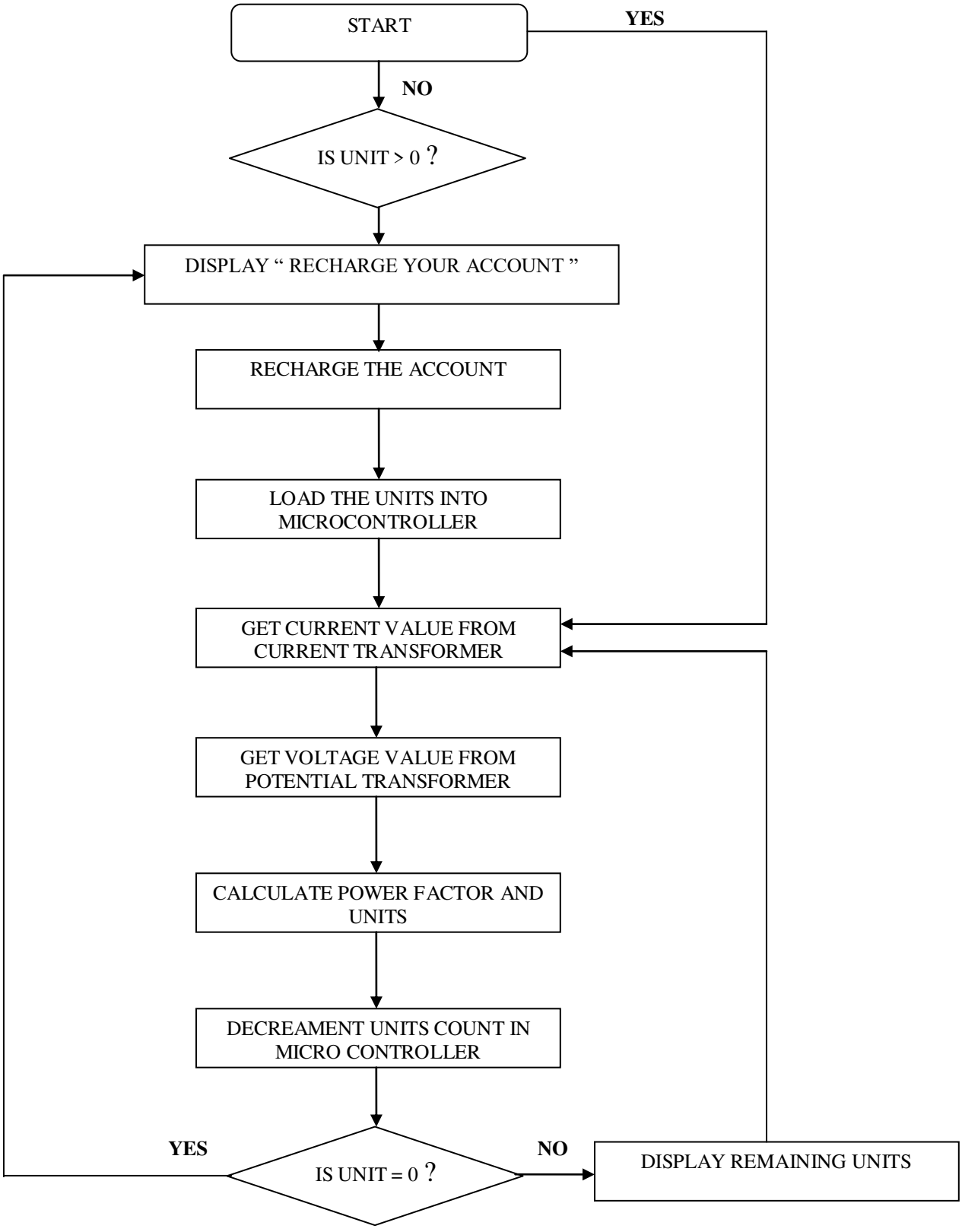
- This system also can be used to disconnect the power supply to the house in case of non - payment of electricity bills.
- A dedicated GSM modem with SIM card is required for each energy meter. The microcontroller pulls the SMS received by phone, decodes it, recognizes the mobile number and then switches on the relays attached to its port to control the appliances.
- After successful operation, controller sends back the message to the user's mobile through SMS. The coding emphasis the fact that it reduces human labor but increases the efficiency in calculation of bills for used electricity.
- The user will have a universal number and they can recharge outlets of electricity board .the acknowledgement of recharged coupon detail will come to notice of the consumer and also will get displayed in LCD module.
- So this process will bring a solution of creating awareness on unnecessary wastage of power and will tend to reduce wastage of power.
- This module will reduce the burden of energy providing by establishing the connection easily and no theft of power will takes place.
- The LCD display will display the used amount and balance amount that can be used.

Future aspects:

Such a tariff structure can also introduced in our project, that for night duration the price/tariff rates are low as there is low load demand and for day time the tariff rates are comparitively high as there is more demand compared to the power generated as to compel the consumers to use the electricity much in night duration which will reduce the maximum demand at the day time.

Flow chart:

Here is the flow chart of our module, which in detail expains the working sequence of the program. This the the flow of the sequence of the performed operations, to be undertaken at different situations created at certain conditions.


START
YES
NO
IS UNIT > 0 ?
DISPLAY " RECHARGE YOUR ACCOUNT "
RECHARGE THE ACCOUNT
LOAD THE UNITS INTO MICROCONTROLLER
GET CURRENT VALUE FROM CURRENT TRANSFORMER
GET VOLTAGE VALUE FROM POTENTIAL TRANSFORMER
CALCULATE POWER FACTOR AND UNITS
DECREAMENT UNITS COUNT IN MICRO CONTROLLER
YES
IS UNIT = 0 ?
NO
DISPLAY REMAINING UNITS

Advantages and Outcomes

- The design of Smart Energy meter using GSM technology can make the users to pay for the electricity before its consumption.
- In this way, consumers hold credit and then use the electricity until the credit is exhausted. If the available credit is exhausted then the electricity supply is cut-off by a relay.
- This reduces human labor and at the same time increases the efficiency in calculation of bills for used electricity.
- Smart energy me ters will bring a solution of creating awareness on unnecessary wastage of power and will tend to reduce wastage of power.
- This module will reduce the burden of energy providing by establishing the connection easily and no theft of power will take place.
- This paper work exposes the purpose of energy monitoring and controlling by implementing prepaid system.
- It is hoped that this work helps the consumers for better energy management and its utility in the distribution system for economic liability of the Electrical Boards.

No.s of meters being required in the village.

- This is calulated in order to calculate the total requiremetns of meters

Present Requirement

- 751 residential
- 15 commercial
- 1 flourmill
- 100 Agricultural
- 1 Angadwadi
- 1 gram panchayat
- 2 schools
- 1 overhead tank control room
- 1 community hall
- 1 Temple
- 1 public health centre

Future Requirement

- 1 ATM
- 1 Bank
- 1 Post office
- 1 Library
- 1 Temple
- 1 Public toilet block

Cost Estimation

Material	Cost
GSM module	1700
Relay	300
Microcontroller	600
Energy Meter	1000
Step Down Transformer	200
Rectifier Circuit	100
Filter Circuit	100
LCD display	200
Enclosing Box	400
Miscelleneous	500
Total Price of 1 Meter	**5100**

As mentioned above, total number of meters required are approximately 900-1000 in the village (Calculation given above)**.**

So the total cost of installation of these GSM based Electricity Tariff meters in the whole village = 51,00,000/-

13.1.10 Solar based irrigation system in farms

Introduction and Village Analysis:

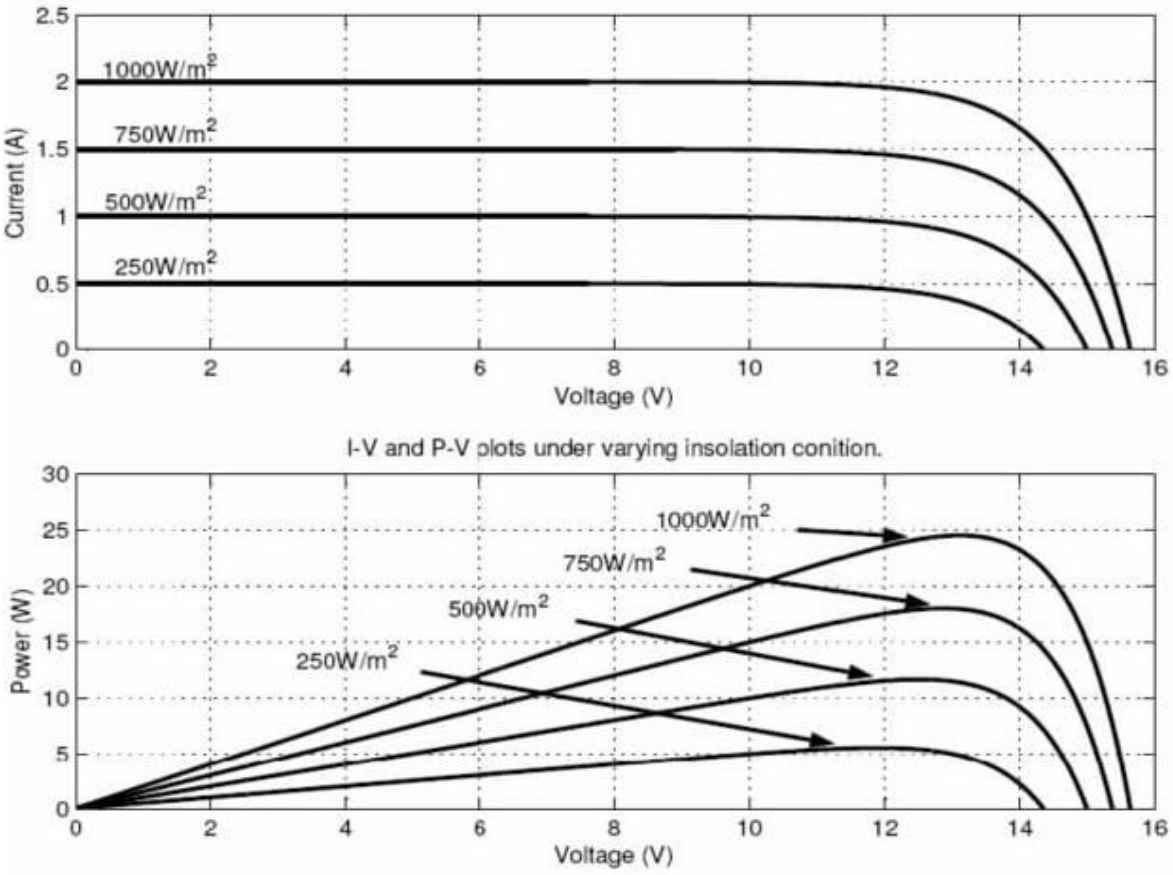
- India is located in the equatorial sun belt of the earth, thereby receiving abundant radiant energy from the sun. Even the tropic of cancer passes from the Kachchh district. The India Meteorological Department (IMD) maintains a nationwide network of radiation stations which measures the solar radiation and its duration.
- Hence mostly, there is a clear sunny weather experienced 250 to 300 days a year, here in Kunariya village. The annual global radiation varies from 1600 to 2200 kWh/sq.m.

- Hence, this design topic is to install the solar panels in the farm lands in the village. As this village comprises of 3633 hectors having main occupation of agriculture. There are almost 1156 farmers performing the agricultural activities. As the rain is very irregular in this region of the state, the irrigation facilities very important and necessary for the sustainable development of the village.
- There are approximate 1300 farms in the village, hence it is very basic reqirement of the pumps for irrigation resulting the very need of the power supply. Hence, in this proposal, we will install solar modules in the farms on the basis of the reqirement and the demand of the farmers which will give them the power supply in the day time as not provided by the respective distribution company.
- In addition to this, the unused generated electricity can be supplied to the grid, which will be the source of income for the farmers, for lifetime once installed.
- Government of Gujarat under GUVNL have also started an initiative Suryashakti Kisan Yojana(SKY) for the same, under which the farmers can generate electricity for their consumption and also can sell the unused electricity to the grid and can earn the income.
- The 60 % subsidy on the cost of this project will be given by the State and Central Government, 35% of the cost will be provided to him through loan with the interest rates of 4.5% to 6% and remaining 5% of the cost will be borne by Farmers.
- Total duration of this scheme is 25 years which is being split between 7-year period and 18-year period. As per this scheme, the farmers will get per unit rate of Rs 7 (Rs 3.5 by GUVNL + Rs 3.5 by State Govt.) for the first 7 years and succeeding 18 years, the farmers will get the rate of Rs 3.5 for each unit sold.

Solar Plant Design:

- The long term “commercialization” of utility based solar photovoltaic electric generation requires the development of safe, efficient, reliable, affordable components and systems that meet utility expectations of performance and cost per kWh production goals, while allowing for full integration of time variant intermittent renewable generation resources in the utility generation portfolio.

- Cost reductions available through design, material specification and construction techniques developed by the power industry for the need of lower cost traditional generating stations that can affect significant cost savings when applied to PV generation systems.
- Higher generation through proper design and use of efficient system components effectively means lower cost of power. Some critical factors which must be kept in mind during design include proper selection of modules, optimum angle of tilt, minimization of ohmic losses with proper selection of conductors, selection of efficient transformers and inverters etc. Use of reliable and long life components is equally essential for expensive solar power plants.
- The actual energy output that one can expect from a given PV system depends on a large number of factors. Some of these are:
  - The PV efficiency is affected to a greater or lesser extent by the temperature of the module, usually decreasing with increasing temperature.
  - Nearly all the module types shows decreasing efficiency with low light intensity. The strength of this effect varies between module types.



I-V and P-V plots under varying insolation conition.

- Some of the light is reflected from the surface of the modules and never reaches the actual PV material. How much depends on the angle at which the light strikes the module. The more the light comes from the side (narrow angle with the module plane), the higher the percentage of reflected light. This effect varies (not strongly) between module types.
- The conversion efficiency depends on the spectrum of the solar radiation. Where nearly all PV technologies have good performance for visible light, there are large differences in the efficiency for near-infrared radiation. If the spectrum of the light were always the same this effect would be assumed to be part of the nominal efficiency of the modules. But the spectrum changes with the time of day, and with the amount of diffusion of light.
- Finally, some module types have long-term variations in the performance. Especially modules made from amorphous silicon are subject to seasonal variations in performance, driven by long-term exposure to light and to high temperatures.

Mounting position:

For fixed and non-tracking systems the way the modules are mounted will have an influence on the temperature of the module, which will affect the efficiency of the system. Experiments have shown that if the movement of air behind the modules is restricted, the modules can get considerably hotter (up to 15°C at 1000W/m2 of sunlight).

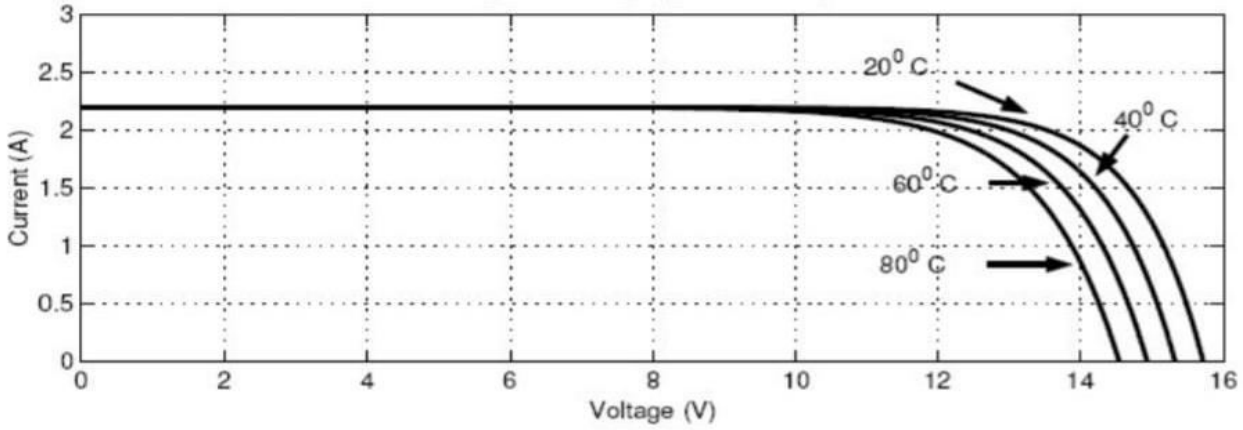
Inclination angle:

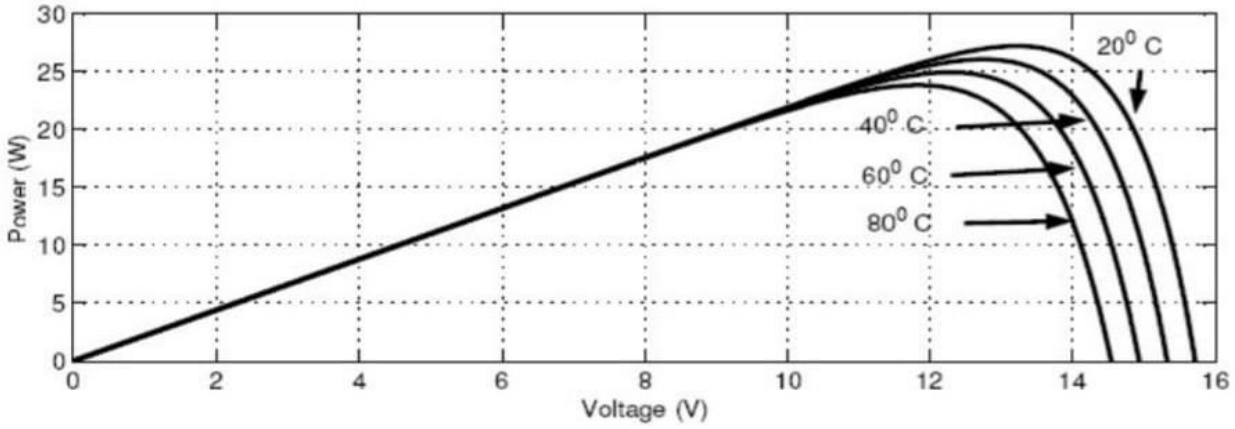
This is the angle of PV modules from the horizontal plane, for a fixed mounting. It is also noted that the global radiation measurements are done on horizontal surface. The maximum radiation can be obtained by tilting the panels 22^{o} to the surface at an optimum angle, which is determined by the latitude of the location.

Temperature:

Module performance is generally rated under Standard Test Conditions (STC): irradiance of 1,000 W/m², solar spectrum of AM 1.5 and module temperature at 25°C. All electrical parameters of solar module depend on the temperature. The module output decreases with the increase in temperature. The loss of the power is defined by the temperature coefficients. This

effect can be seen in the sample V-I characteristics, obtained from the specification sheet for commercially available module.





The temperature coefficient represents the change in power output with different temperatures. Typical values of temperature coefficient for crystalline silicon are as follows:

- γ (P_{mpp}) typical values for crystalline modules is -0.4 to 0.45%/K
- γ (P_{mpp}) typical values for amorphous modules is -0.2 to 0.23%/K
- γ (P_{mpp}) typical values for Cd-Te modules is -0.24 to 0.25%/K

Therefore thin film modules will certainly give higher performance at elevated temperature when compared to crystalline silicon.

Long term reliability:

The long term reliability of photovoltaic modules has been improving steadily, with manufacturers offering over 25 years guarantee on their panels. However, no power plant has been in existence for such a long period of time, for verification of the guarantee. It is important for the PV industry to know the long term reliability, since it impacts the life of the PV system, and hence changes the cost considerations. The factors mentioned as other losses in the section above are used for accelerated rate testing since it is not feasible to test for 25 years to get results. However, these accelerated tests still do not completely simulate the real conditions and hence field accelerated techniques are used wherein one of the factors is artificially enhanced and tests are done, but on installed plants.

NREL tests have concluded that the degradation and the losses in maximum power are almost entirely due to losses in short circuit current, and that these losses are almost identical for single and poly crystalline panels and are highly dependent on the process used in manufacture. The drop in current production by the modules can be attributed in part to the visually observable physical defects including EVA browning, delaminating at the Si- cell/EVA interface and the occurrence of localized hot spots.

Module Degradation:

The degradation of solar modules with temperature and time contributes significantly to the final output from the panel. As the output reduces each year, so does the revenue from sale of power, and therefore accurate data must be available at the outset to ensure that the power plant design is exact and not over or under the required output. Lifetime of the module is one of the four factors besides system price, system yield and capital interest rate which decides the cost of electricity produced from the module, and this lifetime is decided by the degradation rate.

The effect of degradation of photovoltaic solar modules and arrays and their subsequent loss of performance has a serious impact on the total energy generation.

And with respect to this maximum power at standard test conditions, (P_{max} at STC) is the most critical characteristic of the photovoltaic module or array for all of its operational life. For calculation of the system size to the associated investment costs P_{max} is a key working value. The effective cost of power generation Rs. /kWh is dependent on the initial investments, expected

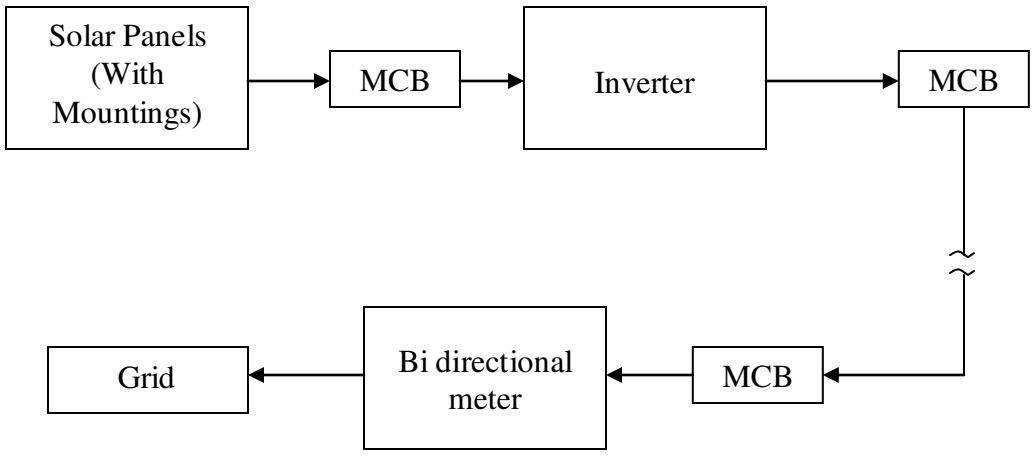
returns (KWh) and the assumption that the module will operate for a sufficiently long period (lifetime) to guarantee the return of the investment. Most manufacturers indicate the extent to which the panel will degrade, through the guarantee. This is specified as a ratio of the maximum power available at the time time of installation. Most manufacturers claim their panels will produce 90% of the maximum power after a period of 10 years, and 80% of the maximum power after 25 years. Hence, most power plants are also designed for a life of 25 years.

However, since most installed solar PV power plants is less than 25 years old, this data is not available readily, and especially in the Indian scenario where solar power plants are relatively new.

Inverter efficiency:

A solar PV inverter is a type of electrical inverter that is made to change the direct current (DC) electricity from a photovoltaic array into alternating current (AC) for use with home appliances or to be fed into the utility grid. These inverters may be stand alone inverters, which are used in isolated systems, or grid tie inverters which are used to connect the power plant to the grid. The efficiency of an inverter has to do with how well it converts the DC voltage into AC. The currently available grid connected inverters have efficiencies of 96 to 98.5%, and hence choosing the correct inverter is crucial to the design process. There are less efficient inverters below 95% also available. Inverters are also much less efficient when used at the low end of their maximum power. Most inverters are most efficient in the 30% to 90% power range.

Block Diagram:



Cost Estimation of 1 KW module installation and even for different ratings including subsidies:

Equipments Used for Installation of a 0.99KW solar plant:	**Cost**
Solar Panel- 0.33 KW(330 W, 30V) x 3	30,000
3 phase 1kW Inverter	7000
MCB switches	2000
Conecting wires	500
Mounting and frames for installation of Panels	3000
Lightening arrester	1500
miscellaneous	1000
Total	**45,000**

KW capacity	**Price Per KW**	**Subsidy Amount**	**Total Cost**
0.99	46827	18543 (40%)	27815/-
1.32	42993	22700 (40%)	34050/-
1.65	42993	28375 (40%)	42563/-
1.98	42993	34050 (40%)	51076/-
2.31	41991	38799 (40%)	58200/-
2.64	40993	44342 (40%)	66514/-
2.97	40993	49885 (40%)	74828/-
3.30	40993	49191 (40%)+2495 (20%)	83626/-
3.96	40993	49191 (40%)+7870 (20%)	105271/-
4.29	40993	49191 (40%)+10576 (20%)	116092/-
4.95	40993	49191 (40%)+15987 (20%)	137737/-
5.28	40993	49191 (40%)+18692 (20%)	148560/-
5.94	40993	49191 (40%)+24103 (20%)	170204/-
6.27	40993	49191 (40%)+26809 (20%)	181026/-
6.93	40993	49191 (40%)+32220 (20%)	202670/-
7.26	40993	49191 (40%)+34926 (20%)	213492/-
7.92	40993	49191 (40%)+40337 (20%)	235136/-
8.25	40993	49191 (40%)+43042 (20%)	245959/-
8.91	40993	49191 (40%)+48453 (20%)	267603/-
9.24	40993	49191 (40%)+51159 (20%)	278425/-
9.90	40993	49191 (40%)+56570 (20%)	300069/-

Guarantees and long term Analysis:

Here is the list of the guarantees given by the various panel manufacturers. It was noted that most panels are guaranteed to produce outputs of 90% after 10 years of use and 80% after 20 years of use. The table below lists the various solar modules considered and the guarantees provided by the manufacturers.

Manufacturer	Country	Watts	Life in years/ Guarantee given
Bosch	Germany	240	10 years 90%
Canadian solar	Canada	170	25 years
Coenergy	US	215	12 years 92%
Del Solar	Taiwan	120	10 years 90%
Evergreen solar	US	200	25 years
First solar	US	70	10 years 90%
Isofoton	Spain	160	10 years 90%
Kyocera	US	235	12 years 90%
Mitsubishi	Japan	190	
Mo-Tech	US	205	10 years 90%
Photowatt	France	210	12 years 90%
Q cells	Germany	70	25 years
RE corporation	Norway	215	10 years 90%
Sayno	Asia	210	25 years 80%
Schott	Germany	180	25 years 90%
Solar fabric	Germany	125	10 years 90%
Solarways	Germany	210	12 years 90%
Solarworld	US	220	25 years 80.2%
United Solar Ovonic	US	68	10 years 92%
PLG Solar	India	-	10 years 90%
Moser Baer	India	-	10 years 90%
Tata BP Solar	India	-	10 years 90%
BP SOLAR	US	230	12 years 93%

13.2 Reason for Students Recommending this Design

1. In order to recieve and send parcels, money and many more functions necessary for the villagers.
2. In order to do better transactions, including withdrawal of the money, opening and closing the bank accounts, passbook entries and many more.
3. Library is designed to increase the litracy rate and increase the interest of the villagers, students and elders and to promote all to read books.
4. There is a temple, but a new artistic sculpture is needed in the village to fulfill the better place of worshiping God and a place to visit for the villagers and the tourists.
5. A better community hall is needed in the village for performing meetings, seminars, awareness programs and other social and cultural activites and programs in the village.
6. As under the initiative of the government, a clean public toilet is required in the village to make the village a hygeinic place.
7. VAWT module is planned to install on the road sides to generate free electricity from the wind.
8. GSM based electricity tariff system is proposed to decrease the power theft and the labour work increasing the sustainability of the billing system.
9. Solar irrigation system is planned for the farmers to get power supply at day time and to sell the unused power and can earn income for lifetime from their agricultural land.

13.3 About designs Suggestions / Benefit of the villagers

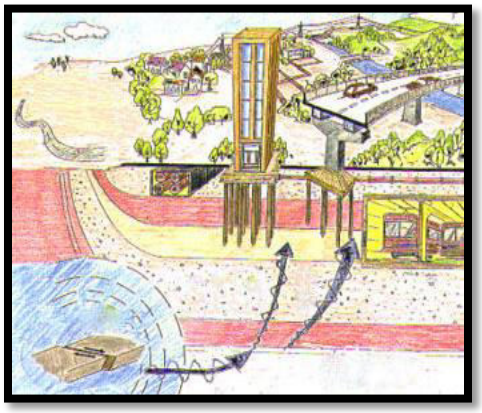
1. Can deal with their valuables easily and smoothly.
2. Can transact easily without travelling to the nearby village.
3. Good opportunity for the book readers and to increase the readers in the village.
4. Better place to worship and visit for villagers and other tourists.
5. To develop the village and to perform certain programs.
6. To increase the living standard of the village.
7. To generate electricity without pollution, to give village an free income once installed.
8. To increase the sustainabilty of the tariff system.
9. To generate free electricity and a new source of income for farmers in addition to the free electricity.

Chapter14.
Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Introduction



Whenever there is earthquake related disaster in the news with collapsed buildings &other structure all over the place, one may think that earthquake resistant design(EQRD) of the structure are still in dark age. Thus we desperately need advanced earthquake resistant design to make structure less vulnerable to the earthquake even for large earthquake.

Advanced Earthquake Resistant Design:

Seismology is a branch of Geophysics concerned with the study and analysis of Earthquakes and the science of energy propagation through Earth's crust.Engineering Seismology is concerned with the solution of engineering problems, connected with Earthquakes.

- Seismology is extremely important for:

- Study of earthquakes gives us important clues about earth's interior.
- An earthquake is the vibration of Earth produced by rapid release of accumulated energy in elastically strained rocks.
- Energy released radiates in all the directions from its source, the focus.
- Energy propagates in form of seismic waves.
- Sensitive instruments around the world, records the event.

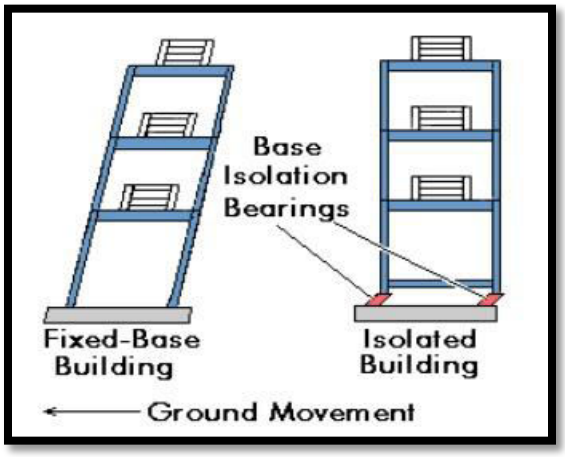
What cause an Earthquake?

"Movement of Tectonic Plates". Earth is divided into sections called Tectonic plates which float on the fluid-like interior of the Earth. Earthquake are usually caused by sudden movement of

earth plate. Rupture of rocks along a fault. Fault is localized areas of weakness in the surface of the Earth,sometimes the plate boundary itself.

Earthquake resistant expansion joint (ERJ)

- Engineered Structure



Buildings need to be designed and constructed as per the building by laws, to withstand the ground shaking. Architectural and engineering inputs need to be put together to improve building design and construction practices.

Building structures on soft soil need to be avoided. Buildings on soft soil are more likely to get damaged, even if the magnitude of the earthquake is not strong. Similar problems persist in building constructed on the river banks which have alluvial soil.

14.1.2 Seismic Retrofitting of Buildings

Seismic retrofitting of constructions vulnerable to the earthquakes is a current problem of great political and social relevance. Most of the Italian buildings, stock is vulnerable to seismic action even if located in the areas that have long been considered of high seismic hazard. During the past 30 years moderate to the severe earthquakes that have occurred in Italy at intervals of 5 to 10 years. Such events have clearly shown vulnerability of the building stock in particular and of the built environment in general. The seismic hazard in areas, where those earthquakes have occurred, has been known for a long time because of similar events that occurred in the past. It is therefore legitimate to ask why constructions vulnerable to the earthquakes exist if people and institutions knew of the seismic hazard. Several causes may have contributed to creation of such a situation. These are associated to the historical events, fading memory, greed, avarice, poverty and ignorance. Among historical events particularly relevant are wars, epidemics, and natural disasters which may limit in significant way, available resources of the country. In such circumstances, there is a tendency to build with poor materials and without too much attention to the good construction techniques and safety margins. A situation of this kind occurred in Italy

and next in Japan after the second world war and similar situations have occurred in Italy many times in past. Also, changes in service conditions, often made arbitrarily, may lead to changes in the structural behaviour resulting in a degradation of the structural response to the expected loading conditions.

Design

Construction of more than 3000 schools is primary result of Iranian schools retrofitting program that has been done by state organization of schools. The financial analysis of this project has valuable data that can be effective on revision of seismic evaluation methods and decision making of future projects. The main aim is financial analysis of retrofitting masonry buildings and describing outcomes of this evaluation on optimizing of retrofitting projects. In the first step, total cost and financial distribution of projects that were being retrofitted by Typical Retrofitting Pattern (TRP) and complete retrofitting, are compared.

In this regard, several methods such as peripheral shotcrete, typical shear walls, shear boxes, center core, etc. have been proposed. It is clear that the final cost of TRP strategy is about 60% of the complete retrofitting. Due to the concentration of supplemental structural elements in peripheral of buildings in the TRP strategy, the demolition and reconstruction of parts of buildings like floors, roofs and internal walls is minimized and main portion of the architectural and electrical and mechanical facility costs were eliminated. However, complete evaluation and retrofitting of a building leads to seismic evaluation of each element, and many internal elements are retrofitted in this approach. So the high cost of architecture and the electrical and mechanical facilities are added to the cost of the structural retrofitting. The required time for the retrofitting of the building with TRP strategy which is much less than the complete retrofitting, and this could be a good suggestion for seismic retrofitting of buildings with the time restriction such as schools.

Cost Distribution between Structural Elements:

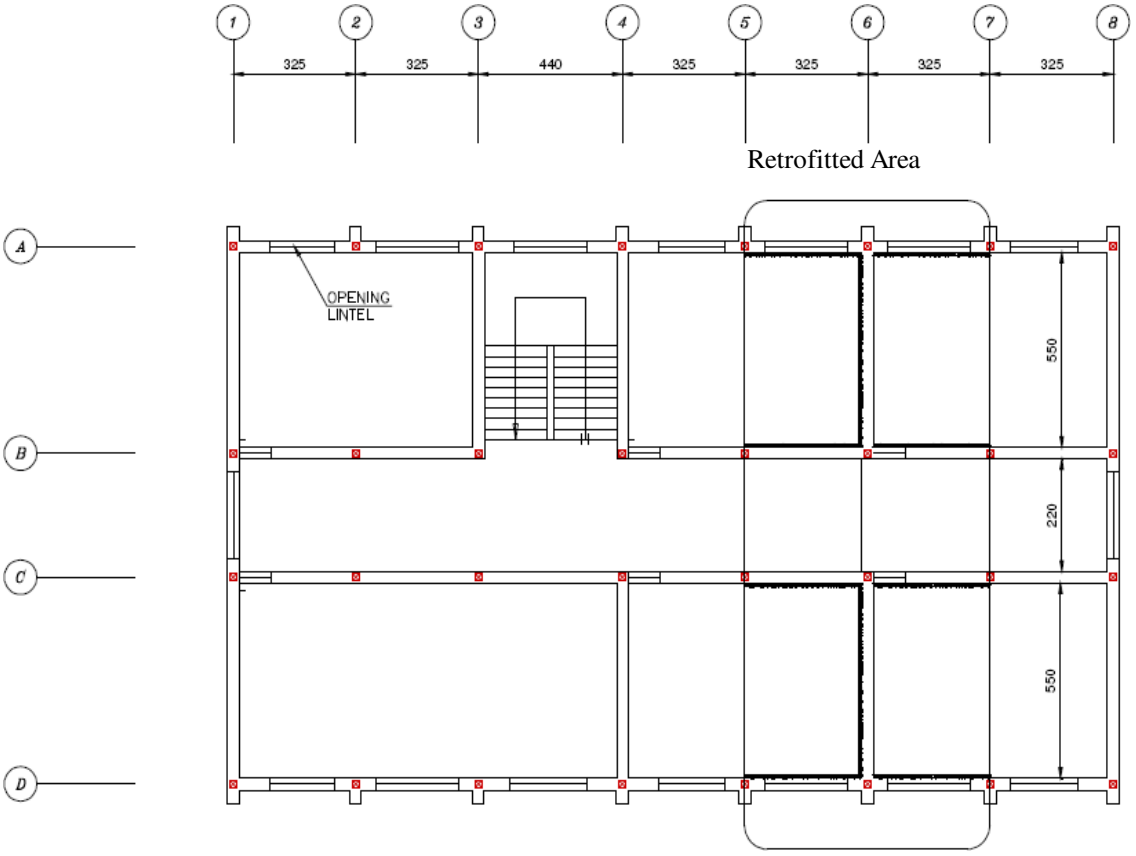
As mentioned before, TRP approach tries to increase seismic performance level of similar Buildings to the target level by retrofitting of similar defects. So the financial analysis of buildings which retrofitted by TRP strategy could clarify cost distribution between structural elements.

Action		**Percentage of Total Cost**	**Percentage of Total structural part**
Foundation		1.26	1.72
Shotcrete	Drilling	2.15	30.23
	Meshing	9.97	
	Shotcrete	9.95	
Slab retrofitting	Diminish	8.28	68.05
	Drilling	1.16	
	Concrete placing	11.95	
	Finishing	13.28	
	Bars	7.89	
	Shear keys	7.12	

Action		**Percentage of Total Cost**	**Percentage of Total structural part**
Foundation	Pile	14.62	29.21
	Cap pile	7.76	
Shear wall	Bars	12	23.32
	Concrete placing	5.88	
Slab retrofitting	Diminish	5.48	47.47
	Drilling	0.84	
	Concrete placing	11.08	
	Finishing	8.55	
	Bars	5.83	
	Shear keys	4.59	

Financial Analysis of Detailing

The main aim of this section is to show that how the minor changes in detailing of retrofitting have major effect in final cost of the project. In this, the part of retrofitted plan of two story masonry building was financially evaluated with two different details.



Retrofitted Area

This area was retrofitted by shotcrete and tie bracing method with two different details of shotcrete. It is concluded that elimination of upper angle, steel tie column and reduction of foundation dimensions lead to more than 60% reduction in final cost. Now, the construction of real projects with corrected details shows that total time of retrofitting has decreased considerably.

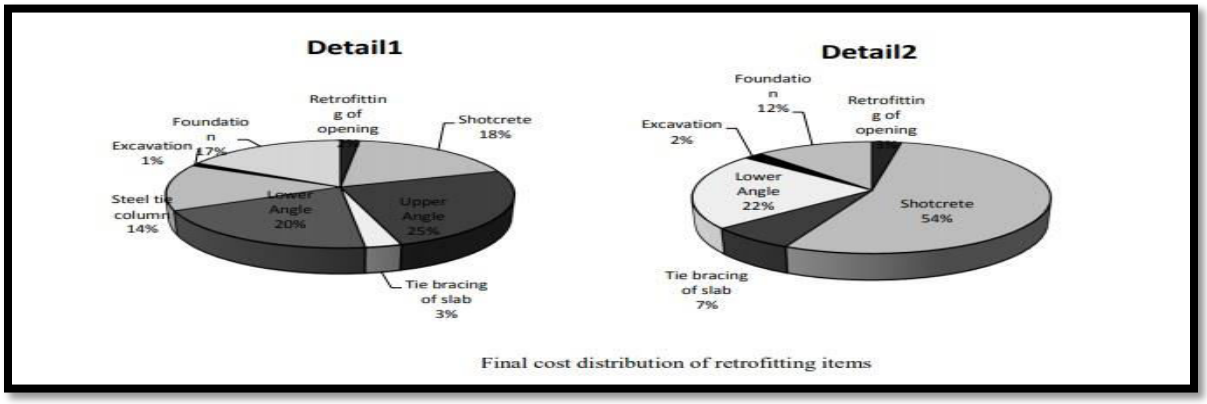
Final cost of two details:-

Method of retrofitting	Final cost of retrofitting per m^2
1	5500
2	2000

Properties of each detail:

Detail 1: Prevailing detail for shotcrete that consist of:	Detail 2: corrected detail of shotcrete that consist of:
- Implementation of shotcrete in one side of masonry wall : Thickness: 7 cm, Mesh Ø 6 mm 150/150 - Tie-bracing method for retrofitting of slab - Adding of top and bottom angles in shotcrete: steel Angle 100 X 100 X 10 - Dimensions of shotcrete Foundation are: 40×40cm - Floor reconstruction: In parts of building which coincide with shotcrete. (width: 1m) - Steel tie column	- Implementation of shotcrete in one side of masonry wall : Thickness: 7 cm, Mesh Ø 6 mm 150/150 - Tie-bracing method for retrofitting of slab - Adding only bottom angles in shotcrete: steel Angle 60 X 60 X 6 - Dimensions of shotcrete Foundation are: 20×20cm - Floor reconstruction: In parts of building which coincide with shotcrete. (width: 1m)

Installation of upper angles has many difficulties, and this consumes a large amount of time and money. Furthermore, the main portion of the retrofitting cost is shifted from secondary structural system (Upper and Lower angles) to the main structural system (Shotcrete).



Final cost distribution of retrofitting items

Decision making criteria

Type of decision making criterion	Criterion Name	Real
Economical	E-1	Execution cost
	E-2	Time of disruption
Social	S-1	Architectural interference
	S-2	Future of the region
	S-3	School population
Technical	T-1	Foundation situation
	T-2	Seismic code edit
	T-3	Lateral load bearing system
	T-4	Seismicity of region

A typical decision making matrix

T-n	…	T-1	S-n	…	S-1	E-2	E-1	Building No.
	…	…	…	…	…	E_{21} Days	E_{11}	1
	…	…	…	…	…	E_{22} Days	E_{12}	2
	…	…	…	…	…	…	…	...
	…	…	…	…	…	E_{2n} Days	E_{1n}	n

Conclusion:

The Typical Retrofitting Pattern (TRP) approach could reduce the total cost of retrofitting about 40%. The main reason of reduction is elimination of retrofitting in parts of building with high architectural effect or mechanical and electrical facilities. Moreover, the Peripheral of buildings is good parts for this purpose. From the structural aspect, distribution of cost between structural elements should be in consistent with their roles on total performance level of buildings.

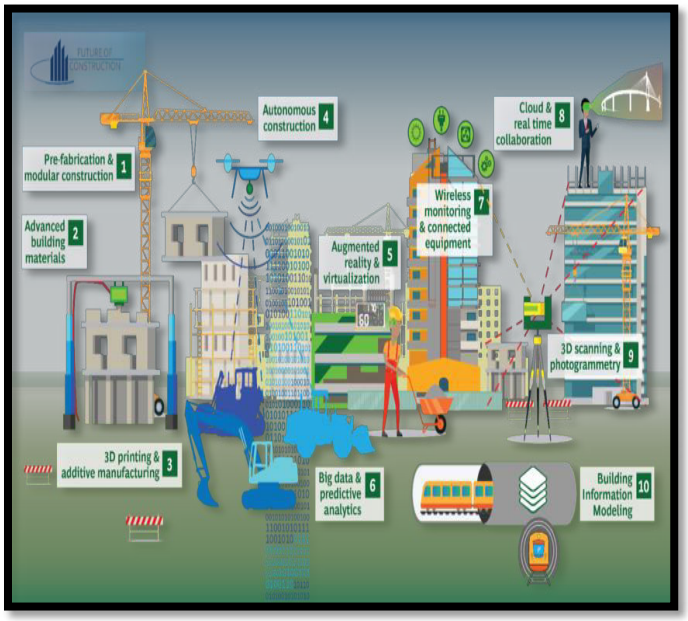
14.1.3 Advance Practices in Construction field in Modern Material, Techniques and Equipments

The construction industry is repeatedly criticized for being inefficient and slow to innovate. Basic methods of construction, techniques and technologies have changed little since Roman times. But the application of innovation in construction industry is not straight forward. Every construction project is different, every site is a singular prototype, construction works are located in different places, and involve the constant movement of the personnel and machinery. Weather and other factors can prevent the application of previous experience effectively.

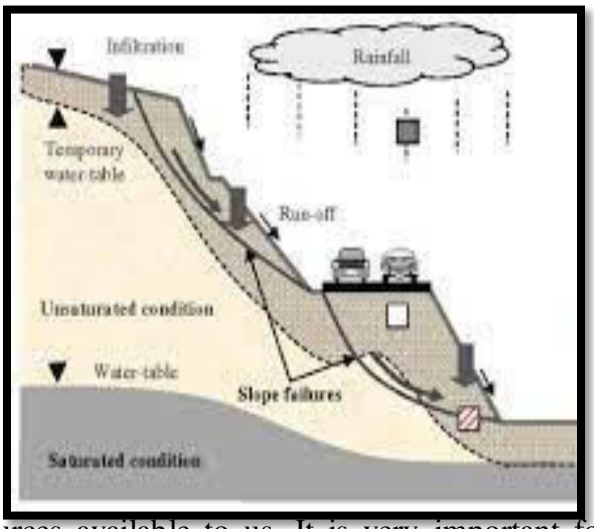
The term 'advanced construction technology' covers wide range of modern technique and practices that encompass the latest development in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and the design, and management studies. Incorporating advanced construction technology into the practice can increase levels of quality, efficiency, safety, sustainability and value for money. However, there is often the conflict between traditional industry methods and innovative new practices, and this is often blamed for relatively slow rate of technology transfer within the industry.

Advanced construction technologies are commonly described as including advanced forms of:

- 3D printing.
- Materials.
- Building information modeling
- Cladding systems.
- Computer numerical control.
- Construction Innovation Hub.
- Construction plant.
- Modern methods of construction.
- Modular construction.
- Offsite manufacturing.
- Prefabrication and preassembly.
- Research and development.
- Site investigations and surveying.



14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment



Soil is a vital part of the natural environment. It is just as important as plants, animals, rocks, landforms, lochs and rivers. It influences the distribution of plant and provides a habitat for a wide range of organisms. It controls the flow of water and chemical substances between atmosphere and the earth and acts as a source and store for gases in the atmosphere.

Soil is one of most valuable natural resources available to us. It is very important for sustenance of life on the earth. The top soil is suitable for plant growth is eroded due to human activities like construction of Thermal power plant, buildings, roads and expansions on other hand the soil layers contaminated deliberately due to Industrial pollution. The soils and its properties are affected to a great extent. The quality of soil is a function of its physical and chemical characteristics.

Earlier, soil surveys have been carried out by topographic maps and cadastral maps as data base. Soil surveys provide desired information on nature, location, extent and physic-chemical characteristics. EIA(Environmental impact Assessment) is process by which the anticipated effects on environment of a proposed development power plant project and also certain measures have been taken to reduce or avoid those effects .Large area of land is required for the coal based Thermal power plant. Due to this natural soil properties changes and it becomes more alkaline due to alkaline nature of fly ash. Suspended Particulate Matter get deposited in land which affects the soil. Spreading and Deposition of the SPM on soil, disturb the soil strata thereby, the fertile and land becomes less productive. The baseline environment quality represents the background environmental scenario various environmental components during the study period. To extract the soil characteristics of the study area for effective management of soil resources for the future development.

14.1.5 Water Supply-Sewage system-Waste Water-Sustainable development techniques

Drainage systems can contribute to sustainable development and improve the places and spaces where we live by balancing the different opportunities and challenges that influence urban design and the development of communities.

Approaches to manage surface water which takes account of the water quantity (flooding), water quality (pollution) biodiversity (wildlife and plants) and amenity are collectively referred to as Sustainable Drainage Systems (SuDS).

SuDS mimic nature and typically manage rainfall close to where it falls. SuDS can be designed to transport (convey) the surface water, slow runoff down (attenuate) before it enters watercourses, they provide areas to store water in the natural counters and can be used to allow the water to soak into the ground or evaporated from surface water and lost or transpired from vegetation (known as evapo-transpiration).

SuDS are drainage systems that are considered to be environmentally beneficial, causing minimal or no long-term detrimental damage. They are regarded as a sequence of management practices, control structures and strategies designed to efficiently and drain surface water, while minimising pollution and managing the impact on water quality of local water bodies. SuDS are more sustainable than the traditional drainage methods because they:

- Manage runoff volumes and flow rates from hard surfaces, reducing the impact of urbanisation on flooding.
- Provide opportunitiesd for using runoff where it falls.
- Protect or enhance water quality.
- Protect natural flow regimes in watercourses.
- Are sympathetic to the environment and the needs of the local community.
- Provide an attractive habitat for wildlife in urban watercourses.
- Provide opportunities for evapotranspiration from vegetation and surface water.
- Encourage natural groundwater/aquifer recharge.
- Create better places to live, work and play.

This reduces opportunities for water to be managed naturally with the potential for the pollution and localized flooding when the piped systems cannot cope with rainfall.

14.2 Electrical Engineering

14.2.1 Design of Power Electronics Converter

There are four types of converters in Power electronics:

- **Rectifiers**- Coverts Alternating current into Direct Current.
- **Cycloconverter**- Converts alternating current to the same with different frequency and voltages.
- **Inverter**- Converts direct current into alternating current.
- **Choppers**- Converts direct current into the same with different voltage levels.

Here, we will have a discussion on the inerter type power electronc converters.

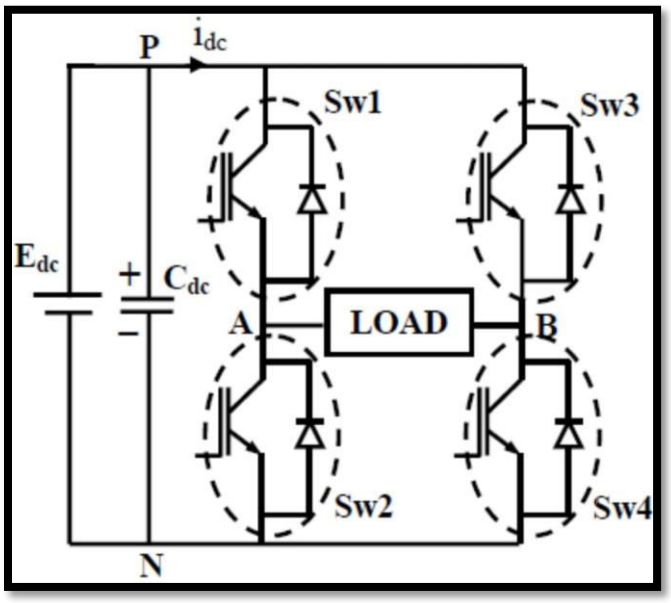
A power inverter, or inverter, is an electronic device or circuitry that changes direct current (DC) into alternating current (AC). Depending upon the number of phases of the AC output, there are several types of inverters.

- Single-phase inverters
- Three-phase inverters

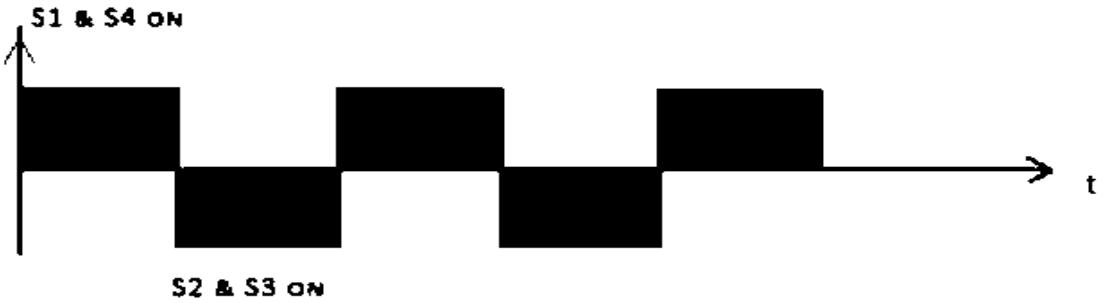
DC is the unidirectional flow of electric charge. If a constant voltage is applied across a purelyresistive circuit, it results in a constant current. Comparatively, with AC, the flow of electric currentperiodically reverses polarity. The most typical AC waveform is a sine wave, but it can also be a triangular or square wave. In order to transfer electrical power with different current profiles, special devices are required. Devices that convert AC into DC are known as rectifiers and devices that convert DC into AC are known as inverters.

In a full-bridge topology 4 switches are needed, since the alternating output voltage is obtained by the difference between two branches of switching cells. The output voltage is obtained by intelligently switching the transistors on and off at particular time instants. There are four different states depending upon which switches are closed. The table below summarizes the states and output voltage based on which switches are closed.

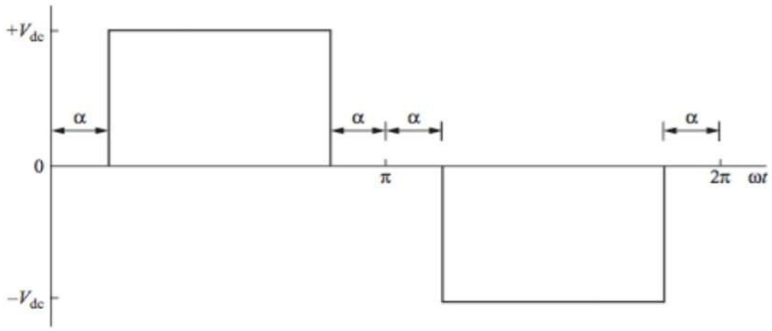
To maximize the output voltage, the fundamental component of the input voltage on each branchmust be 180º out of phase. The semiconductors of each branch are complementary in performance, which is to say when one is conducting the other is cut-off and vice versa. This topology is the most widely used for inverters. The diagram in Fig. 1 shows the circuit of a full-bridge topology for a single-phase inverter.



Here are the switching pusles applied to all the 4 switches.



12 V DC voltage is supplied from the battery to the inverter. The inverter converts this voltage into an AC waveform. The output from the inverter is fed to a step-up transformer which converts 12 V AC Voltage into 220 V which can be used to drive the AC loads. Here are the expected waveforms at the output side of the inverter.



14.2.2 Electrical Soft Starter For 3 Phase Induction Motor For Agriculture

Here is the design to provide a soft and smooth starting for a 3 phase induction motors. The three phase induction motor draws up much higher current than its capacity during the initial starting condition and the motor instantly reaches at its full speed. This results in a huge mechanical jerk and high electrical stress on the windings of the induction motor. Sometimes, the windings of the motor may get burnt. The induction motor should start smoothly and should gradually catch up the speed resulting in a safer operation.

Here is a design to give soft start to the induction motor using SCR firing triggered by heavily delayed firing angle during the initial starting condition and then slowly reducing the delay till it reaches a zero voltage triggering point. This results in the low voltage during the starting and then gradually increases to the full voltage. Thus the motor starts slowly and then slowly picks up the full rated speed.

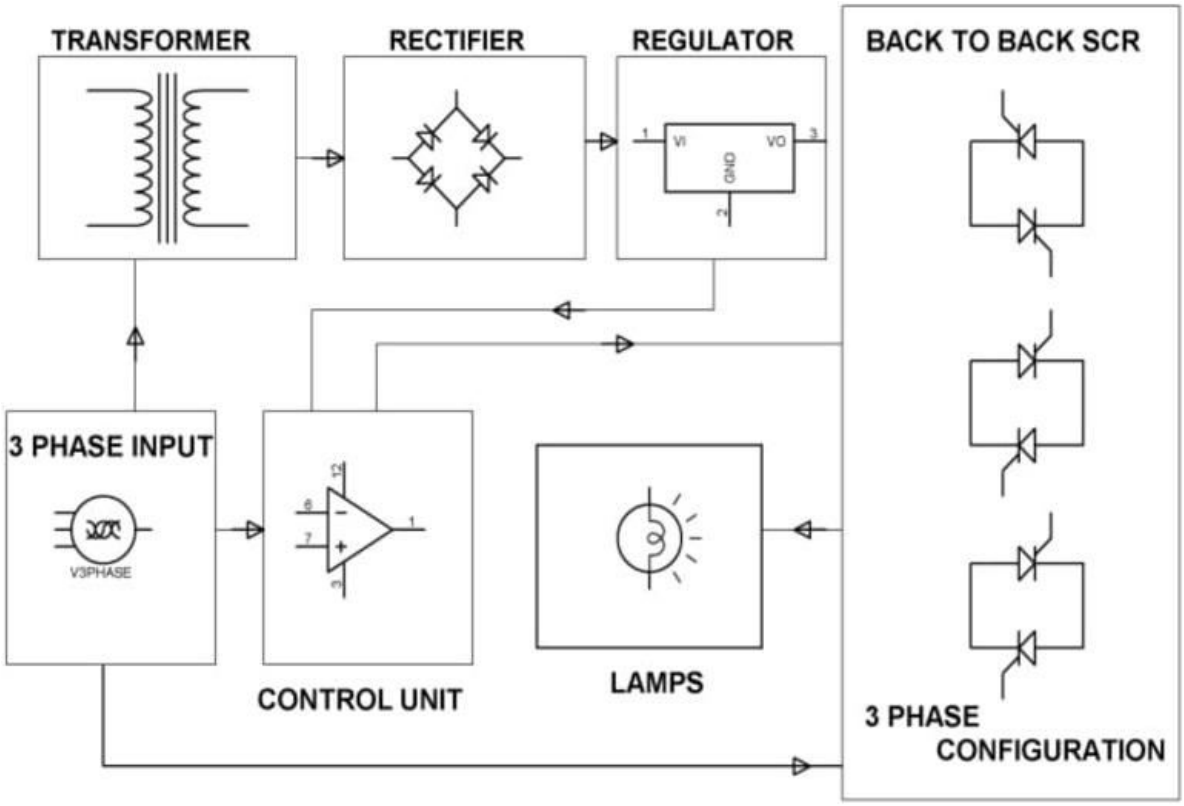
It consists of a six anti-parallel SCRs, two for each phase, and the output is connected to the set of lamps representing the coil of a 3 phase induction motor. The charging and discharging of the capacitors is interfaced to comparators resulting in delayed firing pulses at the starting of induction motor and then gradually reducing the delay till the motor runs at its full rated speed. Now, the output from the comparators is fed through opto-isolators to trigger the SCRs.

Also, a soft starter is form of reduced voltage starter for A.C. induction motor. The soft starter is similar to the primary resistance or primary reactance starter in which it is in series with the supply to the motor.

The current into the starter is equals to the current out of it. Hence, the soft starter employs solid state semiconductor devices to control the flow of current and therefore, the applied voltage to the motor. Soft starters can be connected in series with the line voltages applied to the motor, or can be connected inside delta loop of a delta connected induction motor, controlling the voltage applied to the each winding.

Block Diagram:

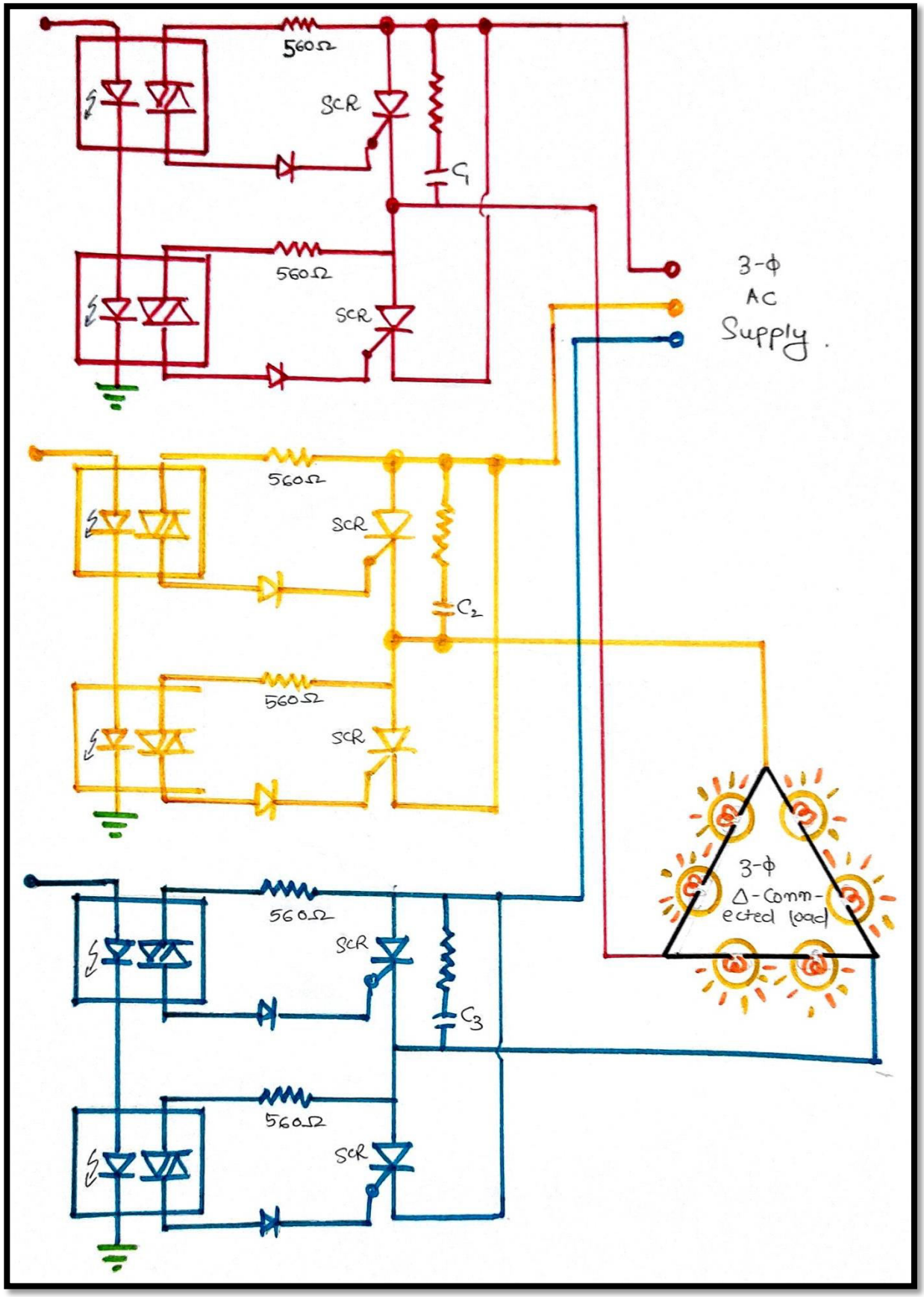
Here is the block diagram showing the elements of the soft starter, used for the 3 phase induction motor with the connections of the various elements.

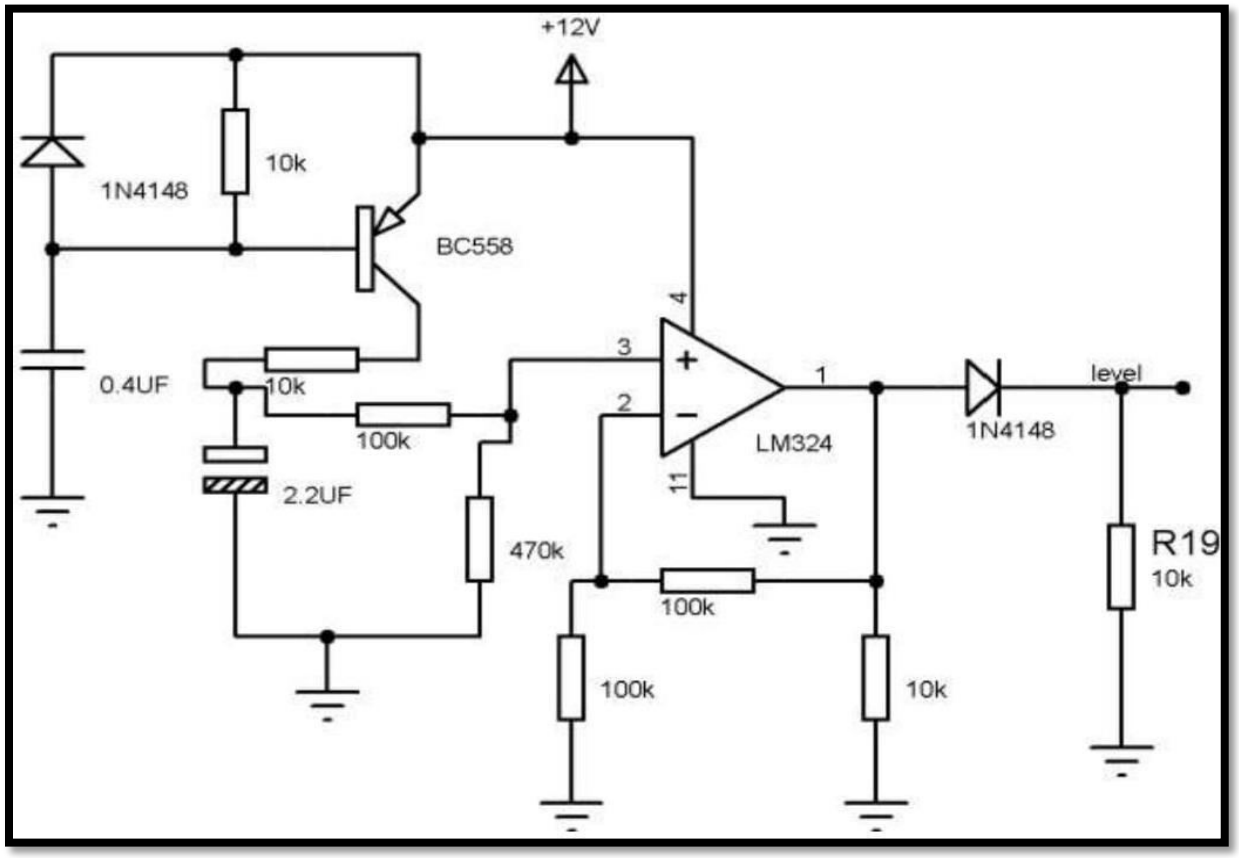


Circuit diagram:

The 3 phase induction motor must not be given full voltage at the time of starting as in off condition the back EMF of the motor is very low. So, initially during starting condition, it draws high initial current. To start the motor with low initial current, two SCRs are connected back to back for each phase and are triggered slowly, initially by delayed the firing angle and then gradually, the triggering pulse is increased by decreasing the delay in the firing angle till zero delay, so that the motor current slowly rises without any excessive initial current during the starting of the motor. To trigger the gates of SCRs, the operational amplifiers LM 339 and LM 324 are used. Lm 324 op-amp is configured to get a level voltage comparison at its input that will initially be high and gradually will be zero. To achieve the above operations, +12v DC supply is being required. Hence we generate our own DC power supply as follows:

Three step-down transformers are used to step down 230V 1 phase AC supply to 12V AC; for each phase. Three bridge rectifiers are used to convert 12V AC to DC. Since we need pure DC supply as well as pulsating DC, a blocking diode is employed after each bridge rectifier in order to isolate pulsating DC and pure DC supply.


560Ω
SCR
C1
560Ω
SCR
3-ϕ
AC
Supply.
560Ω
SCR
C2
560Ω
SCR
3-ϕ
Δ-Connected load
560Ω
SCR
C3
560Ω
SCR



After blocking, a filter capacitor is being used to get the pure DC. The AC supply is not always constant, so a 7812 voltage regulator is being employed to get a fixed 12V DC supply. A 10uf capacitor is connected at the output of 7812 voltage regulator for the stability. A LED with a series resistor of 1k is being connected to indicate the power. The ramp generation and level generation for one phase and the same thing is applied for rest 2 phases. For generating level voltage, a p-n-p BC558 transistor is being used, whose emitter is connected to +12V supply and base is connected to a ceramic capacitor of 0.4uf and the collector is connected to an electrolytic capacitor of 2.2uf via 10k resistor.

Hardware Implementation

The circuit diagram can be implemented using following components. The details of which is provided in the following Table:

	Components	**Quantity**	**Price/Piece**	**Total Price**
A.	**Resistors**			
1	560R	6	2	12
2	1K	7	2	14

3	2.2K	3	2	6
4	3.3K	3	2	6
5	4.7K	9	2	18
6	10K	6	2	12
7	22K	6	2	12
8	27K	1	2	2
9	100K	3	2	6
10	2.2M	2	4	8
11	100R/2W	3	4	12
B.	**Capacitors**			
1	470uF/35V	1	15	15
2	10uF/63W	1	8	8
3	2.2uF/25W	4	8	32
4	0.47uF(470nF) Polyester	2	6	12
5	0.1uF(400V) Polyester	3	6	18
C.	**Diodes**			
1	1N4004	21	3	63
2	1N4148	5	5	25
D.	**Transistors**			
1	BC558/BC557	3	7	21
2	BC547	4	7	28
E.	**Integrated Circuits(ICs)1**			
1	IC78126	1	15	15
2	LM339	2	30	60
3	LM3243	1	30	30
4	MOC30621	6	20	120
F.	**IC Base**			
1	14 pin	3	20	60
2	6 pin	6	15	90

G.	Miscellaneous			
1	Push button 2 pin	1	5	5
2	0-12V Transformer, 500 MVA	3	50	150
3	LED red	2	2	4
4	LED Yellow	1	2	2
5	LED Green	1	2	2
6	Male burge 2 pin	3	5	15
7	female burge 2 pin	3	5	15
8	Heat sink	7	10	70
9	crew nut for heat sing	7	2	14
10	SCRs(TYN612 or TYN 616)	6	5	30
11	PCB connectors 3 pin	2	5	10
12	Lamp	6	50	300
*	Miscellaneous			500
Total price				1822/-

Advantages

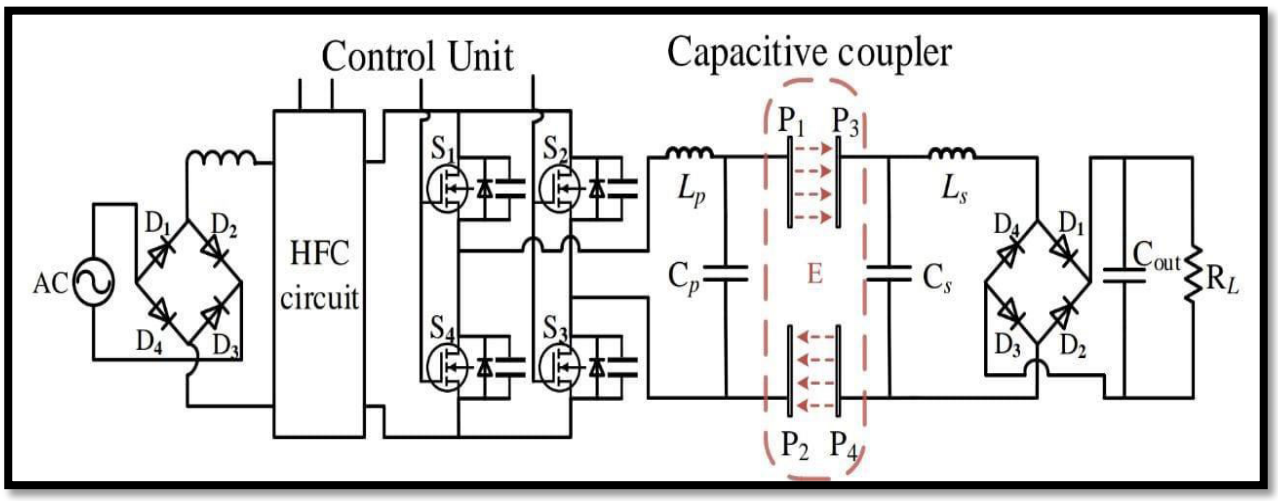
- It eliminates high inrush current and high mechanical torque on startup.
- There is a reduction in the cable and switch-gear rating in the power supply network.
- It limits line voltage dip.
- It reduces the stress on couplings and other transmission devices like gear boxes, shafts, etc.

14.2.3 Advanced Wireless Power Transfer System

The near-field Wireless power Transmission technique is embracing a high-speed development period in recent years. There is a great increase in the academic researchers and industrial engineers who focus on improving the energy transmission performance with a great emphasizes on the efficiency, capability, applicability, flexibility, security and so on. So here is an overview on key technical challenges for irradiative electromagnetic Wireless power Transmission technique systems.

Coil design

In order to ensure the high efficiency of Wireless power Transmission technique systems, the quality factor-Q is the key to the coil design. An improved-hollow planar spiral winding scheme was proposed to improve Q by using non-unity Track-Width-Ratio geometry and increasing the inner radius of winding.



In addition to it, an intermediate coil was utilized for Wireless power Transmission technique system, which can boost the apparent self-inductance and the magnetizing inductance for the primary unit at around the resonating frequency, thus effectively compensate the apparent coupling coefficient. Then a new U-coil WPT system was developed to improve the energy efficiency, ensuring the cleanliness of the space along the direction of the energy transmission, and also increases the power density.

Circuit topology

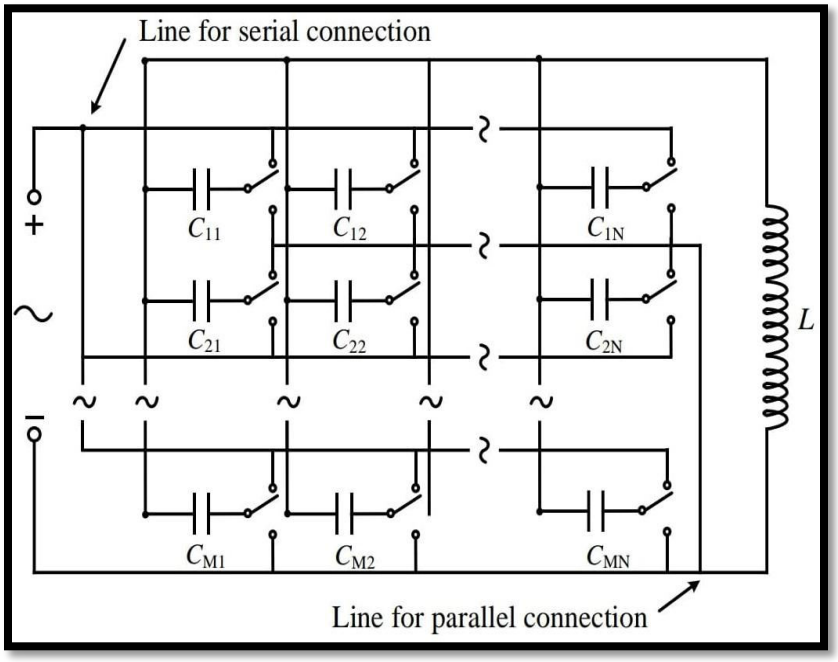
The series-shunt mixed-resonant coupling topology was presented, which can effectively improve the transmission efficiency with the distance. An active single-phase rectifier was implemented by using the auxiliary measurement coil, which can regulate the equivalent load impedance and the output voltage. Based on the exemplified 800-W prototype, the efficiency can be increased by 2 % and for the rated load and10 % for the light load. Now, the frequencies can be identified for the maximum efficiency and the load-independent voltage-transfer ratio, based on the SS and SP compensation networks respectively, that is conductive to realize the efficient power conversion.

Power control

In order to emulate the optimum load value, the switched-mode converter was adopted in the receiving unit and controlled, based on the minimum input power operating point. By controlling the amplitude of the output voltage and the phase-shift of the active rectifier, the equivalent load impedance can be modified to maximize energy transmission efficiency. By using efficiency evaluation scheme for the close-loop Wireless Power Transmission system, maximum efficiency point tracking control scheme was proposed to maximize the energy efficiency when regulating output voltage w.r.t. the varying load and coupling effect. In addition, a series resonant tank was effective to ensure the maximum efficiency tracking while the regulating the output voltage. Apart from controlling the output voltage to adjust the equivalent load impedance, there are also the other attempts for the maximum efficiency tracking Without requirement on a power or current sensor, a low-cost maximum efficiency tracking scheme can be implemented to fulfill the load transformation by controlling DC-DC converter. A pulse-density modulation scheme hence was proposed by using the delta-sigma modulator and a dual-side soft switching technique, which can avoid the disadvantages of the complexity, power loss, low average efficiency, hard switching and DC voltage ripples.

A. Transmitted Power:

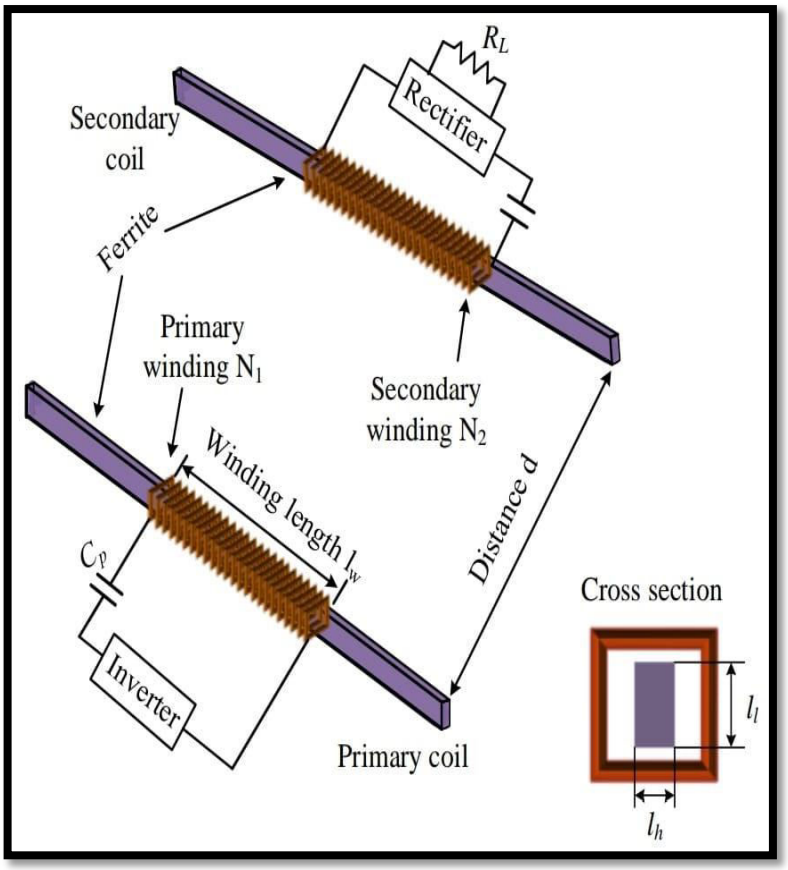
The transmitted power capability is one of the most important performance indices for Wireless Power Transmission systems. Due to the working in a relatively high frequency range, the power level is limited by the switching component, the topology of power-electronic inverters, and associated control scheme.



Regarding to the switching component, an enhanced gallium nitride (eGaN) device was utilized to improve the output power capability in MHz frequency band. For the circuit topology, a LCL load resonant inverter was investigated for maximum power transfer that is operated in the discontinuous current mode and is controlled by a variable frequency scheme. A multiphase parallel inverter was proposed to improve the output power capability for Wireless Power Transmission systems. Regarding to the control scheme, an offline tuning scheme was proposed to ensure the Wireless Power Transmission system to output the maximum power instead of the online frequency regulation. Accordingly, the constant operating frequency can effectively avoid the violation caused by variation of the operating frequency. Hence the key to maximum power transfer is to ensure the impedance matching. A hybrid impedance adjusting scheme was developed by combining the continuous conduction mode and discontinuous conduction mode, which can effectively extend the adjusting range and thus ensure the full utilization of power capacitor for Wireless Power Transmission systems.

B. Transmission Distance

By comparing it with the photovoltaic, acoustic, microwave, and laser energy transmissions; the IPT has the salient advantage of high power. For the long-distance transmission applications, the IPT system has to deal with inevitable key technical issue, namely the extremely loosely coupled effect. According to the measurement results, it shows that the coupling coefficient κ is mostly much less than 0.01 with respect to the transmission distance from 2m to 12m.

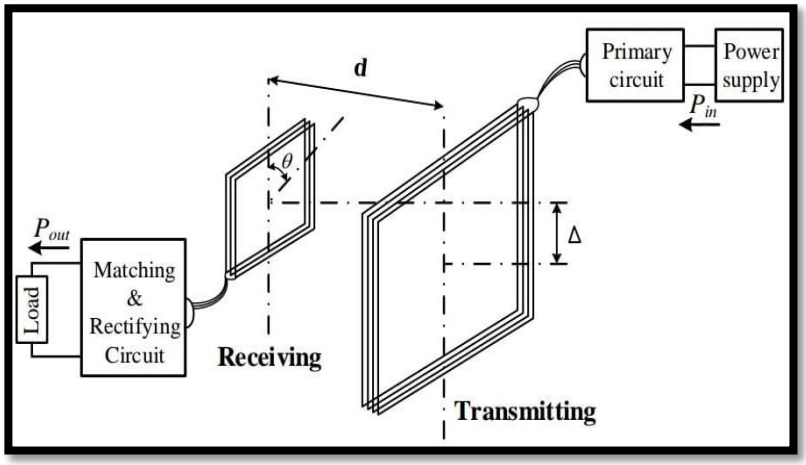


A dipole coil based IPT system was proposed for long-distance energy transmission, which adopts an optimized stepped core structure for evenly distributed magnetic field density. The experimental prototype can deliver 10.3W power upto the 7m at frequency of 20 KHz.

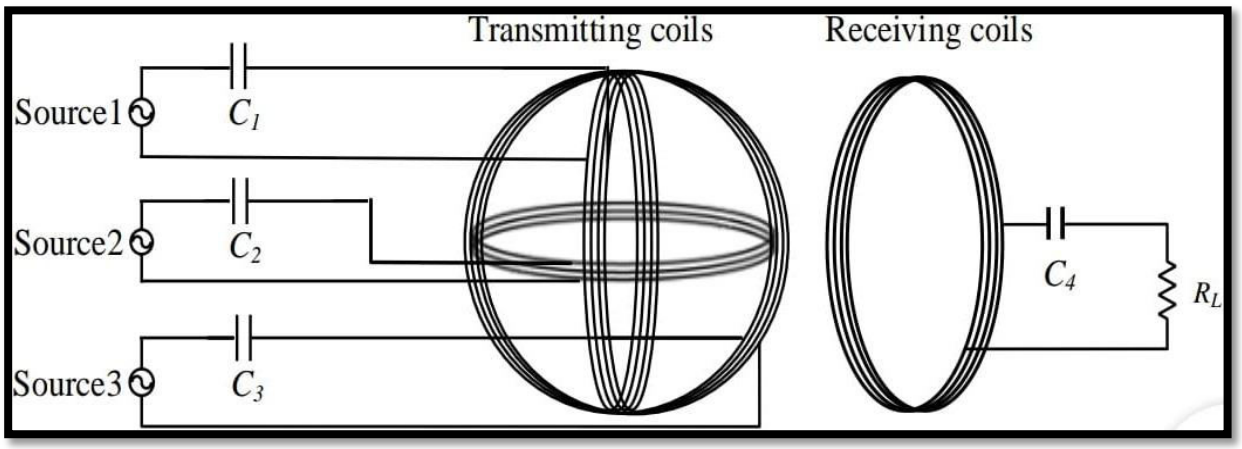
In addition, due to the impact on resonant frequency, the variation of the transmission distance is another important technical concern for IPT systems. In previous studies, consequently there are number of attempts for the impedance matching to ensure the magnetic resonant state even if a varying distance between the transmitting and receiving coils. A capacitor matrix was proposed, which can offer expected compensation capacitances by using limited capacitors to deal with the frequency mismatch caused by the varying transmission distance. A multi-loops topology was utilized to reduce the variation of the input impedance.

C. Displacement Flexibility

Wireless Power Transmission system is sensitive to the relative position between the transmitting and receiving coils, which means that the transmission performance is deteriorated with respect to an angular or lateral misalignment.



D. Omni-directional Charging



Applications:

WPT techniques offer abilities of harnessing the energy over the air. Without the limitation of the conventional wire, the electric-driven devices possess the unprecedented flexibility of energy accessing. The dynamic contactless charging technique is coming to our daily life.

- Electric vehicles
- Portable electronics
- Biomedical implants
- Charging various devices

14.2.4 Industrial Temperature Contoller(Using Microcontroller)

Introduction

To increase the production of the industry, smooth control of temperature is the key function. Different industries have their own individual temperature requirement for specific role. Conventionally, for industrial temperature measurement, instrument thermometer is used to measure the temperature. After observing the temperature reading, the operator controls temperature manually. Sometimes controlling is not so appropriate because of time consuming human operated control of cooling device and heating device. As a result, efficiency of the temperature control fails and production is hampered in industries.

Besides that, the thermostat is used to select temperature which is not efficient because of erosion of metal and losing to strength of metal for successive using. Consequently, the analog system loses its own linearity function, since it is mechanically designed temperature control device. The pseudo code for controlling the overall heating and cooling system can be written as:

When the temperature > real-time temperature

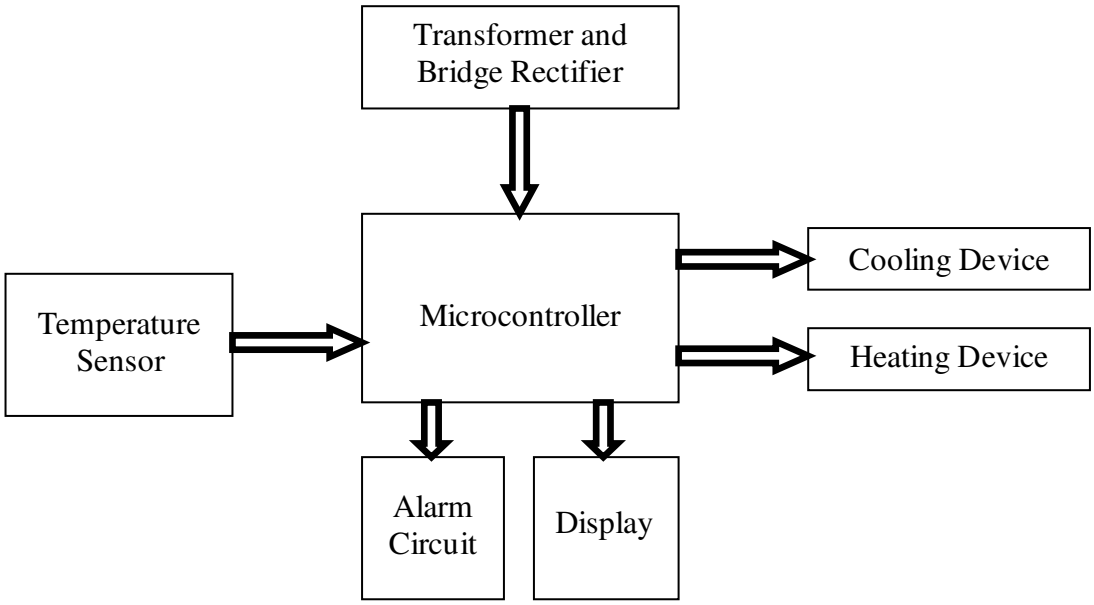
Heating element = 1 for (the temperature + 1 Degree Celsius)

Cooling element = 0 for 1 minute

When the 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 the unexpected or large temperature is found in the system that can cause to damage any of the equipment of the industry.

Method to measure Temperature:

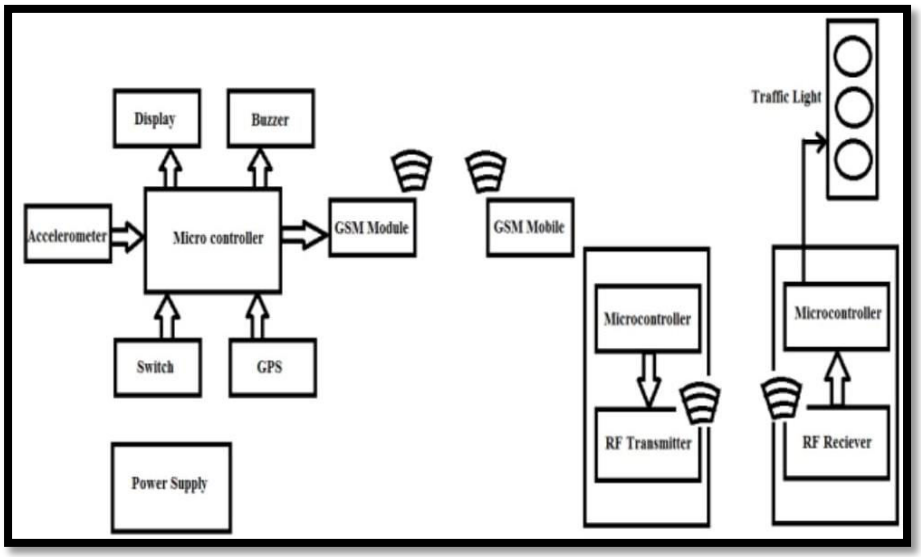
The LM 35 series of temperature sensors, manufactured by National Semiconductor Corporation and are rated to activate over a -55 °C to 150°C temperature range can be used. These sensors do not need any peripheral calibration and output voltage is proportional to the temperature. The scale factor for the temperature to voltage conversion is 10 mV per °C. The LM 35 series sensors come in different packages. Measurement of the negative temperatures (below 0°C) needs a negative voltage source. The lower reference voltage can be provided using a zener diode, a resistor network, or sometimes just simple diodes. Following figure shows an approximate 1.2V reference voltage by connecting the two diodes and a resistor in series across the supply voltage.

14.2.5 Accident Alerts in Modern Traffic Signal Control System – Camera Surveillance System.

As a primary result of the population explosion, number of individuals using automobiles is increasing. In this modern world, the rate of accidents is increasing day by day. Most of the

accident deaths are caused mainly due to ignorance and lack of sufficient remedial measures and timely action. All these facts, points to a need of efficient accident monitoring and vehicle tracking system. Simply, the system works on the basic principle by which the variation of acceleration of any vehicle due to accident is detected. With the help of some special devices accident is detected and message is send towards responsible authorities and proper action can be taken by them. So in this way, we can implement an efficient accident alert system. By implementing this system, we are hoping to have a better control over road accidents by the fast communication between the victim and the control centre. In this way we can minimize the possibilities of accidental death on the road and highways

Block Diagram:



As shown in the diagram ,the main components of this system are microcontroller, accelerometer, GPS module, RF transmitter, RF receiver, power supply circuit and a GSM.

Accelerometer is meant for the detection of change in the acceleration, GPS module is for finding the co-ordinates of the location, GSM for sending message, microcontroller controls all these operations. Accelerometer detects the change in acceleration of the moving mass. The output of the accelerometer will be an analog quantity which is proportional to the change in acceleration. The output of the accelerometer is given to the microcontroller as input. The microcontroller compares the value of input with the programmed value. A value more than the programmed value indicates that accident is detected. At the time when the accident is detected, the alarm circuit will start working by a beep sound. The sound lasts for about 20 seconds. If the accident is not severe the driver himself can stop the further action by simply pressing a switch attached to the controller. In the case of a severe accident the driver may not be able to control

the further action. Upon receiving signals the controller controls the traffic lights in convenience of the ambulance. After the ambulance closes the junction, the traffic comes back to normal flow.

GPS Module

GPS or Global Positioning System mainly consists of an array of satellites orbiting the earth at a particular orbit. Basically it is a space based satellite navigation system, which provides the exact location and time of the particular object on the surface of the earth. GPS system works by sending and receiving signal in the form of radio waves from earth and to the earth. GPS satellites are orbiting the earth an altitude of 11,000 miles. It takes four satellites to determine your position. Each of these satellites transmits a time signal. By comparing the time sent from the satellite to the GPS receiver's own clock, the elapsed time of the transmission can be determined. Because the position of the satellite is known and because we know how fast the message travels through space, the distance between the receiver and the satellite can be determined.

GSM module

As known by all the GSM represents the Global System for Mobile communication. It is provided with special slots for accepting SIM card through which the message is send. The receiver section consists of a quad band GSM receiver which is controlled by AT commands. Depending up on the transmitting power GSM can be classified into 2 classes that is class 1 and class 4. Class 1 requires 2W power for transmission. We can use SIM 1900 GSM module. A GSM network is composed of several functional entities, whose functions and interfaces are specified. The GSM network can be divided into three broad parts, the Mobile Station is carried by the subscriber.

SIM900

SIM900 is a quad-band GSM/GPRS engine that works on frequencies GSM 850Mhz, EGSM 900Mhz, DCS 1800Mhz and PCS 1900Mhz. SIM900 features GPRS multi-slot class 10/class 8 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 24mm x 24mm x 3mm, SIM900 can meet almost all the space requirements in your applications, such as M2M, smart phone, PDA and the other mobile devices

Chapter15.
Smart and Sustainable features of Chapter 8 & 13 designs and Their Impact on The society.

Smart and Sustainable features and their impacts on the Village:

1. ATM: To do fast transactions including money withdrawal, deposit, transferring funds, balance inquiry etc.
2. Artificial Pond: The village is in a desert type area where rain is irregular; hence the water is very important for fulfilling the requirement of the water.
3. PHC Centre: As the PHC centre is very important in case of emergency which will reduce sudden rush to the nearby hospitals.
4. Chabutro: To keep and maintain the tie up with the nature, feeding and nurturing birds is also important.
5. Rain Water Harvesting: To maintain the requirement of water for household work and for drinking, water from rain can be stored for future use.
6. Village Entrance Gate: for the better infrastructure, there should be Entrance Gate.
7. Solar Based Independent Street Lights: As the streetlights are very necessary to be installed in order to provide better facilities to the villagers.
8. Underground Wiring: In order to reduce the frequency of faults, such design is important.
9. Automotor Controller With Water Level Indicator: In order to reduce the wastage of water and electricity, it is very important to install automatic motor controller for overhead tank.
10. Post Office: Recieve and send parcels, money and many more functions necessary for the villagers.
11. Bank Building: For better transactions, including withdrawal of the money, opening and closing the bank accounts, passbook entries and many more.
12. Library is designed to increase the litracy rate and increase the interest of the villagers, students and elders and to promote all to read books.
13. There is a temple, but a new artistic sculpture is needed in the village to fulfill the better place of worshiping God and a place to visit for the villagers and the tourists.

14. Community hall: Needed in the village for performing meetings, seminars, awareness programs and other social and cultural activites and programs in the village.
15. Public Toilet: As under the initiative of the government, a clean public toilet is required in the village to make the village a hygeinic place.
16. A VAWT module is being installed on the road sides for the free electricity from the wind.
17. GSM based electricity tariff system is proposed to decrease the power theft and the labour work increasing the sustainability of the billing system.
18. Solar irrigation system is planned for the farmers to get power supply at day time and to sell the unused power and can earn income for lifetime from their agricultural land.

Period of Development:

- **Immediate**

Sr. No.	Design	Costing
1	ATM	201898
2	Chabutro	249520
3	Entrance Gate	281299
4	Public Toilet	1129519
5	Solar Base Independent Street Lights	18000

- **Within 1 Year**

Sr. No.	Design	Costing
1	Rain Water Harvesting	
2	Public Health Centre	984243
3	Post Office	1038414
4	Bank	3098916
5	Community Hall	2825550
6	Library	778443
7	Automotor Controller with Water level Indicator	13500
8	GSM based tariff system	51,00,000
9	Solar Based Irrigation System in Farms	45,000

- **Long term(3-5 years)**

Sr. No.	Design	Costing
1	Artificial Pond	12499887
2	Temple	3489170
3	Underground Wiring	800000
4	Vertical Axis Wind Turbine	13440000

No NGOs are working here so funding is provided by Government.

Chapter16.
Survey By Interviewing With Talati/ Sarpanch

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards **"Rurbanisation for Village Development"**

CHAPTER- 16

Sr.	Questions	Yes/ No	Remarks
1	What are the sources of income in village?	-	Agriculture
2	What are the chances of employment in village?	-	Agriculture
3	What are the special technical facilities in village?	-	Drip Irrigation.
4	Is any debt on village dwellers?	No	-
5	Are village people getting agricultural help?	Yes	-
6	Is women health awareness Program organized in village?	Yes	-
7	Are women having opportunity to work and income?	Yes	-
8	Child girl education is appreciated in village?	Yes	-
9	Facility of vaccination to child is available in village?	Yes	-
10	Are village people aware about child vaccination and done 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	Not for Drinking Water
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	-
16	Is any death of patient occurred due to unavailability of medical facility in village?	No	-
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	Yes	13 person
18	Is village improvement is observed in comparative scenario from past to present?	Yes	-
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	-
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	-

Nodal officer and students can add more questions. This is a sample. Having Minimum requirement.

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

Chapter 17
Irrigation/ Agricultural Activities And Agro Industry: Alternate Techniques

Agriculture is regarded as a primary occupation of the individuals in Kunariya. To feed the population, it is essential to introduce modern and innovative techniques in the agricultural sector. New technologies are required to encourage the yields to an advanced stage, to make the use of inputs resourcefully and diversify to a more sustainable and higher productive cropping patterns. These are all knowledge intensive technologies which require both; strong research and extension system and skilled farmers.

In addition to this, it also requires a strengthened interface where emphasis is put on the communal exchange of the information which will be advantageous to all. Making use of resources in an effective manner is stated as the driving force behind the use of agricultural technologies. Several resource conservation technologies are, green manure, crop rotations etc. There are numerous types of technologies that are made use of to enhance productivity. The main areas that should be taken into account are, factors relating to adoption of technologies, types of technologies, technologies used in the agricultural sector, advanced agricultural technologies used in the present existence, areas of information technology and role of information technology in agricultural education management.

For efficient growth and development of the agricultural sector, there is a need to familiarize with new technologies, like biotechnology, nanotechnology, high-tech protected cultivation and modern irrigation methods to accelerate production. These technologies, when utilized in an appropriate manner, would prove to be beneficial in improving productivity and profitability.

Latest Scarecrow Technology

Since the dawn of farming, the battle between farmers and birds has been a great struggle. Pests like starlings, blackbirds, and crows can destroy up to 75% of crops within 48 hours of harvest, leading to a huge loss in revenue. Growers have tried everything in the name of pest control. From traditional scarecrows to propane cannons, none which have outrun the evolutionary wit of nature.The laser scarecrow projects green laser lighting not visible by humans in the sun. They are effective due to birds' sensitivity to the color green. The automated laser darts across fields

up to 600 feet and effectively startles birds enough to prevent them from destroying any crop. They are also less environmentally destructive and less labor-intensive compared to the use of netting.

Vertical Farming

With the technique of growing crops in vertically stacked or inclined surfaces that can be integrated into other structures or buildings, vertical farming can produce more crops with less space. This can be the answer to meeting the increasing food demands of an ever-growing population, especially in cities. Farmers can also take advantage of greenhouse settings that can be integrated into vertical farming. This means the production of year-round seasonal crops without any effects from the climate.

Bees and Drone

Drones have many uses in agriculture, but one problem that's been in the media a lot recently is around disappearing bees. Indeed some species are even at risk of extinction. This would be disastrous, as bees play a vital economic role as pollinators, helping maintain current agricultural production levels.

Lucky, drones are now being used in experiments to hopefully supplement the pollination efforts that remaining bees are completing. Other ways that agriculture is starting to use drones includes automated crop harvesting, aerial drone photography and even potentially in future as delivery drones.

Soil Tracking and Water Tracking System

These sensors are durable, unobtrusive and relatively inexpensive. Even family farms are finding it affordable to distribute them throughout their land, and they provide numerous benefits. For instance, these sensors can detect moisture and nitrogen levels, and the farm can use this information to determine when to water and fertilize rather than rely on a predetermined schedule. That results in more efficient use of resources and therefore lowered costs, but it also helps the farm be more environmentally friendly by conserving water, limiting erosion and reducing fertilizer levels in local rivers and lakes.

Chapter 18
Social Activities: Teaching Learning Activities, Awareness camps, Business Ideas and Many More.

As due to the present condition of COVID 19, the situation the village is very critical and entry in the village for outsiders is restricted from many months, it was not possible to organize any activities it the village. But here are the activities that we can perform when the situation will be under control and as allowed by the respected authorities.

As a part of the design proposals, we have proposed some designs, which would be helpful to the villagers/ farmers in which they have to invest their credits which will give them a lot. Designs like rain water harvesting and solar based irrigation farms are very beneficial to the villagers but we have to explain them the importance and provide awareness in the rural area regarding the natural resource management.

Activities that can be undertaken:

Workshop

All the stakeholders of the society like from schools, college, society, colony, NGOs, labor, Peoples representatives etc are called in the workshop on these topic.

Awareness through Exhibition

To increase the awareness level of the public, make arrangements of posters and CDs so as to create awareness in the society related to water management, importance of ground water level, importance and advantages of using solar panels, etc.

Competition Program at ground level

We arrange the programs like essay competition on such topics, rangoli and drawing competition and debate on the topic of water management, solar Irrigation system and sustainable development.

Free technical guidance

A free technical guidance with the help of demos being arranged in the societies, schools, college, public places banks and in villages so as to people can be aware of such technologies and can get benefits of the same.

Chapter 19

Kunariya SAGY Questionnaire Survey Form

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Kunariya Gram Panchayat: Kunariya Ward No. 1-6

Block: Bhuj (4149) District: Kachchh

State: Gujarat L S Constituency: Kachchh

1. Family Identity and Size

Name of Head of Household	Hasree Rupa kesrasiya							Male/ Female	M.
SECC Survey ID:	KABHUK02100275	Family Size	3	Over 18	3	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	SEBC	Life Insurance No	1. All Adults ~~2. Some Adults~~ ~~3. None~~	AABY No	~~1. Yes~~ 2. No	Kisan Credit Card	~~Yes~~ / No
Poverty Status Year[2]:	1. BPL ~~2. APL~~	Health Insurance No	1. All Adults ~~2. Some Adults~~ ~~3. None~~	RSBY No	~~1. Yes~~ 2. No	MGNREGS Job Card Number	No
PDS (If NFSA is not implemented)			Annapurna	Antyodaya	BPL	~~APL~~	Is any woman in the family member of an SHG? ~~Yes~~ / No
PDS (If NFSA is implemented)			Annapurna	Antyodaya	Priority	Other	

2. Adults (above 18 years)

Name	Age	Sex M/F/O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
Hasree	24	M	N	Yes	Illiterate	Yes	Yes	No
Santee	23	F	N	Yes	Illiterate	Yes	No	No
Meghee	65	F	N	Yes	Illiterate	Yes	No	No

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

4. Children below 6 years

Name	Age	Sex M/F/O	Disability Yes/No	Going to School (Y/N)	Going to AWC Y/N	De-worming Done	Fully Immu-nised Y/N	Mother's Age at the time of Child's Birth
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4
[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)
[3] Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4
[4] Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)
[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

IX. Parameters relating to Households & Institutions		Number
a)	Number of eligible Households for pension (old age, widow, disability)	110
b)	Number of Households receiving pension (old age, widow, disability)	87
c)	Number of eligible Households who are not receiving pension	23
d)	Number of Households eligible for Ration Card	223
e)	Number of eligible HHs having ration cards	220
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	89
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	23
h)	Number of active Job Card holders under MGNREGA	453
i)	Number of Job Card holders who completed 100 days of work during 2013-14	425
j)	Number of shops selling alcohol	–
k)	Number of BPL families	130
l)	Number of landless households	63
m)	Number of IAY beneficiaries	14
n)	Number of FRA[2] beneficiaries	0
o)	Number of Community Sanitary Complexes	3
p)	Number of Households headed by single women	18
q)	Number of Households headed by physically handicapped persons	13
r)	Total number of Persons with Disability in the village	13
s)	Number of SHGs	4
t)	Number of active SHGs	1
u)	Number of SHG Federations	0
v)	Number of Youth Clubs	0
w)	Number of Bharat Nirman Volunteers	6

Name and Signature of Surveyor and Respondent

Jethi Neel G.	Suresh Chhanga	Jayesh bhai	20 May 2021.
Surveyor.	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

[2] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

4

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

I. Basic Information

a. Gram Panchayat: Kunariya
b. Block: Bhuj (4149)
c. District: Kachchh
d. State: Gujarat
e. Lok Sabha Constituency: Kachchh
f. Number of Wards in the Gram Panchayat: 1 - 6
g. Number of Villages in the Gram Panchayat: -
h. Names of Villages:
—

Demographic Information

Number of Households 751 Total Population 3521 Male 1817 Female 1704
SC HHs 216 ST HHs 49 OBC HHs 84 Other HHs 402

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	Yes	—
b.	Nearest Primary Health Centre (PHC)	—	34 km
c.	Nearest Community Health Centre (CHC)	—	5 km
d.	Nearest Post Office	Yes	—
e.	Nearest Bank Branch (Any)	—	10 km
f.	Nearest Bank with CBS Facility	—	10 km
g.	Nearest ATM	—	10km
h.	Nearest Primary School	Yes	—
i.	Nearest Middle School	Yes	—
j.	Nearest Secondary School	-	10 km
k.	Nearest Higher Secondary School / +2 College	—	10 km
l.	Nearest Graduate College	—	10 km
m	Nearest ITI / Polytechnic Centre	—	10 km
n	Kisan Seva Kendra	—	10 km

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	–	10 km
p	Nearest Agro Service Centre	–	10 km
p	MSP based Government Procurement Centre	–	10 km
q	Milk Cooperative /Collection Centre	Yes	–
r	Veterinary Care Centre	–	10 km
s	Ayurveda Centre	–	10 km.
t	E – Seva Kendra	–	10 km.
u	Bus Stop	Yes	–
v	Railway Station	–	10 km.
w	Library	–	10 km.
x	Common Service Centre	–	10 km.

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 1 Public 1 Private –

b. Mini Stadium : Yes Yes(Y) /No (N) *(Playground with equipment and sitting arrangement)*

V. Education, ICDS

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres –

Names of such villages: –

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: 1

Secondary Private: – Secondary Govt.: 0

Higher Secondary Private: – Higher Secondary Govt: 0

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (Rice/ Wheat/ Millets)	✓	–	–	–	–	Inside	–
b.	Kerosene	✓	–	–	–	–	Inside	–
c.	Other (mention)	✓	–	–	–	–	Inside	–

2

aire

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered: Yes Not Covered:	Kumariya	—
b.	Hand Pump Coverage in Villages:	Covered: Not Covered:	—	Kumariya
c.	Coverage under Covered Drains:	Covered: 70% Not Covered: —	Kumariya	—
d.	Coverage under Open Drains:	Covered: — Not Covered: 30%	—	Kumariya.
e.	Villages with Household Electricity Connection (Numbers)	Connected: Yes Not Connected:	Kumariya	—

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	2233	d.	Pasture / Grazing Land	174 Hect.	g.	Check Dam	0.
b.	Irrigated Land	570.	e.	Forests/ Plantations	—	h.	Wells/Bore Wells	0.
c.	Un-irrigated Land	1663.	f.	Other Common Land	14 hect.	i	Tanks /Ponds	0.

[1] Mention the number of Villages Covered and Not Covered

3

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

	Always		Sometimes		Never
After use of Toilet	Soap Yes	Other -	Soap -	Other -	-
Before Eating	Soap Yes	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	-	-
Children	-	-

9. House & Homestead Data

Own House: Yes / ~~No~~	No. of Rooms: 2
Type: ~~Kutcha~~ / Semi Pucca / ~~Pucca~~	
Toilet: Private / ~~Community~~ / ~~Open Defecation~~	
Drainage linked to House: Covered / ~~Open~~ / ~~None~~	
Waste Collection System	~~Door Step~~ / Common Point / ~~No Collection System~~
Homestead Land: ~~Yes~~ / No	Kitchen Garden : ~~Yes~~ / No
Compost Pit: ~~Individual~~/ Group/ ~~None~~	Biogas Plant: ~~Individual~~/ ~~Group~~/ None

10. Source of Water (Distance from source in KMs)

Source of Water		Distance
Piped Water at Home	~~Yes~~ / No	Near
Community Water Tap	Yes / ~~No~~	-
Hand Pump (~~Public~~ / ~~Private~~) ~~Yes~~ / No		-
Open Well(~~Public~~ / ~~Private~~) ~~Yes~~ / No		-
Other (mention):		-

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	78	2 Cultivable Area	78
3 Irrigated Area	78	4 Uncultivable Area	-

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)	-

14. Migration Status – No.

Does any member of the household migrate for Work: ~~Yes~~ / ~~No~~. If Yes ~~Entire Year~~ / ~~Seasonal~~

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~~/ Borewell/Other	
Drip or Sprinkler Irrigation: ~~Drip~~ / ~~Sprinkler~~ / None	

16. Agricultural Produce in a normal year (Top 3)

Name	Unit	Quantity
Jowar	Kilogram	4000
Castor	Kilogram	2000

17. Livestock Numbers

Cows: -	Bullocks: -	Calves: -
Female Buffalo -	Male Buffalo: -	Buffalo Calves: -
Goats/ Sheep: -	Poultry/ Ducks: -	Pigs: -
Any other: Type -		No. -
Shelter for Livestock: ~~Pucca~~ / ~~Kutcha~~ / None		
Average Daily Production of Milk(Litres): -		

18. What games do Children Play

No child.

19. Do children play musical instrument (mention)

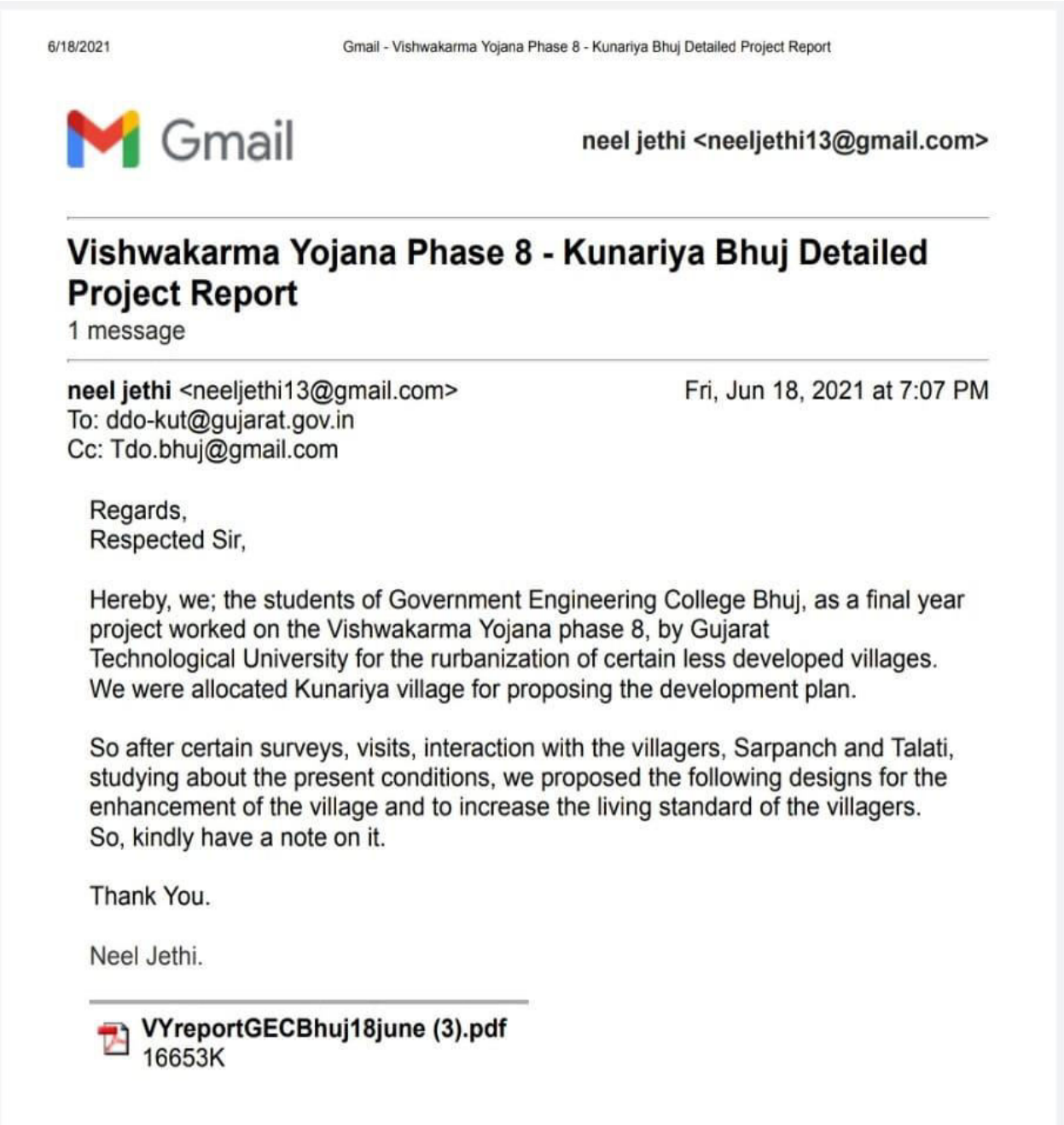
No child.

Schedule Filled By: Neel G Jethi

Principal Respondent: Sarpanch

Date of Survey: 20 May 2021

Chapter 20
TDO-DDO-Collector email sending Soft copy attachment in the report



6/18/2021 Gmail - Vishwakarma Yojana Phase 8 - Kunariya Bhuj Detailed Project Report

Gmail

neel jethi <neeljethi13@gmail.com>

Vishwakarma Yojana Phase 8 - Kunariya Bhuj Detailed Project Report

1 message

neel jethi <neeljethi13@gmail.com> Fri, Jun 18, 2021 at 7:07 PM
To: ddo-kut@gujarat.gov.in
Cc: Tdo.bhuj@gmail.com

Regards,
Respected Sir,

Hereby, we; the students of Government Engineering College Bhuj, as a final year project worked on the Vishwakarma Yojana phase 8, by Gujarat Technological University for the rurbanization of certain less developed villages. We were allocated Kunariya village for proposing the development plan.

So after certain surveys, visits, interaction with the villagers, Sarpanch and Talati, studying about the present conditions, we proposed the following designs for the enhancement of the village and to increase the living standard of the villagers. So, kindly have a note on it.

Thank You.

Neel Jethi.

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16653K

Chapter 21
Comprehensive report for the entire village

Here by, we are allocated the Kunariya village of Kachchh District. This village is almost 20 km. north from the Bhuj Taluka touching the state highway connecting Bhuj and White Rann of Kachchh. With the help of this Vishwakarma Yojana, we are able to give the design plan of this village. Our main aim is to develop this village and to make itself reliant and it should not be dependent on any other village for its basic requirement. Also as a result, the migration rate will decrease.

So here is the summary of the design proposals suggested by us for the enhancement of then village.

19. ATM
20. Artificial Pond
21. PHC Centre
22. Chabutro
23. Rain Water Harvesting
24. Village Entrance Gate
25. Solar Based Independent Street Lights
26. Underground Wiring
27. Automotor Controller With Water Level Indicator
28. Post Office
29. Bank Building
30. Library
31. Temple
32. Community hall
33. Public Toilet
34. VAWT module
35. GSM based electricity tariff system
36. Solar irrigation system