DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
Dungarpur Village
Junagadh District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Thanki Bharvi	Electrical	170830109009
Sorathiya Nidhikumari	Civil	170830106018

NODAL OFFICERS NAME
Prof. Mr. Harshad J. Bhakhar
Prof. Mr. Darshan J. Parmar

DR. SUBHASH TECHNICAL CAMPUS

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

DETAIL PROJECT REPORT

ON

Vishwakarma Yojana: Phase VIII

AN APPROACH TOWARDS RURBANISATION

Dungarpur Village
Junagadh District

Prepared By

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Thanki Bharvi	Electrical	170830109009
Sorathiya Nidhikumari	Civil	170830106018

DR. SUBHASH TECHNICAL CAMPUS

DR. SUBHASH TECHNICAL CAMPUS

NODAL OFFICER NAME
Prof. Mr. Harshad J. Bhakhar
Prof. Mr. Darshan J. Parmar

Year: 2020-21

Gujarat Technological University,
Chandkheda, Ahmedabad – 382424 Gujarat

CERTIFICATE

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

Detail Project Report for,

VILLAGE: Dungarpur

DISTRICT: Junagadh

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
Thanki Bharvi	Electrical	170830109009
Sorathiya Nidhikumari	Civil	170830106018

Date of Report Submission:	
Principal Name and Signature:	**Dr. D. D. Patel**
VY-Nodal Officer Name and Signature:	**Prof. Mr. Harshad J. Bhakhar**
Internal(Evaluator) Guide Name and Signature:	**Prof. Mr. Harshad J. Bhakhar**
College Name:	**Dr. Subhash Technical Campus**
College Stamp:	

ABSTRACT

Vishwakarma yojana is one of the initiatives towards rurbanization by government of Gujarat which was allotted as a pilot project to GTU. the students and faculty members meet all the stake- holders a village, survey the existing facilities. then they re-imagine and re-design the whole of the infrastructure of the village. the students use their engineering skills to prepare detailed project reports for the infrastructure as a part of their final year project work. through the yojana, the students of GTU are getting real work experience and are able to apply their technical knowledge and practices to a real problem.

According to census 2011 information the location code or village code of Dungarpur village is 514522. Dungarpur village is located in Junagadh tehsil of Junagadh district in Gujarat, India. It is situated 10 km away from district headquarter Junagadh. As per 2009 stats, Dungarpur village has also a gram panchayat. the total geographical area of village is 1637.19 hectares. Dungarpur has a total population of 2,429 peoples.

There are about 1084 houses in Dungarpur village. Junagadh is nearest town to Dungarpur which is approximately 10 km away. The village condition is moderate their road is made of C.C. but some area is broken of road some of the houses are well developed and some are made but cow dung.

Dungarpur is one of the villages in Junagadh district. Surrounded by agricultural activities. The city is facing issues of lack infrastructure development of internal roads, residential houses, post-office building. For understanding the actual situation of the village, we have collected different data for number of populations. School, water tank, Aanganwadi, hospital etc. By providing design of civil work such as repairing of old building, bus stop design. For drinking water, we have designed rain water harvesting system installation in individual houses which will benefit the villager.

The study will focus the development trend, intensity of growth of the village, and find out the problems related to the Socio- Cultural or physical development of the area, social infrastructures services, and the administrative systems of the village. Project proposal and sustainability aspect aren't considering in micro level, it is only guiding the way. The study of village gives the reason where there is need of sustainable facilities like infrastructure facilities, community hall, primary health center, post office, general market, pure drinking water, road network, schools, electricity, sanitation, library, Anganwadi, overhead tank, police station, fire station, etc. are available or no.

In Dungarpur village development use idea infrastructure facilities, community hall, primary health center, post office, general market, pure drinking water, road network, schools, electricity, library etc.

Key Words: Dungapur, Smart Village Development, Sustainable Infrastructure, Rural Development, Rurbanization

ACKNOWLEDGEMENT

We are highly indented to **Gujarat Technological University**, Ahmedabad 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-Ahmedabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N.Kher**, **Registrar, 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 Junagadh** 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.) D. D. Patel 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 Officers, **Prof. Mr. Harshad J. Bhakhar** and **Prof. Mr. Darshan J. Parmar** from college **Dr Subhash Technical Campus** 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 project Prof (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, Vishwakarmrma 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.

CONTENT

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
DDO	District Development Officer
GEDA	Gujarat Energy Development Authority
IEC	Information, Education and Communication
HRD	Human Resource Development
MOHRD	Ministry of HRD
BPL	Below Poverty Line
NGP	Nirmal Gram Panchayat
CFL	Compact Flurocent Lamp
LLDF	Light Lumen Depreciation Factor
LDDF	Light Dirt Depreciation Factor
SC/ST	Schedule Cast & Schedule Tribes
SWOT	Strength Weakness Opportunists Threats
IT	Information Technology
GIFT	Gujarat International Finance Tec-City
GRIHA	Green Rating for Integrated Habitat Assessment.
OM	Operation & Managements
PWD	Public Works Department
SOR	Schedule of Rates
WHO	World Health Origination
UNICEF	United Nations International Children's Emergency Fund
Km	Kilo meter
Govt	Government
LPG	Liquefied Petroleum Gas
Kv	Kilo Watt
CC	Cement Concrete
PHC	Primary Health Centre
CSS	Centrally Sponsored Schemes
RO	Reverse Osmosis
Hrs.	Hours
LED	Light Emitted Diode
PPP	Public Private Partnership
NIIF	National Investment and Infrastructure Fund
HPEC	High Power Expert Committee
PCIC	Per Capita Investment Cost
GDP	Growth Domestic Products
SMEs	Small and Medium Enterprise
JMC	Junagadh Municipal Corporation
JUDA	Junagadh Urban Development Authority
SIR	Special Investment Region
IGBC	Indian Green Building Council
CCTV	Close Circuit Television
IPS	Intrusion Prevention System
VPI	Virtual Private Network

Chapter 1
Ideal village visit from District of Gujarat State
(Civil & Electrical Concept)

1.1 Background & Study Area Location Shapur Village:

- Shapur is a Village in Junagadh Taluka in Junagadh District of Gujarat State, India. It is located 10 km towards south from district headquarters Junagadh, 381 km from state capital Gandhinagar.
- Shapur Pin code is 362205 and postal head office is Kalavani (4 km), Rangpur (5 km), Kaneri (5 km), Raningpara (5 km), Fagli (6 km) are the nearby villages to Shapur.
- Shapur is surrounded by Mendarda taluka towards east, Junagadh Taluka towards north, Malia Taluka towards south, Mangrol taluka towards west.
- Shapur local language is Gujarati.
- Shapur village total population is 8108 and number of houses are 1798. Female population is 47.7%. village literacy rate is 72.2% and the female literacy rate is 30.7%.
- **NIRMAL GRAM PURSAKAR** has been awarded to on attaining full sanitation coverage in households, Schools, Anganwadis, etc and for outstanding contribution in promotion of Rural Sanitation by His Excellency Dr. A. P. J. Abdul Kalam President of India on 4th May,2007.
- **SWARNIM AWARD** has been awarded to on attaining Best Gram Panchayat of Talukalevel by **Shree Narendra Modi** Chief Minister of Gujarat on Year of 2010-11.

Table 1 Shapur Population Data

Census Parameter	Census Data
Total Population	8108
Total No of Houses	1798
Female Population %	47.7 % (3871)
Total Literacy rate %	72.2 % (5850)
Female Literacy rate	30.7 % (2488)
Scheduled Tribes Population %	3.0 % (246)
Scheduled Caste Population %	8.9 % (722)
Working Population %	42.2 %
Child(0 -6) Population by 2011	757
Girl Child(0 -6) Population % by 2011	45.4 % (344)

Table 2 Shapur Data

Shapur Sorath Village	
Coordinates: 21.468066°N 70.370994°ECoordinates: 21.468066°N 70.370994°E	
Country	India
State	Gujarat
District	Junagadh
Area	
• **Total**	20 km^2 (8 sq mi)
Elevation	107 m (351 ft)
Population (2011)[1]	
• **Total**	8,108
• **Density**	410/km^2 (1,000/sq mi)
Languages	
• **Official**	Gujarati, Hindi
Time zone	UTC+5:30 (IST)
PIN	362 205
Telephone code	02872
Vehicle registration	GJ-11
Website	www.junagadhmunicipal.org

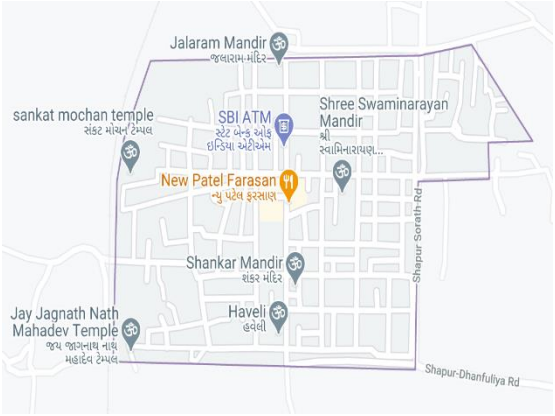


Figure 1 Shapur Map

Figure 2 Shapur Satellite Map

1.2 Concept: Ideal Village, Normal Village

An ideal Indian village will be constructed in such a manner that it will be able to lend itself perfect sanitation. It shall have cottages with sufficient light and ventilation built of material that can be obtained within a radius of five miles of it. The cottages shall have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all kind of avoidable dust. It shall have wells as per the need and demand. It will have houses of worship for all, also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have Panchayats for settling disputes. It will produce its own grains, vegetables and fruit. It shall also have a gram panchayat as the governing body which may help in solving necessary disputes. The water storage is such that it fulfills the requirements of the village. The lanes are well illuminated at night. It also has proper drainage facilities and ideal ways to dispose-off waste properly. The ideal village has transportation facilities that enable efficient connectivity with nearby towns and villages.

1.2.1 Objectives:

- To substantially improve the standard of living and quality of life of all sections of the population
- To prevent distress migration from rural to urban areas, which is a common phenomenon in India ‘s villages due to lack of opportunities and facilities that guarantee a decent standard of living.
- To make the model village a hub that could attract resources for the development of other villages in its vicinity.
- Provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.

1.2.2 Example / Live Case studies of ideal village of India/Gujarat

Shapur is known for lignite based power generation plant owned by Gujarat Electricity Board. This is one of the biggest power generation facilities in Saurastra region and employs more than 2000 people locally. Almost 50% of village business and shoppers come from smaller villages around Shapur. Along the main road, there are several retail shops inside the village. Shapur provides better employment / business / earning opportunities to local workers in farms, industries, retail businesses, ferries, vegetable and beauty stall –Laris etc. Shapur is also famous for oil, engineering, cement products and dairy industries around the region. They provide good deal of internal and external employment and business and economy. Some of the well-known industries are: Thermal Power Station, Shri Arun Industries, Shri Momai Cement factory, Shri Momai Oil mill, Hari Oum Sweet, Trimurti ginning mill (Shashikant & Co.).

After Junagadh became Municipal Corporation, Shapur is one of the best places to do business in real estate and farming land transfer. Farmers having farms on Junagadh-road get very good value of their farms. People, who work in Junagadh but cannot afford living in Junagadh, live in Shapur as commute to Junagadh is only 15 minutes. They save much money in taxes, grocery, and education and get an urban lifestyle and facilities in this modern village. By looking at the growth of region, it looks like Shapur has been partially merged with Junagadh and will be under corporation's control within next few years.

Shapur - Village Overview

Gram Panchayat:	Shapur
Block / Tehsil:	Junagadh
District:	Junagadh
State:	Gujarat
Pincode:	362205
Area:	1845 hectares
Population:	8,108
Households:	1,798
Assembly Constituency:	Manavadar
Parliament Constituency:	Porbandar
Nearest Town:	Junagadh (5 km)

Figure 3 Shapur Prathmik Aarogya Kendra

Figure 4 Interaction with Shapur School Principal

Figure 5 Shapur Coal Power Plant

1.2.2.1 Case Study of Model Village from the state of Gujarat – Punsari

The example of ideal village is Punsari village. Punsari is a Village in Talod Taluka in Sabarkantha District of Gujarat State, India. It is located 32 km towards South from District headquarters Himmatnagar. 19 km from. 58 km from State capital Gandhinagar, Modasa, Prantij, Himatnagar, Dehgamare the nearby Cities to Punsari. Sometimes just a vision for change can create an ocean of a difference. When Himanshu Patel was elected Sarpanch of Punsari, a quaint little village in Sabarkantha district Gujarat, in 2006 there was no sewerage connection, no street lights, no pucca roads and, of course, no source of income for the gram panchayat except the grants and funding from various state and Union government schemes. Six years later, the urban village flaunts a wi-fi and optical fiber broadband network, classrooms with CCTV cameras, its own mini-bus transport system and 25 CCTVs located on important junctions to spot litterbugs. There is an RO water treatment plant that supplies 20-litre cans to houses for a token cost of Rs 4. You also have a school bus to ferry your wards, and that too on clean RCC roads. The gram panchayat also provides facilities of loud speaker covering entire village, gutter project, clean primary health care center, 8 kinder garden schools, banking facility, toll free complain receiving phone service, among others.

Villagers can buy ticket of Re 1 to use the mini bus service. For female students, bus service is completely free. Women come to deposit milk to milk bank couple of times during a day through this bus. Cost of running the service is managed through ticket sales. 120 loud-speakers covering each corner of the village. Villagers listen to prabhatiya in the morning and bhajan and bhakti songs in the evening. Also, important announcements like telephone bill, power bill, results of 10th and 12th are made through these speakers. Unique feature is that the village sarpanch can pass on any announcement from his mobile phone. To set up this system Rs 4 lakh were spent from corpus. “The turn-around happened when we sold part of our grazing land as plotted schemes to various communities. The money is deposited in government coffers,” says the 28-year-old Sarpanch. Some funds were also received through various government schemes.

Figure 6 Punsari Sarpanch

Figure 7 Punsari Garbage Collection

Figure 8 Punsari Solar Streetlight

1.2.3 The Idea of a model/Smart Village

Smart Village refers to a concept developed in rural area that provides solutions to problems occurred and improves the quality of life. The main problems faced by rural areas are cover poverty, low level of education, and limited access to technology. Smart village concept emerged due to some different characteristics between rural and urban areas. Banyuwangi Regency is one of regions that created smart concept starting from rural area, called smart kampung. So far, smart kampung only focused on public services, which included only a small part of smart city concept. Hence, this research was intended to propose the model of smart village examined through initial interview in village sample of Banyuwangi, literature reviews related to smart city, smart village, and smart rural. Then, the results were confirmed and adjusted to support local regulations. This research created a smart village model that was capable to be a guide for each village to develop towards better future. The proposed smart village model was categorized into 6 dimensions including 1) Governance, (2) Technology, (3) Resources, (4) Village Service, (5) Living, and (6) Tourism. This research is expected to be applied to villages in other Regencies by adjusting the characteristics of each region.

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

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

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

Rural Development: Rural development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas. Rural development has traditionally centered on the exploitation of land-

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

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

Socio Economic profile

Table 3 Socio Economic profile

Year	Population	Male	Female
1991	4004	2103	1901
2001	5031	2698	2333
2011	6191	3202	2990

Physical Profile

Shapur Village Gram Panchayat name is Shapur. Shapur is 6 km distance from Sub District Headquarter Junagadh and it is 40 km distance from District Headquarter Junagadh. Nearest Statutory Town is Junagadh in 6 km Distance. Shapur Total area is 1551.48 hectares, Forest area is 8 hectares, Non-Agricultural area is 14.57 hectares, Total irrigated area is 993.98 hectares and Total Water fall area is 0hectares. School, Bank, Aangalvadi, Health center are available there, Grampanchayat in good condition available. For transportation road are available properly there as well as proper street lights are fitted. physical profile of this village is good as ideal village and we also try to do that better.

Demographic Profile

As per constitution of India and Panchyati Raaj Act, Shapur village is administrated by Sarpanch (Head of Village) who is elected representative of village.

- Assembly MLA: Jawahar Chawada Pethaljibhai
- Parliament MP: Rameshbhai lawjibhai Dhaduk
- Sarpanch Name: Dinesh Faldu

Table 4 Demographic Profile

Particulars	Total	Male	Female
Total No. of Houses	1,798	-	-
Population	8,108	4,237	3,871
Child (0-6)	757	413	236
Schedule Caste	722	361	440
Schedule Tribe	246	133	8

Literacy	79.58%	87.07%	70.55%
Total Workers	3,425	2,521	876
Main Worker	2,681	-	-
Marginal Worker	744	209	124

Shapur village has higher literacy rate compared to Gujarat. In 2011, literacy rate of Shapur village was 79.06 % compared to 78.03 % of Gujarat. In Shapur Male literacy stands at 87.07 % while female literacy rate was 70.55%.

Infrastructure Details:

Water

- Treated Tap Water Supply all around the year and in summer also available. Hand Pump and Tube Wells/Boreholes are other Drinking Water sources. For the farm electricity is available for farming.
- 24-hour water supply system is activated with primary treatment at proper time period. The average rainfall in the village is inch.

Drainage

- Open Drainage System Available in this Village. House to House waste Collection available. There is system to Collect garbage on street. Drain water is discharged into sewer plant.

Sanitation

- There is proper sanitization in all houses having a toilet i.e., Safety Tank toilets are installed in every home.

Public announcement:

- Public Announcement system is installed at many places wherein announcements, news been announced when necessary.

Road and Transportation:

- Public Bus service available in this village.
- Nearest Railway Station is in 5 - 10 km. Autos Available in this village.
- Tractors Available in this Village. Animal Driven Carts are there in this village.
- Nearest National Highway is in less than 5 km. Nearest State Highway is in 5 - 10 km. Nearest District Road is in 5 - 10 km.
- Pucca road, Macadam Road and Foot Path are other Roads and Transportation within the village.

Security

- 20-point CCTV cameras and monitors been installed at key locations in order to keep a close watch on the daily activities. Also, CCTV cameras are needed to installed in schools and health center.

1.4 SWOT analysis of Ideal village / Smart Village

SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning. This technique, which operates by 'peeling back layers of the company' is designed for use in the preliminary stages of decision-making processes and can be used as a tool for evaluation of the strategic position of organizations of many kinds (for-profit enterprises, local and national governments, NGOs, etc.). It is intended to specify the objectives of the business venture or project and identify the internal and external

factors that are favorable and unfavorable to achieving those objectives. Users of a SWOT analysis often ask and answer questions to generate meaningful information for each category to make the tool useful and identify their competitive advantage. SWOT has been described as the tried-and-true tool of strategic analysis, but has also been criticized for its limitations.

Figure 9 A SWOT Analysis

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

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

- Establishment of R.O. Plant for providing a pure drinking water for all people.
- 100% CC road in the village.
- Provide a solar streetlight.
- Provide roof top rain water harvesting in all houses.
- These are some of the aspects that need to be improved in the future in the village.

1.6 Benefits of the visits of Ideal village / Smart Village

- It helps us gain first-hand information regarding functioning of the village. Provides an opportunity to plan, organize and engage in active learning experiences. It helps to enhance are inter personal skills and communications, helps to understand the do and do not of the village activity.

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

We have observed the balance of commercial, residential and recreational land use in the Jarod village but as per the feedback which were given by villagers some facilities are lacking in the village from civil aspects and these are, Gas Pipelines, Biogas Plant, Cold Storage Area, Rain Water Harvesting, Solar Street Lights, Public Wi-Fi Connection, Fire Station, etc. Moreover, by providing skill development centers for the youth, panchayat should also focus on enabling the youth to setup the self-employment units. Water harvesting, Ground water recharge and improvement of village tanks/lakes are also projecting to be pursued.

Chapter 2
Dungarpur Literature Review - (Civil & Electrical Concept)

2.1 Introduction: Urban & Rural village concept

Figure 10 Urban Concept

Figure 11 Rural Concept

An urban area is a human settlement with high population density and infrastructure of built environment. Urban areas are created through urbanization and are categorized by urban morphology as cities, towns, conurbations or suburbs. In urbanism, the term contrasts to rural areas such as villages and hamlets and in urban sociology or urban anthropology it contrasts with natural environment. The creation of early predecessors of urban areas during the urban revolution led to the creation of human civilization with modern urban planning, which along with other human activities such as exploitation of natural resources leads to human impact on the environment. In general, a rural area or countryside is a geographic area that is located outside towns and cities. The Health Resources and Services Administration of the U.S. Department of Health and Human Services defines the word rural as encompassing population, housing, and territory not included within an urban area. Whatever is not urban is considered rural.

Urban-rural relationships is beginning to appear more often in the academic literature as well as policy and programming documents. The evolution of the concept has a long history in the study of economics, geography and regional planning. This paper traces some of the historical background of the concept and identifies how it is being used at the present time. The paper is divided in two main parts. In the first part we discuss how the term urban-rural relationship was coined to mark a departure from the traditional view of urban-rural dichotomy: the existence of two distinct and opposing perspectives that have influenced the conceptualization of urban-rural relationships. The first of these perspectives, the anti-urban view, can be traced back to rural-urban migration during the Industrial Revolution and the social, economic, environmental and health problems that this migration caused. The second perspective, the pro-urban view, sees urbanization in terms of natural progress and development and regards cities as generators and centers of culture, knowledge, innovation and economic growth.

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

A village is a small settlement usually found in a rural setting. It is generally larger than a "Hamlet" but smaller than a "Town". Some geographers specifically define a village as having between 500 and 2,500inhabitants.

According to UK: -A small community or group of houses in a rural area, larger than a hamlet and usually smaller than a town, and sometimes (as in parts of the U.S.) incorporated as a municipality the inhabitants of such a community collectively

According to the Planning Commission: - A town with a maximum population of 15,000 is considered rural in nature. In these areas the panchayat takes all the decisions. There are five people in the panchayat.

According to Reserve Bank of India (RBI): - Defines rural areas as those areas with a population of less than 49,000 (tier -3 to tier-6 cities).

Figure 12 Rural/Urban Villages of India

2.4 Scenario: Rural / Urban village of India population Growth

The Indian population census in the 2011 covered a number of parameters during the survey occurs, these parameters are population, growth rate in population, rate of literacy, density of population, sex ratio and child sex ratio etc. According to the census reports of Indian census 2011, the population of India is 1,210,193,422 with 623,724,248 males and 586,469,174 females. The total literacy rate in the country at 74.04%. The density of population is 382 person/sq.km. In regards to sex ratio, at present there are 940 females on average on per 1000 males and the child sex ratio is 914 females per 1000males. Census 2011 is the 15th Census of India since 1872 Provisional Population is arrived at by adding the Population as reported by each Enumerator for the Enumeration Block.

Table 5 INDIA CENSUS 2011 DATA

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

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

As per projection, population of Gujarat 7.04 Crores…

Table 6 Gujarat Population

Description	2011	2001
Approximate Population	6.04 Crores	5.07 Crore
Actual Population	60,439,692	50,671,017
Male	31,491,260	26,385,577
Female	28,948,432	24,285,440
Population Growth	19.28%	22.48%
Percentage of total Population	4.99%	4.93%
Sex Ratio	919	920
Child Sex Ratio	890	883
Density/km2	308	258
Density/mi2	798	669
Area (Km2)	196,244	196,024
Area mi2	75,770	75,685
Total Child Population (0-6 Age)	7,777,262	7,532,404
Male Population (0-6 Age)	4,115,384	4,000,148
Female Population (0-6 Age)	3,661,878	3,532,256
Literacy	78.03 %	69.14 %
Male Literacy	85.75 %	79.66 %
Female Literacy	69.68 %	57.80 %
Total Literate	41,093,358	29,827,750
Male Literate	23,474,873	17,833,273
Female Literate	17,618,485	11,994,477

Gujarat Urban Population 2011: Out of total population of Gujarat, 42.60% people live in urban regions. The total figure of population living in urban areas is 25,745,083 of which 13,692,101 are males and while remaining 12,052,982 are females. The urban population in the last 10 years has increased by 42.60percent. Sex Ratio in urban regions of Gujarat was 880 females per 1000 males. For child (0-6) sex ratio the figure for urban region stood at 852 girls per 1000 boys. Total children (0-6 age) living in urban areas of Gujarat were 2,952,359. Of total population in urban region, 11.47 % were children (0-6). Average Literacy rate in Gujarat for Urban regions was 86.31 percent in which males were 90.98% literate while female literacy stood at 70.26%. Total literates in urban region of Gujarat were 19,672,516.

2.6 Rural Development Issues - Concerns - Measures

Issues:

- *Issue of agriculture*: In general, the issue is how to industrialize agriculture in India. It includes increasing the marketization level of agricultural production and operation, and stabilizing the prices of agricultural products; changing the situation of smallholder economic agriculture, achieving economies of scale of agricultural production and operation; guaranteeing the food security in India.
- *Issue of rural areas*: This is particularly reflected in the disparity of economic and cultural development between urban and rural areas. It is mainly caused by the dual segmentation based on the household registration system.
- *Issue of farmers*: It includes improving the income level of farmers, alleviating burdens of farmers, increasing the cultural qualities of farmers, and safeguarding the rights of farmers.

Measures: Nature policy will be built around the three thematic axes. For each axis a range of measures will be available. In the new Regulation, conditions under which the measures can be implemented have been streamlined and simplified. Under this axis, measures fall into four groups:

1. Human resources: Young farmers, early retirement, training and information, farm advisory services. A series of measures target human resources within and linked to the agriculture and forestry sectors.

2. Physical capital: The EU provides support for modernization of agricultural holdings aimed at modernizing and improving their overall performance through the introduction of new technologies and innovation, targeting quality, organic products and on/off farm diversification, including non-food sectors and energy crops, as well as improving the environmental, occupational safety, hygiene and animal welfare status. Investments could, for instance, aim to modernize farm machinery and equipment so as to meet one of these objectives.

3. *Food quality under food quality, two measures exist*: incentive payments for farmers and information and promotion actions. Incentive payments will be available for farmers who participate voluntarily in EU or national schemes designed to improve the quality of agricultural products and production processes and which give assurances to consumers on these issues.

4. *Transitional measures* for the new Member States Support will be available during the period 2007–2013 for the new Member States via the measures supporting semi subsistence farming and the setting up and operation of producer groups in order to ensure a smooth transition for these countries which address their particular challenges.

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

Table 7 Infrastructure Facilities Norms

Facilities	Planning Commission/UDPF I Norms	Required as per Norms
Education		
Aganwadi	Each Village	1
Primary School	Each Village	1
Secondary School	Per 7,500 Population	2
Higher Secondary School	Per 15,000 Population	0

College	Per 125,000 Population	0
Tech. Training Institute	Per 100,000 Population	0
Agriculture Research Centre	Per 100,000 Population	0
Medical Facility		
Gov./Panchayat Dispensary or Sub PHC or Health Centre	Each Village	1
PHC & CHC	Per 20,000 Population	0
Child Welfare and Maternity Home	Per 10,000 Population	1
Hospital	Per 100,000 Population	0
Transportation		
Pucca Village Approach Road	Each Village	
Bus/Auto Stand Provision	All Villages connected by PT (ST Bus or Auto)	1
Drinking Water (Water Facilities)		
Over Head Tank	1/3 of Total Demand	1.6 lac cap
U/G Sump	2/3 of Total Demand	3.2 lac cap
Public Latrines	Each Village	60
Cremation Ground	Per 20,000 Population	1
Post Office	Per 10,000 Population	1
Gram Panchayat Building	Each individual/group Panchayat	1
APMC	Per 100,000 Population	0
Fire Station	Per 100,000 Population	0
Police Station	Per 15,000 Population	0
Community Hall	Per 10,000 Population	1

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

- Rural electrification under Minimum Needs Programme launched in 1974
- Kutir Jyoti Yojana to provide single point light to below poverty level (BPL) families in rural India launched in1988.
- Pradhan Mantri Gramodaya Yojana to electrify un-electrified villages as per

prevailing definition of electrification launched in 2003 Remote Village Electrification Programme launched in 2001 by Ministry of New and Renewable Energy (MNRE).

- This program me focused on electrifying remote villages not connected to grid (off-grid) through use of renewable energy sources.
- Accelerated Rural Electrification Program me in 2003- 04 electrification of one lakh villages and one crore households launched in2004.
- Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY): Launched in 2005, this programme aimed at providing energy access to all by 2009 and at least one unitof
- electricity per household per day by 2012 as envisaged in NEP (National Electricity policy)2005All earlier programmers were merged in RGGVY.
- In December 2014, current government announced Deendayal Upadhyay Gram JyotiYojana (DDUGJY) with major modifications in RGGVY.

2.9 Other Projects / Schemes of Gujarat / Indian Government

1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
2. Pradhan Mantri Gram Sadak Yojana (PMGSY)
3. Indira Awas Yojana (IAY)

1. **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)**
   MGNREGA Launched on 2nd February 2006 as a momentous initiative towards proper growth. For the first time, rural communities have been given not just a development programme but also a regime of rights. The National Rural Employment Guarantee Act, 2005 guarantees 100 days of employment in a financial year to any rural household whose adult members are willing to do unskilled manual work. This work guarantee also serves other objectives: generating productive assets and skills thereby boosting the rural economy, protecting the environment, empowering rural women, reducing rural urban migration and fostering social equity, among others. The Act offers an opportunity to strengthen our democratic processes by entrusting principle role to Panchayats at all levels in its implementation and promises transparency through involvement of community at planning and monitoring stages.
2. **Pradhan Mantri Gram Sadak Yojana (PMGSY):**
   Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 as a fully funded Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country. The programme envisages connecting all habitations with a population of 500 persons and above in the plain areas and 250 persons and above in hill States, the tribal and the desert areas. According to latest figures made available by the State Governments under a survey to identify Core Network as part of the PMGSY programme, about 1.67 lakh Unconnected Habitations are eligible for coverage under the programme. This involves construction of about 3.71 lakh km. of roads for New Connectivity and 3.68 lakh km. under upgradation. A total of 59564 habitations are proposed to be provided new connectivity under Bharat Nirman. This comprises 60% up gradation from Government of India and 40% renewal by the State Governments.

3. **Indira Awas Yojana (IAY):**
   Housing is one of the basic requirements for human survival. For a normal citizen owning a house provides significant economic security and status in society. For a shelter less person, a house brings about a profound social change in his existence, endowing him with an identity, thus integrating him with his immediate social background. The objective of Indira Awas Yojana is primarily to help construction of dwelling units by members of Scheduled Castes/ Schedule Tribes, freed bonded laborer's and also non-SC/ST rural poor below the poverty line by providing them with grant-in-aid.

Following are the projects/schemes running by the private sector:

1. Non-Governmental Organisations (NGOs)
2. Provision of Urban Amenities in Rural Areas (PURA)

1. **Non-Governmental Organisation (NGOs):**
   The NGOs became prominent after independence, especially after 1970s. Development parishioners, government officials and foreign donors consider that NGOs by virtue of being small scale, flexible, innovative and participatory, are more successful in reaching the poor and in poverty alleviation, NGOs involved in initiating and implementing rural development programme. At present 30,000 NGOs working in India. A non-governmental organization (NGO) is a legally constituted organization created by legal persons that operates independently from any government and a term usually used by governments to refer to entities that have no government status. In the cases in which NGOs are funded totally or partially by governments, the NGO maintains its nongovernmental status by excluding government representatives from membership in the organization. The term is usually applied only to organizations that pursue some wider social aim that has political aspects, but that are not overtly political organizations such as political parties.
2. **Provision of Urban Amenities in Rural Areas (PURA):**
   The objective of the scheme is to provide urban amenities and livelihood opportunities in rural areas to bridge the rural-urban divide, thereby reducing migration from rural to urban areas. PURA aims to achieve "holistic and accelerated development of compact areas around a potential growth centre in a Panchayat (or group of Panchayats) through PPP by providing livelihood opportunities and urban amenities to improve the quality of life in rural areas." The PURA Scheme envisages rapid growth of rural India given enhanced connectivity and infrastructure, the rural population would be empowered and enabled to create opportunities and livelihoods for themselves on a sustainable and growing basis. The key characteristics of the scheme are:
   - Simultaneous delivery of key infrastructure in villages leading to optimal use of resources.
   - Provision of funds for O&M of assets for 10 years post-construction, along with capital investment for creation of assets.
   - Transformation of several schemes into a single project, to be implemented as per set standards in a defined timeframe, with the requirements of each scheme being kept intact.
   - Combining livelihoods creation with infrastructure development.

- Enforcement of standards of service delivery in rural areas almost at par with those obtaining in urban areas.
- Enforcement of service standards through a legally binding arrangement.

Public-Private-Partnership - The Concept:

Public-Private-Partnership or PPP is a mode of implementing government schemes in partnership with the private sector. The term private in PPP encompasses all non-government agencies such as the corporate sector, voluntary organizations, self-help groups, partnership firms, individuals and community-based organizations, PPP, moreover, subsumes all the objectives of the service being provided earlier by the government, and is not intended to compromise on them. Essentially, the shift in emphasis is from delivering services directly, to service management and coordination. The roles and responsibilities of the partners may vary from sector to sector. While in some schemes/projects, the private provider may have significant involvement in regard to all aspects of implementation; in others s/he may have only minor role. The potential benefits expected from PPP could be mentioned as below:

- Cost-effectiveness: since selection of the developer depends on competition or some bench marking, the project is generally more cost effective than before.
- Higher Productivity: by linking payments to performance, productivity gains may Be expected within the programme/project.
- Accelerated Delivery: since the contracts generally have incentive and penalty clauses vis-a-vis implementation of capital projects/programmes this leads to accelerated delivery of projects.
- Clear Customer Focus: the shift in focus from service inputs to outputs create the scope for innovation in service delivery and enhances customer satisfaction.
- Enhanced Social Service: social services to the mentally ill, disabled children and delinquents etc. require a great deal of commitment than sheer professionalism.
- Recovery of User Charges: Innovative decisions can be taken with greater flexibility on account of decentralization. Wherever possibilities of recovering user charges exist, these can be imposed in harmony with local conditions.

Chapter 3
Smart (Cities / Village) Concept Idea and its Visit

(Civil & Electrical Concept)

3.1 Introduction: Concepts, Definitions and Practices

Concepts:

A smart village is one where sustainable energy sources are used as a measure of development and people have access to quality education and healthcare, access to clean drinking water, sanitation and nutrition enhanced security, gender equality and democratic engagement. Based on the exploration of a wide and extensive array of literature from various disciplinary areas we identify eight critical factors of smart city initiative management and organization, technology, governance, policy context, people and communities, economy, built infrastructure and natural environment.

Definition (Civil & Electrical)

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including public works such as roads, bridges, canals, dams, airports, sewerage systems, pipelines, structural components of buildings, and railways.

Electrical engineering is an engineering discipline concerned with the study, design and application of equipment, devices and systems which use electricity, electronics, and electromagnetism.

Smart village means all the necessaries facilities is developed in the village and no need to moves in city for any kind of requirement. A Smart Village enables its inhabitants to make use of the contemporary technological and social achievements, while its infrastructures are still being developed in line with Sustainable Development Goals, offers an opportunity to efficiently deal with future of energy security and issues of local and circular.

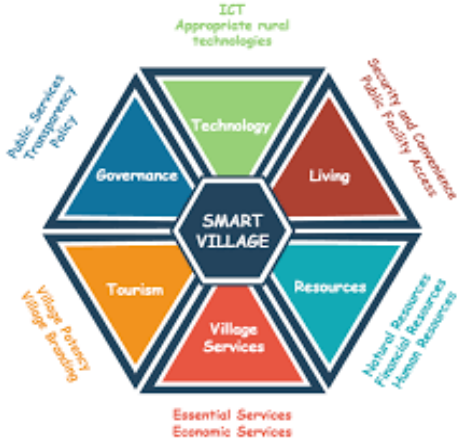


Figure 13 Smart Village Concept

The driving motivation behind the concept on " Smart Village " is that the technology should acts as a catalyst for development, enabling education and local business opportunities, improving health and welfare, enhancing democratic engagement and overall enhancement of rural village dwellers.

Smart Village India gets its foundation from Mahatma Gandhi's vision of Adarsh Gram (model village) and Gram Swaraj (Village self-rule/independence). Gandhi in two texts, Hind Swaraj and Gram (Village) Swaraj, promotes the concept of integrated rural development to impact majority of the population, as the primary initiative after India Independence in 1947. The Eco Needs Foundation has initiated the concept of "Smart Village". Under this project the Foundation is adopting villages and putting efforts for sustainable development by providing basic amenities like sanitation, safe drinking water, internal road, tree plantation, water conservation. The Foundation is also working for inculcating moral values in the society and for improving the standard of living of the villagers.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

Table 8 Smart cities benchmarks

Sr no.	Parameter	Benchmark
A	**Transport**	Maximum travel time of 30 minutes in small &medium size cities and 45 minutes in metropolitan areas. Continuous unobstructed footpath for 2 m wide on either side of all street with Row 12 m more Dedicated and physically segregated bicycle tracks with width of 2m or more, one in each direction, should be provided on all streets with carriage way largerthan 10 m High quality and high frequency mass transport within 800 m of all residences in areas over 175persons / ha of built area
B	**Spatial Planning**	175 persons per Ha along transit corridors. 95% of residences should have daily needs retail, parks, primary schools and recreational areas accessible within 400m walking distance. 95% residences should have access to employment and public and institutional transport or bicycle or walk At least 20% of all residential units to be occupied by economically weaker sections in each Transit Oriented Development Zone 800m from Transit Stations At least 30% residential and 30 commercial/institutional in every TOD Zone within 800m of Transit Stations
C	**Water Supply**	24 x 7 supply of water 100% household with direct water supply connections 135 liters of per capita supply of water 100% metering of water connections 100% efficiency in collection of water related charges
D	**Sewerage & Sanitation**	100% households should have access to toilets 100% schools should have separate toilets for girls 100% households should be connected to the waste water network 100% efficiency in the collection and treatment of waste water 100% efficiency in the collection of sewerage network
E	**Solid management**	100% households are covered by daily door-step Collection system. 100% collection of municipal solid waste 100% segregation of waste at source, i.e. bio-degradable and non-degradable waste 100% recycling of solid waste

F	**Storm storage**	100% coverage of road network with storm water drainage network Aggregate number of incidents of water logging reported in a Year = 0 100 % rainwater harvesting
G	**Electricity**	100% metering of electricity supply 100% households have electricity connection 24 x 7 supply of electricity 100% recovery of cost Tariff slabs that work towards minimizing waste
H	**Health care facilities**	Availability of telemedicine facilities to 100% residents 30 minutes 'emergency response time 1 dispensary for every 15,000 residents Nursing home, child, welfare and maternity. Enter - 25 to 30 beds per lakh population.

Smart Cities Performance Measurement Indicators

Table 9 Smart Cities Measurement Indicators

People	Prosperity	Planet	Governance	Propagation
1. Health 2. Safety 3. Access to services 4. Education 5. Diversity & social cohesion 6. Quality of housing	1. Employment 2. Equity 3. Green economy 4. Economic performance 5. Innovation 6. Attractiveness & Competitiveness	1. Energy & Mitigation 2. Material, Water & Land 3. Climate resilience 4. Pollution 5. Ecosystem	1. Organization 2. Community involvement Multi-level governance	1. Scalability 2. Reliability

Several standards and standardization attempts are presented, all coming from well-known international organizations. 2 of them (from ISO, ITU and BSI) are presented in detail.

1. The ISO 37120standard

- The ISO 37120 Standard is titled "Sustainable development of communities - Indicators for city services and quality of life".
- The standard presents a set of (around 100) indicator to measure the performance of city services and quality of life.
- The standard is applicable to any city, municipality or local government that wants to measure its performance, in a comparable and verifiable manner, irrespective of size andlocation.
- The standard is available at the ISO web site (at a price). A free summary can be obtained here (ISO preview facility)
- My view: a very good start for measuring your smart city initiatives. But, some indicators are quite "indirect" and maybe difficult to gather. No real assessment of ICT infrastructures.

2. The ISO/DIS37101

- This is a standard in draft status (DIS), published in September2015.
- The standard, titled "Sustainable development of communities -- Management systems - Requirements with guidance for resilience and smartness", presents the main axes of activities for a smart city.
- The draft standard is available at a cost from the ISO website.
- My view: very helpful information on how to plan, manage and evaluate a smart city initiative. Also includes the 10 main areas of smart city intervention types (e.g. health, energy, environment, etc). More like a guideline than a standard though Similar information contained in several relevant papers or studies.

3.3 Technological Options

Smart energy

Smart energy systems will monitor and control energy usage to more efficiently manage and conserve energy. Cisco estimates that cities that run on information can improve their energy efficiency by 30 percent within 20 years. By using renewable energy sources, manage water supply and have a waste management system, cities can reduce pollution and use less energy.

Smart mobility

Smart mobility strives to find more sustainable transport options. Deloitte reported that an average American is stuck about 34 hours in traffic every year. With rapidly growing cities, new transportation solutions need to be developed to keep mobility dynamic. By conducting big data drive projects, information can be gathered to identify driving and movement patterns and minimize the accident probability. Finding new and improved solutions will reduce costs and have a positive environmental impact.

Smart infrastructure

Smart infrastructure creates the fundament for all smart solutions. By using new technology to convert raw data into information, urban and regional development can be planed and designed to fit future demand. Also, existing systems can be improved by analyzing data from sensors, traffic patterns and tracking systems.

Smart public services

By connecting city residents and authorities using innovative communication technology, cities can become safer, cleaner and the general city standard will improve. If residents have the possibility to report trash or infrastructural problems, authorities can act faster to solve problems they otherwise would not be aware of.

Smart care

To adapt to changes in population demographics, the development of smarter healthcare services will provide quality services also in the future. Smarter care will reduce costs and connect users within the healthcare industry to provide necessary patient information.

Giving caretakers access to patient information will help doctors collaborate in new ways to give the best patient care possible.

A smart city will respond better to emerging population challenges than traditional city management. By utilizing resources more efficiently governments can save money, improve life quality and meet the needs of future generations.

3.4 Road Map and Safe Guards

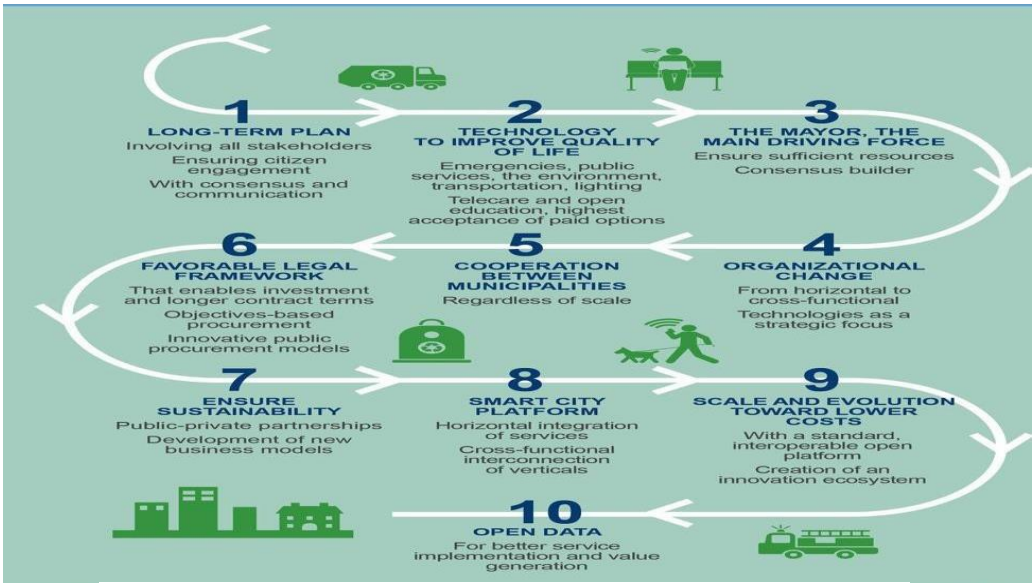


Figure 14 Road Map and Safe Guards

3.5 Issues & Challenges

Unfortunately, it is a fact that, in the world today, 1.3 billion people remain without access to electricity. In addition, 3 billion are still cooking on dangerous and inefficient stoves. Many of them live in remote rural village communities. Until such communities have access to modern energy services, little progress can be made to develop their economies and improve their lives. Following the successful conclusion of this first phase of activities the smart villages Initiative intends to take forward their findings, and leverage the unique global base of knowledge and network that we have assembled, to pursue the linked goals of universal energy access and rural development. Facilitating the establishment, in partnership, of pilot "Smart Villages" around the world to act as examples of the concept and provide a base for demonstrating the sustainable impact of this holistic and sustainable rural development approach. Working with research partners around the world to evidence the impact of the holistic "Smart Villages" development model, through baseline studies and long- term impact assessment across multiple development metrics, across multiple SDGs.

Developing and testing innovative technologies that can help deliver some of these integrated development objectives – for example innovative agricultural technology, cold storage, ICT access, remote education and telemedicine.

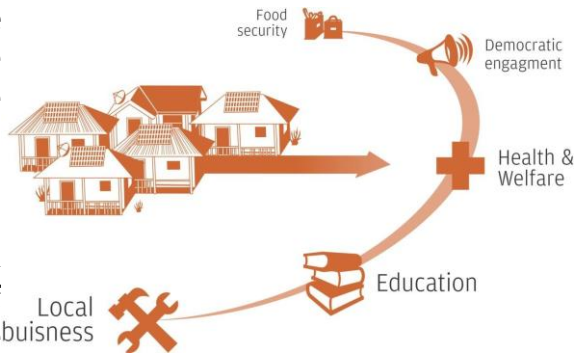


Figure 15 Issues and Challenges

Provide consulting and advisory services on energy access and holistic models of rural development, harnessing the wealth of information and the experience we have assembled through our global network during the course of the past 5 years. Village issues and challenge area is be simplified as below figure in which food, security, democratic engagement, health and welfare, communication, business and education take place given as bellow figure.

3.6 Smart Infrastructure - Intelligent Traffic Management

Smart infrastructure provides the foundation for all the key themes related to a smart city, including smart people, smart mobility, smart economy, smart living, smart governance and smart environment. The central characteristic that underlies most of these components is that they are connected and that they generate data, which may be used intelligently to ensure the optimal use of resources and improve performance. This section introduces some key components of smart city infrastructure and concludes by highlighting the need for a combined method in dealing with such infrastructure. Smart infrastructure includes following:

Smart Infrastructure involves applying this to economic infrastructure for the benefit of all stakeholders. It will allow owners and operators to get more out of what they already have, increasing capacity, efficiency and resilience and improving services.

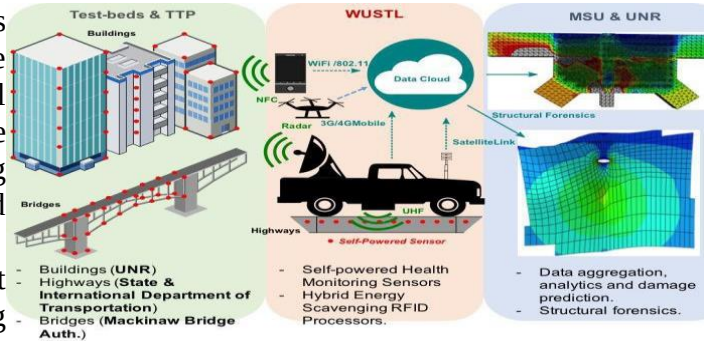


Figure 16 Smart Infrastructure

It brings better performance at lower cost. Gaining more from existing assets is the key to enhancing service provision despite constrained finance and growing resource scarcity.

It will often be more cost-effective to add to the overall value of mature infrastructure via digital enhancements than by physical enhancements – physical enhancements add `more of the same', whereas digital enhancements can transform the existing as well.

Data is the key – the ownership of it and the ability to understand and act on it. Industry, organizations and professionals need to be ready to adjust in order to take advantage of the emerging opportunities. Early adopters stand to gain the most benefit.

Everyone in the infrastructure sector has a choice as to how fast they respond to the changes that Smart Infrastructure will bring. But everyone will be affected. Change is inevitable. Progress is optional. Now is the time for the infrastructure industry to choose: to be Smart.

3.7 Cyber Security

Smart city technologies capture data relating to all forms of privacy and drastically expand the volume, range and granularity of the data being generated about people and places. Privacy can be threatened and breached by a number of practices which are normally treated as unacceptable, however are part of operations in a smart city eco system.

As mentioned previously, smart city technologies have large attack surfaces that have a number of vulnerabilities, especially in systems that contain legacy components using old software which has not been regularly patched. Technology solutions aim to use best practices to mitigate these risks and keep the data safe and secure.

The aim of the technological solutions is to reduce the attack surface as much as possible and to make the surface that is visible as robust and resilient as possible.

These solutions include:

1. End-to-end encryption
2. Strong password policy
3. Up-to date firewalls, anti-virus
4. Isolation of trusted resources from public resources
5. Implement manual over rides on all systems

3.8 District Cooling & Heating

District Cooling

District cooling is the cooling equivalent of district heating. Working on broadly similar principles to district heating, district cooling delivers chilled water to buildings like offices and factories needing cooling. In winter, the source for the cooling can often be sea water, so it is a cheaper resource than using electricity to run compressors for cooling.

District Heating

District heating is a system for distributing heat generated in a centralized location for residential and commercial heating requirements such as space heating and water heating. The heat is often obtained from a cogeneration plant burning fossil fuels but increasingly also biomass, although heat-only boiler stations, geothermal heating, heat pumps and central solar heating are also used, as well as nuclear power.

District heating plants can provide higher efficiencies and better pollution control than localized boilers. According to some research, district heating with combined heat and power (CHPDH) is the cheapest method of cutting carbon emissions, and has one of the lowest carbon footprints of all fossil generation plants.

3.9 Strategic Options for Fast Development

The strategic components of area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city. Below are given the Deion's of the three models of Area-based smart city development:

Retrofitting

Retrofitting will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and livable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected than more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. This strategy may also be completed in a shorter time frame, leading to its replication in another part of the city.

Redevelopment

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

Greenfield Development

Greenfield development will introduce most of the Smart Solutions in a previously vacant area which is more than 250 acres using innovative planning, plan financing and plan implementation tools with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population. One well known example is the GIFT City in Gujarat. Unlike retrofitting and redevelopment.

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

Climate change is predicted to cause significant in precipitation and temperature patterns, affecting the availability of water.

Population growth and urbanization are enforcing rapid changes leading to a dramatic increase in high-quality water consumption. Frequently, this demand for water cannot be satisfied by the locally available water resources, while the discharge of insufficiently treated wastewater increases costs for downstream users and has detrimental effects on the aquatic systems.

Urban Sanitation Challenges

More than 40% of the world's population lacks improved sanitation facilities, and India's urban sanitation coverage rate is only 50%.

Consequences of poor sanitation are devastating on human health and the environment.

Many urban areas provide access to toilets, yet often upkeep is lacking, seepage is not well managed, and sewerage is discharged untreated.

It must also ramp up the waste treatment facilities so that water bodies are not polluted by effluent discharge.

One of the major challenges for the government is to elevate India to the international levels of urban sanitation that is found in developed counties. - Health Risks Along the Entire Sanitation Chain

3.11 Initiatives in village development by local self-government

In the past "government as provider" approach, the priorities were to secure budget allocations and develop projects. The Housing Policy and the NCU statement implicitly give higher priority to two other requirements: first, the reform of policies and regulations that now inhibit development initiatives by the people; and second, more efficient resource management and the building of institutional capacity.

Resource Management and Institutional Development. As discussed in Section 5, India's urban institutions do not have the capacity to provide adequate services at present, let alone address the requirements of accelerated urban growth in the future. Proposals relate to three types of institutions.

3.12 Smart Initiatives by District Municipal Corporation

At present, Gandhinagar Municipal Corporation (GMC) is in the process of revising the Smart city proposal for second round participation.

Urban India faces an enormous challenge: managing its gigantic load of solid waste. It is not just a public health issue, but also turning out to be a serious law and order problem as people resort to violent methods to protest waste being dumped in their backyard. But cities simply do not have the space or the wherewithal to dispose of waste. The challenge is going to be tougher.

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

1. DRDA Administration
2. PradhanMantri Awas Yojana (Grameen)
3. MGNREGA-2005
4. National Social Assistance program
5. PradhanMantri Gram Sadak Yojana
6. Prime Minister Rural Development Fellowship

Projects/ schemes by private sector:

1. Ministry of Rural Development schemes
2. Non- Ministry of Rural Development schemes
3. Financing
4. Capital Grant under RURA

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

Integrated biomass and solar town concept for a smart eco village in Iskandar Malaysia (2014):

This paper presents a new integrated biomass and solar town concept that can serve as a global model for smart eco-villages in tropical countries. The proposed model considers actual operation constraints due to biomass availability, weather variation, and restriction of the thermal plant. The application of this new concept on the Iskandar Malaysia (IM) case study with an average daily demand load of 16,900 kWh/d revealed that a 417-kW direct-fired biomass power generator, 412 kW biogas thermal power plant, 136 kW solar photovoltaic (PV) modules, and sodium Sulphur battery with an energy capacity of 3046 kWh and power of 1530 kW were required. The annual cost of the integrated biomass and solar town was estimated to be approximately RM 3 million at an electricity cost of RM 0.48/kWh.

Village-level solar power in Africa: Accelerating access to electricity services through a socio-technical design in Kenya (2014):

Village-level solar power supply represents a promising potential for access to electricity services. The analysis includes the reasons for its socio-technical design, and the actual functioning of the model. The research shows that an energy centre model can cover basic electricity needs in areas with dispersed settlement patterns, where mini-grid based systems as well as conventional grid extension meet significant challenges. Close attention to the socio- cultural context and the challenges of users, operators and managers is required. Our research draws on theories of socio-technical change and users' innovation, and presents a five step analytical framework for analysis of village-level power provision.

Solar power energy solutions for Yemeni rural villages and desert communities (2016):

According to UNDP Policy Note 2014, only 23% of Yemen rural community have access to electricity – having connected to national grid or use small isolated generating units – while the country is one of the richest in solar energy with over 3000 h per year clean blue sky. Otherwise, energy poverty that is a facet of a multidimensional poverty in Yemen will persists because the possibility of connecting rural communities to the national grid, even in the next ten years, is invisible due to major political and financial problems that the country is facing. Moreover, PV energy is environmentally clean and has proved to be one of the best solutions for rural electrification in many countries worldwide due to noticeable drop of PV systems prices with the advance in PV technology. Accordingly, it should be the best solution for rural electrification in Yemeni as well. The paper demonstrates the cost effectiveness and the design procedure of utilization of solar energy for rural and desert communities in Yemen using a number of subsequent cases typical to Yemeni communities and provides also a practical study to support Bedouin backpackers.

3.15 Electrical concept

- Rural electrification under Minimum Needs Programme launched in1974
- Kutir Jyoti Yojana to provide single point light to below poverty level (BPL) families in.

DDUGJY AIMSAT

- Separation of agriculture and non-agriculture feeders.
- Strengthening and augmentation of sub-transmission and distribution infrastructure in rural areas including metering of distribution transformers feeders/consumers.

Technology

Renewable off-grid enterprises have emerged in many areas to meet the demand for electricity in rural communities.

Photovoltaics, Wind mechanical water pumps, Small wind electric, Diesel solar hybrid power systems: especially for telecommunications worldwide, Bio energy, Micro hydro is very widely implemented in Nepal, Vietnam, and China., Hybrid power is also widely used where a number of different technologies are combined to provide a single power source., LED street light with solar panel, Digital energy meter, Use of necessary device for reducing looses, Low cost with good quality wiring system infrastructure, Regular checkup & maintenance, Planned power distribution system , More use of LED Bulbs

Chapter 4
About Dungarpur Village

4.1 Introduction

4.1.1 Introduction About Dungarpur Village details

Dungarpur is a large village located in junagadh Taluka of Junagadh district, Gujarat with total 1084 families residing. The Dungarpur village has population of 5039 of which 2973 are males while 2813 are females as per Population Census 2011. In Dungarpur village population of children with age 0-6 is 715. 2644 are males and 2395 are females. Dungarpur village has lower literacy rate compared to Gujarat. In 2011, In Dungarpur Male literacy stands at 62% while female literacy rate was 44%. As per constitution of India and Panchyati Raaj Act, Dungarpur village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website, don't have information about schools and hospital in Dungarpur village.

Table 10 Dungarpur CESUS Data

Dungarpur - Village Overview	
Gram Panchayat :	Dungarpur
Block / Tehsil :	Junagadh
District :	Junagadh
State :	Gujarat
Pincode :	362263
Area :	5.36 km²
Population :	6648
Households :	465
Assembly Constituency :	Vishavadar
Parliament Constituency :	Junagadh
Nearest Railway Station & Distance :	Torniya, 0.49 km

Dungarpur 2011 Census Details

Dungarpur Local Language is Gujarati. Dungarpur Village Total population is 6648 and Female Population is 47%. Village literacy rate is 54.0% and the Female Literacy rate is 44%.

Table 11 Dungarpur Population Details

Census Parameter	Census Data
Total Population	5039
Total No of Houses	1059
Female Population %	47%
Total Literacy rate %	54%
Female Literacy rate	44%
Scheduled Tribes Population %	0.6% (31)
Scheduled Caste Population %	13.8 % (738)
Working Population %	48.3%
Child(0 -6) Population by 2011	715
Girl Child(0 -6) Population by 2011	342

4.1.2 Justification/ need of the study

The developmental work in villages that could undertake as per the need of the village in particular includes. Physical infrastructure facilities (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication & other), Social infrastructure facilities (Education, Health, Sanitation), Socio- Cultural Facilities (Community Hall, Library, Recreation Facilities &other) and Sustainable Infrastructures (Rain water harvesting, Biogas plant, Eco Toilets, Solar Street lights & other) for effective development of Villages. Vishwakarma Yojana has provided the platform for real world experience to engineering students and simultaneously applies their technical knowledge in the rural infrastructure development.

4.1.3 Study Area (Broadly define)

Dungarpur is a Village in Junagadh Taluka in Junagadh District of Gujarat State, India. It is located 10 KM towards west from District head-quarters Junagadh and 347 KM from State capital Gandhinagar. Dungarpur Pin code is 362263 and postal head office is Junagadh Joshipura

- Creation of infrastructure - connectivity, civic and social infrastructure along with provision of alternative Economy generation is the key pillars that the concept hinges on.
- Basic physical infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.
- Basic Social infrastructure – Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.

Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure. Reduce migration from rural to urban areas due to lack of basic services and sufficient economic activities in rural areas. Internal roads within village settlement, Efficient Mass Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc.

Identification of sanitation facilities that need improvement – sewerage and drainage line for household connection, door to door solid waste collection & dumping facilities. Electricity connections like street lighting that is energy efficient and eco- friendly Refurbishing of village lakes, water tanks and wells, construction of rain water harvesting structures for sustainable Development.

4.1.4 Objectives of the study

Following are the various objectives of the study:

- To collect data through techno-economic survey of Dungarpur village and analyze basic social and physical infrastructure.
- To analyze existing public infrastructure.
- To promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.
- To reduce migration from rural to urban areas due to lack of basic services and sufficient economic activities in rural areas.

4.1.5 Scope of the Study

The study will focus the development trend, intensity of growth of the village, and find out the problems related to the physical development of the area and infrastructure services of the village. Project proposal and sustainability aspect not consider in micro level, it is only guide way. The study focused to only village Dungarpur. It can be development of the village for basic facility. Whole area and people to change the improving. Population growth high to development village and their rural area compare to the urban area. It is very essential to develop village because India‘s development depends upon the progress of the villages. India is agriculture country and poverty can be removed through improvement in agriculture. Solutions of rural problems can bring the change in the rural society.

4.1.6 Methodology Frame Work for development of your village

Visits for Techno-economic survey of village we took the visit of the DUNGARPUR village Interaction and Inquiry. During our first visit, we met DDO, Serpanch, TDO etc. we have asked about basic amenities like drinking water, electrification, sanitation, transport, health, education etc. By this interaction, we got information about basic amenities of village.

Survey: We visited the village and during our reconnaissance survey, we found sanitation, health, electrification and post office, bank, community hall, and many amenities are there in the village (Photographs attached in annexure). We collected all data and photographs of all amenities and collect requirements and query of all local people and their leader.

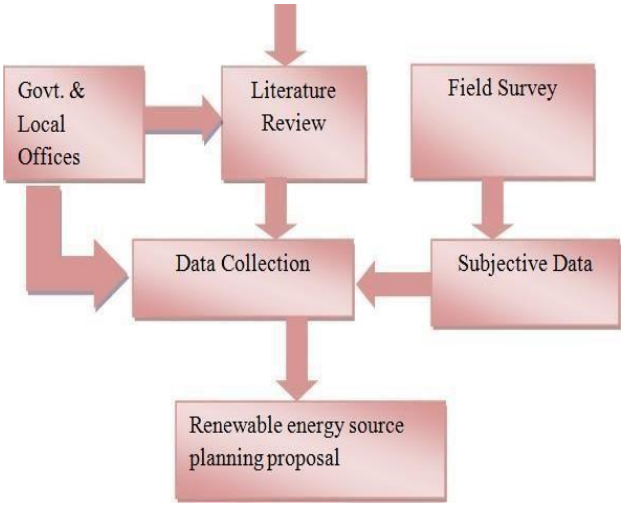


Figure 15 Methodology Framework

4.1.7 Available Methodology for development of related to Civil/Electrical

Civil:

Solid Waste Management facilities	Gram Panchayat Building
Water Tank facilities	School Building
Storm Water network	Sanitation available

Electrical:
Other Renewable
House hold electricity
Use of non-conventional energy sources
Electricity Networks
Street light facilities
Electrical wiring method

4.2 Dungarpur Study Area Profile

4.2.1 Study Area Location with brief History land use details

Dungarpur

Block / Tehsil → Junagadh
District → Junagadh
State → Gujarat

About Dungarpur

According to Census 2011 information the location code or village code of Dungarpur village is 159358. Dungarpur village is located in Junagadh Tehsil of Junagadh district in Gujarat, India. It is situated 12 km towards South from District headquarters Junagadh. 9 Km from 348 km from State capital Gandhiagar. As per 2009 stats, Dungarpur village is also a gram panchayat. Dungarpur Pin code is 362263 and postal head office is Bagdu.

Anandpur (3 KM), Vijapur (3 KM), Padariya (3 KM), Intala (4 KM), Salatha (4 KM) are the nearby Villages to Dungarpur. Dungarpur is surrounded by Vanthali Taluka towards west, Mendarda Taluka towards South, Visavadar Taluka towards East, Bhesan Taluka towards East: Junagadh, Keshod, Manavadar, Upleta are the nearby Cities to Dungarpur.

4.2.2 Base Location map, Land Map, Gram Tal Map

Figure 18 Dungarpur Satellite Map

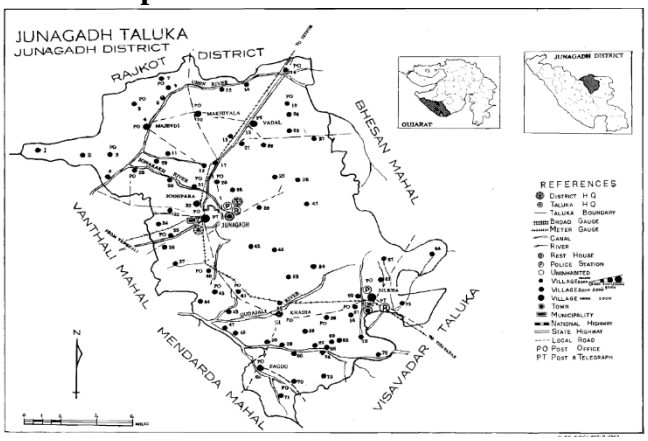


Figure 19 Gram Tal Map

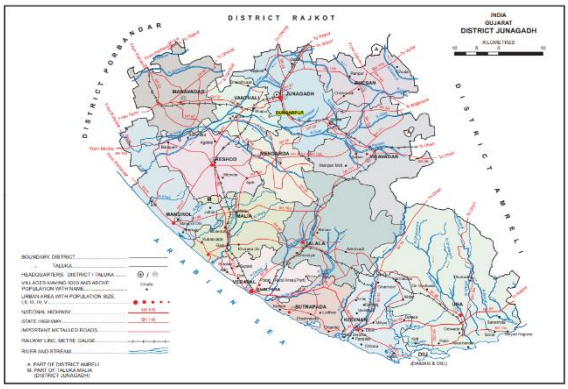


Figure 20 District Map

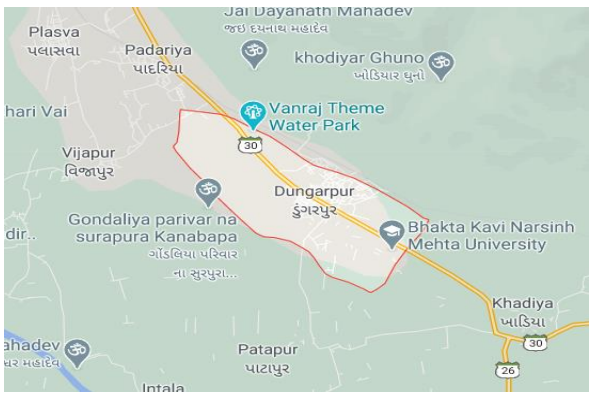


Figure 21 Dungarpur Map

4.2.3 Physical & Demographical Growth

Dungarpur is a large village located in Junagadh Taluka of Junagadh district, Gujarat with total 1059 families residing. The Dungarpur village has population of 5039 of which 2644 are males while 2395 are females as per Population Census2011. In Dungarpur village population of children with age 0-6 is 715. Dungarpur village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Dungarpur village was 54 % compared to 78.03 % of Gujarat. In Dungarpur Male literacy stands at 62% while female literacy rate was 44%.

Table 12 Census – Physical & Demographic Data

Census Parameter	Census Data
Total Population	5039
Total No of Houses	1059
Female Population %	47%
Total Literacy rate %	54%
Female Literacy rate	44%
Scheduled Tribes Population %	0.6% (31)
Scheduled Caste Population %	13.8 % (738)
Working Population %	48.3%
Child(0 -6) Population by 2011	715
Girl Child(0 -6) Population by 2011	342

4.2.4 Economic generation profile / Banks

About the economic profile of this village, most of the villagers are interested in farming and labor work. The village doesn't have any better facilities regarding infrastructure but has good electrification system which distributed 24*7 hours for domestic use and 8 hours for agricultural use. Agriculture is the main occupation of Dungarpur Village. Majority crops taken in the village are wheat, gram and groundnut. Some of the peoples are also running their stores. Dairy and milk production are the secondary source of income.

Table 13 HOUSE OWNERSHIP, LAND OWNERSHIP, MONTHLY INCOME

	House Ownership			Land Owned			Households with Highest Earning member Income as		
Village	**Owned**	**Rented**	**Any Other**	**Total unirrigated land (in hectares)**	**Total irrigated land (in hectares)**	**Total other irrigated land (in hectares)**	**Less than Rs. 5,000**	**Between Rs. 5,000 and Rs 10,000**	**Rs. 10,000 or more**
Dungarpur	770	157	0	0.00	0.00	0.00	944	12	5
Padariya	380	29	11	177.50	134	69.00	402	13	7
Total	**1150**	**186**	**11**	**177.50**	**134**	**69.00**	**1346**	**25**	**12**

Table 14 MAIN SOURCE OF HOUSEHOLD INCOME

Village	Cultivation	Manual Casual Labour	Part-time or Full-Time Domestic Service	Foraging Rag Picking	Non-agricultural Own Account Enterprise	Begging/Charity/ Alms collection	Others
Dungarpur	12	914	10	0	0	8	17
Padariya	7	398	1	0	1	0	15
Total	**19**	**1312**	**11**	**0**	**1**	**8**	**32**

4.2.5 Actual Problem faced by Villagers and smart solution

Table 15 Problems faced in different domain and Suggestions

Village:Dungarpur		Strength		Moderate Gap		Critical Gap
Domain	**Parameter Description**	**Village Status**	**Status of Gram Panchayat**			**Suggestions**
Agriculture	Number of households engaged majorly in Non-Farmactivities	51 [10.67%]	651			Contact the Block Mission Manager, National Rural Livelihood Mission of yourstate.
	Availability of governmentseed centres	Yes	Yes			
	Whether this village is a partof the Watershed Development Project	Yes	Yes			
	Availability of Community Rain Water Harvesting System/Pond/Dam/Check Dam etc.	Yes	Yes			
	Does the village has any Farmers Collective	Both	Both			
	Availability of warehouse forFood Grain Storage	Yes	Yes			
	Availability of Primary Processing facilities at thevillage level	Yes	Yes			
	Does the village have accessto Custom Hiring Centre (Agri-equipments)	Yes	Yes			
Land Improvement &Minor Irrigation	Availability of soil testingcentres	No	Yes			Anyone from the village canopen soil testing centre.
	Availability of fertilizer shop	Yes	Yes			
	Main Source of irrigation	Ground water (tube well)	Ground water (tube well/pump)			
	Number of farmers using drip/sprinkler irrigation	12[7.27%]	14[1.12%]			
	Total area irrigated (in hectare), If in acres divide by2.47	17[10.30%]	29[8.19%]			Call Kisan call centre 1800-180-1551.
Animal Husbandry	Does the village have Livestock Extension services	PashuSakhi/ Pashu Mitra	PashuSakhi/Pashu Mitra			Call agriculture helpline1094 for details
	Availability of Milk CollectionCentre /Milk routes / ChillingCentres	Yes	Yes			
	Any Project supporting Poultry Development	No	No			
	Any Project supporting Goatary Development	No	Yes			
	Any Project supporting PigeryDevelopment	No	No			
	Availability of Veterinary Clinic or Hospital	Yes	Yes			

Rural Housing	No of household with kucchawall and kuccha roof (KutchaWall is Grass/thatch/bamboo etc, Plastic/polythene, Mud/ unburnt brick ,Wood, Stone not packed with mortar,Kutcha Roof is Grass/ thatch/ bamboo/ wood/ mud etc, Plastic/ polythene, Hand made tiles	35[7.32%]	255[16.33%]		Check the waiting list forPMAY-G.
Drinking Water	Availability of Piped tap water	100% habitations covered			
Roads	Whether the village is connected to All weather road	Yes	Yes		
	Whether village has internalpucca roads (cc/ brick road)	Fully covered			MGNREGA can be used to create internal cc/brick road.
	Availability of Public Transport	Bus	Bus		
	Availability of Railway Station	No (Nearest facility(2-5 kms)	No (Nearestfacility <1 km)		
Rural Electrification	Availability of electricity fordomestic use	>12 hrs			Renewable electricity equipments can be used atsusidized rates.
Non Conventional Energy	Use of Solar Energy/Wind Energy for electrification ofthe house	No	Yes		
Maintenance of Community Assets	Availability of PanchayatBhawan	Yes	Yes		
	Is there a Common ServiceCentre (CSC) in the village	Colocated with Panchayat Bhawan	Colocated with Panchayat Bhawan		
	Availability of Public Information Board underPeople's Plan Campaign	Available and updated	Available and updated		
Fuel & Fodder	Common pastures as perrevenue records	No	No		
Libraries	Availability of Public Library	Yes	Yes		
Cultural Activities	Availability of recreational centre/Sports Playground etc	Both	Both		
Financial & Communication Infrastructure	Availability of banks	Yes	Yes		
	Availability of Business Correspondent with internetconnectivity?	Yes	NA		
	Availability of ATM	Yes	Yes		
	Availability of Post office/Sub-Post office	Yes	Yes		
	Availability of telephoneservices	Both	Both		

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

Table 16 Social Scenario

Social Security	No of beneficiaries receiving benefits under Pradhan Mantri Matru Vandana Yojana	10[100.00%]
	No. of beneficiaries receiving benefits under Aayushman Bharat-Pradhan Mantri Jan Arogya Yojana or any State Govt Health scheme	0 [0.00%]
	Total no of households receiving food grains from Fair Price Shops	0 [0.00%]
	Total number of farmers in the age of 18-40 years subscribed to Pradhan MantriKisan Pension Yojana (PMKPY)	0 [0.00%]

4.2.7 Migration Reasons / Trends

This question was asked of that person who had come from elsewhere to reside at the place of enumeration. The code used are: Work/employment-1, Business-2, Education-3, Marriage-4, Moved after birth-5, Moved with household-6 and Any other-7. The reason for migration was determined as applicable at the time of migration and not in reference to any point of time after that. For example, if a person had moved from the place of her/his last residence for the purpose of education and subsequently at some point of time got employment there only, the reason for migration was taken to be 'education' and not 'work/employment'. Migration Reasons as per the data available in Village Profile & Taluka Planning Atlas:

1. Number of families who have migrated from village to village/city to get higher education are 200.
2. Number of families who have migrated from village to other place in the country are 55.
3. Number of families who have migrated from village to out of the country are 25.

Other reasons: Lack of physical and infrastructure facilities in the village like community hall, bank, PHC, etc.

Migration Trend:

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

4.3 Data Collection Dungarpur Village (Photograph/Graphs/Charts/Table)

4.3.1 Describe Methods for data collection

First, we are going to village. And meet the locality person and discuss about the village condition. Like drinking water, drainage facility, waste disposal, etc. Then we are going to gram panchayat of village. And meet the Sarpanch and Talati Mantri of village. Then discuss about village with Sarpanch and Talati Mantri. Like facilities, infrastructures, water supply, electricity, etc. this data gives the Sarpanch and Talati Mantri of the village. We are showing the village and observed village condition.

Data collection is done by filling two forms namely:

1. Techno-economic survey form
2. Smart village survey form

4.3.2 Primary details of survey details

Dungarpur is village in Vanthali Taluka. This Taluka is located on latitude 21.4454° N and on longitude 70.4938° E. We had study about the basic amenities by in different category like education, social life, primary amenities, transportation facilities and economic growth of the village. Dungarpur Pin code is 362263 and postal head office is Joshipura.

As per constitution of India and Panchyati Raaj Act, Dungarpur village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website, don't have information about schools and hospital in Dungarpur village.

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

In Dungarpur: Average size of the house in the village is 30 * 30 foot.

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

4.3.4 No of Human being in One House

Total number of populations in Dungarpur is 6648 as per census. There are different number of people in each house as there are nuclear families as well as joint families, but the average no of human beings in one house is 5.

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

The materials low cost floor materials, stones, Mood flooring, Wooden floor, Cement floor, Mosaic Tile floor and other agricultural cereals are used locally as they are locally easily available.

4.3.6 Geographical Detail

Time zone:
IST (UTC+5:30)

Elevation / Altitude:
86 meters. Above Seal level

Latitude:
21.4454° N

Longitude:
70.4938° E

Figure 22 Dungarpur Geographical Map

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

Table 17 CESUS 2011 Demographical Details

Village	Total Population	SC Population	ST Population	Male	Female
Dungarpur (CT)	4590	481	52	2433	2157
Padariya	2058	640	191	1081	977
Total	**6648**	**1121**	**243**	**3514**	**3134**

4.3.8 Occupational Detail - Occupation wise Details / Majority business

Major occupation of the village is farming so there are no more locally material available. So, this material is brought from the nearest city for the construction of houses and they also do following,

Table 18 Occupational Detail

Village	Cultivation	Manual Casual Labour	Part-time or Full-Time Domestic Service	Foraging Rag Picking	Non-agricultural Own Account Enterprise	Begging/ Charity/ Alms collection	Others
Dungarpur (CT)	12	914	10	0	0	8	17
Padariya	7	398	1	0	1	0	15
Total	**19**	**1312**	**11**	**0**	**1**	**8**	**32**

4.3.9 Agricultural Details / Organic Farming / Fishery

There major crops in the village is like a Kharif Crop and Rabi Crops

Kharif Crops:

In Village Kharif Crop is sown in June-July when rains first begin (Monsoon crop). Harvested in September-October. Requires lot of water and hot weather to grow.

Example: Rice, Jowar, Bajra, Maize, Cotton, Groundnut, Jute, Sugarcane, Turmeric, Pulses (like Urad Dal) etc

Rabi Crops

In Village Rabi Crop Sown in October-November Harvested in April-May. Requires warm climate for germination of seeds and maturation and cold climate for the growth.

Example: Wheat, Oat, Gram, Pea, Barley, Potato, Tomato, Onion, Oil seeds (like Rapeseed, Sunflower, Sesame, Mustard) etc.

Organic farming is a technique, which involves the cultivation of plants and rearing of animals in natural ways. This process involves the use of biological materials, avoiding synthetic substances to maintain soil fertility and ecological balance thereby minimizing pollution and wastage.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses

There is no Manufacturing HUB or Ware House in the village.

4.3.11 Tourism development available in the village for attracting the tourist

There is no tourism cluster in the village.

4.4 Infrastructure Details (With Exiting Village Photograph)

Figure 23 Dungarpur Sports Gate

Figure 24 Dungarpur Water Tank

Figure 25 Dungarpur PHC

4.4.1 Drinking Water / Water Management Facilities

Availability of Piped tap water, for drinking purpose there are two overhead water tanks in Dungarpur village. One overhead tank has 50000 liters of capacity and other tank is of 20000 liters of capacity. Water is supplied through underground pipes to the houses.

4.4.2 Drainage Network / Sanitation Facilities

In Dungarpur village there is less drainage network. Therefore, the people make own drainage sumps in front of house. The solid waste thrown in outside of village and liquid waste flow though out by sumps.

In village some place drainage systems are available is in good condition. A drainage network is open and pucca and drain water is discharge directly in strip.

There required some place to build a drainage system.

4.4.3 Transportation & Road Network

In village their internal road network is bad condition. Some internal streets is and c.c road.. Village approach road is bitumen pucca road. That is approx 10 km. nearest Junagadh – Somnath highway. Some internal road is poor condition that required maintenance

For Local Transportation Public uses Auto, Chhakda and private vehicles for locally transportation. Bus station has bad condition and location also. As per our point of view, we can say Bus station is not at present, coz its condition is poor to that situation, where people does not use it and it is not in condition to use.

.4.4.4 Housing condition

The house condition is 60% of kutcha and 40% of pucca approximate. But all house condition is well & good and also some house condition is very bad. Total number of houses is 1067. [27.10%] and No of households having piped water connection 465[100.00%]

Figure 26 Housing Conditions

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

Health Facilities: There is a Public Health Centre in the village.

Education Facilities: There are 2 Government primary schools and a private primary school. There is government secondary and higher secondary school in the village.

Community Hall: There is no community hall in the village.

Library: There is no public library in the village.

Figure 27 Aayushman Bharat Health Center Dungarpur

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

Existing condition of the public buildings are in good condition.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

Most of the people in the village use smart phones. There is good network coverage in the residential area of the village. There is no Wi-Fi in the village.

4.4.8 Sports Activity as Gram Panchayat

There is no sports activity by the gram panchayat. Khel Mahakumbh registration is available in gram panchayat are participated in various competitions.

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

There is no other socio-cultural facility available at village. There is one community hall in the village , it is in normal condition. There is no any public library available in the village. There are lack of public Garden, Park and play ground.

Small size of lake is available in the vilage. Gramin post office is also available in the village. But they are not have seprate building. All post office work is done in one house building.

4.5 Electrical Concept

4.5.1 Renewable energy source planning particularly for villages

Figure 28 Renewable Energy

Nearly 73 % of India's population lives in more than 5.5 lakh villages. The ministry has been supporting programs for the use of renewable energy products and devices such as biogas plants, solar thermal systems, photovoltaic devices, biomass gasifiers, etc. as well as the Integrated Rural Energy Programme. Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth. Included in the definition is electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources. Renewable energy source plans like Biogas

power generation, storing of rain water by rainwater harvesting system, use of solar energy, use of wind power etc. may be used. These renewable energies may be used for power generation, heating and for transportation purpose.

4.5.2 Irrigation Facilities

Irrigation is the application of controlled amounts of water to plants at needed intervals. **Irrigation** helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall.

The main sources of irrigation are canal, bore and well. Although there mostly private bore and well are available and also there village is near to madhuvanti river. Then water is adequate.

4.5.3 Electricity Facilities with Area

In the Dungarpur village the no local source of electrical energy is available. Source of Electricalenergy is only one that is Governmental electrical energy which is supplied from substation. Under the Jyoti gram Yojana government provide 24hour power supply to respective village power produced GETCO and distribute by PGVCL (private sector). Electricity is the basic need for the better facilities.

4.6 Existing Institution like - Village Administration – Detail Profile

4.6.1 Bachat Mandali

Bachat Mandali is a kind of organization in which villagers invest their money. Bachat Mandali provides facilities almost similar to bank. Villagers can invest their money in bachat mandali and withdraw their money whenever they want. There is no Bachat Mandali.

4.6.2 Dudh Mandali

Dudh Mandali is a kind of organization in village‘s people all milk are collect in the village and after its distributed various milk refinery. There is one Dudh mandali.

4.6.3 Mahila forum

Mahila Mandalas are voluntary service organizations which work for the betterment ofthe women in the villages of India. These rural women are interested in working together with the help of Gram Sevikas, Mukhya Sevikas, Supervisor, and Program Officer. No mahila forum founded in village.

4.6.4 Plantation for the Air Pollution

To make self-reliant and conscious of their human and constitutional rights and to put pressure on the state for fulfilling its obligation towards its people.

4.6.5 Rain Water Harvesting - Waste Water Recycling

Rain water harvesting is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). One method of rainwater harvesting is roof to harvesting. There is availability of Community Rain Water Harvesting System/Pond/Dam/Check Dam etc.

4.6.6 Agricultural Development

Agriculture development means providing assistance to the crop producers with the help of various agricultural resources. Providing protection, assisting in the research sphere, employing latest techniques, controlling pests and facilitating diversity all fall within the purview of agriculture development.

Chapter 5
Sustainable Technical Options with Case Studies of the Existing Village

5.1 Concept (Civil)

5.1.1 Advance construction techniques

The construction industry is repeatedly criticized for being inefficient and slow to innovate. The basic methods of construction, techniques and technologies have changed little since Roman times. But the application of innovation in the 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 personnel and machinery. In addition, the weather and other factors can prevent the application of previous experience effectively. The term 'Advanced Construction Technology' covers a wide range of modern techniques and practices that encompass the latest developments in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and design, and management studies. Incorporating advanced construction technology into practice can increase levels of quality, efficiency, safety, sustainability and value for money. However, there is often a conflict between traditional industry methods and innovative new practices, and this is often blamed for the relatively slow rate of technology transfer within the industry. The adoption of advanced construction technology requires an appropriate design, commitment from the whole project team, suitable procurement strategies, good quality control, appropriate training and careful commissioning. Advanced construction technologies are commonly described as including (amongst many others) advanced forms of:

- 3D printing. Materials.
- Building information modeling (BIM). Cladding systems.
- Computer aided design and computer aided manufacturing (CAD/CAM).
- Computer numerical control.
-

5.1.2 Causes Prevention and Repair of Cracks in Building / rectification of building tilt / rehabilitation techniques

Understanding the cracks: Generally, cracks can be divided into two types:

1. Structural cracks 2. Non-structural cracks.

1. Structural Cracks may rise due to various reasons such as in correct design, overloading of the structural components. Structural cracks endanger the stability of the building and may be difficult to be rectified.

2. Non-structural cracks (Hair cracks) are generally due to internal forces developed in the building materials due to moisture variation, temperature changes and suitable remedial measures can be taken to control it. Cracks may appreciably vary in width from very thin hair crack barely visible to naked eye to gaping crack. Depending upon the crack width, the cracks are classified as:

a. Thin Crack -less than 1 mm in width.
b. Medium Crack -1 to 2 mm in width.
c. Wide Crack -more than 2 mm in width.
d. Crazing – Occurrence of closely spaced fine cracks at the surface of a material is called crazing. Crazing is the development of a network of fine random cracks on the surface of concrete or mortar caused by shrinkage of the surface layer.

5.1.3 Disaster management in natural calamities

Disaster management in India refers to conservation of lives and property during a natural and man-made disaster. Disaster management plans are multi-layered and are planned to address issues such as floods, hurricanes, fires, mass failure of utilities and the rapid spread

of disease. India is especially vulnerable to natural disasters because of its unique geo-climatic conditions, having recurrent floods, droughts, cyclones, earthquakes, and landslides.

National Disaster Management Act 2005: National Disaster Management Act, 2005 defines events that cause substantial less of life, prosperity and environment. It read, "Disaster means catastrophe, mishap, calamity or grave occurrence in any area, arising from nature or man-made causes, or by accident or negligence which result in substantial loss of life, of human suffering or damage to, and destruction of property, or damage to, or degradation of environment, and is of such nature or magnitude as to be beyond the coping capacity of the community of affected areas." About 60 percent of landmass in India is prone to earthquakes of various intensities, over – 40 million hectares is prone to floods, about 8 percent of the total area is prone to cyclones and 68 percent of area is susceptible to drought. Disaster management Act, 2005 defines Disaster Management as, a continuous cycle and integrated process of planning, organizing, coordinating and implementing, coordinating and implementing measures which are necessary or expedient for-

(i) Prevention of danger or threat of any disaster;
(ii) Mitigation or reduction of risk of any disaster or its severity or consequences;
(iii) Capacity-building;
(iv) Preparedness to deal with any disaster;
(v) Prompt response to any threatening disaster situation or disaster;
(vi) Assessing the severity or magnitude of effects of any disaster;
(vii) Evacuation, rescue and relief;
(viii) Rehabilitation and Reconstruction. Disaster Management Amendment Bill, 2006 aims at broadening the meaning of Disaster in Disaster Management Act.

5.1.4 Various types of Roads / Intelligent transport system

A. Classification of Roads Based in India

1. National highways.
2. State highways.
3. District highways.
4. Major district roads.
5. Minor district roads.
6. Village roads.

B. Intelligent Transport System

Intelligent transportation system (ITS) is the application of sensing, analysis, control and communications technologies to ground transportation in order to improve safety, mobility and efficiency. ITS includes a wide range of applications that process and share information to ease congestion, improve traffic management, minimize environmental impact and increase the benefits of transportation to commercial users and the public in general.

ITS, which is part of the Internet of Things, includes vehicle-to-vehicle (V2V) and vehicle- to- infrastructure (V2I) technology and incorporates both wireless and wire line communications-based information and electronics technologies. Wireless technology is used to connect vehicle information and location to other vehicles, other transportation modes (such as pedestrians or bicyclists), local infrastructure and remote infrastructure in the cloud.

ITS is having a significant effect on transportation in applications such as electronic toll collection, ramp meters, traffic light cameras, traffic-signal coordination, transit signal priority and traveler-information systems. The adoption of ITS is expected to increase in applications such as fleet monitoring, tolling management, ticket management, transportation pricing, telematics and traffic monitoring. Key beneficiaries of ITS safety improvements as well as the availability of real-time information and analytics are travelers, businesses and transportation agencies. Data from ITS also has homeland security applications.

Floating car data/floating cellular data: Triangulation method. Vehicle re-identification GPS based methods Smartphone-based rich monitoring.

Sensing technologies: Inductive loop detection Video vehicle detection Bluetooth detection information fusion from multiple traffic sensing modalities

5.1.5 Various type of Environmental Factors

External factors and loads influence and impact the life and quality of structures and buildings. Forces of nature are some of the harshest tests that these structures are subjected to. From different kinds of wind loads to seismic loads, effects of corrosion and solar radiation – there are many factors to consider in the engineering and design of buildings and structures.

1. Wind Effects on Structures:

Wind is a powerful force that has a great deal of effect on structures. There are two broad types of effects of wind on structures: static and dynamic. The static load mainly leads to elastic bending and twisting of structure. Dynamic analysis of wind is required for skyscrapers, taller, long-span and slender structures. This is because gusts of wind cause fluctuating forces on the structure that induce large dynamic motion, including oscillations.

2. Impact of Solar Radiation, Corrosion, Wind on Civil Structures:

In contemporary architecture, tall buildings and skyscrapers have increasingly complex design and scale that puts them at a greater risk to wind effects and induced forces on the structure. How various structures respond to wind depends on the characteristics of wind. With taller structures that have high aspect ratios, it is vital to analyze the unsteady vortex shedding because this can cause oscillating cross wind forces with a certain frequency. And if this coincides with the natural frequency of the structure then it could lead to a lot of damage or even structural failure. Thus, the architectural, civil and structural design engineers must create a safe, sustainable and cost- efficient design with the help of wind engineering skills and studies. Wind engineering is an industry standard and is used to first review the dynamic impact of wind on structures and also understand the ways in which design can be optimized to mitigate the effect.

3. Impact of Corrosion on Structural Integrity:

Put simply, corrosion is the damage to metals over a period of time because of their reaction with the environment. For civil and structural engineers, corrosion is not simply an aesthetic issue; it causes severe damage and deterioration to buildings, bridges, equipment and pipelines. While the metal components on the exterior of the building are more prone to atmospheric damage and corrosion, the effect of corrosion on all the metal elements especially within the building – like foundation and structural walls – is equally bad.

If suitable corrosion control and prevention measures are not applied, corrosion can lead to irreparable structural damage and serious problems in the long-term. Whilst most corroded elements and structures can be salvaged or replaced, the cost is prohibitive. This is mainly why best practice recommends contractors to exercise a preventive approach. During project planning and design stages, structural engineers must look into the site data sheets or environmental studies documents and specifications along with the metal components and coating systems ‘survivability given the environment factors. Corrosion in building structures can diminish the overall value of various buildings because it can result in: Thinning of metals used, leading to loss of mechanical strength, damages and ultimately failure. Environmental damage: leaking pipes, fuel tanks and vessels can have grave consequences on public health and the entire ecosystem.

4. Corrosion of Steel in Concrete:

Concrete is a secure protective layer for steel and prevents corrosion and rusting of steel. Owing to high initial alkalinity, a thin passive film of ferric oxide is automatically formed on the steel surface. It is this layer, however thin, that protects steel from corrosion. However, once the environment loses its alkalinity, the layer is no longer effective and the steel starts corroding. To maintain the alkalinity of the environment, the concrete needs to be impermeable. The following preventive measures can be taken to mitigate corrosion:

- Ensure reinforcement is not heavily congested specifically at the intersection of beams and columns.
- Prevent steel from coming in contact with soil, wood, bricks and other porous non-alkaline substances. Use materials sensibly, avoiding those that promote the corrosion process that is aggregates with high salt, water containing high salt etc.
- Best-in-class structural design practices with provision of cover Giving cathodic protection to reinforcements.
- Corrosive resistant surface coatings with paints, tars, asphalts, etc. Using high grade, impermeable concrete. Correct water-cement ratio.

5. Effect of Solar Radiation on Buildings:

Solar radiation or UV rays are the energy from the sun. The quantity of solar radiation on a particular site depends on the location – that is latitude and sunlight hours in that area.

UV radiation impacts the durability of many building materials. The paints fade, plastic- based materials become brittle, timber twists and moves, and expansion and contraction owing to heating and cooling causes stress on various materials, so UV radiation is an important consideration in the building ‘s sustainability. Engineers must choose materials with a higher UV index number as they have higher resistance to UV degradation.

5.1.6 E – waste disposal / Any West disposal

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery, or disposal are also considered e-waste. Informal processing of e-waste in developing countries can lead to adverse human health effects and environmental pollution. Electronic scrap components, such as CPUs, contain potentially harmful materials such as lead, cadmium, beryllium, or brominates flame retardants. Electronic waste is emerging as a serious public health and environmental issue in India. India is the “fifth largest electronic waste producer in the world”; approximately 2 million tons of e-waste are generated annually. E-waste is a popular, informal name for electronic products nearing the end of their “useful life.” Computers, televisions, VCRs, stereos, copiers, and fax machines are common electronic products. Many of these products can be reused, refurbished, or recycled. There is an up gradation done to this E-waste garbage list which includes gadgets like Smartphone, tablets, laptops, video game consoles, cameras and many more.

5.1.7 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Mechanism of Corrosion

The corrosion process that takes place in concrete is electrochemical in nature. Corrosion will result in the flow of electrons between anodic and catholic sites on the rebar. For corrosion to occur, four basic elements are required:

- Anode – site where corrosion occurs and current flows from.
- Cathode – site where no corrosion occurs and current flows to.
- Electrolyte – a medium capable of conducting electric current by ionic current flow(i.e. soil, water or concrete).
- Metallic Path – connection between the anode and cathode, which allows the current return and completes the circuit.

The anode is the location on a steel reinforcing bar where corrosion is taking place and metal is being lost. At the anode, iron atoms lose electrons to become iron ions (Fe+2). This oxidation reaction is referred to as the anodic reaction. The cathode is the location on a steel reinforcing bar where metal is not consumed. At the cathode, oxygen in the presence of water, accepts electrons to form hydroxyl ions (OH-). This reduction reaction is referred to as the

5.1.8 Case Study On Race course Ring Road, Rajkot

Site Description:

Race Course is a large ground located in the heart of Rajkot. The place is ideal for strolls in the morning, as well as night. The main attractions in this place include the Children's Traffic Park, Fun World, and Baal Bhavan. Apart from this, it also provides sports facilities like an indoor stadium, a cricket ground, hockey ground, football and volley ball grounds, gym, swimming pool and more. It also has large seating arrangement with cement benches embedded on its border.

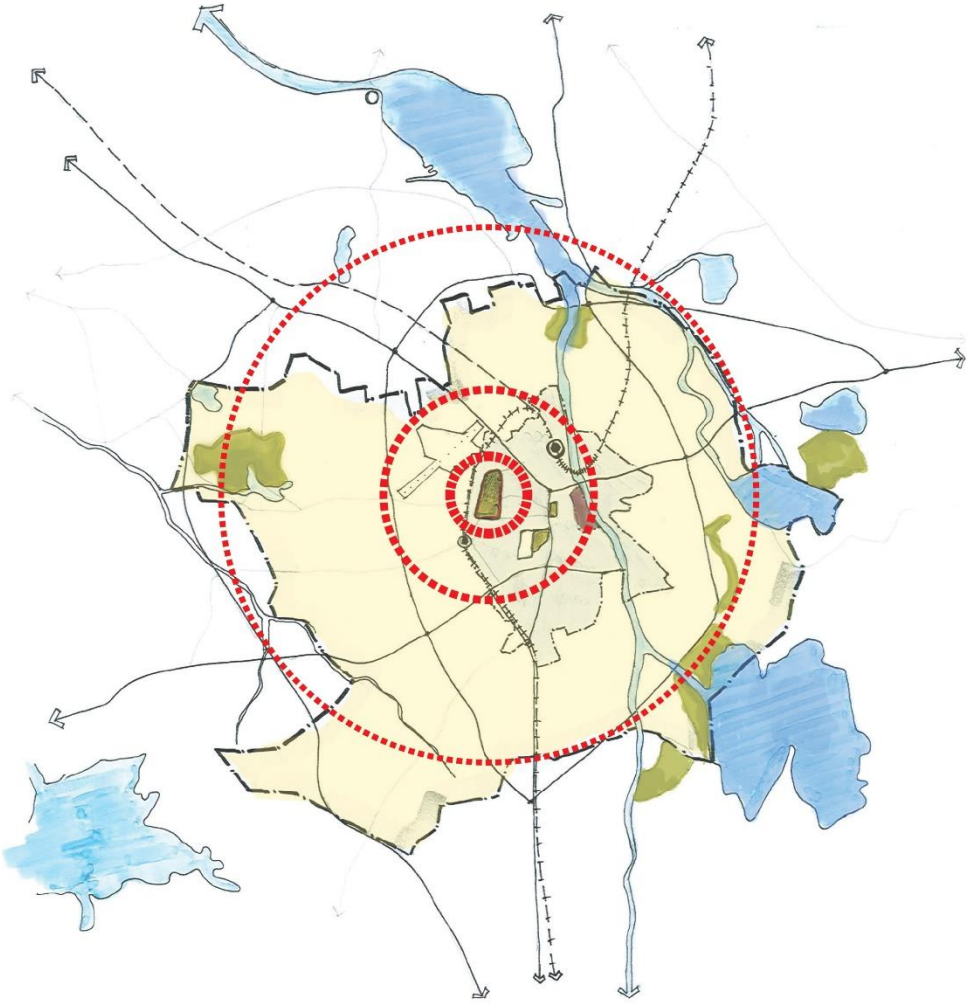
Project Requirements:

Said by Commissioner of Police H.P. Singh (IPS Rajkot City): "My dream & vision is to have entire city of Rajkot covered with CCTV camera. This would indeed decrease the rate of crime because then you can catch criminals more easily. Also it creates an awareness in minds of An ISO 9001:2008 Certified Company (Design) people that they are being watched all the time, so that they would think twice before committing any crime.Commissioner of Police, Rajkot wanted to establish electronic safety security surveillance system with high definition day & night camera system with locations of cameras identified by Proeyetech Elektrotekniks Pvt Ltd., where the cameras will cover all the entry and exit of Race Course Ring Road, Rajkot to catch any thief from stealing vehicles, terror, maintaining & increasing strength on traffic rules and public safety & security at the time of any festivals held.

Photographs

Problem Faced & Area of Concerns:

As the majority of locations were long distances from the Commissioner of Police Building where Central Monitoring Station room is established, a traditional copper wired co-axial video system was cost prohibitive and impractical to implement.



Solution Provided:

Thanks to Proeyetech Elektrotekniks Pvt. Ltd. who designed the solution with Armored Fiber Optic network & Wireless Point 2 Point connectivity technology to ensure 0% down time and 100% security, the decision was made to use real time crispy and sharp High Definition (HD) fixed day & night video cameras to recognize faces and capture vehicles with identified number plates, including High Definition (HD) Pan Tilt Zoom cameras which can be moved manual as well as automatically to monitor a single person or in a group to cover complete range of vehicles or any pedestrian persons with a 500 meters of distance, complete 360o of continuous rotation, and 90o from ground to top can be covered within day as well as in night time.

A well-organized user oriented CCTV Monitoring and Surveillance System which is established with help of senior & expertize personals, which helps the police officers of Commissioner of Police office to monitor & control the public during peak times and festival times.

24×7 monitoring and capacity for 30 days of recording.

Cost effective method for monitoring large scale site.

Backboned with Fiber Optic ring network with 1000MBPs connectivity and Wireless Network to ensure 0% down time error.

Real time video recording and network transmission with more than 20 users' connectivity at the same time.

Effective event handling and professional visual alarm verification with Electronic Camera Mapping Function.

Scope of the Project:

With heightened internal security issues facing many organizations, the demands for cost-effective and reliable CCTV surveillance in and around large sites, such as city surveillance has never been higher. The need for remote surveillance and central control of large area operations is increasingly important to ensure a rapid, co-ordinate response in the event of an incident. Viewing multiple HD cameras in a central security control room from around a sprawling complex requires vast amounts of cable and equipment. IP-HD Video has established itself as a reliable, high-quality cost-efficient alternative technology for CCTV surveillance, replacing multiple runs of video cable with a single Fiber Optic cable & Power-Over-Ethernet technology. But when IP-HD Video is combined with the latest wireless broadband technology it provides an unbeatable solution for remote site monitoring.

Responsibility to manage 1000 and more public with a range of 4000 meters of area by instructing the remote police vehicles that are managed from Central Monitoring Station.

Being a daily use for monitoring the city in-charge will obviously need the Monitoring and Surveillance CCTV System implemented on the stipulated areas, which can help police officers reduce the mental pain and increase the workability.

Implementation:

Etrovision High Definition (HD) Fixed Day & Night Cameras & High Definition (HD) Pan Tilt Zoom Camera, Alnet Systems Netstation used to record all the Network based HD cameras on one platform with capability to compress with DJPEG1 and transmit on local network as well as internet with highest authentication on Alnet and firewall on IBM, IBM Video Server with RAID technology to protect and conserve recording for multiple days. CISCO Gigabit Managed Power-Over-Ethernet Switches are used to provide High Quality Video Stream, Power, An ISO 9001:2008 Certified Company (Design) Controlling cameras through one cable.

The CISCO Network Switches were then connected from cameras to an IBM Video Server with a capacity to record 30 days of video footage and secured recording was made on RAID storage IBM Hard Disks.

All the High Definition (HD) based CCTV Video Cameras got merged on one CCTV Recording Server for Network Video recorder i.e. ALNET SYSTEMS Netstation PC-Based Recorder, by which it can record individual cameras with motion recording for 30 days, which can transmit locally through the internal network with advanced authentication user rights. This provided a connection to the IP network for the security team's suite of computers and monitoring equipment. This enabled monitoring and control of CCTV cameras locally, as well as the cameras viewed on PDA's via a secure Intranet connection. And through the Internet

they can view it from anywhere in the world on the client pc/laptop/ or even mobile phone. Each equipment are powered through uninterruptible power supply backup for 24hours on battery backup, ensuring CCTV coverage even when the power is down, an Ethernet switch, IBM Video Server, a Alnet Systems Netstation, surge suppressor. This provided a self-contained CCTV surveillance point that was immune to the environment and could be fully controlled by the remote security team without using any interconnecting cable!

Deliverable:

Unmanned areas, such as city surveillance require 24 hours real time CCTV monitoring and surveillance to prevent crime or attack. The solutions provided by Alnet Systems CCTV enable 7 days a week, 24 hours a day standalone and remote operation with real time monitoring and recording which can be operated from Security An ISO 9001:2008 Certified Company (Design) Authorities, Commissioner of Police Rajkot and other authorized users also from anywhere within in the Intranet or by Internet also by staying anywhere in the world. Its professional event handling and visual alarm identification can quickly response to a wide range of events which can be taken on immediate actionThe benefits of High Definition IP-CCTV Video with Fiber optic & Power-Over-Ethernet includes:Significant reduction of cabling and installation costs associated with traditional co-axial systems

5.2 Concept (Electrical)

5.2.1 Local / Out Source of Energy

Local Source of Energy

For their rural areas there is no immediate prospect of being connected to the central electricity grid, and other commercial energy sources are often too expensive for poor people. However, many rural areas do have local access to other sources of energy, such as solar energy, water streams, wind and biomass. There are opportunities for these resources to be tapped using existing technologies and thereby release a range of useful services.

Out Source of Energy

- Their Dungarpur village electricity is delivered by Gujarat State Electricity Corporation Limited (GSECL) is a wholly owned subsidiary company of the Gujarat Electricity Board (GEB), which came into existence in August 1993 after the unbundling of the GEB.
- It is a power generation company working in the territory of Gujarat, India.
- It delivers electricity through four distribution companies DGVCL, MGVCL, PGVCL, and UGVCL.
- PGVCL is supplied a electricity in Dungarpur village.
- The PGVCL is one of the distribution companies which started functioning from 1st April; 2005.Area served by PGVCL is the largest of all four distribution companies.

5.2.2 Auto Intensity Controlled Solar LED Street Light / High Power LED

As we know that, nowadays energy sources are limited and energy consumption has increased, so renewable energy sources are used in order to meet the increase the demand for energy. Keeping this in mind in this article, we are discussing about a solar powered LED street light with auto intensity control. This project is driven by solar energy used to control the light intensity from morning to evening based on the brightness.

A case study is also done to demonstrate the advantages of this solar LED street light compared to traditional street light. Because, this solar powered street light can conserve a large amount of electricity compared to the other lights which are a light to their maximum intensity at all times after they are turned on Solar Powered Led Street Light with Auto Intensity Control Circuit and Its Working.

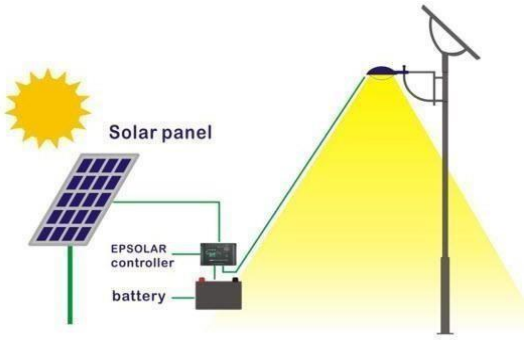


Figure 29 Solar Panel Semantics

Figure 30 Solar Powered Street Light

The solar powered LED street lights activate from dusk to dawn. The LED street light automatically turns ON after the dusk and turns OFF after the dawn. The designing of the entire system includes: Solar panels, LED light, Rechargeable battery, Controller, Pole and interconnecting cables.

Working of a Solar Powered Led Street Light with Auto Intensity Control Circuit and Its Working

The solar powered led street lights activate from dusk to dawn. The LED street light automatically turns ON after the dusk and turns OFF after the dawn. The designing of the entire system includes: Solar panels, LED light, Rechargeable battery, Controller, Pole and Interconnecting cables.

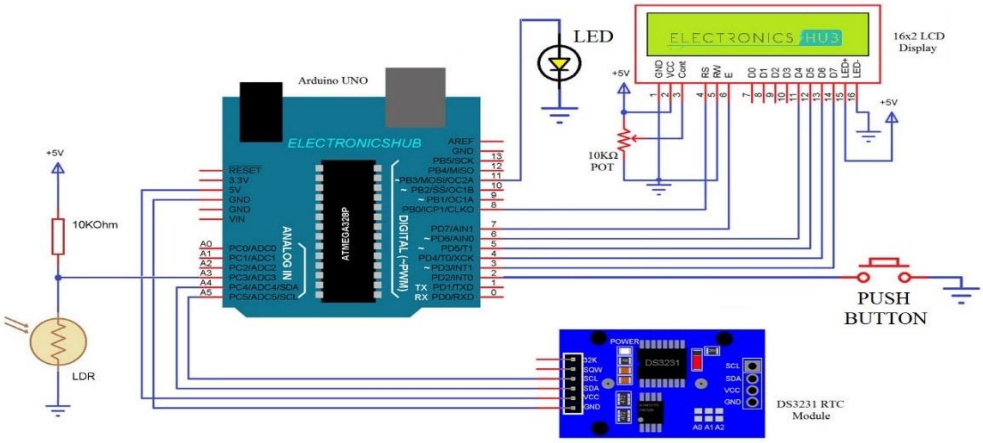


Figure 31 Solar Powered LED Street Light with Auto Intensity Control Circuit Diagram

Solar Panels

The solar panel or PV cell in the solar street light is one of the most essential parts. These cells are available in two types: mono crystalline and poly crystalline. The mono crystalline conversion rate is higher than the poly crystalline. The light energy used by the solar panels from the sun is used to change solar energy into electricity, which can be used in various applications. Electrical connections of this project are made in series to achieve an o/p voltage and to afford a current facility connection are made in parallel. The majority of the modules uses silicon (Si) but most of the solar panels are fixed.

Light Emitting Diode

LEDs are used in modern street lights to provide brighter light with low energy consumption. The energy consumption of LED fixture is lesser than the high-pressure sodium fixture, which is commonly used in traditional streetlights. Compare to the other lamps, LED lights do not produce light in all directions. The design of lamps can be affected by the uniqueness of the LEDs. The single LED o/p is not equal to the incandescent and fluorescent lamps. But, a bunch of LEDs will give bright light than these two lamps. The advantages of LEDs mainly include Eco friendly, durable, zero UV emissions and long life.

Rechargeable Battery

Rechargeable battery is a one kind of electrical battery and it has electro mechanical reactions to adjust so it is also called as secondary cell. Generally, there are two kinds of batteries, namely gel cell deep cycle and lead acid battery. A rechargeable battery is used in solar LED street lights, this battery is used tostore electricity generated from the solar panel during the sunrise to afford energy in the sunset. The lifetime and capacity of the rechargeable battery are essentials they affect the backup power days of the lights.

Controller

A controller is a very significant device in solar street light, used to decide the status of the charging and lighting by switch on or switch off. Some recent controllers are preprogrammed and it consists of a battery charger, a Led lamp driver, a driver, a secondary power supply, an MCU and a protection circuit. The battery can be controlled by the controller from the under and over charging conditions. The battery can be charged by the power received from the solar panels in the sunrise and while in the sunset it charges the battery.

Pole

A strong pole is mandatory for each and every street light and also for a solar street light. There are various components such as panels, batteries and fixtures fixed on the top of the pole. In this light, the i/p operating voltage is 12V DC which is a nominal system voltage, and the light o/p at the height of 12 feet is a minimum of 09 LUX (unit of luminance).

Interconnecting Cables

The cable is used to interconnect the LED, solar panel and battery box which is fixed on the top of the pole. This cable is used to connect a Photovoltaic module to the controller, controller to the lamps and battery. The size and length of the cable depend on the current being carried to the LED lights and the height of the pole. The assembling of the entire solar LED street light system can be connected using all the above components which use sun energy to give the power to the LED lamps fixed on street poles.

5.2.3 Automatic Water Plant System / Designing of DC Motor Speed Control Unit /Irrigation Water Pump Controller for Illiterates Using GSM

Automatic Water Plant System

In this system, soil moisture sensor senses the moisture level of the soil. If soil will get dry then sensor senses low moisture level and automatically switches on the water pump to supply water to the plant. As plant get sufficient water and soil get wet then sensor senses enough moisture in soil. After which the water pump will automatically get stopped. I have used a self-made water pump in this system using 5-volt DC motor. I could use 12-volt water pump in the system but to operate this, it will require a relay module. So, to reduce all these

Figure 32 Automatic Water Plant System Pictorial Representation

hardware complexities, I made DC motor-based water pump using diode, transistor and registers combined circuit which operates DC motor according to the Arduino code

Outdoor Watering Systems

Timers are commonly used nowadays because they can be set up in a way that your plants will never be under watered or over watered. They can be integrated with an irrigation system–sprinkler system, hose, or drip system – and then scheduled to conserve water. One of the best timers is the electric hose model which is attached to a water spigot and connected to a hose. When you choose frequency and length of the watering, you can program that to the timer.

Indoor Watering Systems

Even though there are a number of indoor plant watering systems, the most popular is the plant watering globes and spikes. It uses the capillary action principle to water your plants because water is stored in the globe. Drip watering system is another option that will keep your mind at peace because you don't need to remember watering your plants every time. Interestingly, there are no pots to fill or refill water because the drip can be run to those pots and then a timer is set.

Designing of DC Motor Speed Control Unit

The speed of a DC motor is directly proportional to the voltage applied across its terminals. This project uses the above principle to control the speed of the motor by varying the duty cycle of the pulse applied to it (popularly known as PWM control). A microcontroller is used to deliver the PWM pulses to the motor. The project is designed to control the speed of a DC motor using an 8051 series microcontroller. The speed of DC motor is directly proportional to the voltage applied across its terminals. Hence, if voltage across motor terminal is varied, then speed can also be varied.

This project uses the above principle to control the speed of the motor by varying the duty cycle of the pulse applied to it (popularly known as PWM control). The project uses two input buttons interfaced to the microcontroller, which are used to control the speed of motor. PWM (Pulse Width Modulation) is generated at the output by the microcontroller as per the program. The program can be written in Assembly language or in Embedded C. The average voltage given or the average current flowing through the motor will change depending on the duty cycle (ON and OFF time of the pulses), so the speed of the motor will change. A motor driver IC is interfaced to the microcontroller for receiving PWM signals and delivering desired output for speed control of a small DC motor.

Irrigation Water Pump Controller for Illiterates Using GSM

The main aim of this 3-phase irrigation water pump controller for illiterates using GSM modem project is to control the three-phase water pump by using GSM modem for illiterates. In this ECE project the mainly used components are two microcontrollers one microcontroller in control switch another at water pump, one microcontroller sends the data then another side have to perform the corresponding functionality, here two G.S.M modems are used in this project, to communicate the both pump side and switch side throw G.S.M the data is send to the other microcontroller. Between the water pump and microcontroller there is interfacing circuit for the interfacing, here two power supplies are needed to perform the operation of water pump, here use the LED indicators to display the information.

The microcontroller used here operates at 5volts, this project equipment is more sensitive because here microcontrollers used, and illiterates can easily know the status of the motor by using LED indicator. The features of this project are easily interfaced, high voltage water pumps are easily controlled, more sensitive, the response is generated from the LED indicator, and wireless connection. To design this project designer should aware of embedded c programming, PCB connections, remote control. This project mainly used in houses.

5.2.4 Central Control Unit for Irrigation Water Pumps Construction

Irrigation is the artificial application of water to land for the purpose of agricultural production. Effective irrigation will influence the entire growth process from seedbed preparation, germination, root growth, nutrient utilization, plant growth and regrowth, yield and quality. The key to maximizing irrigation efforts is uniformity. The producer has a lot of control over how much water to supply and when to apply it but the irrigation system determines uniformity. Deciding which irrigation systems is best for your operation requires a knowledge of equipment, system design, plant species, growth stage, root structure, soil composition, and land formation. Irrigation systems should encourage plant growth while minimizing salt imbalances, leaf burns, soil erosion, and water loss. Losses of water will occur due to evaporation, wind drift, run-off and water (and nutrients) sinking deep below the root zone.

Features:

- User friendly interfacing.
- Identification of water pumps through RFID technology.
- Feedback generated with the help of LED indicator.
- Controls high voltage water pumps.
- Wireless control of remote water pump using RF technology.
- Highly sensitive.

5.2.5 Design of Sensing Soil Moisture Content by Auto Irrigation System

- Water is a very precious resource and must be properly utilized. Agriculture is one of those areas which consume a lot of water. Irrigation is a time-consuming process and must be done on a timely basis
- The aim of the article is to develop an auto irrigation system which measures the moisture of the soil and automatically turns on or off the water supply system.

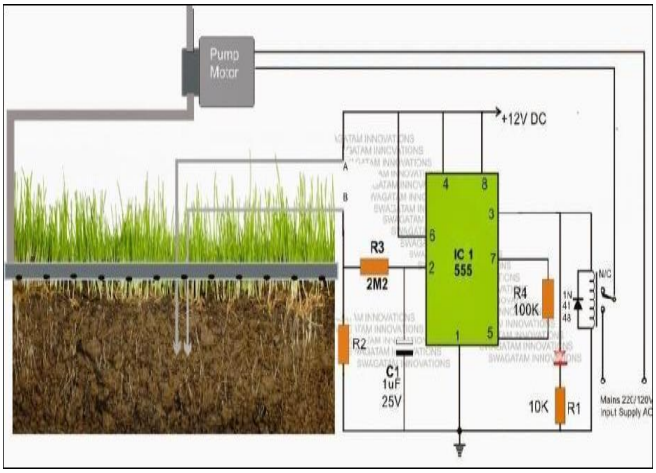


Figure 33 Block Diagram of Soil Moisture Content Based Irrigation

- The aim of the project is to control a motor based on the moisture in the soil. The design of the circuit is as follows. PIC 16F877A is the main processing IC.
- A 12 MHz crystal oscillator is connected across OSC1 and OSC2 (Pins 13 and 14). The crystal is connected with two33pFcapacitors.
- The Master Clear pins is normally connected to Vcc via a pull-up resistor. A bypass button is connected to ground. This button is used to reset the microcontroller.
- The idea of the project is to implement an automatic irrigation system by sensing the moisture of the soil. The working of the circuit is as follows. Wet soil will be more conductive than dry soil. The soil moisture sensor module has a comparator in it. The soil moisture sensor is inserted in the soil. Depending on the quality of the sensor, it must be inserted near the roots of the plant. The soil moisture sensor measures the conductivity of the soil.

5.2.6 Energy Meter Reading with Load Control Using GSM

The main objective of the project is to develop a GSM based energy meter reading system and load control through SMS. Electricity department sends employees to take meter reading every month, which is an expensive and time-consuming job. The proposed project provides a convenient and efficient method to avoid this problem. The electricity department and the user can get the readings of the energy meter of consumers via SMS. The loads can also be controlled by the user of this system via SMS using this project. A microcontroller input is effectively interfaced to a digital energy meter that takes the reading from the energy meter and displays the same on an LCD. The reading of the energy meter is also sent to the control room by an SMS via SIM loaded GSM modem. This GSM modem can also receive commands from the cell phone to control the owner's electrical loads. It uses a standard digital energy meter that delivers output pulses to the microcontroller to perform counting for necessary action. On receiving command, it can switch ON/OFF the loads.

Automatic Meter Reading (AMR) technology, electrical utilities (EUs) have been exploiting their own infrastructure to bill their customers in an efficient and economical way. Since the amount of data that has to be send is quite low related to the available time to perform this task, AMR applications have been demanding low bit rates. At this moment, EUs are exploring and demanding other services as load and alarm management, remote monitoring and disconnections, etc. In this context, the Low Voltage modems should provide more throughout while keeping the cost of the hardware low. The results of this low complexity AMR technology are that in order to deploy an AMR network, the cost of the equipment on the customer premises and the added value services that the system provides are two key factors in its business case. It describes the different methods by which distribution transformer loads can be allocated for power-flow studies. Individual distribution loads are calculated using four different methods of allocation. The results of the power-flow studies are compared to those determined using the actual customer meter readings. Daily kWH, Monthly kWH, Transformer kVA

5.2.7 Street Light Monitoring and Control System

Street Light Monitoring and Control System using Smart Feeder Panel is a unique combination of Smart Meter with GPRS based technology installed inside a feeder panel for remote. Street Light Monitoring and Control System using Smart Feeder Panel is a unique combination of Smart Meter with GPRS based technology installed inside a feeder panel for remote monitoring and controlling group of street lights. It is group wise cloud-based monitoring system. Smart Meter with Astronomical timer-based controller is an Automatic Street light control throughout the year on basis of precise sunrise and sunset time depending on the geographical location. Cloud based remote monitoring performs analytics and reporting of street light consumption through smart metering and provide power failure, fault occurrence information to the cloud server. It achieves instant fault reporting via SMS/email along with fault information & details of location. Feeder Panel has IP 55 protected enclosure.

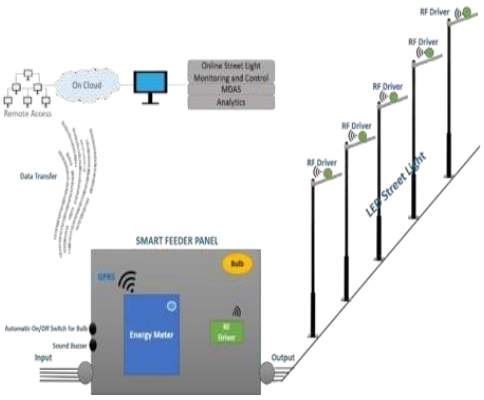


Figure 34 Streetlight Monitoring and Control System

Chapter 6
Swatchh Bharat Abhiyan (Clean India)

Swachh Bharat Abhiyan or Clean India Mission is a country-wide campaign initiated by the Government of India in 2014 under the leadership of Honourable Prime Minister Narendra Modi to eliminate open defecation and improve solid waste management. The core objectives of the mission were to reduce open defecation and improve management of municipal solid waste in both urban and rural areas. Elimination of open defecation was to be achieved through construction of individual household level toilets and public toilets.

Swachh Bharat Abhiyan is expected to cost over ₹62 thousand crores. The government provides an incentive of ₹12,000 for each toilet constructed by a rural family. An amount of ₹9 thousand crores was allocated for the mission in the 2016 Union budget of India. The World Bank provided a US$1.5 billion loan and $25 million in technical assistance in 2016 for the Swachh Bharat Mission to support India's universal sanitation initiation. The programme has also received funds and technical support from the World Bank, corporations as part of corporate social responsibility initiatives, and by state governments under the Sarva Shiksha Abhiyan and Rashtriya Madhyamik Shiksha Abhiyan schemes.

Impacts of Swachh Bharat Abhiyan

According to the dashboards maintained by respective ministries, more than 100 million individual household level toilets have been constructed in rural areas, and 6 million household toilets in urban areas. In addition, nearly 6 million community and public toilets have also been constructed in the urban areas. Consequently, 4,234 cities and more than 600,000 villages across the country have declared themselves open defecation free.

More than 81.5 thousand wards in urban areas now have100% door to door collection of solid waste and nearly 65 thousand wards practice 100% segregation of waste at source. Of the nearly 150 thousand metric tonnes of solid waste generated in urban areas, 65% is being processed.

6.1 Swatchhta needed in allocated village -Existing Situation with photograph

The village has a solid waste collection system which collects the solid waste two days a week. But there is a lack of awareness in the dustbins to throw the solid waste. Therefore, there are solid wastes on the sides of road in the village.

The Gram Pnachayat authorities are trying their best to keep the village clean. Sweepers are employed to clean the village. Government facility related to the west management is not available in Dungarpur village people support needed.

Figure 35 Existing Situation Sub Center

6.2 Guidelines - Implementation in allocated village with Photograph

Guideline for the process of implementation of SBA

1. Elimination of open defecation
2. Eradication of Manual Scavenging
3. Modern and Scientific Municipal Solid Waste Management
4. Generate awareness about sanitation and its linkage with public health
5. Capacity Augmentation for ULBs to create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance)
6. The estimated cost of implementation of SBM (Urban) based on unit and per capita costs for its various components is Rs. 62,009 Crore.
7. The Government of India share as per approved funding pattern amounts to Rs. 14,623 Crore. In addition, a minimum additional amount equivalent to 25% of GoI funding, amounting to Rs. 4,874 Crore shall be contributed by the States as State/ ULB share.

Mission Components

- Household toilets, including conversion of insanitary latrines into pour-flush latrines
- Community toilets.
- Public toilets and urinals
- Solid waste management
- IEC & Public Awareness
- Capacity building and Administrative & Office Expenses (A&OE)

6.3 Activities Done by Students for allocated village with Photograph:

There is lack of awareness among the people to use the dustbin to throw solid waste. So we educated the people of the village of the importance of the cleanliness of the village and to throw the waste in the dustbins. We also made people aware of the Swachh Bharat Abhiyan which is started by our beloved Prime Minister Narendra Modi. We also discussed the issue with the Sarpanch and Talati about the programs for the awareness of the clean village through Swachh Bharat Abhiyan.

Figure 36 Swachhta Abhiyan & logo

Chapter 7
Village condition due to Covid-19

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

District administrations and Gram Panchayats all across the country are proactively taking various measures to check the spread of the COVID-19 pandemic in the country's hinterland. Ministry of Panchayati Raj, Government of India remains in close coordination with State Governments, District authorities and Gram Panchayats to ensure that lockdown conditions are not violated and norms of social distancing are scrupulously followed.

In all gram panchayats in the state, the use of Social Media WhatsApp group has been used to create awareness among the masses in the villages. Information at the grassroots level is being given to the people by putting posters everywhere. Regular cleaning operations are being carried out and disinfectant is being sprayed on the roads.

Face masks are being distributed to the citizens by Gram Panchayat members and social organizations and citizens are also being told not to touch their eyes, nose, and mouth, wash hands with soap frequently and maintain social distance. Along with ration distribution to villagers, fodder for abandoned cattle is also being provided by a social service organization. Due to the lockdown there were no jobs in the cities, therefore lots of people who resided in the cities came back to the village which increased the risk of coronavirus in the village.

Therefore, quarantine center was established in the school premises for the people coming from cities outside of the village. The people were quarantined for 14 days in the quarantine facility before they can go to their homes in the village Their daily needs were satisfied by the gram panchayat in collaboration with the district authorities and state government.

Arogya Setu App

Aarogya Setu is an COVID–19 contact tracing, syndromic mapping and self-assessment digital service. It is a mobile app. It is developed by the National Informatics Centre. It is run by the Ministry of Electronics and Information Technology (MeitY). Arogya Setu app has the stated purpose to spread awareness of COVID–19 and to connect essential COVID–19-related health services to the people of India. This app augments the initiatives of the Department of Health to contain COVID–19 and shares best practices and advisories.

Figure 37 Aarogya Setu App Overview

Arogya Setu App is a tracking app which uses the smartphone's GPS and Bluetooth features to track the coronavirus infection. With Bluetooth, it tries to determine the risk if one has been near (within six feet of) a COVID–19-infected person, by scanning through a database of known cases across India. Using location information, it determines whether the location one is in belongs to one of the infected areas based on the data available.

The central government has made it mandatory for the government employees to use the Arogya Setu app. The gram panchayat officials and the health care officials have made people aware to use the Arogya Setu app for the benefit of the village. With the Arogya Setu app the government health officials can track down the origin of the corona virus if there is any case noted in the village.

7.2 Activities Done by Students for allocated village Clean with Photograph

Due to lack of knowledge of the Coronavirus disease the villagers are afraid to meet the people of the city. We made them aware about the Coronavirus disease and how it spreads through contact of hand. We made them aware about the importance of the social distance, wearing mask at public places and cleaning your hands with soap or disinfectant at regular intervals. We assured them that there is nothing to fear about the disease if we follow the guidelines given by the government. We made the people aware about the Arogya Setu app on the mobile. We insisted people to use the Arogya Setu app on their mobile. We taught the village people how to use the Arogya Setu app which will be helpful in the future.

7.3 Any other steps taken by the students / villagers

Sanitization has been done in the Dungarpur Village. The disinfectant has been sprayed on the back of a bike. The sanitization process is done in every street of the village and the public buildings across the village. “Remember the 3 W’s” slogan is given to spread awareness on the coronavirus disease. The 3 W in the slogan are:

1. Wear a mask to cover your face.
2. Wait six feet apart from each other to avoid close contact.
3. Wash your hands frequently by using hand sanitizer or soap.

Figure 38: Children awareness in the village

Figure 39: Slogan for awareness of coronavirus

Chapter 8
Sustainable Design Planning Proposal (Prototype Design)- Part- I (Scenario / Existing Situation / Proposed Design in Auto cad / Recapitulation Sheet / Measurement Sheet / Abstract Sheet / Sustainability of Proposal / Any other software)

8.1 Design Proposals

The village lack some basic infrastructure like Social infrastructure, Physical infrastructure, Socio-Cultural infrastructure and the use of renewable energy is null in the village. It is very important to provide basic infrastructure facility and it is economical, eco-friendly and efficient also. Following design are provided with use of civil and electrical engineering technology.

- Bus Stand
- Post Office
- Public Garden
- Community Hall
- Public Library

8.1.1 Sustainable Design (Civil- Garden)

Design Drawings

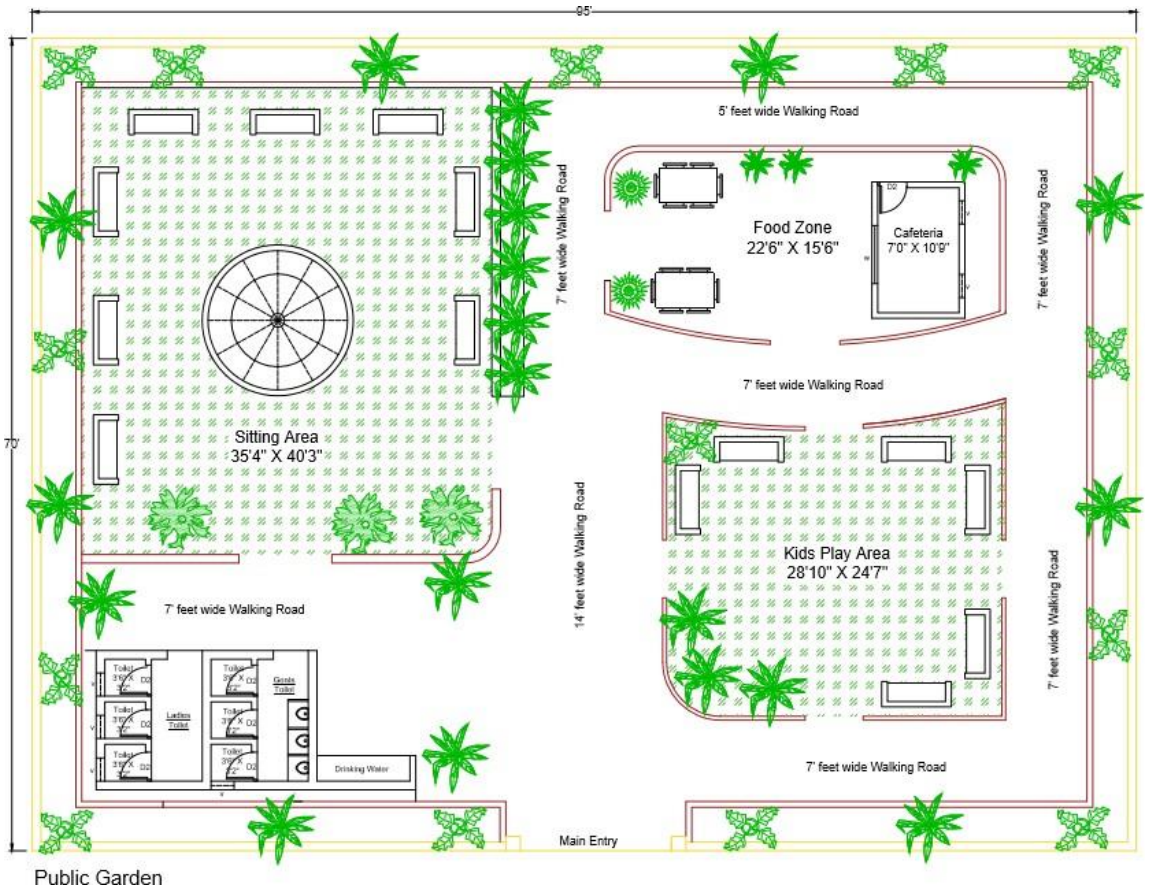


Figure 40 Design of Garden

Measurement Sheet:

Table 19 Measurement of Garden

Sr no.	Item Description	No.	Length	Width	Depth	Quantity
1	Excavation for Compound wall					
	long wall	2	46 m	0.45m	1m	41.4cu.m
	short wall	2	24.40 m	0.45m	1m	21.96cu.m
					total	63.3cu.m
2	PCC work for Foundation	1	140m	0.90 m	0.15m	18.9cu.m
3	Brick masonry compound wall	1	140m	0.30m	1.52m	63.84cu.m
4	Plaster work compound wall	1	140m		1.52m	212.8sq.m
5	Paver blocks for walking track	1	147m	1.52m		223.44sq.m
6	Paint on compound Wall	1	140		1.52m	212.8sq.m

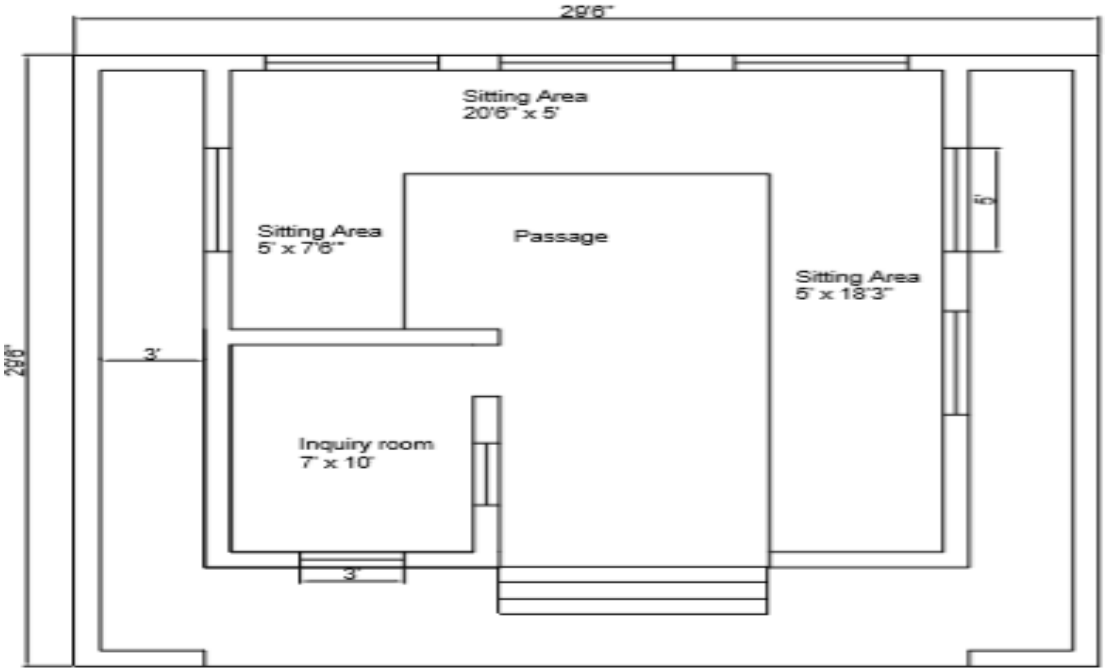
Abstract Sheet:

Table 20 Abstract Sheet of Garden

Sr. No.	Item Description	Rate	Per	Quantity	Cost
1	Excavation In Foundation	236 Rs/-	cu. M	63 cu.m	14868/-
2	Pcc In Foundation In1:4:8	2604 Rs/-	cu. m	18 cu.m	46872/-
3	Brick Masonry	332 Rs/-	cu. m	64 cu.m	212544 /-
4	Plaster Work	105 Rs/-	sq. mt	212.8sq.m	22365/-
5	Paver Flooring Walking Track	335rs/-	sq. mt	223 sq.m	74705/-
6	Painting	80rs/-	Sq.mt	212.8sq.m	17000rs/-
8	Swing	1500rs/-	Each	6	9000rs/-
9	Banches	800rs/-	Each	25	20000/-
				TOTAL	**417354/-Rs**

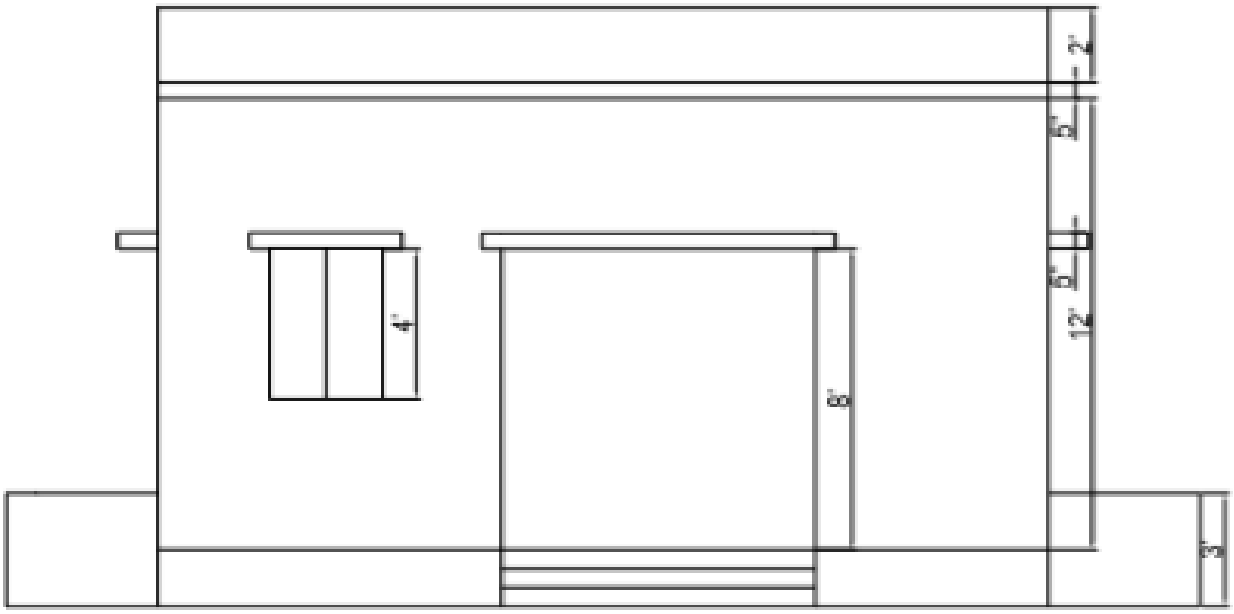
8.1.2 Physical design (Civil – Bus Stand)

Design Drawings



PLAN

Figure 41 Plan of Bus stand



ELEVATION

Figure 42 Elevation of Bus Stand

Measurement Sheet:

Table 21 Measurement Sheet of Bus Stand

Sr. No.	Description	No.	Length	Width	Depth	Quantity
			(m)	(m)	(m)	cu. M
1	Total centre line of all walls		41.03	0.9	1.5	55.39
					Total	55.39
2	P.C.C. in foundation		41.03	0.9	0.06	2.21
	1:2:4					
3	Masonry in foundation 1:3 standard Brick		41.03	0.6	1.5	35.44
					Total	35.44
4	Brick masonry up to slab level 1:4	1	41.03	0.3	3.04	34.41
	internal wall		5.09	0.3	3.04	4.64
					Total	39.05
	Deduction					
5	Door and window	7	0.94	0.94		6.18
		2	1.82	2.13		7.76
					Total	13.94
6	Net masonry work					39.05
						13.94
					Total	25.11
7	Plaster work in 1:3					
	according to masonry work		46012	3.04		140.2
	Internal					13.94
					Total	126.26
	Qty R.C.C slab		3.04	6.09	0.15	2.77
	01:05.5		9.14	6.09	0.15	8.34
					Total	11.11

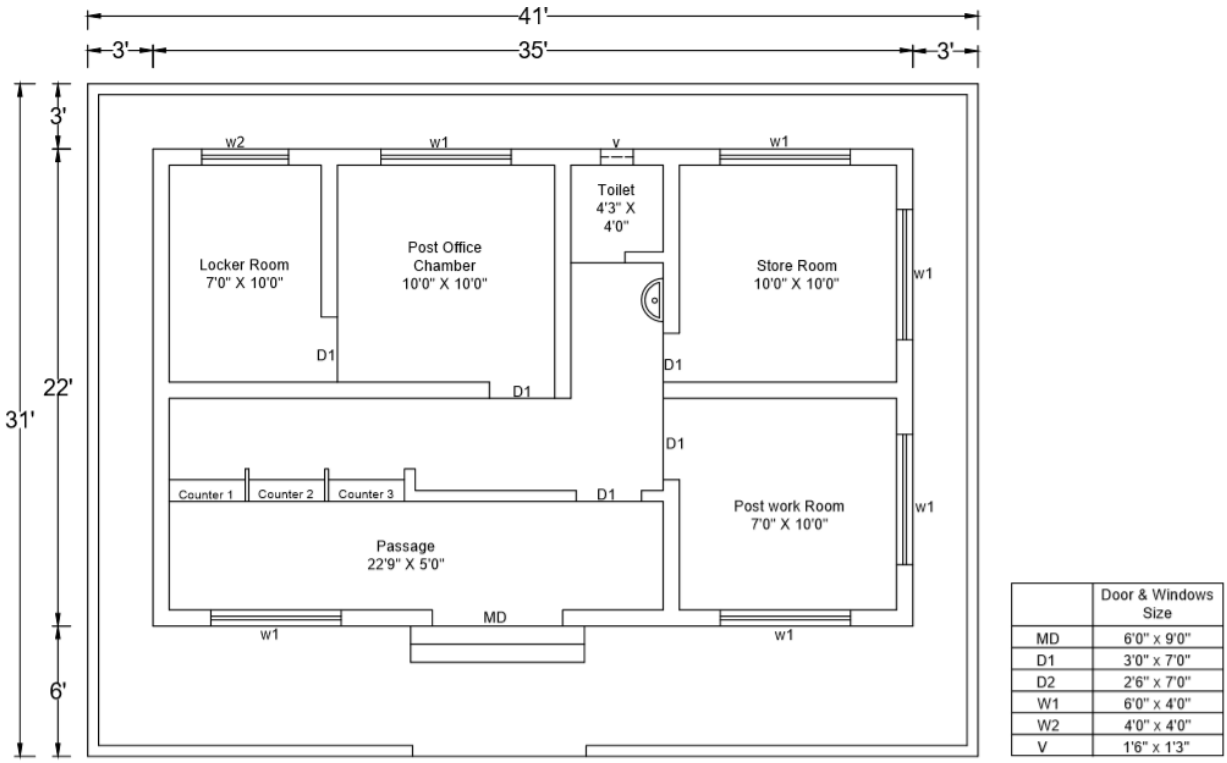
Abstract Sheet:

Table 22 Abstract Sheet Of Bus Stand

Sr. No.	Item Description	Quantity	Rate	Per	Amount Rs.
1	Excavation Earth Work Mechanically	53.39	67.2	m^3	3722
2	Concrete Work In Foundation	2.21	19.81	m^3	4378
3	Brickwork for parapet wall	7 m^3	3500	m^3	24500
4	RCC work for slab	8.42 m^3	8800	m^3	74096
5	Plaster Work	126.26	98.8	m^2	12400
6	Painting	126.26		m^2	998
		Total		Rs.	120094

8.1.3 Social design (Civil – Post Office)

Design Drawings



	Door & Windows Size
MD	6'0" x 9'0"
D1	3'0" x 7'0"
D2	2'6" x 7'0"
W1	6'0" x 4'0"
W2	4'0" x 4'0"
V	1'6" x 1'3"

Figure 43 Plan of Post Office

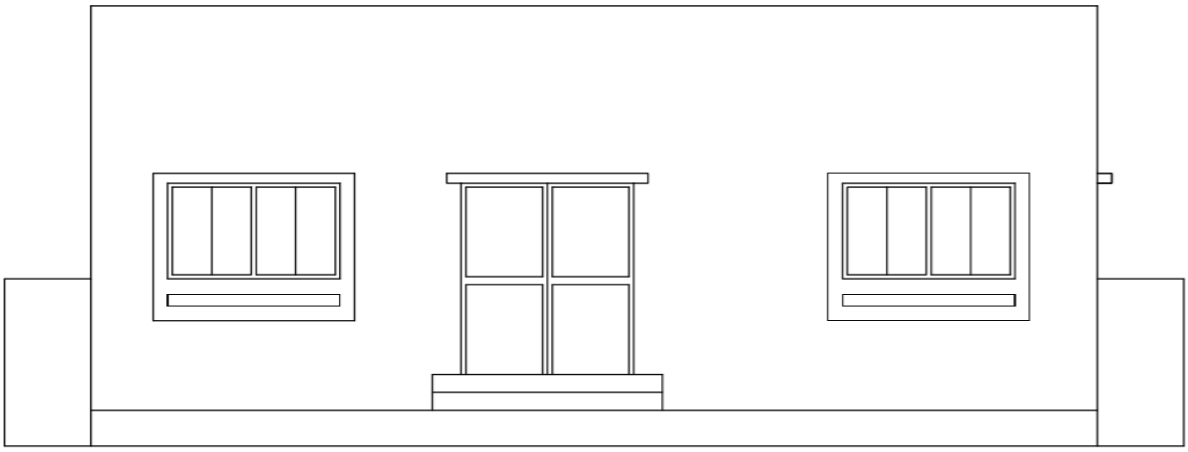


Figure 44 Elevation of Post Office

Total Centre line length

L=6.71x10.67
L=9.45x12.50
L=6.98x1.52
L=2.13x3.05
L=3.05x3.05
Total Centre line length = 44.51m
Total no of Junction=10

Measurement Sheet:

Table 23Measurement Sheet of Post office

Sr No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (m^3)
1	**Excavation In Foundation**					
	Net C.L. Length					
	=44.51-0.5*0.9*10	1	40.01	0.9	1.1	**39.61**
	=40.01					
2	**Plain cement concrete in foundation in 1:4:8**	1	40.01	0.9	0.2	**7.20**
3	**Brickwork in foundation Upto plinth**					
	Step 1 L=44.51-0.5*0.5*10 =42.01m	1	42.01	0.5	0.3	6.30
	Step 2 L=44.51-0.5*0.4*10 =42.51m	1	42.51	0.4	0.3	5.10
	Step 3 L=44.51-0.5*0.3*10 =43.01	1	44.03	0.3	0.85	10.97
				Total Quantity		**22.37**
3	**Brickwork in super structure in cement mortar 1:6**					
	L=44.51-0.5*0.3*10 =43.01 m	1	43.01	0.3	3	**38.71**
4	**RCC. Slab**	1	10.67	6.71	0.12	**8.59**
5	**Smoot plaster on inside wall and celling in C.M. (1:3)**					
	Locker Room	2	2.13	3	3	12.78
	Post office chamber	2	3.05	3	3	18.30
	Store Room	4	3.05	3	3	36.60
	Post work room	4	3.05	3	3	36.60
	Toilet	2	1.31	3	3	7.86
				Total quantity		**228.62**
6	**Parapet wall**					
	L=30.76m	2	10.61	0.7		**14.94**

Abstract Sheet:

Table 24 Abstract Sheet of Post Office

Sr No.	Item Description	Quantity	Rate	Per	Amount Rs.
1	Excavation in foundation	39.61m^3	85	m^3	3366.85
2	Brick bat cement concrete in Foundation	7.20m^3	3200	m^3	23040
3	First class brickwork upto plinth in CM 1:6	22.37 m^3	3200	m^3	71584
4	Brickwork in super structure in CM 1:6	38.71 m^3	3500	m^3	135485
5	Brickwork for parapet wall	24.33m^3	3500	m^3	85155
6	RCC work for slab	8.59m^3	8800	m^3	75592
7	Smooth plaster on inside walls and ceiling in CM 1:3	216.12 m^2	150	m^2	32418
				Rs.	426640.85
		Add 5% contingencies			21332
				Rs.	**447973**

8.1.4 Socio-Cultural design (Civil- Community Hall)
Design Drawings

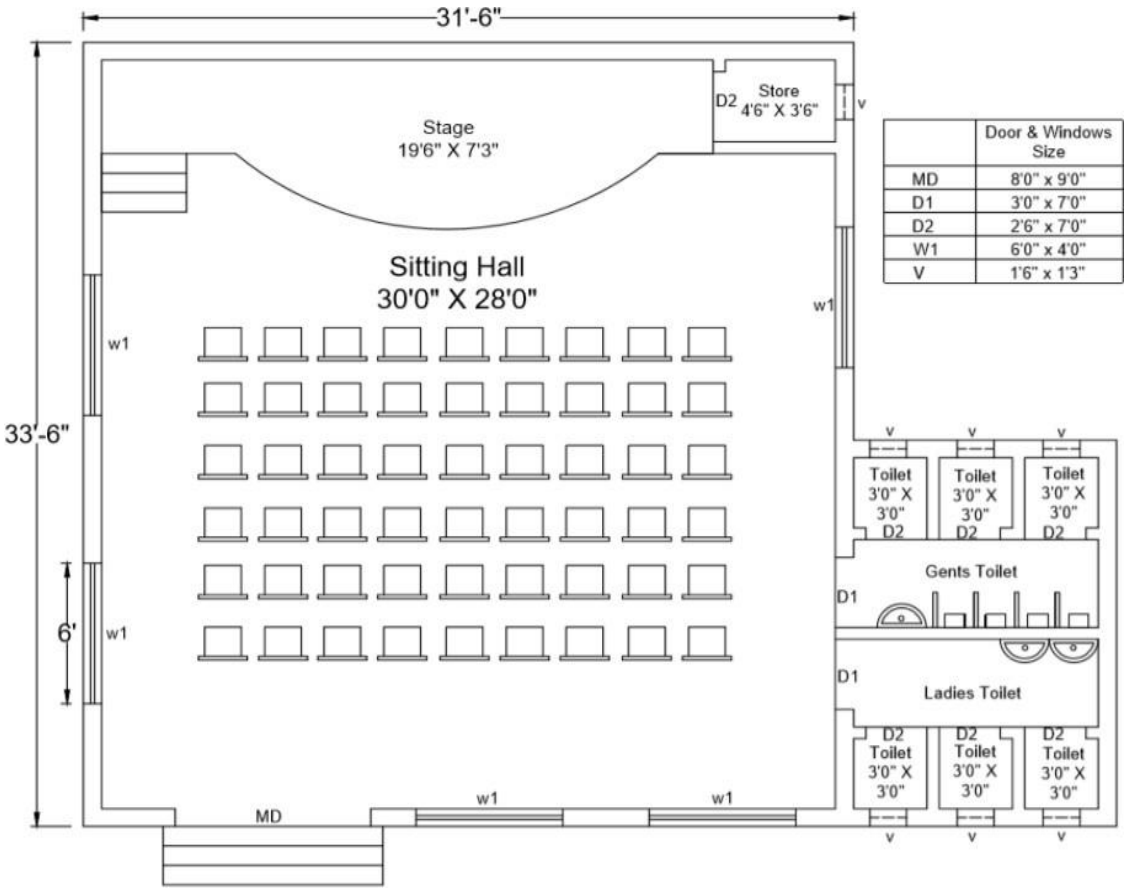


Figure 45 Plan of Community Hall

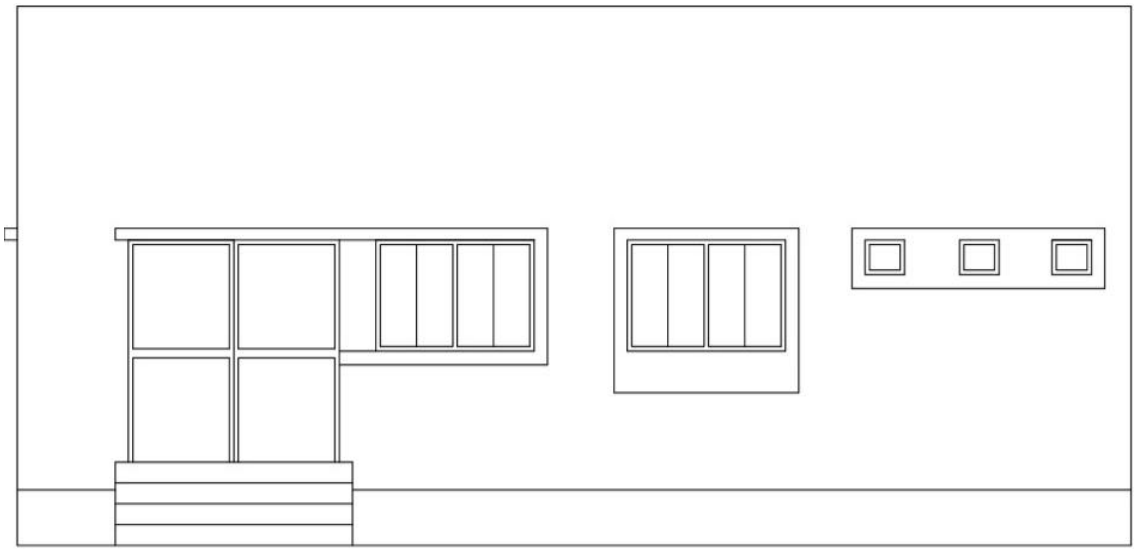


Figure 46 Elevation of Community Hall

Measurement Sheet:

Table 25 Measurement Sheet of Community Hall

Sr No.	Item Description	No.	Length(m)	Width(m)	Height(m)	Quantity(m^3)
1	**Excavation in FoundationNet Centre line length** = 48.92-(0.5*0.9*2) =48.02m	1	48.02	0.9	1.1	47.54
2	**P.C.C. in foundation (1:4:8)**	1	48.02	0.9	0.2	8.64
3	**Brickwork in foundation up to plinth**					
	Step 1 L=48.92-0.5*0.5*2 =48.42	1	48.42	0.5	0.2	4.84
	Step 2L=48.92-0.5*0.4*2 =48.52	1	48.52	0.4	0.2	3.88
	Step 3L=48.92-0.5*0.3*2 =48.62	1	48.62	0.3	0.85	12.40
	Total Quantity	29.5				
4	**Brickwork in super structure in cement mortar (1:6)**	1	48.62	0.3	3	43.76
5	**RCC. Slab**	1	13.06	10.24	0.12	16.05
6	**Smoot plaster on inside wall and celling in C.M. (1:3)**					
	Hall walls	2	9.03		3	54.18
		2	9.64		3	57.84
	Hall ceiling	12	0.91		3	32.76
	Toilet wall	12	0.91		3	32.76
		2	1.40		3	8.40
	Toilet ceiling	2	1.10		3	6.60
	Total Quantity	192.90				
7	**Parapet wall : L =49.23**	2	13.06		0.7	18.28

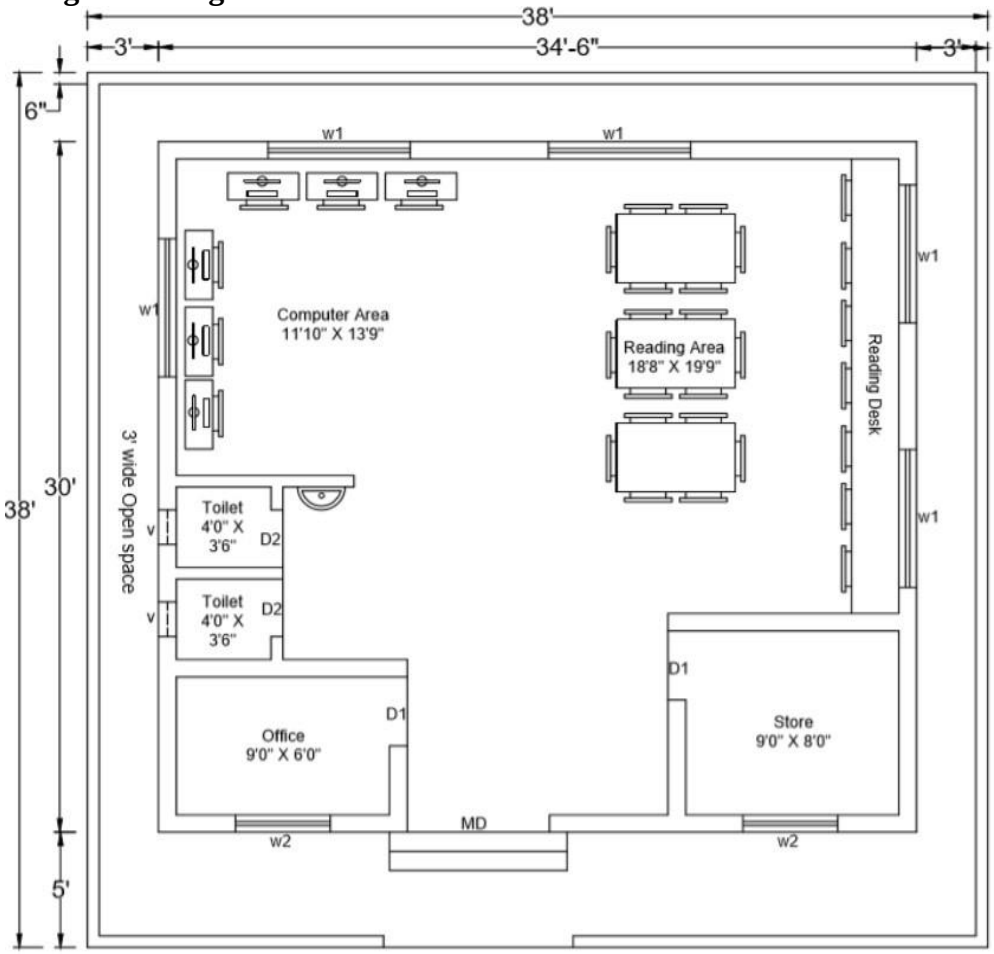
Abstract Sheet:

Table 26 Abstract Sheet of Community Hall

No.	Item Description	Quantity	Rate	Per	Amount Rs.
1	Excavation in foundation	47.54	85	m^3	4040.9
2	Brick bat cement concrete in foundation	8.64	3200	m^3	27648
3	First class brickwork up to plinth in C.M. 1:6	29.5	3200	m^3	67584
4	Brickwork in super structure	43.76	3500	m^3	153160
5	Brickwork for parapet wall	31.78	3500	m^3	95515
6	RCC work for slab	16.05	8800	m^3	141240
7	Smooth plaster on inside walls and ceiling in C.M. 1:3	192.90	150	m^2	28935
		Total			**527432.9**
		Add 5% contingencies			26371.64
		Grand total			**Rs. 553805**

8.1.5 Smart Village Design (Civil – Library)

Design Drawings



	Door & Windows Size
MD	6'0" x 9'0"
D1	3'0" x 7'0"
D2	2'6" x 7'0"
W1	6'0" x 4'0"
W2	4'0" x 4'0"
V	1'6" x 1'3"

Figure 48 Plan of Library

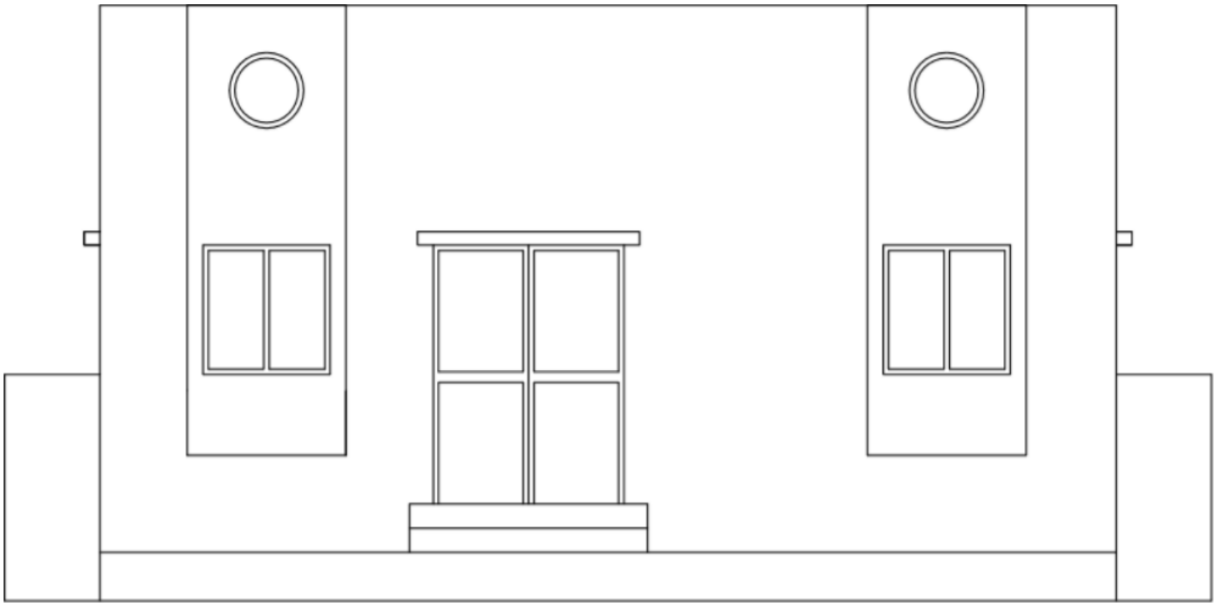


Figure 49 Elevation of Library

Total Centre line length

L=11.28x4=45.12m
L=2.44x2=4.88m
L=2.14x1=2.14m
L=1.53x1=1.53m
Total Centre line length = 53.67m
Short Wall = 3.84
Total no of Junction=6

Measurement Sheet:

Table 27 Measurement Sheet of Library

Sr No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (m3)
1	Excavation in Foundation Net C.L. Length =53.67-0.5*0.9*6 =50.97 m	1	50.97	0.9	1.10	**50.46**
2	Plain cement concrete in foundation in 1:4:8	1	50.97	0.9	0.3	**13.76**
3	Brickwork in foundation Up to plinth					
	Step 1 L=53.67-0.5*0.6*6 =51.87 m	1	51.87	0.6	0.2	6.22
	Step 2 L=53.67-0.5*0.5*6 =50.37 m	1	50.37	0.5	0.2	5.04
	Step 3 L=53.67-0.5*0.4*6 =49.17 m	1	49.17	0.4	0.2	3.93
	Step 4 L=53.67-0.5*0.3*6 =48.27 m	1	48.27	0.3	0.9	13.03
	Total Quantity					**28.22**
	Brickwork in super structure in cement mortar 1:6					
	L=53.67-0.5*0.3*6					
	=48.27 m	1	48.27	0.3	3	**43.44**
4	RCC. Slab	1	11.68	11.58	0.12	**16.09**
5	Smoot plaster on inside wall and celling in C.M. (1:3)					
	Office	4	2.74	1.83	3	60.17
	Store	4	2.74	2.44	3	80.23
	Common Area	4	7.78	6.70	3	625.512
	Total Quantity					**765.912**
6	Parapet Wall					
	L=46.32m	1	46.32	0.3	0.7	**9.73**

Abstract Sheet:

Table 28 Abstract sheet of Library

Sr No.	Item Description	Quantity	Rate	Per	Amount Rs.
1	Excavation in foundation	51.80	85	m^3	**4403**
2	Brick bat cement concrete in foundation	14.13	3200	m^3	**45216**
3	First class brickwork up to plinth in C.M. 1:6	28.22	3200	m^3	**90304**
4	Brickwork in super structure in C.M. 1:6	44.68	3500	m^3	**156380**
5	Brickwork for parapet wall	9.73	3500	m^3	**34055**
6	RCC work for slab	16.09	8800	m^3	**141592**
7	Smooth plaster on inside walls and ceiling in C.M. 1:3	625.512	150	m^2	**93826.8**
				Total	**568976.8**
				Add 5% contingencies	**28448**
				Grand Total	**597424.8**

8.1.6 Electrical Design 1 (Fire Alarm Circuit using Thermistor and 555 timer IC)

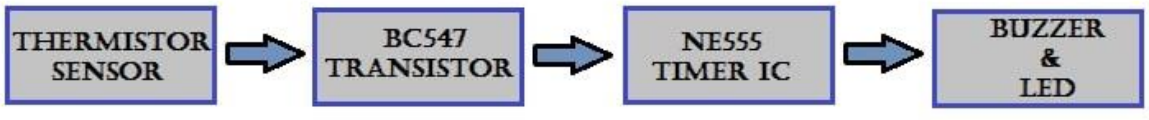
Objectives

In these days a big problem is suddenly fire accidents at building, office, bank, gas station and other property. So the fire alarm is a crucial device to detect fire at an early stage and warns people about the fire. Basically, Fire alarm can be created by two logic first one is sensing smoke and another one is sensing temperature. In this project, we will learn how can design a Fire alarm circuit by 2nd logic sensing temperature. Here we use a thermistor to sense the temperature and ne555 timer IC to process the thermistor output.

Project Concept

The key component of the circuit is Thermistor, transistor, 555 Timer IC and Buzzer. The thermistor is a variable resistor its resistance change according to the changing of the temperature. It is used to detect the temperature. The transistor works as a switch. It operates by the thermistor output voltage and controls the NE555 timer IC output. The NE555 timer IC works in Astable mode so it produces oscillating output for LED and buzzer. The LED and Buzzer work as an indicator. When the thermistor detects fire then the LED will turn ON and Buzzer makes sounds.

Block Diagram of Fire Alarm Circuit



Components Requirement

10k Thermistor

The thermistor is one type of variable resistor whose resistance change according to the change in temperature. There are two types of temperature available one is the negative temperature coefficient (NTC) and another one is the positive temperature coefficient (PTC). In this project, we will use the 10K negative temperature coefficient (NTC) thermistor. Whose, resistance is increase when the temperature is decreased and resistance is decreased when the temperature is increasing.

BC547 Transistor

BC547 is an NPN Bipolar Junction Transistor. This is normally used as a switch and amplifier. In this circuit, the transistor is used as a switch. The smaller amount of current applied at the base, it can control the larger amount of currents at the collector and emitter.

NE555 timer IC

555 Timer IC one of the most well-known and most utilized ICs ever. This IC mainly used as a time delay, oscillator, and flip-flop element in different applications and projects. The 555 timer IC has three different operating modes, these are astable modes, bistable modes, and monostable modes. So, this IC output pin can produce rectangular pulses having a specific frequency.

Buzzer and LED (D2)
The buzzer and Red LED(D2) is used as an indicator. When the thermistor detects fire then the LED will turn ON and Buzzer makes sounds.9v power supply is used to operate this circuit and LED (D1) indicates the circuit is ON.

Circuit Diagram Fire Alarm using Thermistor and 555 timer IC

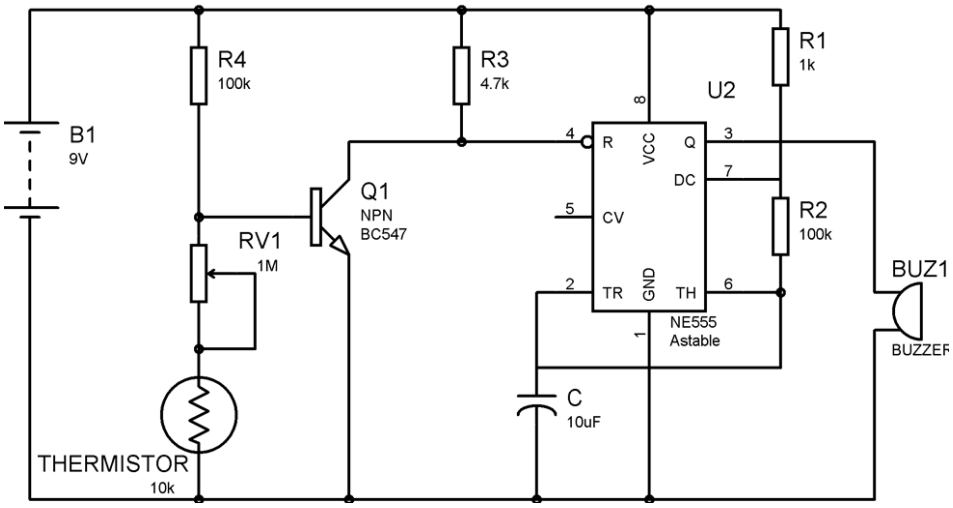


Figure 50 Circuit Diagram Fire Alarm using Thermistor and 555 timer IC

Working Principle of Fire Alarm

The working of the Fire Alarm circuit is very simple. When the thermistor has not detected any Temperature, Therefore, thermistor resistance is 10 k ohm. So sufficient voltage available across the base-emitter of the transistor, which makes it ON. In transistors, usually, 0.7v voltage is required across the Base and Emitter. As a result, 555 timer IC Pin 4 is connected to the ground, When a negative pulse is applied to pin 4 then the IC becomes reset or disable.

Similarly, When the thermistor has detected Temperature, Then thermistor resistance starts to decrease. So sufficient voltage is not available across the base-emitter of the transistor, which makes it OFF. Now, the 555 timer IC Pin 4 is disconnected to the ground and it gets positive voltage through the resistor (R3). As a result, the IC starts working and generate an output signal. Also, the buzzer & LED get voltage to operate and its start indicates.

Estimation of Fire Alarm Circuit

Components Name	Quantity	Price
NE555 Timer IC	1	10
BC547 Transistor	1	10
NTC 10k Thermistors	1	10
R1: 330 ohm Resistors	1	2.54
R2: 22 k ohm Resistors	1	2.54
R3: 4.7 k ohm Resistors	1	2.54
R4: 100 k ohm Resistors	1	2.54
R5: 1 k ohm Resistors	1	2.54
R6: 150 ohm Resistors	1	2.54
Variable Resistor 100 k ohm	1	25
C1: 0.01 uf Ceramic Capacitor	1	3
C2: 47 uf Electrolytic Capacitor	1	27
Buzzer	1	250
Red LED (D1)	1	1.5
Green LED (D2)	1	1.5
Switch	1	49
Battery 9v	1	54
Total		₹456

Table 29 Estimation of Fire Alarm Circuit

8.1.7 Electrical Design 2 (Auto Intensity Control of Street Light Using Arduiono)

Components Required

Arduino UNO
DS3231 RTC Module
LDR
16×2 LCD Display
LED
10KΩ Potentiometer
10KΩ Resistor
Push Button
Connecting Wires8051
Breadboard

Circuit Diagram

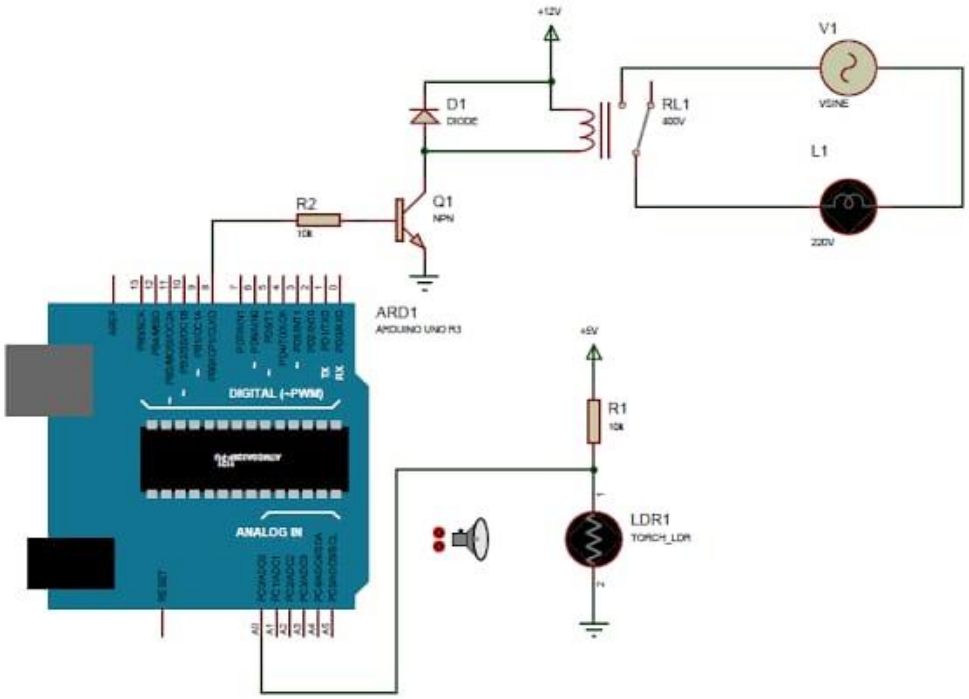


Figure 51 Circuit Diagram of auto intensity street light

Circuit Design

First connect the SDA and SCL pins of DS3231 RTC Module to A4 (SDA) and A5 (SCL) pins of Arduino. A 10KΩ Resistor and an LDR are connected in a voltage divider format and its output is given to A3 pin (of Arduino).The data pins of 16×2 LCD Module i.e. D4 – D7 are connected to 6, 5, 4 and 3 pins of Arduino respectively. The RS and E pins are connected to pins 8 and 7.A Push Button is connected to Pin 2 of Arduino and an LED is connected to Pin 11. You can follow the rest of the connections from the circuit diagram.

Working

After making the connections and uploading the code to Arduino, turn on the Power supply to the project. Initially, the Arduino runs in RTC Mode where there are two times set in the code: the ON TIME and the OFF TIME.Arduino compares the ON TIME with the time from RTC Module and when they match, the LED is turned ON. After this, the Arduino waits for the OFF TIME and once the time from RTC Module reaches the OFF TIME, the LED is turned OFF.During anytime of this operation, if the button (connected as an external interrupt to Pin 2) is pushed, the Arduino enters LDR Mode. In this mode, the Arduino reads the value of the LDR from A3 and based on the value, it adjusts the intensity of the LED.In order to switch back to RTC Mode, all you have to do is push the button.

Cost Calculation

Components Name	Quantity	Price
Arduino UNO	1	575
DS3231 RTC Module	1	250
LDR	1	30
16×2 LCD Display	1	158
LED	1	1.5
10KΩ Potentiometer	1	299
10KΩ Resistor	1	2.54
Push Button	1	200
Connecting Wires 8051	1	38
Breadboard	1	88
Total		₹1642.04

Table 30 Estimation of Auto intensity street light control

8.1.8 Electrical Design 3 (Solar irrigation system)

Solar irrigation system is the green way of energy production,so it is a good option for farmers for irrigation. After the initial cost it will become free of charge to farmers and farmers can install it anywhere. These systems work in the sunlight. When sun shines the water pumping process is a sensible way of solar electric power utilization throughout the summer, as the water necessity is the highest. These pumps provide a reliable water source for plantation. For any solar based pumping system, the capacity to drive water is a function of three variable such as power, flow and pressure. The following main components are used in this automatic solar submersible pump control panel for irrigation.

System Requirements

Solar Panel

These panels are designed with solar cells composed of semiconductor materials. The main function of Solar panels is to convert solar energy into DC electrical energy generally of 12V, which is further used for the rest of the circuit. The number of cells required and their size depends on the rating of the load. The collection of solar cells can produce maximum electricity.But, the solar panel must place exactly at right angles to the sun rays.

The Source

Water sources are available in the form of springs, drilled wells, rivers, ponds, etc.

The Submersible Pump

This solar system contains a submersible pump, a water tank, an irrigation pump, associated water pumps. In the site trial, the submersible pump is kept in a stainless steel case, which is placed in a well pit at the junction of the open channel and the natural stream course. The pump controller pumps water to the water tank at a particular time period as set in the control unit. This system is designed with 450W of power, which is capable of pumping 2000 liters of water within 60 minutes. This power capacity takes into account the height difference between the water tank and the solar submersible pump.

The PV Panels

The photo voltaic cells depend on the size of the pump. A panel is esteemed in watts of power it can produce. This solar submersible pumping system should be operated with a PV array of capacity in the range of 200 to 500 watts peak, and measured under some standard test conditions. A plenty of modules in series & parallel could be used to get the necessary PV power array power o/p. The o/p power of the PV modules which are used in the PV array under standard test conditions should be a min of 74 watts peak.

Charge Controller

A solar charge controller is very important device in any solar-power system. It is used to maintain proper charging voltages of the batteries. The charge controller controls current and voltage from the solar panel and charges the battery, and also stops the charging of the battery from over and undercharging conditions.

Battery

The Battery is an electric device, that is used to store current which is produced from the solar panel and supplied to the corresponding loads. The number of batteries required depend on the load requirement.

Inverter

The main function of the inverter is that it converts the battery's voltage to AC voltage in order to activate then loads. Therefore, it helps us to run many electronic devices, home appliances and computers. There are numerous types of inverters available in the market today.The characteristics of typical inverters include high switching frequency, high conversion frequency and less harmonic content, and so on

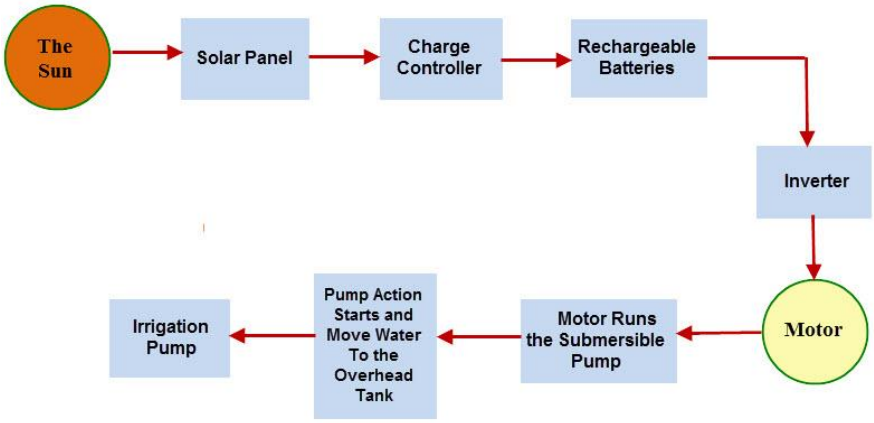


Figure 52 Block Diagram of Solar based irrigation System

Circuit Diagram

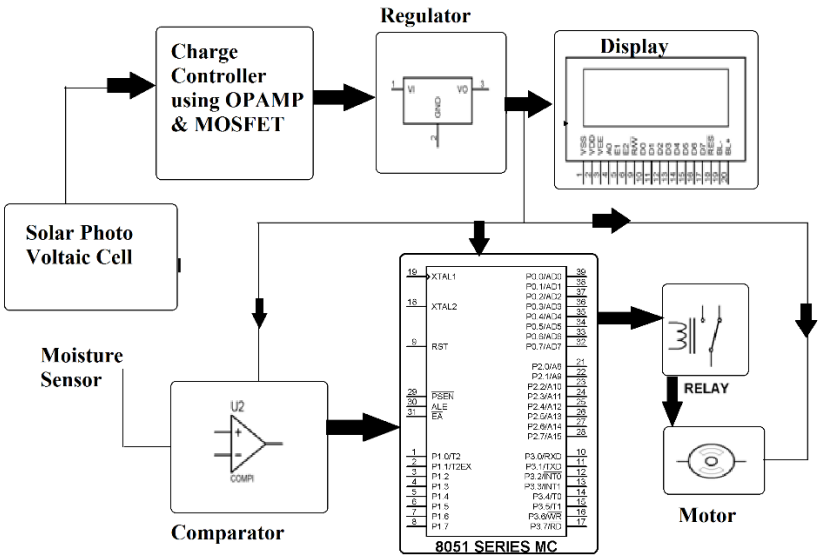


Figure 53 Circuit Diagram of Solar based irrigation System

Table 31 cost estimation of solar based irrigation system

NO	Materials with Specification	Quantity	Total cost
1	Solar panel (32 cells)	8	192000
2	Water pump	1	15000
3	Battery(120V)	2	40000
4	Converter circuit	1	1000
		Total cost	2,48,000

8.2 Reason for Students Recommending this Design

- For old age people and children / toddlers Garden design we are recommended.
- For the better transportation and tourism for villagers' bus stand design recommended.
- For efficient and effective communication via post post-office deign is included.
- The design for community hall is to be needed for carrying out meeting and other function carried out by village dwellers.

- The design of Library is to be required for students and elders to read literature build community to share knowledge and help them to grow by education.

8.3 About designs Suggestions / Benefit of the villagers

- We suggest of the villagers to use Community Hall for events and other functions.
- There is no any public garden or recreational center is available in village so we also think about to design of it.
- There is in house post office in village so we have suggested post office design to make workspace so effective communication can be done.
- We have suggested library design to make village dwellers literate and encourage them to grow in life.
- To make feasible transportation solution we have suggested bus stand.

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

Agricultural Storage Yard

Agricultural Storage Yard is a place where the farmers' store their crops which are yielded, before selling to the appropriate buyer at appropriate rate. Agricultural Storage Yard helps to keep the crop of the farmers' safe from the sun and the rain.

Skill Development Centre

Skill Development Centre is a place where people come to learn skills so as to gain employment in their desired profession. It provides theoretical and practical application of the desired subject to the under educated people who are unemployed due to lack of skill and knowledge.

Rainwater Recharge System

Rainwater Harvesting is a technique to store the rainwater in the monsoon season for the purpose of using it in the dry season of summer. Rainwater Recharging is a technique to recharge the underground water with the rainwater so as to keep the underground water level high to easily use in the future.

Speaker System & CCTV Control Room:

There is no speaker system is available in Dungapur village. Speaker system is giving any information as soon as possible to village people. Speaker system is control by control room. Advantages of speaker system are, Spared information speedy, Hazard information can give by speaker system, Heat wave alert can give during summer, Heavy rain alert can give during monsoon, Meeting can arrange quickly by give the information.

.

Chapter 10
Conclusion of the Entire Village Activities of the Project

After working on the Vishwakarma project our conclusion is this around 70% of the State's population is living in rural areas. People in rural areas should have the same quality of life as is enjoyed by people living in sub urban and urban areas. By this Vishwakarma Yojana project government, want technical solution of the problem of villages at the engineering point of view. In this project the common problem of village is solved by the engineering students. Through various government departments are involved in various infrastructural development works, a holistic view and modern solutions etc. can be provided by new engineers under Vishwakarma yojana.

There is increasing demand for facilities in urban areas, which result in several negative effects like undeveloped rural areas, ignorance of lower-class group, demolitions and several destructions. Many people; mainly farmers who move to cities in search of better life and better occupational opportunities end up as casual labor. This leads to menacing problem of urbanization. Dungarpur is one of the villages of Junagadh district. So, it is necessary to develop the village for growth of Junagadh district, state and country also.

In Dungarpur village infrastructure facilities like drinking water, 10% pukka road, 65% pukka house. In Dungarpur village general facilities like chowk, public latrine block and drainage are not available, and they are not using a sustainable energy.

Dungarpur is one of the villages in Junagadh district. Surrounded by agricultural activities. The city is facing issues of lack infrastructure development of internal roads, residential houses, post-office building. For understanding the actual situation of the village, we have collected different data for number of populations. School, water tank, Aaganwadi, hospital etc. By providing design of civil work such as repairing of old building. New road development and bus stop design. For drinking water, we have designed rain water harvesting system installation in individual houses which will benefit the villager.

According to UDPFI norms, lacking in basic amenities And Smart Amenities can be suggested as- Village c.c. Road, PHC & Health Center Eco-Sanitation, Post office building Solar water pump Solar Street light.

Chapter 11
References refereed for this project

1. https://grammanchitra.gov.in/
2. http://www.onefivenine.com/india/villages/Junagadh/Junagadh/Shapur
3. http://www.censusgujarat.gov.in.
4. http://rural.nic.in/netrural/rural/index.aspx
5. Urban development plans formulation and implementation guidance 2014 Vishwakarma Yojana portal.
6. Google Maps
7. IRJABS, 2013, Challenges of sustainable rural development
8. M K Gandhi-CWMG volume (82) publication division New Delhi Narangashok(2006), Indian rural problem new Delhi
9. Report on village evaluation study planning commission govt. of India.
10. N.G. HEGDE, 1998, Strategy of Rural Development.
11. District Census Handbook Junagadh District
12. GTU Vishwakarma Yojana guidelines and briefings
13. URDPFI norms
14. Smart Villages" (PDF). Malaysian Commonwealth Studies Center. 2015.
15. Sapra, Ipsita (February 2013). "Living in the villages". Rural Democracy. D+C Development and Cooperation. Retrieved 24 April 2015.
16. "Our Work". Smart Villages Initiative (Trinity College Cambridge). Retrieved November 7, 2015. smart cities definition - Google Search www.google.co.in
17. Smart city best practices as learned from existing smart cities www.i-scoop.eu
18. Shaping the Future - Building the City of Tomorrow - Shaping the future www.research-in- germany.org
19. Case study of a project-based learning course in civil engineering design: European Journal of Engineering Education: Vol 36, www.tandfonline.com
20. Case study of civil engineering projects - Google Search www.google.co.in smart city practices Google Search www.google.co.in
21. Case study of grey water - Google Search www.google.co.in
22. Smart City Maturity & Benchmark model - TM Forum www.tmforum.org Suggestions on Sansad Adarsh Gram Yojana. www.mygov.in
23. Dungarpur Village, Junagadh Taluka, Junagadh District www.onefivenine.com
24. Census of India Website: Office of the Registrar General & Census Commissioner, Indiacensusindia.gov.in
25. Dungarpur Junagadh censuse2011.co.in - Google Search www.google.co.in technological options for smart cities - Google Search www.google.co.in finishing smart cities development - Google Search www.google.co.in

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:	SHAPUR (SORATH)
Name of Taluka:	VANTHALI
Name of District:	JUNAGADH
Name of Institute:	DR. SUBHASH TECHNICAL CAMPUS
Nodal Officer Name & Contact Detail:	Prof. RAHUL B. CHANDEGRA Mo. 9898624290
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch - DINESHbhai Fadadu Teacher - KETANBHAI KANERIA WORKER - RAJUBHAI RATHOD
Date of Survey:	05/11/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	7,200	33,200	36,900	1,567
ii)	2011	8,108	4,206	3871	1,798

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1,845 hectares
	Forest Area (In hect.)	575
	Agricultural Land Area (In hect.)	658
	Residential Area (In hect.)	796 ha
	Other Area (In hect.)	166 hactor
	Water bodies	Watertank, tubewell
	Nearest Town with Distance:	Vanthali - 2 Km

3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agriculture - Farming 2. Shopkeeper 3. Employee

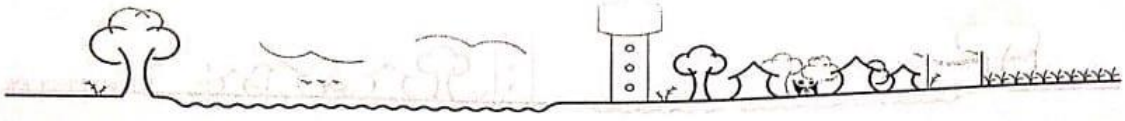
4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Yes	✓		
	• RO Water	No			
	• Well (Covered/ Uncovered)	Yes	✓		
	• Hand pumps	Yes		✓	9
	• Tube well/ Borehole	Yes			
	• River/ Canal/ Spring/ Lake/ Pond	Yes	✓		6
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 2 Lac	✓		
	Underground Sump	Capacity: 1.7 lac	✓		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	85% closed	✓		
	If Open than Pucca / Kutchcha	-			
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Yes	✓		
Suggestions if any:					

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	WBM	✓		
	Main road	RCC	✓		
	Internal streets	CC	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH-7KM SH-3KM	✓		
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes	✓		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Chakdo Private	✓		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. PGVCL (24hr)	✓		
	Power supply for Domestic Use	Yes	✓		
	Power supply for Agricultural Use	Yes	✓		
	Power supply for Commercial Use	Yes	✓		
	Road/ Street Lights	Yes	✓		



	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	No			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes - 2 no	✓		
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	No			
	Any facility for Waste collection from road	D to D	✓		
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	tube well Canal	✓		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	88% Pucca 12% Kutcha			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

K.	Health Facilities:					
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	CHC Govt. Hospital Yes	✓			
	Private Clinic/Private Hospital/ Nursing Home	Available	✓			
	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	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: 10....kms.				
Suggestions if any:					

M.	Socio- Culture Facilities				
	Community Hall (With or without TV) Location:	No			

Gujarat Technological University, Ahmedabad, Gujarat

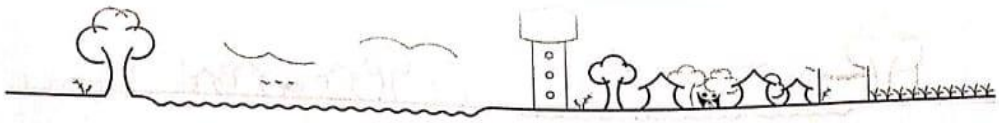
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

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

Suggestions if any:

N.	Other Facilities				
	Post-office	Yes	✓		
	Telecommunication Network/ STD booth	No			



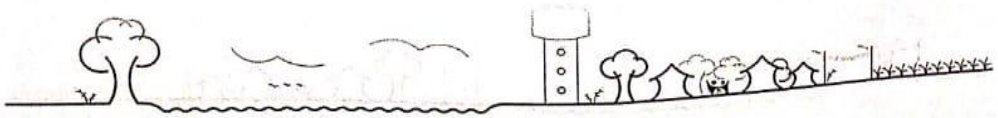
	General Market	Yes	✓		
	Shops (Public Distribution System)	Yes	✓		
	Panchayat Building	Yes	✓		
	Pharmacy/Medical Shop	Yes	✓		
	Bank & ATM Facility	Yes	✓		
	Agriculture Co-operative Society	Yes	✓		
	Milk Co-operative Soc.	Yes	✓		
	Small Scale Industries	Yes	✓		
	Internet Cafes/ Common Service Center/Wi Fi	No			
	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	No (own house used)	-	-	-
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	No No No No	-	-	-
Q.	Any Other	-	-	-	-

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Unavailable (soft available)



Recent Projects going on for Development of Village	No
Any NGO working for village development	No

8. **Additional Information/ Requirement:**

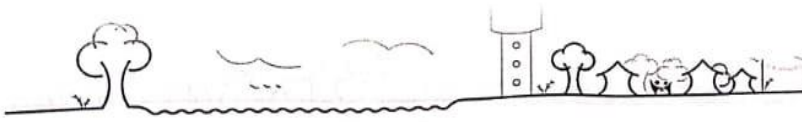
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Existing is good, school need maintainance	-
2.	Additional Information/ Requirement	No	-

9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Solar Street light Rain collection	Possible delopment	-

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

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



12.2 Survey form of Smart 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

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	JUNAGADH
Name of Taluka:	KESHOD
Name of Village:	AJAB
Name of Institute:	DR. Subhash technical campus
Nodal Officer Name & Contact Detail:	Prof. Rahul B. Chandegra
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Ranchhod bhai Villagers
Date of Survey:	01/12/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	6802	3548	3245	1516
2.	2011	8026	4105	6921	1898

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector) Coordinates for Location:	3238.08 Hectors
2.	Forest Area (In hect.)	0
3.	Agricultural Land Area (In hect.)	3,143 hect.
4.	Residential Area (In hect.)	94.90 hect.
5.	Other Area (In hect.)	-
6.	Distance to the nearest railway station (in kilometers):	13 KM

1

7.	Name of Nearest Town with Distance:	Sevgadh - 4KM
8.	Distance to the nearest bus station (in kilometers):	100M
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.	Farming
	2.	Labour
	3.	Job
Major crops grown in the village:	1.	Magfali
	2.	Cotton
	3.	tuver

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:						
B.	**Water Tank Facility**					
	Overhead Tank	Capacity:	3 Lac	Ltr		
	Underground Sump	Capacity:	4 lac	Ltr		
Suggestions if any:						
C.	**The Type of Drainage Facility**					
	A. UNDERGROUND DRAINAGE	80% VG				
	1	close	✓			
	2					
	B. OPEN WITH OUTLET	✓				
	C. OPEN WITHOUT OUTLET					
Suggestions if any:						
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**					
	Village approach road	RCC	✓			
	Main road	CC / RCC	✓			
	Internal streets	Blocks	✓			
	Nearest NH/SH/MDR/ODR Dist. in kms.	16 KM	✓			
Suggestions if any:						
E.	**Transport Facility**					
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	✓ 13 KM				
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	yes available	✓			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Chakdo	✓			
Suggestions if any:						
F.	**Electricity Distribution**					
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	PGVCL	✓			

31

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	Yes	✓		
	Power supply for Agricultural Use	Yes	✓		
	Power supply for Commercial Use	Yes	✓		
	Road/ Street Lights	Yes	✓		
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	No	✓		
	LED Facilities	No			
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Not available			
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	out of village			
	Any facility for Waste collection from road	Regular			
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND	✓	✓		
	STREAM/RIVER	-			
	CANAL	✓	✓		
	WELL	✓	✓		
	TUBE WELL.	✓	✓		
	OTHER (SPECIFY)	Pump	✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	80% P 20% K			

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	✓		
	Sub-Centre	Yes	✓		
	PHC	No			
	BLOCK PHC	No			
	CHC/RH	Yes	✓		
	District/ Govt. Hospital	Yes	✓		
	Govt. Dispensary	Yes	✓		
	Private Clinic	Yes	✓		
	Private Hospital/	Yes	✓		
	Nursing Home	No			
	AYUSH Health Facility	Yes	✓		
	sonography /ultrasound facility	No			
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**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	-			
	If any of the above Facility is not available in village than approx. distance from village: .13....kms.				

5

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

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

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	Yes		Yes	
	Telecommunication Network/ STD booth				No
	General Market	Good		Yes	
	Shops (Public Distribution System)			Yes	
	Panchayat Building			Yes	
	Pharmacy/Medical Shop			Yes	
	Bank & ATM Facility	Good		Yes	
	Agriculture Co-operative Society	Good		Yes	
	Milk Co-operative Soc.	Good		Yes	
	Small Scale Industries	Average		Yes	
	Internet Cafes/ Common Service Center/Wi Fi	Good		Yes	
	Youth Club	-		Yes	
	Mahila Mandal	-		Yes	

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	-		Yes	
	Other Facility				

Suggestions if any:

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

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

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	Recreation center	✓		
3.	Any NGO working for village development	No			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	No - - - - - - -			

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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

IX. Smart Village / Heritage Details

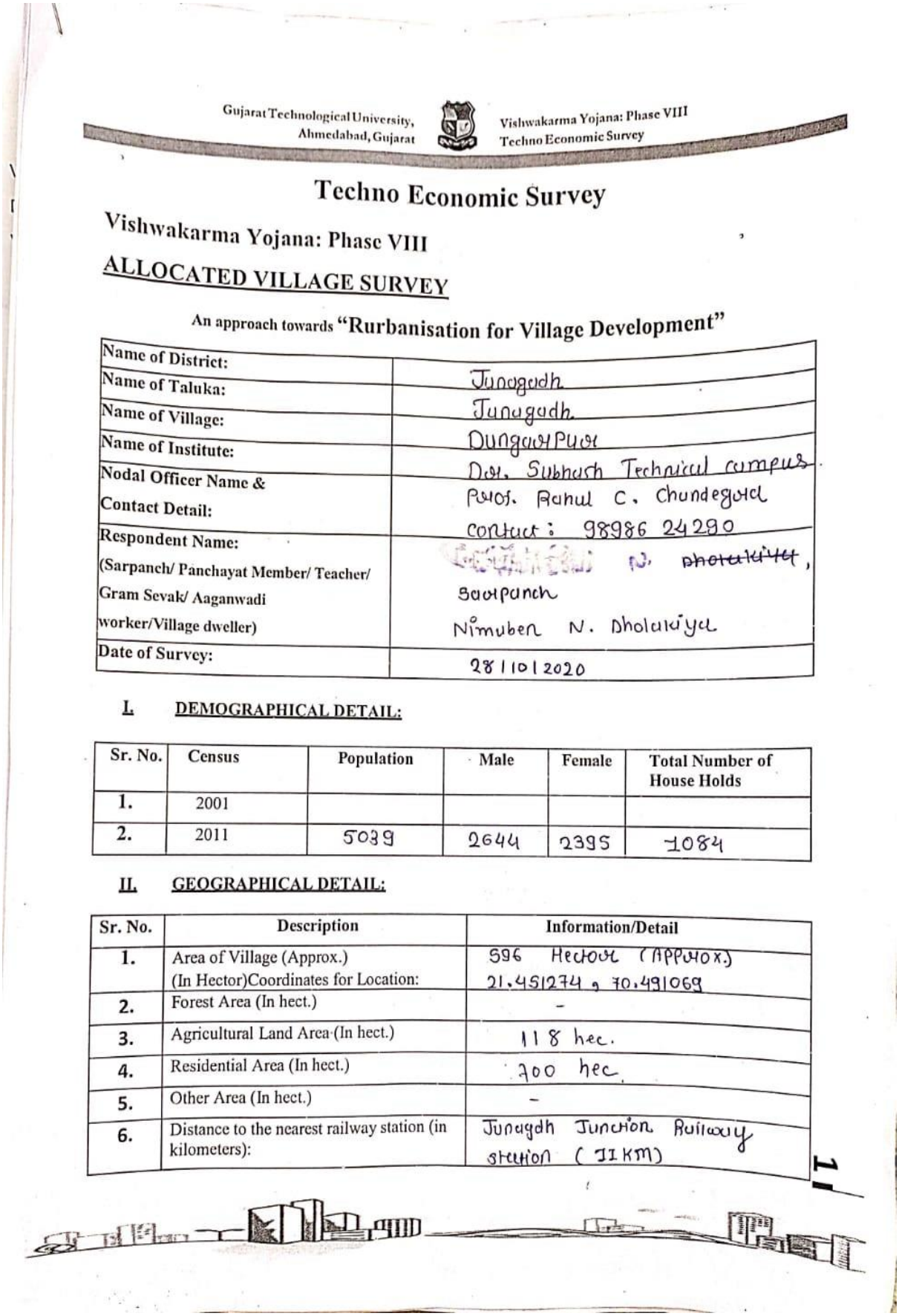
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	public wifi	needed

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

ગામ પંચાયત કચેરી
તાલુકો-કેશોદ

12.3 Survey form of Allocated 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

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Junagadh
Name of Taluka:	Junagadh
Name of Village:	Dungarpur
Name of Institute:	Dr. Subhash Technical campus
Nodal Officer Name & Contact Detail:	Prof. Rahul C. Chundegard Contact : 98986 24290
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch Nimuben N. Dholariya
Date of Survey:	28/10/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	5039	2644	2395	1084

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	596 Hector (Approx.) 21.451274 , 70.491069
2.	Forest Area (In hect.)	-
3.	Agricultural Land Area (In hect.)	118 hec.
4.	Residential Area (In hect.)	200 hec.
5.	Other Area (In hect.)	-
6.	Distance to the nearest railway station (in kilometers):	Junagadh Junction Railway station (11KM)

1

7.	Name of Nearest Town with Distance:	Junagadh
8.	Distance to the nearest bus station (in kilometers):	Kalwa chowk Bus stop, Junagadh (8.6 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.	Farming- Agriculture
	2.	Animal Husbandry
	3.	Labour workers.
Major crops grown in the village:	1.	Groundnut
	2.	cotton
	3.	Brinjal, mangoes

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Yes	✓		-
2.	**DUG WELL** Protected Well Un Protected Well	Yes	✓		-
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	No	✓		-
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	R-O plant Narmada canal,			-

	Other(Specify)Lake/ Pond	pond		✓	-
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 1-2 Lac.	✓		1
	Underground Sump	Capacity: 2 Lac.	✓		1
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	70 % underground	✓		touching River.
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	WBM.	✓		
	Main road	CC	✓		
	Internal streets	Blocks	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH - 2KM	✓	-	
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No. 11KM			Junagadh 11 KM
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No. 8.6 KM	✓		Kuiwa chowk 8.6 KM
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto / Private vehicles	✓		-
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	PGVCL 24 hours	✓		

3

	Power supply for Domestic Use	Yes	✓		
	Power supply for Agricultural Use	Yes	✓		
	Power supply for Commercial Use	Yes	✓		
	Road/ Street Lights				
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	-	-		
	LED Facilities	-	-		

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No			
	Location Condition	-			
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	No			waste out village.
	Any facility for Waste collection from road	No			

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND	Yes	✓		-
	STREAM/RIVER	No	✓		
	CANAL	Yes	✓		-
	WELL	Yes	✓		-
	TUBE WELL.	Yes	✓		-
	OTHER (SPECIFY)	pump	✓.		-

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)				

4

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	yes.	✓		3
	Sub-Centre	No			1
	PHC	yes.	✓		
	BLOCK PHC	No			
	CHC/RH	yes.	✓		1
	District/ Govt. Hospital	No			
	Govt. Dispensary	No			
	Private Clinic	No			
	Private Hospital/	No			
	Nursing Home	No			
	AYUSH Health Facility	No			
	sonography /ultrasound facility	No			
	If any of the above Facility is not available in village than approx. distance from village: 9.9...kms. (Junagadh)				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	yes	✓		
	Primary School	yes.	✓		
	Secondary school	No			
	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: ...9.9..kms.

Suggestions if any:

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

If any of the above Facility is not available in village than approx. distance from village: ...9.9...kms.

Suggestions if any:

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

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

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?	-		Yes,	
	3. Janani Suraksha Yojana	-			No
	4. Kishori Shakti Yojana	-			No
	5. Balika Samriddhi Yojana	-			No
	6. Mid-day Meal Programme	Average		Yes,	
	7. Intergrated Child Development Scheme (ICDS)	-			
	8. Mahila Mandal Protsahan Yojana (MMPY)	-		Yes.	
	9. National Food for work Programme (NFFWP)	good		Yes.	
	10. National Social Assistance Programme				No.
	11. Sanitation Programme (SP)				No
	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				No
	16. Employee Guarantee Scheme (EGS)	Very good,		Yes	
	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)	Yes.		Yes.	
	23. Other (SPECIFY)				No.

71

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

8

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
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		
3.	During the last six months how many times CLEANING .... FOGGING...................................... Drive was undertaken in the village?	✓ yes ✓ yes	- -

IX. Smart Village / Heritage Details

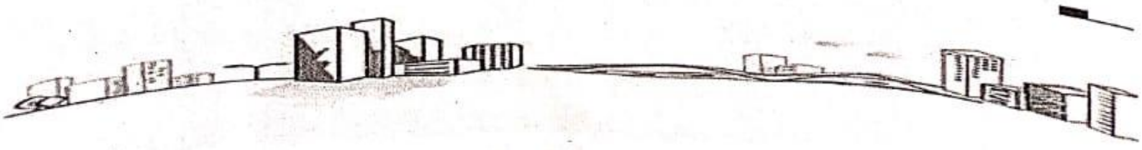
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	Renewable energy source LED light	

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
ગ્રામ પંચાયત ડુંગરપુર

9/



12.4 Gap Analysis of the Allocated Village

Table 32 Gap Analysis

Village Facilities	Planning Commission/UDPFI Norms	Village Name:	Dungarpur		
		Population:		5039	
		Existing	Required as per Norms	Smart Village / Cities / Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	6	1		5
Primary School	Each Per 2500 population	1	1		0
Secondary School	Per 7,500 population	1	2		1
Higher Secondary School	Per 15,000 Population	1	0		1
College	Per 125,000 Population	0	0		0
Tech. Training Institute	Per 100000 Population	0	0		0
Agriculture Research Centre	Per 100000 Population	0	0		0
Skill Development Centre	Per 100000 Population	0	0		0
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1		0
Primary Health & Child Health Centre	Per 20,000 population	0	0		0
Child Welfare and Maternity Home	Per 10,000 population	1	1		0
Multispeciality Hospital	Per 100000 Population	0	0		0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	45	50		5
Physical Infrastructure Facilities					
Transportation		**Adeqt/ Inadet**			
Pucca Village Approach Road	Each village	Adequate			
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)		Inadequate	YES	
Drinking Water (Minimum 70 lpcd)		**Adeqt/ Inadet**			
Over Head Tank	1/3 of Total Demand	Adequate			
U/G Sump	2/3 of Total Demand	Adequate			
Drainage Network - Open			Inadequate		
Drainage Network - Cover			Inadequate		
Waste Management System			Inadequate		
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	1		0
community hall and Public Library	Per 15000 Population	0	1		1

Cremation Ground	Per 20,000 population	0	1		1
Post Office	Per 10,000 population	1	1		0
Gram Panchayat Building	Each individual/group panchayat	1	1	YES	0
APMC	Per 100000 Population	0	0		0
Fire Station	Per 100000 Population	0	0		0
Public Garden	Per village	0	1	YES	1
Police post	Per 40,000Population	0	0		0
Shopping Mall		0	0		0
Electrical Design					
Electricity Network		**Adeqt/ Inadet**			
		Adequate			
Any Smart Village Facility					
Technology	No				
		ESR cap	0		
		Sump cap	50,000 Ltr.		
		Lat cap	0		

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

Table 33 Summary Details of all vilages

Sr.No.	VillageName	Discipline	Part- I	Part - II
1	DUNGARPUR	CIVIL	Design of Library	Design of Agricultural Storage Yard
			Design of Bus Stand	Design of Skill development center
			Design of Post Office	Design of Rain water recharge system
			Design of Community Hall	Design of Speaker System and CCTV Control room
		ELECTRICAL	Design of Electrical plan of Post Office	Electrical Plan of Library
			Design of Electrical plan of Bus stand	Electrical Plan of Community Hall

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

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

12.7 Summary of Good Photographs in Table Format (village visits, Ideal, Smart Village or any other)

Table 34 Summary of Good Photographs

Allocated Village	Ideal Village	Smart Village
		
		
		
		

12.8 Village Interaction with sarpanch Report with the photograph

Village Interaction with sarpanch / Talati letter

Vishwakarma Yojana Phase VIII

Dungarpur Village ,Junagadh , Junagadh District

Village Code : 51522

Subject : Village Interaction form with sarpanch / Talati of Dungarpur Village

I sarpanch / talati of Dungarpur village undersigned gives approval of doing village interaction activity under Vishwakarma Yojana Phase VIII . An approach towards rurbanization by students of Dr. subhash technical campus junagadh named Bharvi Thanki (170830109009) and Nidhi Sorathiya (170830106018).

Date :

Sign:

સરપંચ

ગ્રામ પંચાયત ડુંગરપુર

Seal of Grampanchayat

12.9 Sarpanch Letter giving information about the village development

DR SUBHASH TECHNICAL CAMPUS JUNAGADH

ELECTRICAL & CIVIL DEPARTMENT

VISHWAKARMA YOJANA PHASE VIII

SARPANCH LETTER FOR DUNGAPUR VILLAGE

[Application for Approval of Design]

To,
Sarpanch/Talati,
Village: Dungapur
Taluka: Junagadh
District: Junagadh

Subject: Approval of proposed design for Dungarpur village.

Respected Sarpanch/Talati,

Vishwakarma yojana is the one of the schemes which is organized by Gujrat technical university, Gujrat. In this project, university take a step to enhanced engineering students to do some new things. this project is useful for villagers as more as students. In this project, we have to choose any village give in list which villages is surround our collage and our task is the preparation of design which should be sustainable, economical and also useful for villagers. For our allocated village we have to give various civil design and electrical designs. Governments main aims thorough this project is improve rural area by help of engineering's thoughts and enhance student's power.

We have provided following designs for your village as a part of our Vishwakarma Yojana Phase VIII. These designs will be helpful for growth of your village towards the path of smart village. Kindly consider this application and approve the designs, if you find helpful for the village growth.

Design proposals as off part I and II

1 Public Garden
2 Bus Stand
3 Post Office
4 Community Hall
5 Library
6 Agricultural Storage Yard
7 Skill Development Centre
8 Rain Water Recharge System
9 Speaker System and CCTV Control Room

Yours faithfully,
Thanki Bharvi (170830109009)
Sorathiya Nidhikumari (170830106018)

સરપંચ
ગ્રામ પંચાયત ડુંગરપુર

તલાટી-કમ-મંત્રી
ગ્રામ પંચાયત ડુંગરપુર

PART II

Chapter 13

Sustainable Design Planning Proposal Part II

13.1 Design Proposals

13.1.1 Civil Engineering Design 1

Agricultural Storage Yard

Agricultural Storage Yard is a place where the farmers' store their crops which are yielded, before selling to the appropriate buyer at appropriate rate. Agricultural Storage Yard helps to keep the crop of the farmers' safe from the sun and the rain.

Design Overview

The design of the Agricultural Storage Yard consists of 6 large storage units. There are two offices for the employees who will run the Agricultural Storage Yard. The office will keep record of the goods stored and will collect the fees for storing the goods. There is a big parking area for the transport vehicles to park in front of the storage units.

Design Drawings

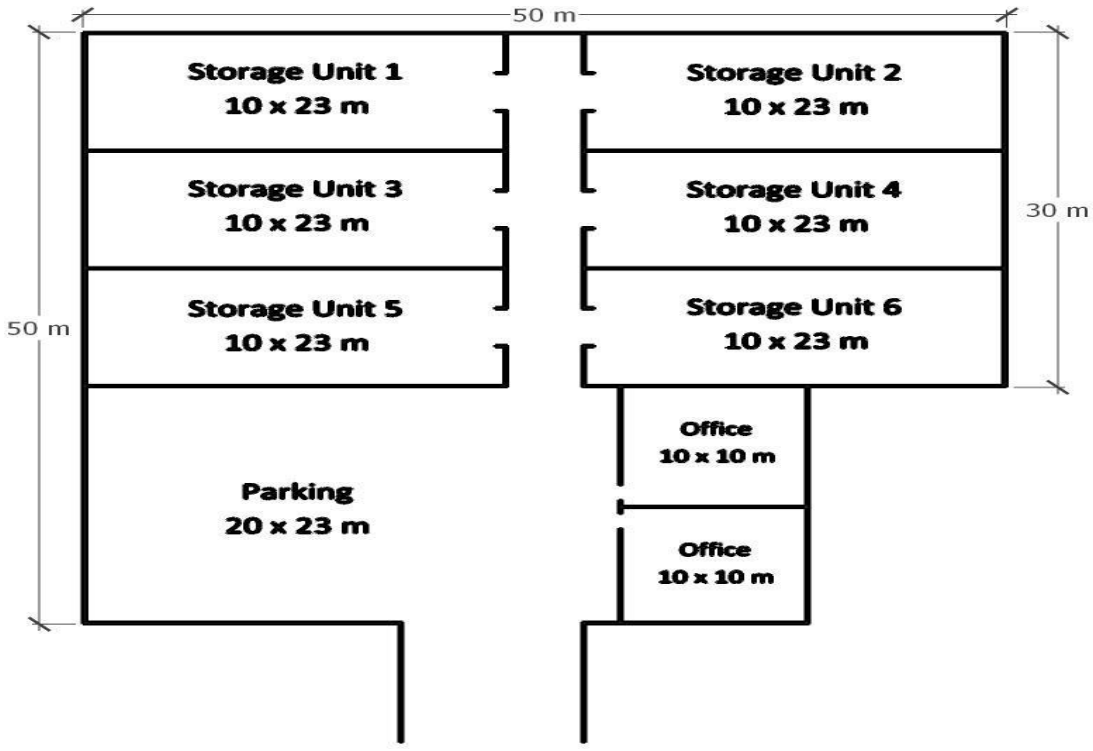


Figure 52 Plan of Agricultural Storage Yard

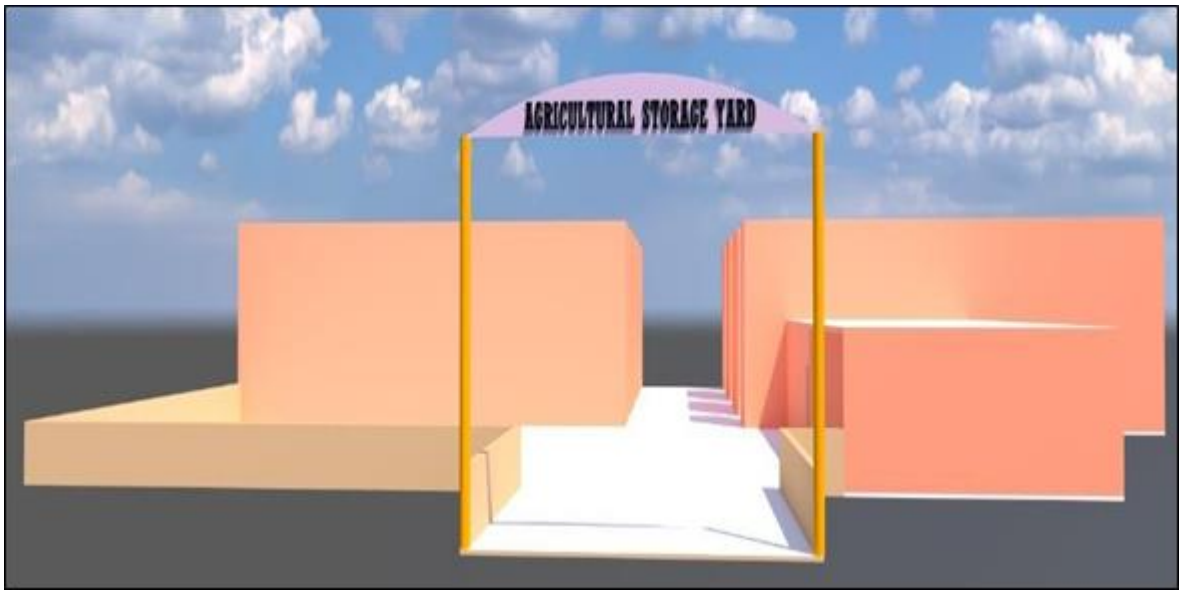


Figure 53 Elevation of Agricultural Storage Yard

Measurement Sheet:

Table 35 Measurement Sheet of Agricultural Storage Yard

Sr No.	Item Description	No	Length (m)	Width (m)	Height (m)	Quantity
1	Excavation in Foundation Net Centre line length = 183-(0.5*0.8*2) =182.2m	1	182.2	0.8	1.1	160.3 m^3
2	P.C.C. in foundation (1:4:8)	1	182.2	0.8	0.2	29.1 m^3
3	Brickwork in foundation up to plinth					
	Step 1 L=183-0.5*0.4*2 =182.6 m	1	182.6	0.4	0.2	14.6
	Step 2 L=183-0.5*0.3*2 =182.7 m	1	182.7	0.3	0.2	10.95
	Step 3 L=183-0.5*0.2*2 =182.8m	1	182.8	0.2	0.5	18.25
					Total Quantity	43.8 m^3
4	Brickwork in super structure in cement mortar (1:6)	1	182.7	0.2	3	109.62 m^3
5	Roofing	1	50	30	-	1500 m^2
6	RCC Slab	2	10	10	0.12	12 m^3
7	Smoot plaster on wall and celling in C.M. (1:3)					
	Storage walls	12	50	-	3	1800
		12	30	-	3	1080
	Office Walls	8	10	-	3	240
					Total Quantity	3120 m^2

Abstract Sheet:

Table 36 Abstract Sheet of Agricultural Storage Yard

Sr. No.	Description	Qty.	Rate	Per	Amount
1	Excavation in foundation	160.3	85	m^3	13625
2	Brick bat cement concrete in foundation	29.1	2200	m^3	64020
3	First class brickwork up to plinth in C.M. 1:6	43.8	2300	m^3	100740
4	Brickwork in super structure	109.62	2400	m^3	263015
5	Roofing	1500	150	m^2	225000
6	RCC work for slab	12	8000	m^3	96000
7	Smooth plaster on walls and ceiling in C.M. 1:3	3120	75	m^2	234000
				Total	**996400**
				Add 5% contingencies	49800
				Grand total	**Rs. 1046200**

13.1.2 Civil Engineering Design 2

Skill Development Centre

Skill Development Centre is a place where people come to learn skills so as to gain employment in their desired profession. It provides theoretical and practical application of the desired subject to the under educated people who are unemployed due to lack of skill and knowledge.

Design Overview

The design of Skill Development Centre consists of three classrooms for teaching purpose. There is a staffroom for the teachers. There is a ladies' toilet. There is a gents' toilet. The central area is open in which the practical teaching can be done.

Design Drawings

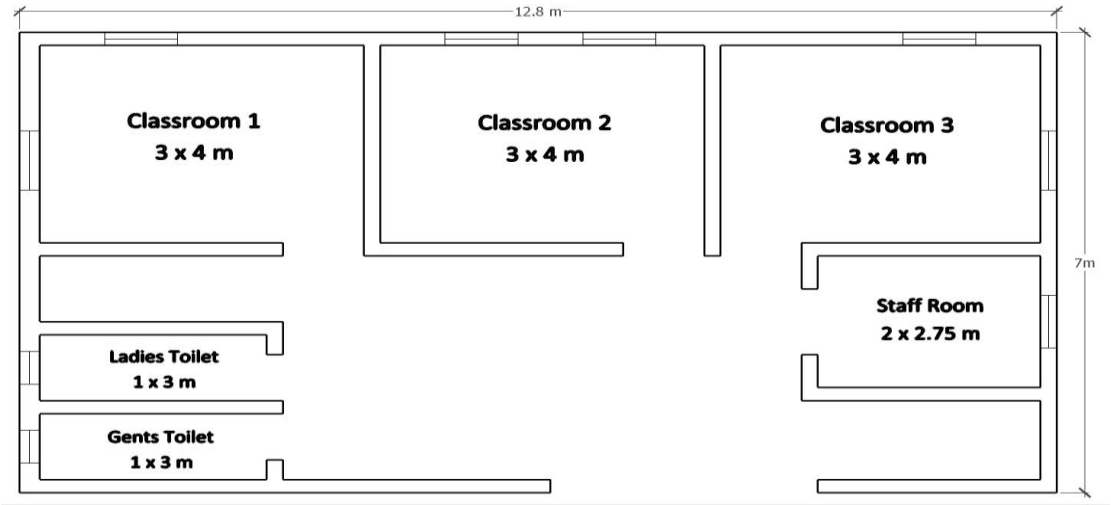


Figure 54 Plan of Skill Development Centre

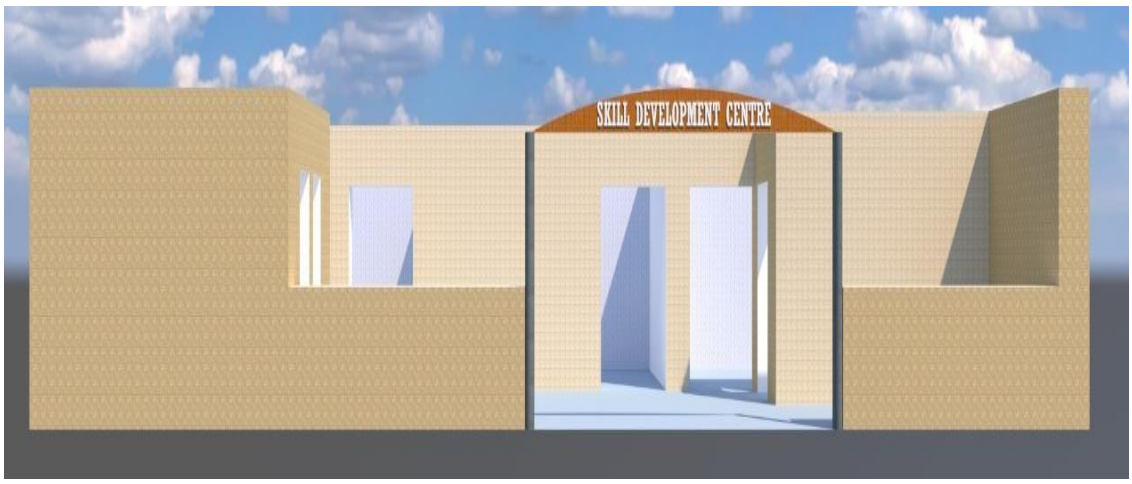


Figure 55 Elevation of Skill Development Centre

Measurement Sheet:

Table 37 Measurement Sheet of Skill Development Centre

Sr No.	Item Description	No.	Length(m)	Width(m)	Height(m)	Quantity(m3)
1	Excavation in FoundationNet Centre line length = 39.6 -(0.5*0.8*2) =38.8m	1	38.8	0.8	1.1	34.15
2	P.C.C. in foundation (1:4:8)	1	38.8	0.8	0.2	6.4
3	Brickwork in foundation up toplinth					
	Step 1 L=39.6-0.5*0.4*2 =39.2 m	1	39.2	0.4	0.2	3.14
	Step 2 L=39.6-0.5*0.3*2 =39.3 m	1	39.3	0.3	0.2	2.36
	Step 3 L=39.6-0.5*0.2*2 =39.4 m	1	39.4	0.2	0.85	6.7
					Total Quantity	12.2
4	Brickwork in Super Structure incement mortar (1:6)	1	39.4	0.2	3	23.64
5	RCC. Slab	1	12.8	7	0.12	10.75
6	Smoot Plaster on Walls and Ceiling in C.M. (1:3)					
	Hall Walls	8	4	-	3	96
		4	3	-	3	36
	Hall Ceiling	1	12	4	-	48
	Toilet Wall	3	3	-	3	27
		2	1	-	3	6
	Toilet Ceiling	1	3	2	-	6
	Staffroom Wall	2	2.75	-	3	16.5
		1	2	-	3	6
	Staffroom Ceiling	1	2	2.75	-	5.5
					Total Quantity	247

Abstract Sheet:

Table 38 Abstract Sheet of Skill Development Center

Sr. No.	Description	Qty.	Rate	Per	Amount
1	Excavation in foundation	34.15	85	m^3	2900
2	Brick bat cement concrete in foundation	6.4	3200	m^3	20500
3	First class brickwork up to plinth in C.M. 1:6	12.2	3200	m^3	39040
4	Brickwork in super structure	23.64	3500	m^3	82750
5	RCC work for slab	10.75	8800	m^3	94600
6	Smooth plaster on inside walls and ceiling in C.M. 1:3	247	150	m^2	37050
				Total	**276840**
				Add 5% contingencies	13840
				Grand total	**Rs. 290680**

13.1.3 Civil Engineering Design 3

Rainwater Recharge System

Rainwater Harvesting is a technique to store the rainwater in the monsoon season for the purpose of using it in the dry season of summer. Rainwater Recharging is a technique to recharge the underground water with the rainwater so as to keep the underground water level high to easily use in the future.

Design Overview

Here water is being collected from the roof of the house and transferred to a diversion tank through a PVC pipe. When the diversion tank is full the water is passed to the filtration tank where, the water is filtered and the impurities are removed. Now the water is passed to the nearest underground water sources such as bore well through a pipe connected from the filtration tank.

Design Drawings

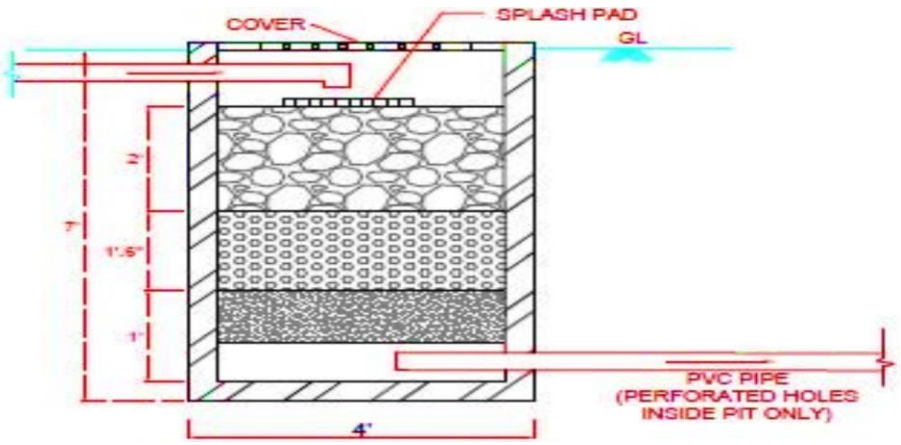


Figure 56 Filtration Tank

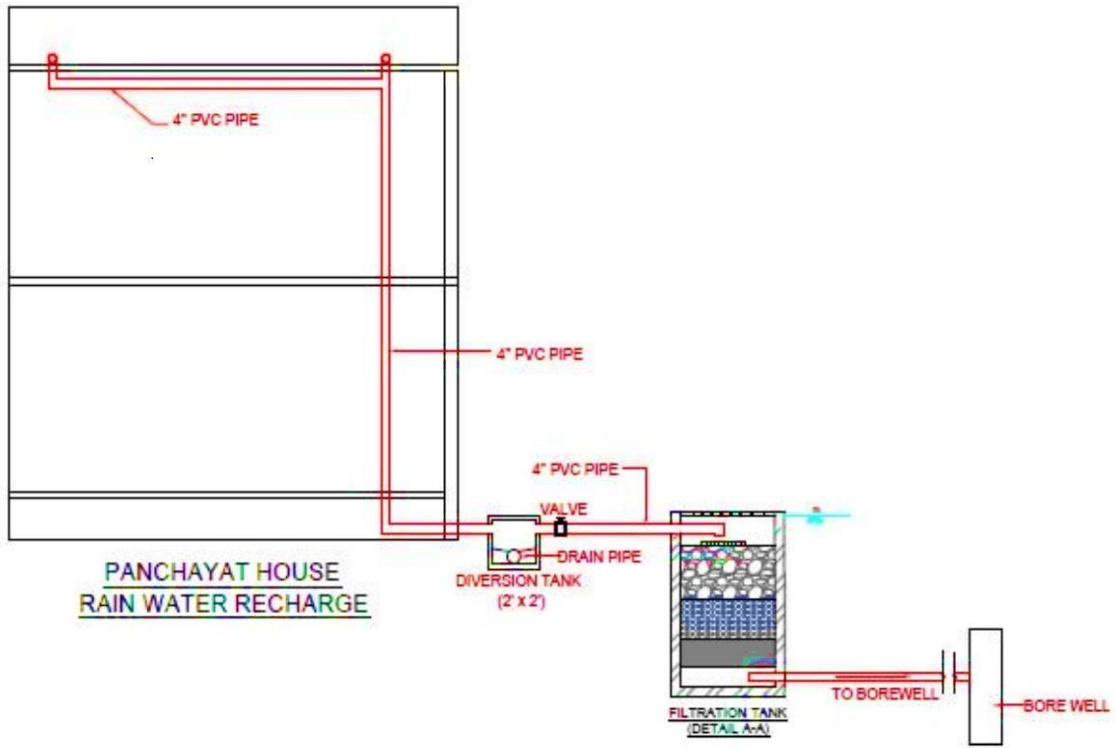


Figure 57 Rainwater Recharge System

Abstract Sheet:

Table 39 Abstract Sheet of Rainwater Recharge System

Sr.No	Description of item	Qty.	Rate	Per	Amount
1	Filtration tank	1	15000	Nos.	15000
2	Diversion tank	1	2000	Nos.	2000
3	4" PVC pipe	10	400	Nos.	4000
4	Valve	4	700	Nos.	2800
5	Elbow, T & Coupling	15	350	Nos.	5250
6	Solution	15	100	Nos.	1500
				Total	**30550**
				Add 5% contingencies	1550
				Grand total	**Rs. 32100**

13.1.4 Civil Engineering Design 4

Speaker System & CCTV Control Room:

There is no speaker system is available in Dungapur village. Speaker system is giving any information as soon as possible to village people. Speaker system is control by control room. Advantages of speaker system are, Spared information speedy, Hazard information can give by speaker system, Heat wave alert can give during summer, Heavy rain alert can give during monsoon, Meeting can arrange quickly by give the information.

Design Drawings:

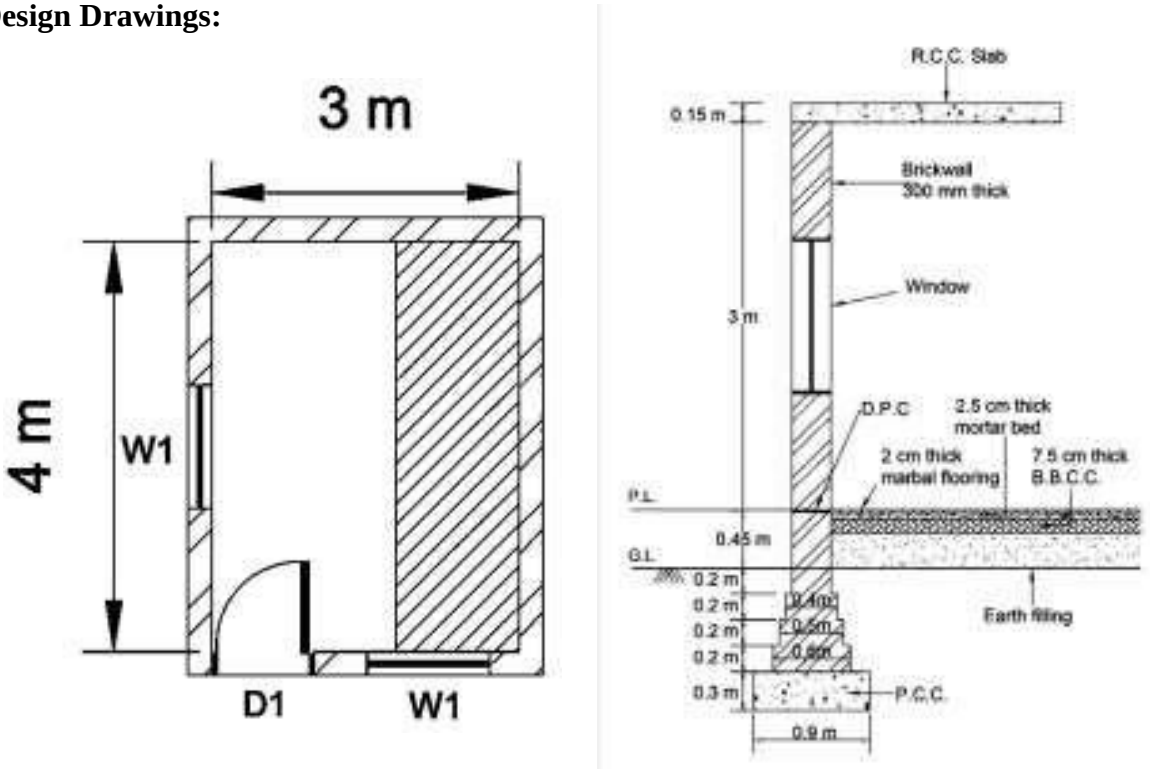


Figure 58 Plan & cross-section of speaker system &CCTV control room

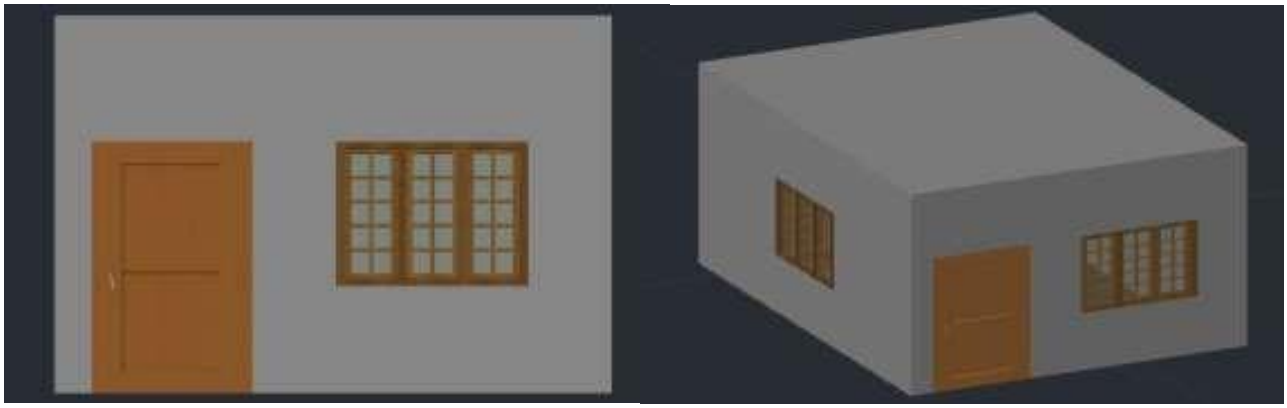


Figure 59 Elevation and 3D view of Speaker system and CCTV control room

Measurement Sheet:

Table 40 Measurement Sheet of Speaker System and CCTV Control Room

Sr. No.	Description Of Item	Nos.	Length (m)	Breadth (m)	Height (m)	Quantity
1	**Excavation for foundation** Net center line =15.2 m	1	15.2	0.9	1.1	15.05 m^3
2	**PCC for foundation**	1	15.2	0.9	0.3	4.10 m^3
3	**Brick Masonry up to Plinth**					
	Step 1 (Width 0.6 m) L = 15.2 m	1	15.2	0.6	0.2	1.82 m^3
	Step 2 (Width 0.5 m) L = 15.2 m	1	15.2	0.5	0.2	1.52 m^3
	Step 3 (Width 0.4 m) L = 15.2 m	1	15.2	0.4	0.2	1.22 m^3
	Step 4 (Width 0.23 m) L =15.2 m	1	15.2	0.3	0.2	0.91 m^3
	Step 5 (Width 0.23 m) L =15.2 m	1	15.2	0.3	0.45	2.05 m^3
					Total Brickwork	**7.52 m^3**
4	**Sand filling up to G.L. Quantity** = (Excavation -PCC-Brick work upto GL)= (15.05 - 4.10 -5.47)= 5.48	-	-	-	-	5.48 m^3
5	**Brick Masonry above plinth up to slab level** L = 15.2 m	1	15.2	0. 3	3	13.68 m^3
	Deduction for door-windows					
	D1	1	1	0.3	2.1	-0.63 m^3
	W1	2	1.2	0.3	1.2	-0.86 m^3
	Deduction for door-windows lintel					
	D1	1	1.3	0.3	0.1	-0.04 m^3
	W1	2	1.5	0.3	0.1	-0.09 m^3
				Total		**12.06 m^3**
6	**Sand filling for* Plinth level**	1	3	4	0.33	3.96 m^3
7	**BBCC above sand filling**	1	3	4	0.075	0.9 m^3
8	**Marbal flooring**	1	3	4	-	12 m^2
8	**Concreting for slab**	1	3	4	0.15	**15.80 m^3**
9	**Formwork for slab**	2	3.6	-	0.17	3.12 m^2
		2	4.6	-	0.17	3.90 m^2
		-	3	6		12 m^2
				Total		**19.02 m^2**
10	**Inside plaster**					
	For main hall with stage	2	3	-	3	18 m^2

		2	-	4	3	24 m^2
	Deduction for door-windows					
	D1	1	1	-	2.1	-1.05 m^2
	W1	2	1.2	-	1.2	-1.44 m^2
				Total		**39.51 m^2**
11	**Outside plaster**					
	Main wall	1	16.4	-	3	49.2 m^2
	Deduction for door-windows					
	D1	1	1	-	2.1	-1.05 m^2
	W1	2	1.2	-	1.2	-1.44 m^2
				Total		**46.71 m^2**

Abstract Sheet:

Table 41 Abstract sheet of speaker system &CCTV control room

Sr. No.	Description Of Item	Quantities	Rate	Per	Amount
1	Excavation	15.05 m^3	110	Cu. M	1655
2	PCC	4.10 m^3	965	Cu. M	3956
3	Sand Filling	9.44 m^3	90	Cu. M	850
4	Concreting Work	15.8 m^2	130	Sq. M.	2054
5	Brick Work	19.58 m^3	1250	Cu. M.	24475
6	Inside Plaster	39.51m^2	150	Sq. M..	5926
7	Outside Plaster	46.71m^2	250	Sq. M..	11677
8	Steel Work	8.2 m^2	200	Sq. M..	1640
9	Shuttering	8.2 m^2	70	Sq. M..	574
10	Marble work	8.2 m^2	600	Sq. M..	4920
11	BBCC	0.9 m^3	2700	Cu. M.	2430
12	Cement	180 bags	280	Bag	50400
13	Sand	15.28 m^3	900	Cu. M.	13752
14	Aggregate	16.93 m^3	1000	Cu. M.	16930
15	Brick	9790 nos.	4	Brick	39160
16	Steel	1245 kg	55	Kg	68475
17	Binding Wire	12.5 kg	60	Kg	750
18	CCTV Camera	32	1500	Nos.	48000
19	Speaker	32	1800	Nos.	57600
				TOTAL	3, 55,224
		Add 1.5% water charge Rs.			5330
		Add 10% contractor profits Rs.			35523
				Total Cost	**3, 96,077 /-**

13.1.5 Electrical Engineering Design 1 (water level Indicator and Alarm system)

This project helps to detect the different water tank levels (like overflow condition, top, middle, and bottom) with the help of three different LED notifications. We can also set the buzzer along with LED.

This system helps to indicate water levels in two different ways.
It will glow the LEDs at different levels.
It also starts making buzz sound when tank overflows.

Components

Three different colors LEDs
Three 220Ω Resistor
Four BC547 Transistor
9v DC Battery with clip connector
Buzzer
Electric Switch
Zero PCB Board
Breadboard and Connecting wire (Jumper wire)

Circuit Diagram

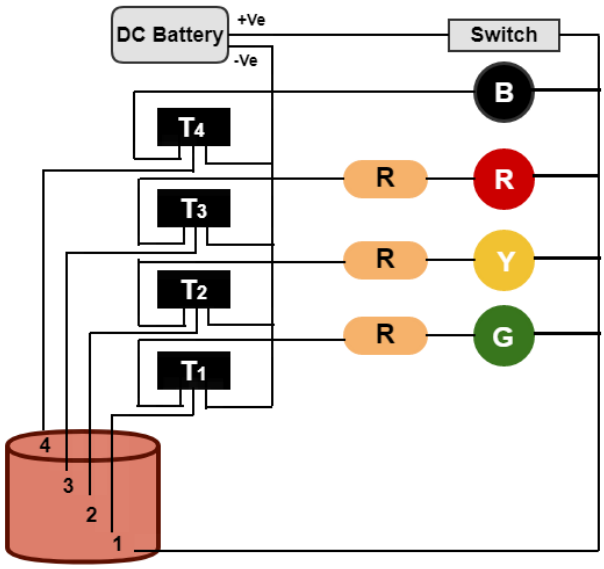


Figure 54 Circuit Diagram of water level indicator

Working of Water Level Indicator System

The main function of this project is to detect and alert the system for the particular water tank level. A buzzer helps to alert the system and three different color LEDs indicate different levels like Maximum, Minimum, and Bottom water level

Suppose, the water tank is empty. And we are pouring water in it.At first, all the LEDs will be off.

1. Green Light Indication (Water Level 1- Bottom): When the water reaches the first level, the base terminal of the transistor (T1) becomes active. And the green LED glows.

2. Yellow Light Indication (Water Level 2- Middle): When the water level reaches the middle level (at point 2), the two-transistor (T1 and T2) gets activated. The yellow light will glow.Both yellow and green light will be ON in the middle level.

3. Red Light Indication (Water Level 3- Maximum): When the water tank reaches at the top level (at point 3) of the tank. the red light will glow.At this stage, green, yellow, and red LEDs will glow by activating the three base terminal of the transistors (T1, T2 and T3).

4. Buzzer Indication (Water Level 4- Overflow): When water overflows from the tank, all-transistor will be active and complete the circuit. Because of the complete closed circuit, a buzzer starts beeping and gives an alert indication to the system.At overflow condition, all the LEDs will glow and the buzzer will start beeping sound.

Cost estimation:

Components Name	Quantity	Price
LED	3	4.5
220Ω Resistor	3	7.5
BCS47 Transistor	4	40
9v battery with clip connection	1	54
Buzzer	1	250
Zero PCB board	1	35
Electric switch	1	49
Breadboard	1	88
Total		₹528

Table 42 Cost estimation of water level indicator

13.1.6 Electrical Engineering Design 2 (LPG Gas Leakage Detector Project using Gas Sensor and 555 Timer IC)

Project Concept

The LPG Gas Leakage Detector Project is based on a very simple concept and it very easy to build. When this system detects LPG gas, it alerts us by turn on the LED and Buzzer. The key components are the MQ2 gas sensor module, BC557 Transistor, 555 Timer IC, LED, and

Buzzer. The MQ6 is a gas sensor module, which can scene LPG, Alcohol, Propane, Hydrogen, CO, and even methane. Here we will use it to detect LPG. The BC557 transistor work as a switching device, it is activated by the sensor output. Here it is used to drive the 555 Timer IC. The 555 Timer IC is the main Chip, it generates output to control LED and Buzzer. The LED and Buzzer are work as an indicator.

Block Diagram of LPG Gas Leakage Detector Project

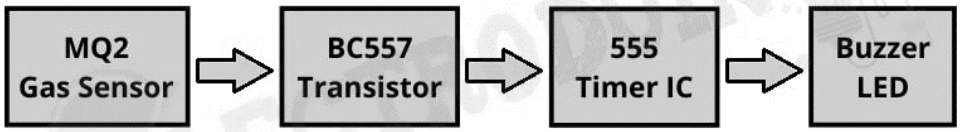


Figure 61 Block Diagram of LPG Gas Leakage Detector Project

Circuit Diagram

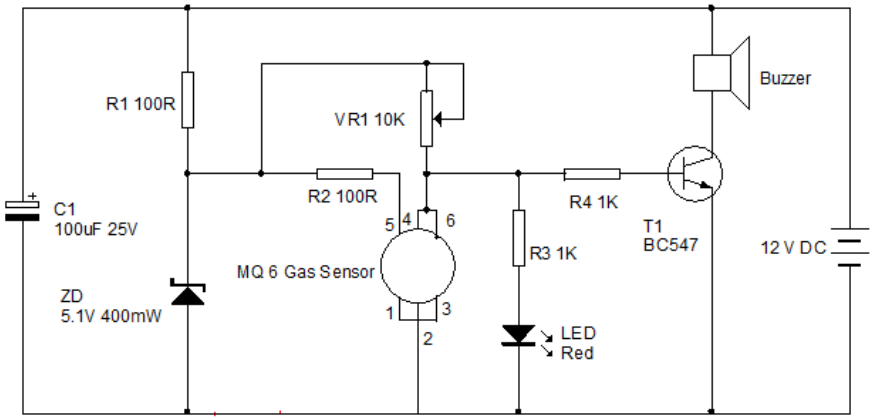


Figure 62 Circuit Diagram of LPG Gas Leakage Detector Project

Working Principle LPG Gas Leakage Detector Project

An LPG gas sensor is a one kind of device which is used to sense the presence of a hazardous LPG gas leak in service station, cars, storage tanks and homes. This sensor is attached to an alarm circuit to give an alert to the operators through a buzzer sound in the area where the gas leak is occurring.

When we will turn on the circuit power supply between 5v to 12v, then the 7805 voltage regulator IC converts the input voltage into 5v output. Because MQ2 Gas Sensor Module operates on 5v input voltage. The MQ2 gas sensor module can sense LPG. Here the 555 timer IC configured in monostable mode, so when it gets a LOW (Ground) trigger pulse at its trigger pin, then the IC OUTPUT becomes High. After turn on the power supply MQ2 gas sensor start sensing LPG gas is present in the air or not. If LPG gas leaks from a cylinder then the MQ2 gas sensor detects it and provides LOW (Ground/0v) output voltage from the “D0” pin. This output voltage goes to the Base terminal of the BC557 Transistor and the transistor becomes active. Now it starts conducting and the 555 timer ic trigger pin (IC pin 2) connects to the ground. Then the IC produces High out from Pin 3.This output voltage goes to the LED and Buzzer. Then the LED starts glowing and the buzzer generates Sound.

Cost Estimation of LPG Gas Detector

Components Name	Quantity	Price
NE555 Timer IC (U2)	1	6.5
7805 Voltage Regulator (U1)	1	10
BC557 Transistor (Q1)	1	10
MQ2 Gas Sensor Module	1	150
150 ohm Resistor (R1, R4)	1	5
10K ohm Resistor (R2)	1	2.5
47K ohm Resistor (R3)	1	2.5
100 uF Capacitor (C1)	1	10
0.01uF Capacitor (C2)	1	10
Red LED (D1)	1	1.5
Buzzer (B1)	1	250
Slide Switch (SW1)	1	30
5V to 9V Power Supply	1	54
PCB board	1	35
Connecting Wire	1	38
Total		₹615

Table 43 Cost Estimation of LPG Gas Leakage Detector Project

13.1.7 Electrical Engineering Design 3 (Smart Dustbin using Arduino, Ultrasonic Sensor & Servo Motor)

Concept behind Smart Dustbin using Arduino

The main concept behind the Smart Dustbin using Arduino project is Object Detection. I have already used Ultrasonic Sensor in Object Avoiding Robot, where upon detecting an object, the Robot will change its course of direction.A similar methodology is implemented here, where the Ultrasonic Sensor is placed on top of the dustbin's lid and when the sensor detects any object like a human hand, it will trigger Arduino to open the lid.

Circuit Diagram

The following image shows the circuit diagram of the Smart Dustbin using Arduino. It is a very simple design as the project involves only two components other than Arduino.

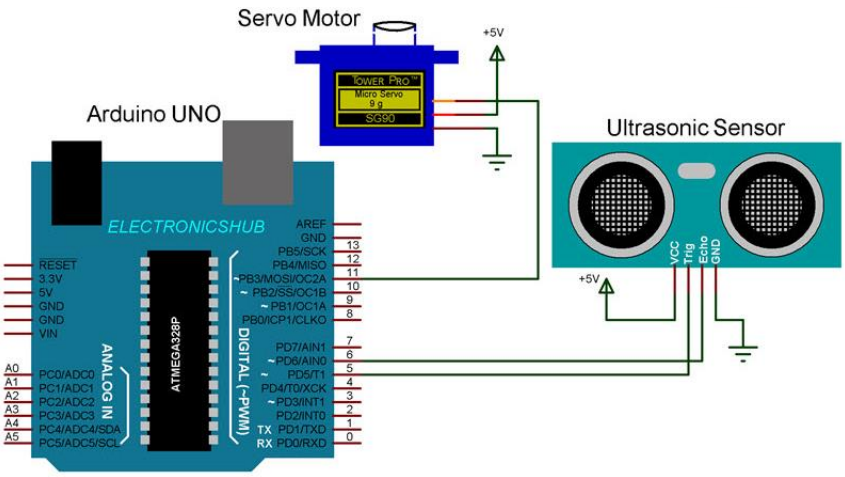


Figure 63 Circuit Diagram of smart Dust Bin

Components Required

Arduino UNO
HC-SR04 Ultrasonic Sensor Module
TowerPro SG90 Servo Motor
Connecting Wires
5V Power Supply
A small dustbin with hinged lid

Code

```
#include <Servo.h>
Servo myservo;
int pos = 20;
const int trigPin = 5;
const int echoPin = 6;
const int led = 13;
long duration;
float distance;
void setup()
{
  myservo.attach(11);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(led, OUTPUT);
  myservo.write(pos);
}
void loop()
{
  //Serial.begin(9600);
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
```

```
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = 0.034*(duration/2);
  //Serial.println(distance);
  if (distance < 27)
  {
    digitalWrite(led,HIGH);
    myservo.write(pos+160);
    delay(1000);
  }
  else
  {
    digitalWrite(led,LOW);
      myservo.write(pos);
  }
  delay(300);
}
```

Working

After setting up the Smart Dustbin and making all the necessary connections, upload the code to Arduino and provide 5V power supply to the circuit. Once the system is powered ON, Arduino keeps monitoring for any object near the Ultrasonic Sensor.
If the Ultrasonic Sensor detects any object like a hand for example, Arduino calculates its distance and if it less than a certain predefined value, Arduino will activate the Servo Motor and with the support of the extended arm, it will list the lid open.After certain time, the lid is automatically closed.

Cost Estimation for smart Dust Bin

Components Name	Quantity	Price
Arduino UNO	1	550
HC-SR04 Ultrasonic Sensor Module	1	180
TowerPro SG90 Servo Motor	1	237
Connecting Wires	1	35
5V Power Supply	1	180
A small dustbin with hinged lid	1	400
Miscellaneous (glue, plastic tube, etc.)	1	100
Total		₹1682

Table 44 Estimation of Smart Dust Bin

13.2 Reason for Student Recommending this Design

- The Agricultural Storage Yard will help the farmers of the village because there is no provision for storage of agricultural goods. The goods are stored out in open land areas.
- Skill Development Centre will help people learn new skills and also improve their known skills.
- In the summer days there is a shortage of water. So Rainwater Recharge System will help in storage of rainwater for the use of water in summer.
- There is no speaker system is available in Dungapur village. Speaker system is giving any information as soon as possible to village people. Speaker system is control by control room

13.3 About designs Suggestions / Benefit of the villagers

- Agricultural Storage Yard will help farmers in storing the agricultural goods in a safe and secure environment.
- Skill Development Centre will help people learn new skills, thus help in employment of the people. Thus reducing unemployment problem in the village.
- Rainwater Recharge System will help in recharging the underwater sources through the collection of rainwater. Thus helping in the use of water in summer days.
- Advantages of speaker system are, Spared information speedy, Hazard information can give by speaker system, Heat wave alert can give during summer, Heavy rain alert can give during monsoon, Meeting can arrange quickly by give the information.

Chapter: 14
Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant Techniques

Base Isolation Method

A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

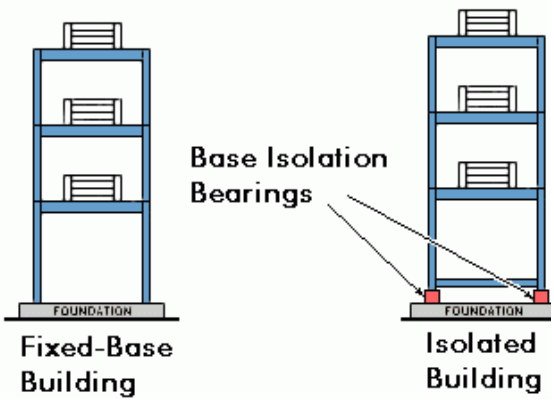


Figure 62 Comparison of Fixed Base Building & Isolated Base Building

To get a basic idea of how base isolation works, examine Figure 2 This shows an earthquake acting on both a base isolated building and a conventional, fixed-base, building. As a result of an earthquake, the ground beneath each building begins to move. In Figure 2, it is shown moving to the left. Each building responds with movement which tends toward the right. The building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia. The inertial forces acting on a building are the most important of all those generated during an earthquake. It is important to know that the inertial forces which the building undergoes are proportional to the building's acceleration during ground motion. It is also important to realize that buildings don't actually shift in only one direction. Because of the complex nature of earthquake ground motion, the building actually tends to vibrate back and forth in varying directions.

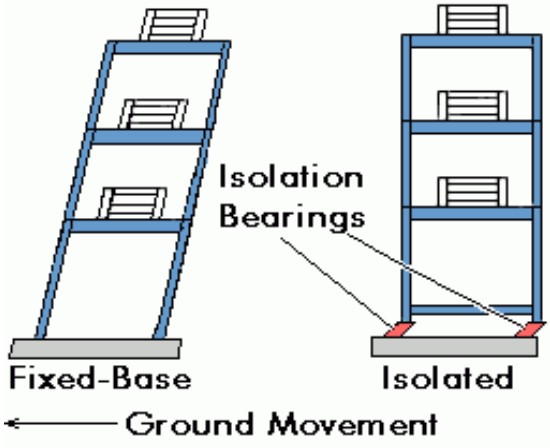


Figure 63 Effect of Ground Vibration on Fixed Base Building & Isolated Base

In addition to displacing toward the right, the un-isolated building is also shown to be changing its shape-from a rectangle to a parallelogram. It is deforming. The primary cause of earthquake damage to buildings is the deformation which the building undergoes as a result of the inertial forces acting upon it.

By contrast, even though it too is displacing, the base-isolated building retains its original, rectangular shape. It is the lead-rubber bearings supporting the building that are deformed. The base-isolated building itself escapes the deformation and damage, which implies that the inertial forces acting on the base-isolated building have been reduced. Experiments and observations of base-isolated buildings in earthquakes have been shown to reduce building accelerations to as little as 1/4 of the acceleration of comparable fixed-base buildings, which each building undergoes as a percentage of gravity.

14.1.2 Seismic Retrofitting of Buildings

Seismic Retrofitting

It is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. The retrofit techniques are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms.

Seismic Retrofitting Objectives

Public Safety: The goal is to protect human life, ensuring that the structure will not collapse upon its occupants or passers-by, and that the structure can be safely exited. Under severe seismic conditions the structure may be a total economic write-off, requiring tear-down and replacement.

Structure Survivability: The goal is that the structure, while remaining safe for exit, may require extensive repair (but not replacement) before it is generally useful or considered safe for occupation. This is typically the lowest level of retrofit applied to bridges.

Conventional Retrofitting Techniques

Adding Steel Bracings: An effective solution when large openings are required. Advantages of adding steel bracings:

1. Higher strength and stiffness,
2. Opening for natural light,
3. Amount of work is less since foundation cost may be minimized
4. Adds much less weight to the existing structure

Figure 64 Steel Bracings

Jacketing: Most popular method for strengthening of building columns. It is used in restoring existing column to original size or to increase in size.

Advantages of Jacketing: Increases concrete confinement, Increase shear strength, Increases flexural strength.

Figure 65 Jacketing

Modern Advanced Retrofitting Technique

Use of Fibre Reinforced Polymer (FRP): Fiber reinforced polymer (FRP) composites are now widely used for seismic strengthening of the reinforced concrete members as conventional materials pose complications. Although it is cost-effective to use steel plates, the strengthening technique is labor intensive and have many disadvantages. One of the major disadvantages of traditional strengthening techniques is the manipulation of heavy steel and the risk of corrosion. It is also impossible to visually examine the condition of a concrete member following a seismic event. FRP composites are used to considerably increase strength and ductility without increasing stiffness. Therefore, the use of FRPs in seismic retrofit applications can help prevent the need to retrofit other parts of the structure. Following are some of the key metrics of FRP application for seismic retrofitting as compared with steel and other conventional techniques:

High stiffness and strength-to-weight ratio make advanced composites ideal for strengthening and seismic retrofitting. The durability and mechanical characteristics of FRPs can be customized in accordance with the application. FRP composites protect the inner reinforcement against rust as they can effectively withstand the harsh environment. It is easy to produce, handle, and install FRP wraps without any heavy equipment. The reduced maintenance cost and long service life make FRPs economically viable strengthening solution.

14.1.3 Advance Practices in Construction field in Modern Material, Techniques and Equipment's

Building Information Modelling (BIM): Building Information Modelling (BIM) is a very broad term that describes the process of creating and managing digital information about a built asset such as a building, bridge, highway or tunnel.

ISO 19650:2019 defines BIM as: Use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions.

BIM Maturity Levels: The range of BIM maturity levels have been categorized as:

- Level 0: Unmanaged CAD (Computer Aided Design).
- Level 1: Managed CAD in 2D or 3D.
- Level 2: Managed 3D environment with data attached, but created in separate discipline models.
- Level 3: Single, online, project model with construction sequencing, cost and life-cycle management information.

Characteristics of BIM: Fundamentally, the purpose of BIM is to ensure that appropriate information is created in a suitable format at the right time so that better decisions can be made throughout the design, construction and operation of built assets. It is not about creating a 3D model for its own sake, and it is not an add-on process. BIM is fundamental to the way a project is set up and run. BIM centers around the creation of employer's information requirements (EIR), which define the information that the employer wishes to procure in order to develop and operate a built asset. Setting this out in a contract document ensures that appropriate information is created in a suitable format at the right time.

Sustainable and Green Building Materials

1. Bamboo: Bamboo is considered one of the best eco-friendly building materials. It has an incredibly high self- generation rate, with some being reported to have grown up to three feet within 24 hours. It continues spreading and growing without having to be replanted after harvest. Bamboo is a perennial grass and not wood and grows everywhere. It also has a high strength-to-weight ratio, even greater comprehensive strength than concrete and brick, and lasts incredibly long. It is, therefore, the best choice for flooring and cabinetry.

2. Rammed Earth: It is a technology that has been used throughout human civilization for thousands of years and lasts a very long time. It is a popular and affordable solution to creating steadfast foundations and floors and walls. When pressed tightly in wooden forms, it creates walls that have a similar feel to concrete. Rammed earth provides several advantages such as superior thermal mass, temperature and noise control, strength and durability, low maintenance, fire proofing, load bearing and pest deterrence.

3. Hemp Crete: It is a concrete-like material created from the woody inner fibers of the hemp plant. The fibres are bound with lime to create concrete-like shapes that are strong and light. Hemp concrete blocks are lightweight, dramatically reducing the energy used to transport the blocks. Hempcrete is sturdy, has good thermal and acoustic insulation qualities and is fire resistant. Additionally, its biggest sustainable property is that it is CO2 negative, meaning it absorbs more CO2 than it emits.

4. Timber Crete: Timber Crete is made from a combination between timber waste from various sources and concrete. It is a green material that is lighter that solid concrete with greater strength and insulating capabilities. This green material provides unique thermal qualities that combine thermal mass and insulation usually turned constructed for eco-housing. Timber Crete is also bushfire proof, which allows minimal heat transfer and radiation.

Figure 66 Bamboo

Figure 67 Rammed Earth

Figure 68 Hemp Crete

Figure 69 Timber Crete

14.1.4 Engineering Aspects of Soil Mechanics - Environmental Impact Assessment

Soil Mechanics: Soil mechanics is a branch of soil physics and applied mechanics that describes the behavior of soils. Soil consists of a heterogeneous mixture of fluids usually air and water also particles such as clay, silt, sand, and gravel, but soil may also contain organic solids and other matter. Along with rock mechanics, soil mechanics provides the theoretical basis for analysis in geotechnical engineering.

Soil mechanics is used to analyses the deformations of and flow of fluids within natural and man-made structures that are supported on or made of soil, or structures that are buried in soils. Principles of soil mechanics are also used in related disciplines such as geophysical engineering, coastal engineering, agricultural engineering, hydrology and soil physics.

Application of Soil Mechanics

1. Foundations: The loads from any structure have to be ultimately transmitted to a soil through the foundation for the structure. The foundation is important part of a structure, the type and details of which can be decided upon with the knowledge and application of the principles of soil mechanics.

2. Underground and Earth-retaining Structures: Underground structures such as drainage structures, pipe lines, and tunnels and earth-retaining structures such as retaining walls and bulkheads can be designed and constructed only by using the principles of soil mechanics and the concept of 'soil-structure interaction'.

3. Pavement Design: Pavement Design may consist of the design of flexible or rigid pavements. Flexible pavements depend more on the subgrade soil for transmitting the traffic loads. Problems peculiar to the design of pavements are the effect of repetitive loading, swelling and shrinkage of sub-soil and frost action. Consideration of these and other factors in the efficient design of a pavement is a must and one cannot do without the knowledge of soil mechanics.

4. Excavations, Embankments and Dams: Excavations require the knowledge of slope stability analysis; deep excavations may need temporary supports 'timbering' or 'bracing', the

design of which requires knowledge of soil mechanics. Likewise, the construction of embankments and earth dams where soil itself is used as the construction material requires a thorough knowledge of the engineering behaviour of soil especially in the presence of water. Knowledge of slope stability, effects of seepage, consolidation and consequent settlement as well as compaction characteristics for achieving maximum unit weight of the soil in-situ, is absolutely essential for efficient design and construction of embankments and earth dams.

Environmental Impact Assessment: Environmental assessment (EA) is the assessment of the environmental consequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.

The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made". EIAs are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts. Environment Impact Assessment in India is statutorily backed by the Environment Protection Act, 1986 which contains various provisions on EIA methodology and process.

The EIA Process: EIA involves the steps mentioned below. However, the EIA process is cyclical with interaction between the various steps.

Screening: The project plan is screened for scale of investment, location and type of development and if the project needs statutory clearance.

Scoping: The project's potential impacts, zone of impacts, mitigation possibilities and need for monitoring.

Collection of baseline data: Baseline data is the environmental status of study area.

Impact prediction: Positive and negative, reversible and irreversible and temporary and permanent impacts need to be predicted which presupposes a good understanding of the project by the assessment agency.

Mitigation measures and EIA report: The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probable environmental damage or loss.

Public hearing: On completion of the EIA report, public and environmental groups living close to project site may be informed and consulted.

Decision making: Impact Assessment Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping in mind EIA and EMP (Environment Management Plan).

Monitoring and implementation of environmental management plan: The various phases of implementation of the project are monitored.

Assessment of Alternatives, Delineation of Mitigation Measures and Environmental Impact Assessment Report: For every project, possible alternatives should be identified, and environmental attributes compared. Alternatives should cover both project location and process technologies. Once alternatives have been reviewed, a mitigation plan should be drawn up for

the selected option and is supplemented with an Environmental Management Plan (EMP) to guide the proponent towards environmental improvements.

Risk assessment: Inventory analysis and hazard probability and index also form part of EIA procedures.

14.1.5 Water Supply, Sewerage System, Waste Water, Sustainable Development Techniques

Sustainable Water Supply: Sustainable water management means the ability to meet the water needs of the present without compromising the ability of future generations to do the same. Achieving sustainable water management requires a multidisciplinary and holistic approach in which technical, environmental, economic, landscape aesthetic, societal and cultural issues are addressed. On a global scale, having sustainable water means to provide each person on the planet with affordable access to the minimum 20 to 50 litres of daily water required to sustain life. This follows the United Nations General Assembly recognition of "the right to safe and cleaning drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights".

Figure 70 Sustainable Water

Sustainable Water Solutions: Sustainable water systems should provide adequate water quantity and appropriate water quality for a given need, without compromising the future ability to provide this capacity and quality.

Surface water: Surface water is limited as is unequally distributed around the world and pollution from various activities means that surface water without treatment is not suitable for drinking. If properly constructed, dams can provide a sustainable water supply as the structures can be used for power generation, irrigation, flood prevention, water diversion and navigation.

Groundwater: Groundwater accounts for more than 50 per cent of global freshwater and is critical for potable water. Groundwater can be a sustainable supply of water only if the amount of water entering, leaving and being stored in the system is conserved.

Reclaimed water: Reclaimed water, or water reuse as it's known, can also be a sustainable source for water supply and can alleviate stress on primary water resources, such as surface and groundwater. Depending on the given application, reclaimed water must be treated to provide an appropriate quality, for example for irrigation or industry use. The level of water reuse varies globally.

Figure 71 Smart Water

Reduce Wastage of Water: A water supply system will be sustainable only if it promotes efficiencies in both the supply and the demand sides. Initiatives to meet demand for water supply will be sustainable if they prioritize measures to avoid water waste. Avoiding wastage will contribute to reducing water consumption and, consequently, to delaying the need for new resources.

Sustainable Method of Wastewater Treatment Systems

For sustainable wastewater treatment the most economical method is to decentralize the treatment rather than installing expensive sewer systems that combine and increase the volume of the waste. The next involved choosing an appropriate treatment technology for the community where several types proposed included lagoons/wetlands, up flow anaerobic sludge blanket, and soil aquifer treatment. The common characteristic of all of the described types is that they encourage "zero-discharge" technology. This cyclical, rather than linear approach includes the reuse of the treated effluent for agricultural reuse. The reuse of the wastewater decreases the money spent on fertilizers and it is considered safe, since it has been treated for microorganisms. The traditional linear treatment systems must be transformed into the cyclical treatment to promote the conservation of water and nutrient resources.

Decentralized wastewater systems convey, treat and dispose or reuse wastewater from small and low-density communities, buildings and dwellings in remote areas, individual public or private properties. Wastewater flow is generated when appropriate water supply is available within the buildings or close to them. Decentralized wastewater systems treat, reuse or dispose the effluent in relatively close vicinity to its source of generation. They have the purpose to protect public health and the natural environment by reducing substantially health and environmental hazards.

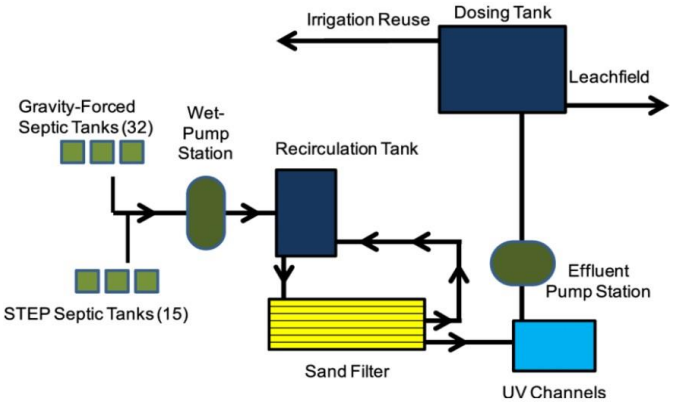


Figure 72 Decentralized Water System

Application

In locations with developed infrastructure, decentralized wastewater systems could be a viable alternative of the conventional centralized system, especially in cases of upgrading or retrofitting existing systems. Many different combinations and variations of hybrid systems are possible. The development of new treatment technologies allows for decentralized solutions, which are technically and aesthetically sound and acceptable.

Decentralized applications are a necessity in cases of new urban developments, where the construction of the infrastructure is not ready or will be executed in future. Decentralized systems allow for flow separation or source separation, which segregates different types of waste water, based on their origin, such as: black water, greywater and urine. This approach requires separate plumbing systems to convey the segregated flows and the purpose is to apply different level of treatment and handling of each flow and to enhance the safe reuse and disposal of the end products. In the specific case of developing countries, where localities with poor infrastructure are common, decentralized wastewater treatment has been promoted extensively because of the possibility to apply technologies with low operation and maintenance requirements. In addition, decentralized approaches require smaller scale investments, compared to centralized solutions.

14.1.6 case study on The Statue of Unity

The Statue of Unity depicts India's first deputy prime minister Sardar Vallabhbhai Patel. It is situated near the Sardar Sarovar dam in the state of Gujarat. With a height of 182 m, the statue stands conveniently taller than its predecessor, the Spring Temple Buddha in China. It also consists of a museum of the Adivasi (indigenous people) of the region, who were relocated to make way for the construction of the statue.

Statue of Unity

The statue is a structural system comprising of two semi-elliptical reinforced concrete cores. It also has a reinforced concrete podium that acts as a base for the statue clad in bronze, supported by structural steelwork fixed on to the concrete cores. About 21,0000 m3 of concrete, 18,500 tonnes of reinforcement, 6500 tonnes of structural steel, and 1800 tonnes of bronze were utilized for the construction of the statue. It took 13 months for the design process and the actual construction was completed in just 33 months. The construction of the Statue of Unity was completed in 2018.

1. Site Location

The Statue of Unity is situated on a strong rock on the banks of the river Narmada in Gujarat, India. It is 90 kilometers south of the city of Vadodara and around 3 kilometers downstream of the Sardar Sarovar dam.

location map of statue of unity

Figure Location of Statue of Unity

2. Geology of the Site

The following points describe the geology of the site:

- The project site is occupied by the Deccan basalt flows underlain by sedimentary rocks.
- The sedimentary rocks at the site consist of quartzite sandstone, argillaceous sandstone, shale, pebbly sandstone, and limestone.
- Basic dykes are exposed in the area. Dykes are aligned in the NE-SW direction.
- The project is located in the seismic zone III of the seismic zoning map of India.
- The data on earthquake occurrence shows that the Maximum Credible Earthquake (MCE) in this area can have a magnitude of 6.5.
- Based on the studies of the area, the nearest fault exists at a distance of 22 km from the site of the statue. This fault has been assumed as a causative fault for the seismic design of the statue.
- The island is accessible from at least one side via land for about eight months of the year as the water level recedes post-monsoon season.
- During the monsoon season, the water level typically rises by 5 m, and goes up to 20 m, with very strong currents.
- Access to the island is available via two ways. Primarily, a built-up rock bridge which is constructed at the normal flood level, and then a Bailey bridge that is built above the high flood levels.
- The Bailey bridge has two lanes, one dedicated to vehicle and material movement, and the second one for access to workers.
- Several options were evaluated for maintaining access to the island during the Monsoon floods. These included a cofferdam, a rock bridge, and an elevated steel bridge.

3. Materials Required for Construction

The following points describe the materials used for the construction of the statue:

- The statue is located at a remote location, therefore, the material delivery, staging, and erection posed unique challenges for the project.
- For the construction of the statue, the required concrete strengths varied between 40 MPa to 65 MPa. The statue required 21,0000 m3 of concrete, reinforced with 18,500 tonnes of grade 500 MPa bar.
- Additionally, the composite cores of statue, suspended space frame, cladding substructure, and podium framing required 6500 tonnes of structural steel with a minimum grade of 355 MPa.
- The structural steel in the cores and space frame of the statue is comprised of W-360 I-shaped sections.
- As a part of the ‘Loha’ campaign, iron tools were collected from farmers across the country with the intent of it being melted and converted into rebars for use in the foundation.
- The ordinary portland cement used is of the grade 53.
- The concrete was supplied by two batching plants of 56 m3 per hour capacity.
- The structural steel was supplied by Tata Steel and SAIL.

4. Foundation of Statue of Unity

The details of the foundation of the statue of unity are explained below:

- The hillock over which the statue is constructed had several fracture planes. For the successful construction of the foundation, the fracture planes were treated with grout injection and grouted anchor rods.
- The levelling of the hillock was done in order to construct the foundation mat of the statue. As the mat sits on the strong rock, pile foundation was not required. However, grouted rock anchors were used to reduce the localized tension.
- The foundation was high in tension due to the overturning moments from the lateral loads. These loads are resisted by rock anchors socketed into the rock and tensioned at the foundation level.
- Based on the site investigation results, the average bearing strength of the rock was found to be 2300 KN/m2, which is more than sufficient to support the statue.
- Self-compacting concrete of M60 grade was utilized for the mat foundation. In addition, the temperature level was maintained between 18°C to 22°C for the placement of concrete in mat foundation.
- The surface area of the mat foundation was covered with a polythene sheet and, on top of the sheet, a layer of 100 mm dry sand was placed to avoid any thermal differences.
- A quantity of 4354 m3 concrete was used in the construction of the primary raft which was completed in a single constant pouring of concrete in 132 hours.
- Throughout the constant pouring of concrete in the raft, two on-site batching plants were continuously used to produce concrete. The positioning of concrete was done by a mix of fixed pumps. Additionally, concrete was pumped horizontally for 420 m through a 125 mm sized steel pipeline.

Foundation of statue of unity

Construction of raft foundation of Statue of Unity

5 Concrete Design System

The construction of the world's largest statue required about 21,0000 m3 of concrete. For such a large quantity of concrete, a qualitative design of concrete was needed. The major factors

which affect the quality of concrete are the production, pumping, and durability of concrete. These factors have been discussed below:

4.1 Concrete Durability Design

Concrete durability is a major requirement for any project therefore the following points were considered for a durable concrete design:

The life span of the structure is estimated to be 100 years and may go beyond it as the structure lies on the river bed and faces no danger of attack from chlorides and sulfates to the strengthened concrete structure.
The structure is anticipated to come in contact with water only during monsoon season. However, the water would be devoid of any contaminants.
The superstructure including two concrete cores are dressed in bronze. Thus, bronze serves as the main shield to the structure. Furthermore, there is no source of air-borne chlorides in the area because the site is far away from the shoreline.
This is the first structure in India to have a contractual requirement for a desired life span of 100 years, despite no significant danger to it.

6. Structural System of Statue of Unity

The main structural components of the statue of unity consist of the base and the core walls. These components are discussed below:

6.1 Base of the Statue

The following points describe the base of the statue:

The base of the statue was constructed on shallow foundations (i.e. raft foundation) supported over a strong rock.
The level of the base differs from +45 m to +52.5 m.
The ground floor is at +58 m level. It is made of structural slabs supported by columns and walls.
Both concrete and steel were used thoroughly from +58 m level to +83 m level.
The slab at +78 m, +83 m, and inclined roofings are made of composite deck slab resting on structural beams and trusses.

6.2 Core Walls

The following points describe the core walls of the statue:

Two primary vertical core walls of the statue are elliptical in shape. The dimensions of the core walls are 11.30 m x 8.40 m.
The elliptical core walls are 154 m high with openings for lift lobby and fire stairs.
The core wall basically starts from +56.575 m level and continues up to +209.50 m level.
The coupling wall is linked to the core walls from +115.0 m level to +193.0 m level.
Core walls are confined by an external oval concrete wall up to the podium level at +83 m.
Above the podium level, where the facade geometry of the statue appears, the cores are coupled together with two RC walls (known as coupling wall) up to the entire height of core walls.
The thickness of the core wall is continuous throughout the height, whereas the thickness of the coupling wall varies from 0.55 m to 1.33 m.

The elliptical shape of the core wall was achieved by bending the rebar of 32 mm diameter around the core wall.
The core walls were constructed with a self-compacting concrete (SCC) of M65 grade.
core wall and coupling wall of statue of unity.
Figure depicting core wall and coupling wall
Core wall construction process
Construction process of core wall

7. Construction Sequence

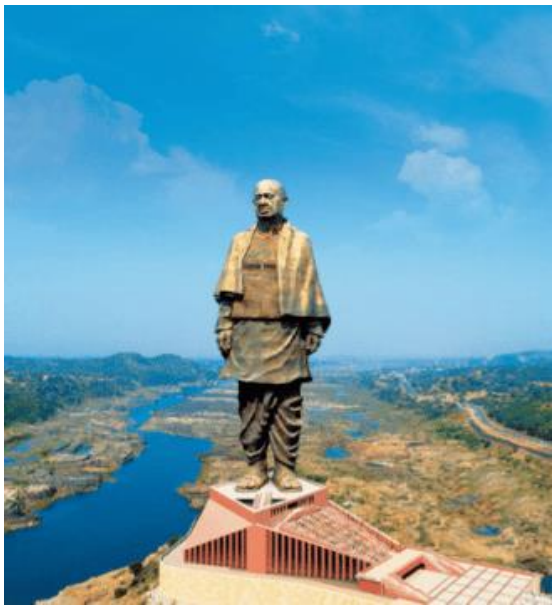
The construction process of the Statue of Unity was made as simple as possible. The composite core construction follows a methodology that is typically used for composite columns and walls in tall buildings. The suspended truss frame was either welded or bolted to core walls.

The construction sequence of the world's tallest statue is described below:

- The fracture planes of hillocks were treated via grout injection and grouted anchor rods.
- Leveling of the hillock was done in order to construct the mat foundation.
- After that, the casting of the raft foundation was done.
- Structural steel of shape W-360 was embedded in the composite core walls.
- The W-360 shapes of structural steel were then connected with the internal bracing of the 150 mm x 150 mm (6” x 6”) angles.
- Further, the structural steel truss frame was erected from the concrete cores. For this process, W-360 steel shapes were shop-welded to the internal steel shapes in the cores.
- Internal steelwork was continued and followed by the casting of the cores.
- After that, the bronze-cladded panels were connected to the truss frame. For this purpose, the exterior of the structural truss frame was welded to a subframe of steel. This subframe was connected to the clad panel to support the weight of the cladding system and to resist earthquake and wind forces. Also, the clad panels were designed to have overlapping panels that allow the vertical and ho

The above process was repeated until the completion of the statue.

Construction seqence of the statue



To accomplish an excellent temperature-controlled concrete, it is essential that the main active ingredients of concrete, the coarse aggregate is pre-cooled prior to mixing with other ingredients.

Two totally insulated silos of 3.9 m size and 12 m height were used as secondary storage just before mixing to control the temperature variation.

The aggregates were fed into these silos, using a secondary belt conveyor.

14.2 Electrical Engineering

14.2.1 Design of Power Electronics converter

The power semiconductor devices or power electronic converter fall generally into six categories:

i. AC to DC Converter (Controlled Rectifier)
ii. DC to DC Converter (DC Chopper)
iii. AC to AC Converter (AC voltage regulator)
iv. DC to AC Converter (Inverter)
v. Static Switches

Diode Rectifiers: A diode rectifier circuit converts AC voltage into a fixed DC voltage. The input voltage to rectifier could be either single phase or three phases.

AC to DC Converters: An AC to DC converter circuit can convert AC voltage into a DC voltage. The DC output voltage can be controlled by varying the firing angle of the thyristors. The AC input voltage could be a single phase or three phases.

AC to AC Converters: This converter can convert from a fixed ac input voltage into variable AC output voltage. The output voltage is controlled by varying firing angle of TRIAC. These type converters are known as AC voltage regulator.

DC to DC Converters: These converters can converter a fixed DC input voltage into variable DC voltage or vice versa. The DC output voltage is controlled by varying of duty cycle.

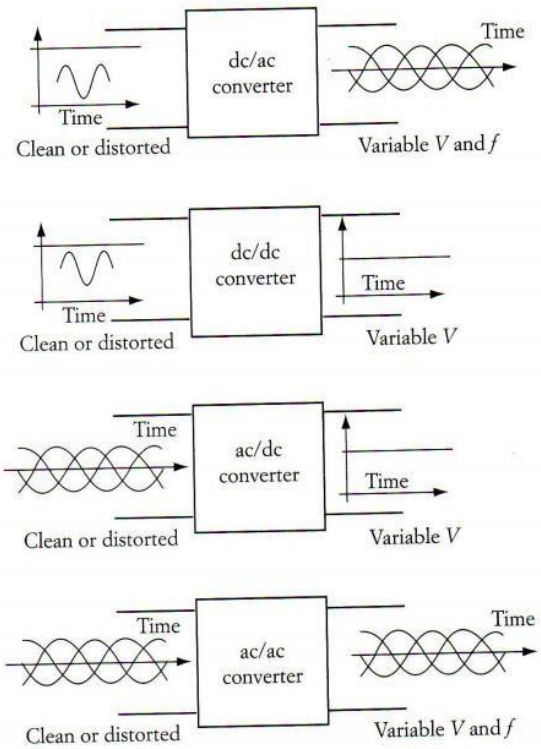


Figure 73 Power Electronics Converters

Static Switch: Because the power devices can be operated as static switches or contactors, the supply to these switches could be either AC or DC and the switches are called as AC static switches or DC static switches.

14.2.2 Electronic Soft Starter for 1/3 Phase Induction Motor for Agriculture

An induction motor draws current more than the rated capacity during starting phase which might damage stator windings of three phase induction motor. To avoid the problem of high starting current, voltage is increased gradually from lower to higher level using smooth and soft starters. A smooth and soft starter is employed in a three-phase induction motor to eliminate the surge in current and electromagnetic torque during starting. The surge in current and torque are eliminated temporarily using soft started at the time of starting. This in turn reduces the stress applied on an electric motor and shaft attached with rotor. The soft starter also eliminates the unwanted effects in electric cables and power distribution network.

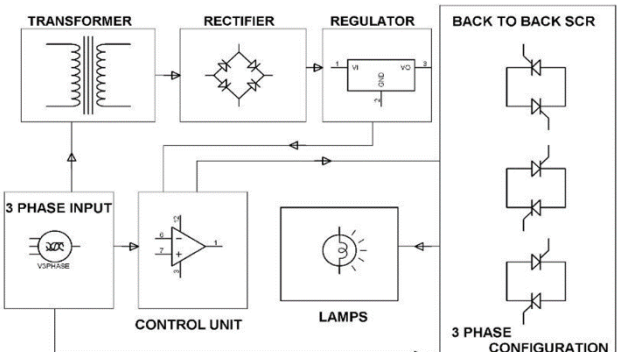


Figure 74 Working of Soft Starter

A soft starter provides reduced voltage to stator windings of three phase induction motor by controlling the acceleration of an electric motor. A three-phase induction motor is a self- starting motor and electromagnetic torque is produced due to an interaction between revolving magnetic field around rotor and rotor current. Initially during starting, a rated voltage is applied which causes high current to flow through stator windings. Now this high current is greater than the rated current which can cause heating of the stator windings and eventually damaging the insulation applied on stator windings. To avoid the problem of high starting current, there is a need of motor starters in an electric motor. The motor can be started in three ways. Firstly, by applying full load voltage i.e., direct on line starting. Secondly, by applying voltage gradually using star-delta starter and soft starter. Thirdly, by applying part winding starting i.e., autotransformer starter. A soft starter provides reduced voltage and hence reduced torque on electric motor. A soft starter comprises of solid-state devices like thyristors. The supply voltage to the motor is controlled by power semiconductor devices like thyristors. In a three-phase induction motor, the torque is proportional to the square of the starting current which in turn, is proportional to the applied voltage.

The starter works on the principle described above. Therefore, the torque and the current can be controlled by applying the reduced voltage at the time of starting of an electric motor. The two types of control are possible using soft starter. The first one is open loop control and second is closed loop control. In an open loop control, a start voltage is applied with time. This start voltage is applied irrespective of the current drawn or the speed of the motor. For each phase, two SCRs are connected in antiparallel direction and SCR are initially started at a delay angle of 1800 during respective half wave cycles. Each SCR conducts in each half cycle. This delay is reduced gradually with time when applied voltage reaches to the full supply voltage. The reduced voltage ramps up to the full voltage and simultaneously, the firing angle is reduced from 1800 to 00. This type of system is known as time voltage ramp system. This method has a drawback that it cannot control the acceleration of motor. In a closed loop control, any characteristic of the motor is monitored for the desired response. The starting voltage is modified depending on required motor current or motor speed. The current in each phase is monitored properly and time voltage ramp is stopped when current in each phase exceeds a certain set point. The supply voltage applied to stator windings of three phase induction motor is controlled by controlling the conduction angle of SCRs.

14.2.3 Advanced Wireless Power Transfer System

WIRELESS POWER TRANSFER METHOD

INDUCTIVE COUPLING: This type of WPT is simply based on inductive coupling between two coils. This is a type of near field technique measuring with appliance near the source. It is generally based on the principle of mutual induction, where two coils are placed vicinity to each other and there is no physical connection between these two coils. The simplest example is transformer where the transfer of energy takes place due to electromagnetic coupling. Each of these coils connected without wires and it has been an important and popular technology to transfer power without wires because of its simplicity and reliability. Based on this technology there are various application device has been already made including electric brush and charging pad for cell phones or laptop. But this kind of method also have some limitation i.e., the range can be very less up to few cm and separation distance is very less than the coil diameter.

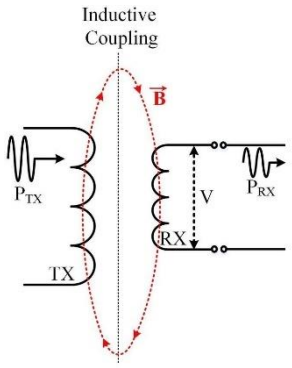


Figure 75 Inductive Coupling

MAGNETIC RESONANCE COUPLING WPT: This is also one of the important methods for transferring power based on near field technique. It generally overcome the disadvantage of up to some extent which arise in Non resonant inductive coupling. This type of coupling used the concept of resonance. At resonance we know that natural frequency and excitation frequency are same. This leads to the maximum amplitude, that means a maximum amount of energy is transferred between two coils. Here the receiver and transmitter coils are tuned to be at same resonant frequency. This allows us to transfer significant amount of power by increasing distance between coils [7]. These types of system are used for building mid-range power transfer. Mid-range can be specified by distance up to 10 times the diameter of the transmitting coil. Magnetic resonance coupling has several advantages such as efficiency increases with decrease in the radiation and power loss and range can be increase up to some meter and it is directional. The mainly disadvantage is that selection of resonance frequency which tunes with the natural frequency and it cannot be used for long range application.

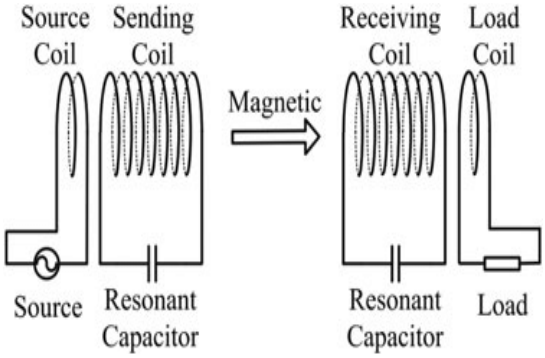


Figure 76 Magnetic Resonance Coupling

MICROWAVE WPT: This is one of the types of far-field technique of WPT which have range upto KM, with power transfer up to MW. This method uses microwave frequency ranging from 1GHZ to 1000GHZ generated from the microwave generator. First the microwave is generated by microwave generator which pass through the coax-waveguide adapter to the waveguide circulator. Then a tuner and directional coupler are used to separate wave according to their propagation direction. Then they are transmitted through antenna. At the receiver terminal, a receiver antenna receives which pass through a low pass filter to finally produce DC power. Based on microwave WPT system the present application is solar power satellite [8]. Advantages of microwave WPT are that it is used for several KM range with transferring high amount of power. Disadvantage are generally that the radiation effect to human beings from the microwave electromagnetic radiation

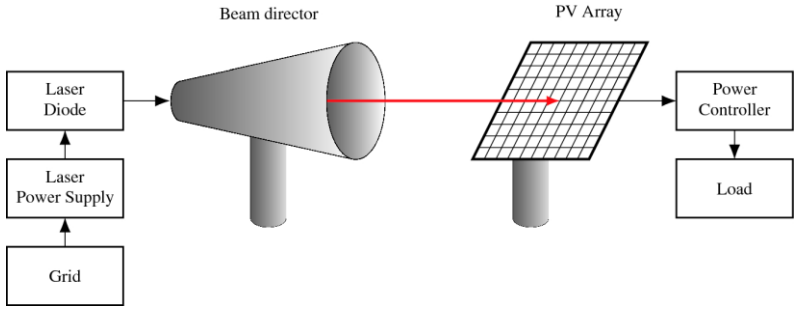


Figure 77 MICROWAVE WPT

LASER WPT: This is also one of the types of far- field technique, where the power is transmitted through LASER beams. For power transmission firstly the electrical energy is converted to high LASER beams and at receiving side, these LASER beams are converted to electricity by using photo voltaic cells. This type of WPT has several disadvantages i.e., why it is not used for electrical power transmission because LASER beams can easily harm human being if they cut LASER beam path. Therefore, these are generally used for military weapon development and space research

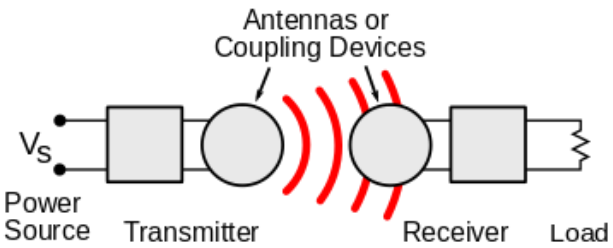


Figure 78 Laser WPT

Table 45 COMPARISON BETWEEN WPT METHODS

WPT METHODS	SEPERATION DISTANCE	POWERE	EFFICIENCY
Inductive coupling	Few mm	Few watts	Low
Magnetic resonance coupling	Few mm	Few Kilo Watts	High
Microwave WPT	Up to 100KM	Up to 100 MW	High
Laser	Few meters but with high intensity	Up to 100 MW	Low

14.2.4 Industrial Temperature Controller

Temperature controllers are used in most of the manufacturing industries. The industries like textile mill, pharmaceutical industry, oil refinery etc. all requires temperature controller. The temperature controllers are used to maintain constant temperature of process or plant or any material. In such temperature controller system, there is one reference temperature called set point or set temperature that is the desired temperature that must be maintained. This reference temperature is set by external means. Also, it can be always adjustable according to requirements. Once this temperature is set the system tries to maintain it by sensing the current temperature and controlling it using heater, cooler or compressor etc.

It senses current temperature, compares it with reference temperature and generates error signal. Then based on this error signal it controls heating element (or cooling element). If set temperature is more than error signal is negative and vice versa. So here I have given one such temperature control system that senses current temperature using temperature sensor. It compares it with the set temperature that is set by external reference. And it gives indication of error signal as positive or negative. If error is positive that means current temperature is more than set temperature that has to be reduced If error is negative that means current temperature is less than set temperature and it is required to increase it.

System Block Diagram: As shown in above figure, major building blocks of system are temperature sensor, Analog to Digital Converter (ADC), micro- controller, LCD, clock generator and LE D indicators.

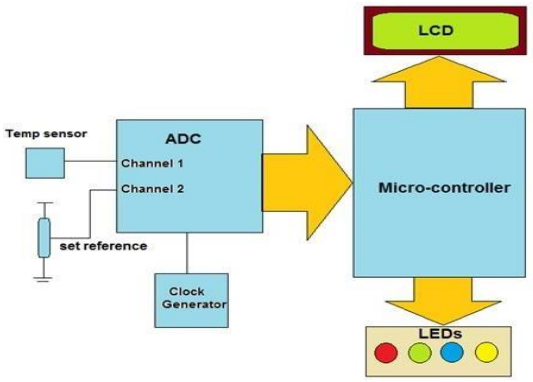


Figure 79 System Block Diagram Temp Controller

Temperature sensor: It's a transducer. It gives corresponding voltage (or current) output as change in temperature. It can be calibrated to degree Celsius. Otherwise, it has to be calibrated first.

Reference potentiometer: It sets reference temperature between min to max value. The system operation depends upon this set temperature value.

ADC: Its analog to digital converter with built in multiplexer. It takes two analog inputs one from temperature sensor and another from reference potentiometer. It gives 8-bit digital output corresponding selected analog input. To get the digital output of any one channel, micro controller will select the required channel and takes digital output.

Clock generator: ADC requires clock signal for its operation. This clock signal is generated by IC555 based clock generator.

Micro controller: It controls operation of ADC and LCD. It takes digital output of both channels and displays them on LCD. It takes suitable decision by comparing two temperatures. Also, it gives different indications on LEDs

LED indicators: Shows different indications like

Table 44 LED indicatiors

Reading channel 1 temperature	Red LED
Reading channel 2 temperature	Green LED
Sensor temperature is more than set temperature (+Ve error)	Blue LED
Sensor temperature is less than set temperature (+Ve error)	Yellow LED

Working and operation: Microcontroller first latches address of channel 1 in to ADC. Then it asserts start signal to start conversion. It waits for end of conversion (EOC) signal from ADC. When it gets it, it takes digital input from P1 and after processing it displays it on LCD as set temperature Next microcontroller latches address of channel 2. Again, it asserts start signal and waits for EOC. When it gets EOC, takes digital input – process it – displays it on LCD as current temperature. Then microcontroller take difference of these two temperature values that is the error. If error is positive then it indicates this on BLUE LED. If error is negative then it gives indication on YELLOW LED. This process is continuously repeated after every two second

14.2.5 Accident Alerts in Modern Traffic Signal Control System

Camera Surveillance System: In proposed system if a vehicle has met accidents, immediately an alert message with the location coordinates is sent to the Control center. From the control center, a message is sent to the nearby ambulance. Also, signal is transmitted to all the signals in between ambulance and vehicle location to provide RF communication between ambulance and traffic section. The vehicle accident observed using vibration sensor and in the control section it is received by the microcontroller and then the nearby ambulance is received from the PC and controller sends the message to the ambulance. The signal to Traffic signal section is transmitted through RF communication. Also, if any fire occurs, it is detected using fire sensor and an alarm message is directly sent to the fire station.

If a vehicle has met accident, vibration sensor or fire sensor gives the electric signal to microcontroller through signal conditioner. Then GPS provides latitude and longitude information about vehicle location to control section through GSM. In control section GSM modem receives message about accident and send it to PC. PC identifies the nearest ambulance and ambulance is instructed to pick up the patient. Control section transmits the control signal to all the signals in between ambulance and vehicle by RF transmission. Whenever the ambulance reaches near to the traffic signal (approximately 100m), the traffic signal will be made to green through RF communication. Thereby the ambulance is recommended to reach the hospital in time.

SYSTEM IMPLEMENTATION: System consists of three main units, which coordinates with each other and makes sure that ambulance reaches the hospital without any time lag. Thus our system is divided into following three units,

i. The Vehicle Unit
ii. The Ambulance/control Unit
iii. Traffic unit

i. Vehicle unit: The vehicle unit installed in the vehicle senses the accident and sends the location of the accident to the controller. According to our system, every vehicle should have a vehicle unit. The vehicle unit consists of a vibration sensor, controller, siren, a user interface, GPS system and a GSM module. The vibration sensor used in the vehicle will continuously sense for any large-scale vibration in the vehicle. The sensed data is given to the controller GPS SYSTEM inside the vehicle. The GPS SYSTEM finds out the current position of the vehicle (latitude and the longitude) which is the location of the accident spot and gives that data to the GSM MODULE. The GSM MODULE sends this data to the control unit whose GSM number is already there in the module as an emergency number

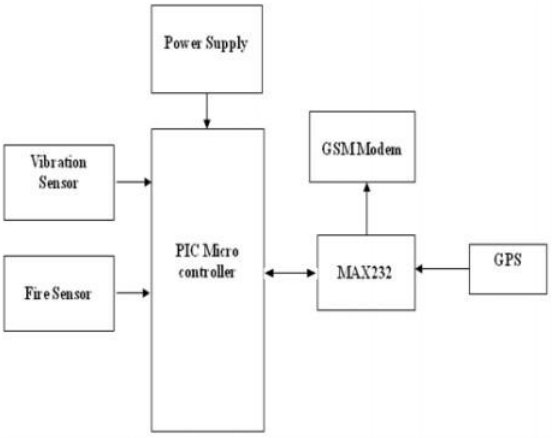


Figure 80 Block diagram of Vehicle Unit

ii. Ambulance unit: The controller finds the nearest ambulance to the accident spot and also the shortest path between the ambulance, accident spot and the nearest hospital. The controller then sends this path to the ambulance. Also using this information, the controller controls all the traffic signals in the path of ambulance and makes it ready to provide free path to ambulance, which ensures that the ambulance reaches the hospital without delay. At the same time, the ambulance unit turns ON the RF transmitter. This will lead to communicate with the traffic section.

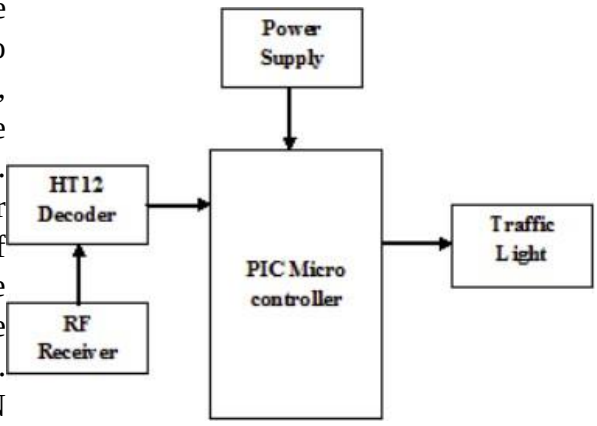


Figure 81 Block Diagram of Ambulance / Control Unit

iii. Traffic unit: Whenever traffic signal section receives the information about accident, the RF receiver in this section is turned ON to search for ambulance nearing the traffic signal. Whenever the ambulance reaches near to the traffic signal (approximately 100m), the traffic signal will be made to green through RF communication. Thereby the ambulance is recommended to reach the hospital in time

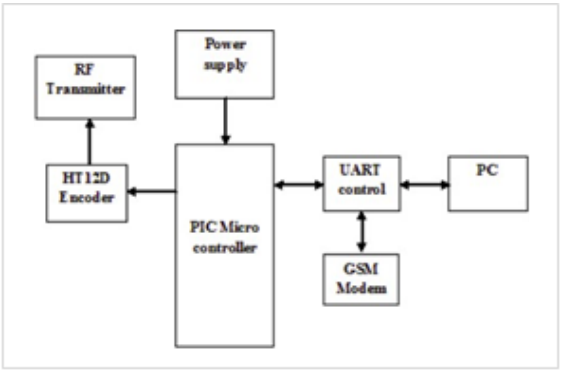


Figure 82 Block Diagram of Traffic Unit

Chapter 15
Smart and/or Sustainable Features Of Chapter 8 & 13 Designs, Impact On Society with doing small changes, Period, Amount Expenditure and Benefit

Smart and/or Sustainable features of Chapter 8 & 13 Designs

Table 46 Smart and/or Sustainable features

Sr. No.	Design Name	Amount (Rs.)	Benefit
1.	Civil – Garden	2,80,846	For old age people and children / toddlers
2.	Civil – Bus Stand	1,20,094	For the better transportation and tourism for villagers
3.	Civil – Post Office	4,77,667.3	For efficient and effective communication via post
4.	Civil – Community Hall	5,53,805	Carrying out meeting and other function carried out by village
5.	Civil – Library	5,97,424.8	students and elders to read literature build community to share knowledge
5.	Electrical – Post Office	74,685	To facilitate online post office
6.	Electrical – Bus Stand	39,980	To carried out best operational and functional activities in bus stand
7.	Electrical – Public Garden	21,207.9	For evening and night use, electricity and illumination.
8.	Civil - Agricultural Storage Yard	10,46,200	To keep the crop of the farmers' safe from the sun and the rain
9.	Civil - Skill Development Centre	2,90,680	Youth of village get technical knowledge.
10.	Civil - Rain Water Harvesting system	32,100	To recharge the underground water with the rainwater so as to keep the underground water level high to easily use in the future
11.	Civil - Speaker System & CCTV Control Room	3,96,077	Spared information speedy and Monitor the village
12.	Electrical – Library	29,994.82	To facilitate electricity to use electric equipment.
13.	Electrical – Community Hall	35,941	To provide electricity for electric equipment.

Impact on society with doing small changes, Period, Amount Expenditure and Benefit

Table 47 Impact on society

Sr. No.	Design Name	Period	Amount (Rs)	Benefit
1.	Civil – Garden	long-term	2,80,846	For old age people and children / toddlers
2.	Civil – Bus Stand	long term	1,20,094	For the better transportation and tourism for villagers
3.	Civil – Post Office	1 year	4,77,667.3	For efficient and effective communication via post
4.	Civil – Community Hall	immediately	5,53,805	Carrying out meeting and other function carried out by village
5.	Civil – Library	within 1 year	5,97,424.8	students and elders to read literature build community to share knowledge
5.	Electrical – Post Office	1 year	74,685	To facilitate online post office
6,	Electrical – Bus Stand	long-term	39,980	To carried out best operational and functional activities in bus stand
7.	Electrical – Public Garden	long-term	21,207.9	For evening and night use, electricity and illumination.
8.	Civil - Agricultural Storage Yard	immediately	10,46,200	To keep the crop of the farmers' safe from the sun and the rain
9.	Civil - Skill Development Centre	long-term	2,90,680	Youth of village get technical knowledge.
10.	Civil - Rain Water Harvesting system	immediately	32,100	To recharge the underground water with the rainwater so as to keep the underground water level high to easily use in the future
11.	Civil - Speaker System & CCTV Control Room	within 2 year	3,96,077	Spared information speedy and Monitor the village
12.	Electrical – Library	within 1 year	29,994.82	To facilitate electricity to use electric equipment.
13	Electrical – Community Hall	immediately	35,941	To provide electricity for electric equipment.

Chapter 16
Survey By Interviewing with Talati and/or 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?	Yes	farming, labour work
2	What are the chances of employment in village?	No	
3	What are the special technical facilities in village?	No	
4	Is any debt on village dwellers?	No	
5	Are village people getting agricultural help?	Yes	Insurance
6	Is women health awareness Program organized in village?	Yes	anganwadi
7	Are women having opportunity to work and income?	No	
8	Child girl education is appreciated in village?	Yes	No remarks
9	Facility of vaccination to child is available in village?	Yes	No Remark
10	Are village people aware about child vaccination and done to each and every child as per norms?	Yes	No Remark
11	Women help line number information is provided to village people?	Yes	No Remark
12	Is water scarcity in village? How many days per year?	No	No remark
13	Is village under any debt?	No	No remark
14	Is any serious issue due to debt from bank or any person happened in village?	No	No remark
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	No	No Remark
16	Is any death of patient occurred due to unavailability of medical facility in village?	Yes	oxygen
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	No Remark
18	Is village improvement is observed in comparative scenario from past to present?	Yes	No Remark
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	No Remark
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	No Remark

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

તલાટી મંત્રી
ગ્રામ પંચાયત રવની
2/2/21

સરપંચ
રવની ગ્રામ પંચાયત

Chapter 17
Irrigation / Agriculture Activities and Agro Industry, Alternate Techniques and Solution

Agroecology

Agroecology is an applied science that studies ecological processes applied to agricultural production systems. Bringing ecological principles to bear can suggest new management approaches in agroecosystems. Agroecologists study a variety of agroecosystems. The field of agroecology is not associated with any particular method of farming. As a systematic approach, agroecology relies on the improvement of agro-food processes as a whole, with the constant goal of improving environmental performance. Small-scale farmers produce food for 70% of the global population. Yet, they are some of the world's poorest and most food insecure people. Alternatives to conventional farming should be embraced to improve subsistence farmers' yields and to ensure adequate food production for the growing global population. The stark reality, according to the International Food Policy Research Institute, is that the world needs to produce more food with fewer resources.

Agroecology, a farming approach that mimics natural ecosystems, is an alternative method that can produce more food using fewer resources. Small-scale farmers in Africa have used Agroecology to more than double crop yields within 3 to 10 years of implementation, according to the UN special rapporteur on the right to food. Farmers also use Agroecology to improve soil fertility, adapt to climate change, and reduce farming input costs.

In contrast, conventional farming is characterized by mono-cropping, green revolution technologies, and synthetic fertilizer. It is resource intensive in terms of capital, land, water, and fossil fuel use. Conventional farming threatens future food production by reducing biodiversity, and contributing to environmental degradation and climate change which lower yields.

Application of Agroecology: Permaculture

Permaculture, a contraction of permanent agriculture, is a promising design system for the application of Agroecology. It was developed in Australia in the 1970s based on Agroecology and indigenous farming systems. In practice, permaculture farms are organic, low-input, and biodiverse, and use techniques like intercropping trees, planting perennials, water harvesting, and resource recycling. Permaculture programmes are more multifunctional than typical agricultural development programs. This is important given the growing call for "triple-win solutions" for agriculture, health, and environmental sustainability.

Despite the potential of permaculture and Agroecology, mainstream agriculture continues to focus on conventional techniques. There are a number of reasons why permaculture has not been more widely adopted, or even considered.

First, the small-scale, grassroots nature of permaculture, while part of its strength, has contributed to its slow dissemination and minimal visibility.

Second, permaculture is a design system, rather than an easily replicated model, which makes it more difficult to teach and adopt than a typical agriculture project. Further, permaculture challenges how governments and NGOs usually teach people to farm. Indigenous farming knowledge, like that used in permaculture, has been devalued and eroded with the imposition of mono-cropping and green revolution technologies.

Third, skepticism remains over whether people's food needs can be met using organic, labour intensive, small-scale farming. To date, there has not been enough rigorous research on permaculture to evaluate its impact, its application on a large scale, or to support its adoption.

Academia has not seriously engaged with permaculture, and there are no companies with a profit incentive to research and disseminate it.

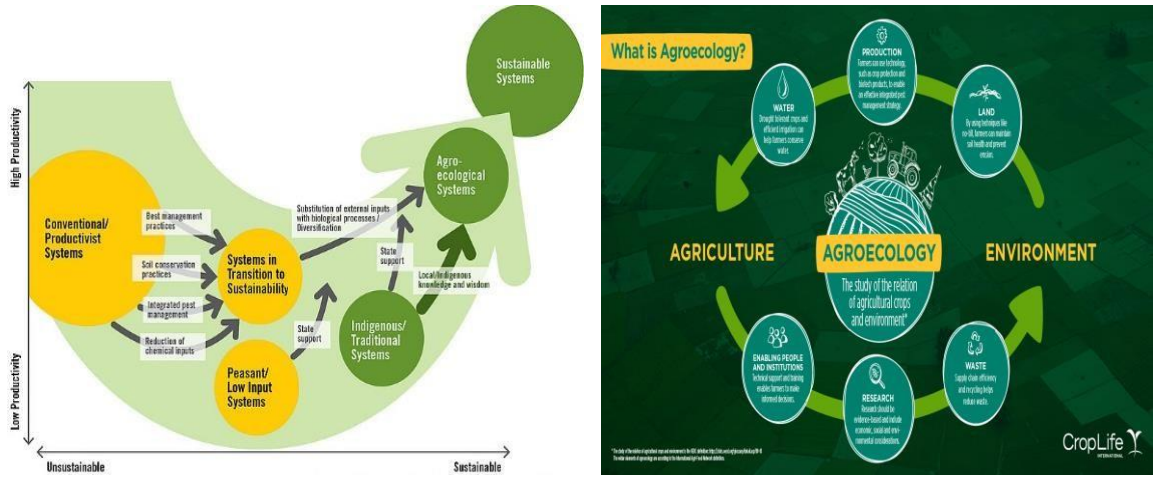


Figure 83 Agroecology

Agriculture Technology – Revolutionizing the Food Industry

Agriculture technology is one of the far-reaching and dynamic areas of new-age technology redefining the farming sector. Its rapid growth has largely been prompted by the demand for more food to cater to the ever-growing world population. Therefore, the agricultural sector must increase its production efficiently and effectively, to keep up with this escalating demand. Furthermore, the fast depleting and rampantly used natural resources have also raised the red flag and require immediate corrective and preventive measures.

The Current Scenario

The conventional methods of farming have led to irresponsible use of natural resources like water and energy over the years. Coupled with this is a lack of awareness and training in good agricultural practices among the farmers. As a result, all these have added to the challenges faced by the sector.

Water wastage, overuse of fertilizers and pesticides are some of the challenges faced by traditional methods of farming. They eventually seep into the soil and water sources, causing irreparable damage to the ecosystem. Therefore, there is an urgent need to conserve the resources and move towards a sustainable future.

Agriculture technology beckons the use of new and sophisticated techniques like robots, GPS, soil, weather and moisture mapping and IoT (Internet of Things) etc. These help in making the sector more productive, efficient, profitable, safer and environment-friendly. Agriculture technology has opened new vistas for the farming sector.

High-tech, powered machinery is taking over, and progressive techniques are being used to increase productivity. This sweeping change has led to an increase in the farm output, and very important, the optimal utilization of resources.

The significance of Agriculture Technology

Helps in the optimal utilization of water (by using new-age irrigation techniques like ‘Drip and Sprinkle Irrigation’). Also, in the effective usage of fertilizer, pesticides and other inputs. Consequently, it helps in the conservation of natural resources and minimal and effective use of pesticides.

Keeps the nutrition value of the food intact and protects it from the harmful effects of overuse of pesticides. Furthermore, the efficient use of the resources also helps in keeping the food prices down. Helps in increasing crop productivity. The utilization of safe and modern machinery leads to higher farmer/worker safety. Employing sophisticated and efficient techniques results in reducing the impact on the ecosystem. Which, in turn, makes moving toward a sustainable future, a viable option.

New Age Agricultural Technologies

High-Tech Irrigation Techniques

Irrigation is most certainly among the most evolved areas of agriculture that uses technology to improve the efficiency of natural resources like water. New techniques like Drip and Sprinkler irrigation play a pivotal role in helping sustain the environment. Soil moisture sensors, weather and other field data's availability on phones and computers, support the farmers to make informed irrigation control decisions.

Robotics

Robotic technologies enable dependable monitoring and management of natural resources like water and air quality. Therefore, its use results in more efficient and safer production of the crop. Additionally, it helps in lowering the price of the produce and aids in reducing the adverse effects on the environment.

Internet of Things (IoT)

Internet of Things connects the various devices being used on the field to monitor and measure the work done. Right from information on the soil moisture levels, water meters, weather stations to irrigation pumps, all data is accessible on smartphones. These inputs help in planning and quick decision making, on all sizes of farms, from small to the big. As more solution-centric devices develop, we will see even more significant benefits from IoT in agriculture in the future.

Technology is an integral part of our lives and is redefining every aspect of modern lives, including the farming sector. The high-tech technology currently being used in agriculture is making sure that what we eat today, reaches us faster. Also, is fresher, retains its nutritional value and is more cost-effective. Agricultural technology is revolutionizing the food industry and will only become more cutting edge in the times to come.

CHAPTER 18
SOCIAL ACTIVITIES – ANY ACTIVATES PLANNED BY STUDENTS

Our project time is passed during the COVID-19 pandemic, so we can't able to do some extra social activities for following COVID-19 guidelines in village. But Swachh Bharat awareness program and COVID-19 awareness program suggested by the GTU in this project, so we did these two activities in Dungarpur village.

Figure 84 Stay Home Stay Safe

TOWARD A SWACHH BHARAT: "A clean India would be the best tribute India could pay to Mahatma Gandhi on his 150-birth anniversary in 2019," said Shri Narendra Modi as he launched the Swachh Bharat Mission at Rajpath in New Delhi. On 2nd October 2014, Swachh Bharat Mission was launched throughout length and breadth of the country as a national movement. While leading the mass movement for cleanliness, the Prime Minister exhorted people to fulfil Mahatma Gandhi's dream of a clean and hygienic India. Shri Narendra Modi himself initiated the cleanliness drive at Mandir Marg Police Station. Picking up the broom to clean the dirt, making Swachh Bharat Abhiyan a mass movement across the nation, the Prime Minister said people should neither litter, nor let others litter. He gave the mantra of 'Na gandagi karenge, Na karne denge.' Shri Narendra Modi also invited nine people to join the cleanliness drive and requested each of them to draw nine more into the initiative.

NATIONAL RURBAN MISSION: Large parts of rural areas in the country are not stand-alone settlements but part of a cluster of settlements, which are relatively proximate to each other. These clusters typically illustrate potential for growth, have economic drivers and derive locational and competitive advantages. These clusters once developed can then be classified as 'Rurban'. Hence taking cognizance of this, the Government of India, has launched the Shyama Prasad Mukherji Rurban Mission (SPMRM), aimed at developing such rural areas by provisioning of economic, social and physical infrastructure facilities. The Mssion was launched on 21st February, 2016. The Mission aims at development of 300 Rurban clusters, in the next five years. These clusters would be strengthened with the required amenities, for which it is proposed that resources be mobilized through convergence of various schemes of the Government, over and above which a Critical Gap Funding (CGF) would be provided under this Mission, for focused development of these clusters.

Figure 85 National Rurban Mission

Chapter 19
SAGY Questionnaire Survey Form with The Sarpanch Signature

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: DUNGARPUR Gram Panchayat: DUNGARPUR Ward No.____

Block: _____ District: JUNAGADH

State: GUJARAT L S Constituency: _____

1. Family Identity and Size

Name of Head of Household	Rathod Mayudeen Mohamadbhai							Male/ Female	M
SECC Survey ID:		Family Size	3	Over 18	2	6 to 18		Under 6	1

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	OBC	Life Insurance	1. All Adults 2. Some Adults 3. None ✓	AABY	1. Yes 2. No ✓	Kisan Credit Card	~~Yes~~/ No
Poverty Status Year[2]:	1. ✓ BPL 2. APL	Health Insurance	1. All Adults 2. Some Adults 3. None ✓	RSBY	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]
Karishma M. Rathod	28	F	N			Y	Y	
Mayudeen bhai Rathod	29	M	N			Y	Y	

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
Mahek Rathod	8-9 Mo	F		N	N			

[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) Baseline Household Survey Questionnaire

5. Hand washing

	Always		Sometimes		Never
After use of Toilet	Soap ✓	Other	Soap	Other	
Before Eating	Soap ✓	Other	Soap	Other	

6. Use of Mosquito Net

Children: Yes / No Adults: Yes / No

7. Do members take Regular Physical Exercise

	Yoga	Games	Other Exercises
Adults	Yes / No	Yes / No	Yes / No
Children	Yes / No	Yes / No	Yes / No

8. Consumption of Tobacco

	Smoking	Chewing
Adults		25
Children	-	-

9. House & Homestead Data

Own House: Yes / No	No. of Rooms:
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	500 ft
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	no
Open Well(Public / Private)	Yes / No	no
Other (mention): Bore well		250 ft

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	10	2. Cultivable Area	11
3. Irrigated Area	9	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

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
groundnut		2500 Kg
wheat		1500 Kg
cotton		2000 Kg

17. Livestock Numbers

Cows: 13	Bullocks:	Calves:
Female Buffalo:	Male Buffalo:	Buffalo Calves: 2
Goats/ Sheep:	Poultry/ Ducks:	Pigs:
Any other: Type B		No.
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres): 25 Ltr		

18. What games do Children Play

Cricket, hide & seek

19. Do children play musical instrument (mention)

No

Schedule Filled By:

Principal Respondent:

Date of Survey:

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: Dungarpur

b. Block: _____

c. District: Junagadh

d. State: Gujarat

e. Lok Sabha Constituency: Junagadh

f. Number of Wards in the Gram Panchayat: _____

g. Number of Villages in the Gram Panchayat: 2

h. Names of Villages:

Dungarpur

Demographic Information

Number of Households 1084 Total Population 5039 Male 2644 Female 2395

SC HHs 598 ST HHs 4 OBC HHs _____ Other HHs _____

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	Y	
b.	Nearest Primary Health Centre (PHC)	Y	
c.	Nearest Community Health Centre (CHC)	Y	
d.	Nearest Post Office	Y	
e.	Nearest Bank Branch (Any)	Y	
f.	Nearest Bank with CBS Facility	Y	
g.	Nearest ATM	Y	
h.	Nearest Primary School	Y	
i.	Nearest Middle School	Y	
j.	Nearest Secondary School	Y	
k.	Nearest Higher Secondary School / +2 College	N	2.2 Km Khodiyar, 6.2 Km Junagadh
l.	Nearest Graduate College	N	6.2 Km Junagadh
m	Nearest ITI / Polytechnic Centre	N	6.2 Km Junagadh
n	Kisan Seva Kendra		

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	N	8.6Km Jun.
p	Nearest Agro Service Centre	N	"
p	MSP based Government Procurement Centre	N	"
q	Milk Cooperative /Collection Centre	N	"
r	Veterinary Care Centre	N	"
s	Ayurveda Centre	N	"
t	E – Seva Kendra	N	"
u	Bus Stop	N	8.6 Km Jun.
v	Railway Station	N	8.6 KM Jun
w	Library	N	6.2 Km Jun
x	Common Service Centre	N	"

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 0 Public - Private -

b. Mini Stadium : N 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.: 1

Higher Secondary Private: _____ Higher Secondary Govt: _____

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)					Govt		
b.	Kerosene					Govt		
c.	Other (mention)					Govt	Village	

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 ✓ Not Covered	Dungarpur	
b.	Hand Pump Coverage in Villages:	Covered Not Covered ✓		Dungarpur
c.	Coverage under Covered Drains:	Covered ✓ Not Covered	Dungarpur	
d.	Coverage under Open Drains:	Covered Not Covered ✓		
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ Not Connected	Dungarpur	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	150hec	d.	Pasture / Grazing Land	-	g.	Check Dam	4-5
b.	Irrigated Land	150hec	e.	Forests/ Plantations	10 hec	h.	Wells/Bore Wells	2
c.	Un-irrigated Land		f.	Other Common Land	2 hec	i	Tanks /Ponds	4-5

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

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)	5
b)	Number of Households receiving pension (old age, widow, disability)	20
c)	Number of eligible Households who are not receiving pension	200
d)	Number of Households eligible for Ration Card	248
e)	Number of eligible HHs having ration cards	248
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	-
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	-
h)	Number of active Job Card holders under MGNREGA	50
i)	Number of Job Card holders who completed 100 days of work during 2013-14	20
j)	Number of shops selling alcohol	-
k)	Number of BPL families	40
l)	Number of landless households	35
m)	Number of IAY beneficiaries	10
n)	Number of FRA[2] beneficiaries	9
o)	Number of Community Sanitary Complexes	-
p)	Number of Households headed by single women	20
q)	Number of Households headed by physically handicapped persons	2
r)	Total number of Persons with Disability in the village	12
s)	Number of SHGs	5
t)	Number of active SHGs	5
u)	Number of SHG Federations	NO
v)	Number of Youth Clubs	-
w)	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent'

Thanki Bharvi Sorathiya Nidhikumari Surveyor	નિધીકુમારી સરપચ ગ્રામ પંચાયત ડુંગરપુર PRI Respondent (Preferably Gram Panchayat Chairperson)	તલાટી-કમ-મંત્રી ગ્રામ પંચાયત ડુંગરપુર Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	17-05-'21 Date of Survey

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

4

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

This questionnaire should be filled for each of the villages in the selected Gram Panchayat[1]

I. Basic Information

a. Village: Dungarpur
b. Ward Number: 001
c. Gram Panchayat: Dungarpur
d. Block: _____
e. District: Junagadh
f. State: Gujarat
g. Lok Sabha Constituency: Junagadh
h. Number of Habitations / Hamlets in the Gram Panchayat: 248

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 1084 Total Population 5039 Male 2644 Female 2395

SC HHs 598 ST HHs 4 OBC HHs _____ Other HHs _____

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Y	
b.	Nearest Middle School	Y	
c.	Nearest Secondary School	Y	
d.	Kisan Seva Kendra	N	8.6 Junagadh
e.	Milk Cooperative /Collection Centre	N	1
g.	Health Sub Centre	Y	
h.	Bank	Y	
i.	ATM	Y	
j.	Bus Stop	Y	
k.	Railway Station	N	8.6Km Junagadh

[1] While filling this the surveyor must collect the information from the Ward Member/s and relevant government officials

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
l	Library	N	8.6Km Junagadh
m	Common Service Centre	N	"
n	Veterinary Care Centre	N	"

ii. Road Connectivity

a. Habitations connected by All-weather Roads *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations where not available:_____

iii. Drinking Water Facilities

a.Piped Water Supply Coverage to Habitations:_____ *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

b.Hand Pump Coverage in Habitations: _____ *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

iv. Coverage of Habitations under Waste Management System

a. Coverage under Covered Drains: _____*(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

b. Coverage under Open Drains: _____*(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

c. Coverage under Doorstep Waste Collection: *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

v. Coverage of Habitations under Electrification

a. Coverage under Household Connections: *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

b.Coverage under Street Lighting: All*(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:_____

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): _____

b.Mini Stadium :___N___Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres:_____

c. Schools (Number)

Primary Private: ___ Primary Govt.:___1___

Middle Private:___ Middle Govt.:___1___

Secondary Private:___ Secondary Govt.:___1___

Higher Secondary Private: ___ Higher Secondary Govt: _____

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	150hec	d.	Pasture / Grazing Land	-	g.	Check Dam	4-5
b.	Irrigated Land	150hec	e.	Forests/ Plnatations	10hec	h.	Wells/Bore Wells	2
c.	Un-irrigated Land	-	f.	Other Common Land	2hec	I	Tanks /Ponds	4

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	85
2	Number of active Job Card holders who have completed 100 days of work	85
3	Number of shops selling alcohol	-
4	Number of BPL families	1.55
5	Number of landless households	57
6	Number of IAY beneficiaries	-
7	Number of FRA beneficiaries	-
8	Number of common sanitation complexes	-
9	Number of SHGs	0
10	Number of active SHGs	-
11	Existence of SHG Federation in the Village (Yes / No)	-
12	Number of Youth Clubs	-
13	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent'

Thanki Bharvi Sorathiya Nidhikumari Surveyor	નીધીબેનપાદાળ સરપચ ગ્રામ પંચાયત ડુંગરપુર PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	[redacted]-ક્રમ-મંત્રી ગ્રામ [redacted] ડુંગરપુર Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	17-05-'21 Date of Survey

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

Gmail Bharvi Thanki <bharvithanki99@gmail.com>

Detailed Project Report of Dungarpur Village

1 message

Bharvi Thanki<bharvithanki99@gmail.com> Fri, Jul 2, 2021 at 5:53 PM
To: collector-jun@gujarat.gov.in, tdo-junagadh@gujarat.gov.in, ddo-jun@gujarat.gov.in

Respected Sir/Ma'am,

Greeting from Electrical and Civil Engineering Department, Dr Subhash Technical Campus Junagadh,

Dr Subhash Technical Campus Junagadh affiliated to Gujarat Technological University- GTU is an institution of higher learning dedicated to providing quality, career-focused undergraduate programs that prepares students with the knowledge, skills and credentials needed to launch, enhance, or change careers.

The Gujarat Technological University has allotted an important and prestigious project of Vishwakarma Yojana by the Government of Gujarat in the year 2012-13. Vishwakarma Yojana provides Design to Delivery solutions for the development of villages in R-urban areas. The developmental work in villages that could be undertaken as per the need of the villages includes Physical infrastructure facilities, Social infrastructure facilities, Socio-Cultural Facilities, and Sustainable infrastructures for the effective development of villages.

As a part of the final year UG Electrical Engineering Project, we students carried out the survey of Dungarpur village and designed various amenities to deliver it to them making them ideal for living a better life as per necessity & current village condition.

Our Proposed Designs with an approximate Cost

Sr. No.	Design Name	Period	Amount (Rs)	Benefit
1.	Civil - Garden	long-term	2,80,846	For old age people and children / toddlers
2.	Civil – Bus Stand	long term	1,20,094	For the better transportation and tourism for villagers
3.	Civil – Post Office	1 year	4,77,667.3	For efficient and effective communication via post
4.	Civil – Community Hall	immediately	5,53,805	Carrying out meeting and other function carried out by village
5.	Civil – Library	within 1 year	5,97,424.8	students and elders to read literature build community to share knowledge
5.	Electrical – Post Office	1 year	74,685	To facilitate online post office
6.	Electrical – Bus Stand	long-term	39,980	To carried out best operational and functional activities in bus stand
7.	Electrical – Public Garden	long-term	21,207.9	For evening and night use, electricity and illumination.
8.	Civil - Agricultural Storage Yard	immediately	10,46,200	To keep the crop of the farmers' safe from the sun and the rain
9.	Civil - Skill Development Centre	long-term	2,90,680	Youth of the village get technical knowledge.
10.	Civil - Rainwater Harvesting system	immediately	32,100	To recharge the underground water with the rainwater so as to keep the underground water level high to easily use in the future
11.	Civil - Speaker System & CCTV Control Room	within 2 year	3,96,077	Spared information speedy and Monitor the village
12.	Electrical – Library	within 1 year	29,994.82	To facilitate electricity use electric equipment.
13	Electrical – Community Hall	immediately	35,941	To provide electricity for electric equipment.

Please find herewith attached detailed report of Dungarpur Village.

VISHWAKARMA YOJANA JUNAGADH DUNGAPUR.pdf
11694K

Chapter 21
Comprehensive report for the entire village

Vishwakarma yojana is the one of the schemes which is organized by Gujrat technical university, Gujrat. In this project, university take a step to enhanced engineering students to do some new things. this project is useful for villagers as more as students. In this project, we have to choose any village give in list which villages is surround our collage and our task is the preparation of design which should be sustainable, economical and also useful for villagers. For our allocated village we have to give six civil design and three electrical designs. Governments main aims thorough this project is improve rural area by help of engineering's thoughts and enhance student's power.

Background of the Village

Dungarpur is a Village in Junagadh Taluka in Junagadh District of Gujarat State, India. It is located 10 KM towards west from District head-quarters Junagadh and 347 KM from State capital Gandhinagar. Dungarpur Pin code is 362263 and postal head office is Junagadh Joshipura

Dungarpur is one of the villages in Junagadh district. Surrounded by agricultural activities. The city is facing issues of lack infrastructure development of internal roads, residential houses, post-office building. For understanding the actual situation of the village, we have collected different data for number of populations. School, water tank, Aanganwadi, hospital etc. By providing design of civil work such as repairing of old building. New road development and bus stop design. For drinking water, we have designed rain water harvesting system installation in individual houses which will benefit the villager.

I. Creation of infrastructure - connectivity, civic and social infrastructure along with provision of alternative Economy generation is the key pillars that the concept hinges on.

II. Basic physical infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.

III. Basic Social infrastructure – Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.

Conclusion

In this project we learn many things like how village panchayat system works and how various government scheme is implemented in village and through this project student knows their strength and ability. This project also important for the village, village development also occur. Village can turn out urban from rural area. Village have opportunities for better connectivity and technologies in village. By help of this project we change the image of the village by smart and innovative technological ideas and designs. In this project we done many interactions with sarpanch and panchayat member of smart, ideal and allocated village and also visit the village by this we have some new experiences and knowledge that how the panchayat system work and how all the work of government scheme is done by the sarpanch and panchayat members. Thus, this project can help both village as well as student for their development