DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
BAREJADI -Village

AHMEDABAD - District

PREPARED BY,

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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Nitin Shrivas	Electrical Engineering	170020109014

COLLEGE NAME

Ahmedabad Institute Of Technology

NODAL OFFICERS NAME

Prof. Tanha Shah

COLLEGE LOGO

YEAR:2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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CERTIFICATE

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

Detail Project Report for,

VILLAGE -BAREJADI

DISTRICT - AHMEDABAD

Under,

Vishwakarma Yojana: Phase-VIII

GUJARAT TECHNOLOGICAL UNIVERSITY,CHANDKHEDA

Inpartial fulfillment of the project offered by,

During the academic year 2020-21.

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

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Sakir Qureshi	Civil Engineering	160020106024
Nitin Shrivas	Electrical Engineering	170020109014

Date of Report Submission:	
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Internal(Evaluator) Guide Name and Signature:	**Assit. Prof. Sandhya Girish MC.**
College Name:	**Ahmedabad Institute of Technology**
College Stamp:	

ABSTRACT

"Developing village with rural soul but with all urban facilities that a city may have".

Vishwakarma Yojana project and how you do your vision project:

Vishwakarma Yojna is one the initiatives towards rurbanisation by government of Gujarat which was selected as a real time situation type project provide to GTU the student and faculty member meet all the inhabitant of the village, survey the existing accommodations. Then they reimagine and design the whole of the infrastructure of the village. The students use their engineering skills to prepare detailed project report for the infrastructure as the part of their final year project work. By this project, students are experience a real work and able apply own technical knowledge on any real problem. This involves hard work, many students visit to the village and do survey on his specific village.

About your village description:

According to census 2011 information the location code or village code of BAREJADI village is 511637.BAREJADI village is located in Daskroi Tehsil of Ahmedabad district in Gujarat, India. It is situated 14km away from Ahmadabad, Which is both district & sub-district headquater of BAREJADI village. As per 2009 stats, BAREJADI village is also a gram panchayat.The total geographical area of village is 1070.61 hectares. BAREJADI has a total population of 4268 peoples. There are about 831 houses in BAREJADI village. Ahmadabad is nearest town which is located 14km away.

About existing village condition:

There is closed type of drainage system in Barejadi. For transportation, there is a bus stand in the main road of village from where buses connecting to the different cities are easily not available.75% of the houses are pucca while 25% of the houses are kutcha. There is one Primary school and one anganwadi. Village is connected with 24-hour electricity supply. The development of city will lead the people to develop their villages otherwise there will be more migration towards cities, which will setup RURBAN planning.

About your proposed designs your view for village development:

We decided to plan various six designs for the future development of the village. The six designs are primary health centre, village main gate, solid waste management. All this designs might help for the village development.

About future scope of the village development:

For future prospect, the village BAREJADI can use more advanced technologies for agricultural prospect and for other requirement also. They can make the village WI-FI zone and can improve the computer lab in the schools. They can also provide biogas plant in the village. In the future, due to the development of Ahmedabad city the development of the BAREJADI will increase and the area of the city become spreads so that the allocated village will include in the city area and it will make a portion of the Ahmedabad city.

Key Words: Rurbanisation, Rural soul, Development, Migration

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.

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We are also thankful to our **Prof**.(**Dr.) Sarda Devi Principal**, faculties of our colleges for their encouragement and support to complete this project work.

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,
Dr./Mr./Mrs Sandhya Girish Mc./Mrs. Tanha Shah from college Ahmedabad Institute of Technology 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 VishwakarmaYojana 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, VishwakarmrmaYojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

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

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
APL	Above poverty line
AMTS	Ahmedabad Municipal Transportation service
AUDA	Ahmedabad Urban Development Authority
A.M.C.	Ahmedabad Municipal Corporation
A.D.B.	Asian Development Bank
ATM	Automated Teller Machine
ATMS	Advance Traffic Management System
A.T.V.T.	AppnoTaluko Vibrant Taluko
BPL	Below poverty lone
BRTS	Bus Rapid Transit System
BPO	Business process outsourcing
B.O.D.	Biological Oxygen Demand
BOOT	Built Own Operate and Transfer
C.C.	Cement concrete
CAD	Computer Aided Design
CBD	Central Business District
CDP	City Development Plan
CEZS	Coastal Employment Zones
CSR	Corporate social responsibility
CCTV	Closed Circuit Television
CFC	Chlorofluoro Carbon
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
DTH	Door to Door
DHC	District Heating and Cooling
DPP	Desert Development Programme
DPAP	Drought Prone Area Programme
DRDA	District Rural Development Agency
ERKC	Energy Research Knowledge Center
FFC	Fourteenth Finance Commission
FR	Feeder Routes
FRP	Fiber Reinforce Plastic
GIFTCL	Gujarat International Finance Tec City Company Limited
GSRTC	Gujarat State Road Transport Corporation
GDP	Gross Domestic Product
GOI	Government of India

GOG	Government of Gujarat
GHB	Gujarat Housing Board
GUDA	Gandhinagar Urban Development Agency
GSM	Global System Of Mobile
GEB	Gujarat Electric Board
G.L. / L.L. / S.L.	Ground Level/ Lintel Level / Slab Level
HARIDAY	National Heritage City Development And Augmentation Yojana
HDPE	High density Polyethylene.
IL&FS	Infrastructure Leasing And Financial Services Limited
ITI	Industrial Training Center
IAY	Indira Awaas Yojana
ICDC	Integrated child development center
ICAP	Integrated Cluster action Plan
IRDP	Integrated Rural Development Programme
ICT	Information and Communication Technology
ITDP	Integrated Tribal development Programme
IMIS	Integrated Management Information System
IEC	Information, Education and Communication
IPC	Interpersonal Communication.
JN NURM	Javaharlala Nehru National Urban Renewal Mission
KPO	Knowledge process outsourcing
KLD	Kilo Liter per Day
KV	Kilovolt
LED	Liquid Emitting Display
MLD	Million Liter per day
MFAL	Marginal farmers and Agricultural Labours Agencies
NRUM	National Rurban mission
MDWS	Ministry of Drinking Water and Sanitation
MSW	Municipal Solid waste
NGO	Non-Government Organization
NWDA	National Water Development Agency
NIIF	National Investment And Infrastructure Fund
NRI	Nonresident Indian
NREP	National Rural Employment Programme
OHWT	Over Head Water Tank
PDS	Public distribution system
PPP	Public Private Partnership
PMKVY	Pradhan MantriKaushalVikasYojana
PMSAGY	Pradhan MantriSansadAdarsh Gram Yojana
PTC	Primary Teacher Certificate
R.O.	Rivers osmosis
R.C.C.	Reinforce Cement Concrete
SC	Scheduled Caste
ST	Scheduled Tribe

SFDA	Small Farmers Development Agencies
SAGY	SansadAdarsh Gram Yojana
TOD	Transit oriented development
TRYSEM	Training of a Rural Youth For self Employement
UGWT	Under Ground Water Tank
ULB	Urban Local Body
UF	Ultrafiltration
URDPFI	Urban & Regional Development Plan Formulation and Implementation
VMSS	Vadodara MahanagarSevaSadan
WI-FI	Wireless Fidelity

Chapter 1: Ideal village(PARDHOL)Visit from district of Gujarat state

Introduction:-

- In this village we have study to the ideal village survey and to the ideas for our allocated village for the development of the village. We have study literature review and find the Rurban problems.

1.1 Background:-

- Present status and techno-economic survey of villages in given district of the state in terms of basic and public amenities, essential commodities, other infrastructural facilities for the need of people and on the adequacy of the available resource with reference to the population of the village and growth of the area with the consultation of local revenue authorities, T.D.O. and D.D.O. the future need of the village keeping to mind the need of days, future targeted population growth, growth of surrounding town or taluka places etc.
- We have visited an ideal village Pardhol of Gandhinagar district for the purpose of understanding the basic concept of an ideal village.
- Social infrastructure facilities (education, health, sanitation) socio- cultural facilities (community hall, library, recreation facilities & other) and sustainable infrastructures (rainwater 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.

- According to census 2011 information, the location code or village code of PARDHOL is 511633. PARDHOL vllage is located in DASKROI taluka of Ahmedabad district of Gujarat, India. It is situated 13 km away from Ahmedabad. As per 2009 stats, PARDHOL village is also a gram panchayat.

Fig 1. Pardhol map

Vilage: Pardhol ,
Taluka: Daskroi
State: Gujarat
Pin code:382330
Language: Gujarati, Hindi, English

1.2 Concept: Ideal village:-

- This ideal village has good system of sanitation and drainage. Because filth and rubbish of the village should be regularly removed away into the compost pits.

- An ideal village has very good drain system so that the dirty water of the village is properly drained away.

House:

- The residence/house in an ideal village are very neat and clean. The owners of these houses look to the house sanitation and house-drainage.
- The houses have sufficient windows to let in air and light**.**

Agriculture:

- People of an ideal village are good farmers and good in nature. They grow food crops and seasonal crops etc.
- Now they improved method of farming for more production of crops.

Educational facilities:

- There are Primary schools and High schools in an ideal village. Primary education is free and compulsory.

Medical facilities:

- In an ideal village, there are clinical facilities for villagers and animals. Hence, there are lots of dispensaries.

Other facilities:

- We can find post-office, public library, playground, garden, Skill Development Centre etc there.
- People: People of an ideal village are very neat and clean. They have a sense of discipline and collaboration.
- They have a spirit of service and let go.

Conclusion:-

- An ideal village makes all possible provision for development of her people.
- It is our main duty that we should develop every village of India to much higher level.
- The idea of an ideal village will certainly help us in discharge our duty.

1.2.1 Objectives:-

- Design of Public library, Community hall, bank & ATM,
- Post office, Medical shop, internet cafe should be provided
  - Reduce migration from rural areas due to lake of basic services and sufficient Economic.
- Design electricity connections like solar lighting should be provided.
- Repairs & maintenance of Existing Public Buildings like Gram Panchayat, School Buildings & Other.

Table 1.Details of Pardhol

Gram panchayat	Pardhol
Tehsil	Daskroi
District	Ahmedabad
State	Gujarat
Pin code	382330
Area	508.6 hectare
Population	3946
Household	799
Nearest town	Ahmedabad

1.2.2 Live case studies of ideal village of Gujarat:-

According to census 2011 information, the location code or village code of PARDHOL is 511633. PARDHOL village is located in DASKROI taluka of Ahmedabad district of Gujarat, India. It is situated 13 km away from Ahmedabad.

- The literacy rate in the village is high. There are different religions people lived in village. Main approach road of village is state highway. There are many of socio-cultural facilities. Thus, the people of village have to go nearby city in Gandhinagar. The irrigation facility is good but the most of land of the area is N.A.
- Generally, when we listen the word village the first impression which strikes to our mind is, mud houses, narrow roads, no drainage and no drinking water facilities with socially backward and unconnected people, but Pardhol is different story from others.
- Every home in the village has toilets, a primary health center, streetlights and a drainage system.
- The main occupation in the village is government servant, business, etc.
- Mr. Shabhuji Hothaji Thakor is the current Sarpanch of Pardhol village.

1.2.3 The idea of an Ideal village/Smart village:-

- The smart village is a model in which, energy access acts as a catalyst for a range of development outcomes. If managed correctly, technology leapfrogging could lead to rapid improvements in healthcare, nutrition, education, and economic security.
- The social, economic and scientific developments in these communities helped in the growth of such villages and also have become the building block of civilizations.
- However, even after the collapse of such progressed civilizations, villages continued to exist and flourish through rich heritage and traditional practices.
- It was the dream of Mahatma Gandhi to make the Indian villages smarter and ideal/model by improving them in all aspects like physical, economic and social etc.

What is smart village?

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

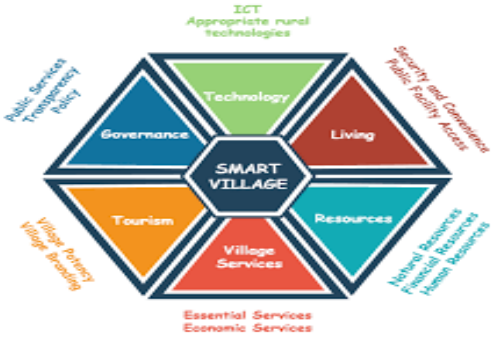


Fig 2. The idea of Smart village

Objectives of Ideal village:-

- To study the existing growth, characteristics and development of villages.
- To study how to improve drainage and sanitation systems.
- To study the future developing and growth scenario of village.
- To analyze all feasibility parameters and relevant factors for sustainable development of villages.
- To study the existing infrastructure facilities and its management issues phasing by villages.
- Creating models of local development which can be example of other villages.

Provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.

1.2.4 Ancient History civil:-

- It is difficult to determine the history of emergence and beginning of civil engineering.
- Man used the old shelter caves to protect themselves of weather and harsh environment, and used a tree trunk to cross the river, which being the demonstration of ancient age civil engineering.
- Ancient historic civil engineering constructions include the water management system.
- The Romans developed civil structures throughout their empire, including especially aqueducts, insulae, harbors, bridges, dams and roads.

1.3 Detail Study:-

Social Details:-

- We have found that all villagers of this village are much connect with today technology environment and working area.

Physical Details:-

According to census 2011 information, the location code or village code of PARDHOL is 511633. PARDHOL village is located in DASKROI taluka of Ahmedabad district of Gujarat, India. It is situated 13 km away from Ahmedabad, which is both district and sub district headquarter of PARDHOL village. The total geographical area of village is 508.6 hectares. Ahmedabad is nearest town to PARDHOL which is approximately 13 km away.

Demographic Details:-

Table 2. Population of PARDHOL

Sr. No.	Census	Population	Male	Female
1.)	2011	3946	2029	1917
2.)	2001	3824	1997	1827

The village is developed during recent years very efficiently. The village has basic physical amenities like,

- Sanitation facilities
- Education
- Post office
- Drainage system
- CC Roads
- Street lights
- Anganwadi
- Community hall

Economic Details:-

Table 3. Economic Details

Name of three major occupation groups in village	Farming	70%
	Production of food items	30%
	Jobs in Ahmedabad	10%

Infrastructure Details:-

Fig no 3.Pardhol village road condition

Fig 4. Dena bank

Fig 5. Drainage system

Fig 6. Post office

Fig 7. Private clinic

1.4 SWOT Analysis of Ideal village:-

Table 4. SWOT Analysis of ideal village

Strength	Weakness	Opportunities	Threats
Proper Drainage facilities.	Unproper disposal of waste	Improving in waste management	Lack of awareness of villagers about cleaning.
Transportation facilities	Unproper layout of village	Women empowerment	Lack of wastage of garbages.
Sanitation facilities	No facilities for higher education	Educational awareness	Lack of funds and technical knowledge in agriculture.

1.5 Future prospects of development of the ideal village:-

- For future prospect, the village PARDHOL can use more advanced technologies for agricultural prospect and for other requirements also.

- They can make the village WIFI zone and can improve the computer lab in the schools. They can also provide biogas plant in the village. In the future, due to the development of Ahmedabad city the development of the PARDHOL will increase and the area of the city become spreads so that the allocated village will include in the city area and it will make a portion of the Ahmedabad city.

1.6 Benefits of the visit of Ideal village:-

- From this village we get the actual definition idea of developed village.
- We get idea about how to develop our village.
- We know about which basic amenities should provide in village.
- Know about development of village only use by government scheme.
- We visited Pardhol village, Daskroi, by the visit of the village Pardhol, we got an idea about an ideal village. We had seen much kind of new technologies which can be used in village that are being used in the urban area. By this visit of this village, it has improved our communication skills and we knew how to interact with the different peoples.
- To improvement allocated village
- To understand allocated village condition.

1.7 Electrical concept of Ideal village / Smart village:

- Smart villages capture many of the benefits of urban living while retaining valued aspects of rural life and ensuring balanced development at the national level. This enables villagers to attain healthy and fulfilling lives, achieve their development potential, earn a viable living and be connected to the wider world, giving them a real choice between the traditional route of migration to a city, or life in a smart village.
- Smart villages will be connected to towns and cities through information andcommunication technologies (ICT) enabled by access to energy. Such technologies will enhance education and health services by providing links to the world's knowledge base and opportunities for distance learning, as well as supporting initiatives in m-health (mobile health, also known as telemedicine). Connectivity will also open up participation in governance processes at local, regional and national levels.
- Key enablers of these development benefits in smart villages are sustainableelectricity supplies and the availability of clean and efficient appliances for cooking. Productive enterprises and facilities with higher energy demands will tend to be located in hub villages supplied by the national grid if sufficiently close or – for the many remoter communities – by local mini-grids driven by renewable energy sources, possibly in hybrid form with diesel generators in some cases. The more dispersed communities around the hub villages will typically use picopower and stand-alone home systems.
- This enables villagers to attain healthy and fulfilling lives, achieve their development potential, earn a viable living and be connected to the wider world, giving them a real choice between the traditional route of migration to a city, or life in a smart village.
- Connectivity will also open up participation in governance processes at local, regional and national levels

Chapter 2: About Village:-

2.1. Introduction:-

- Understanding urbanization and the links between rural and urban areas is fundamental to making the most of the global transformations happening around the world, and to challenging the many myths that exist.
- Rural is noticeably agricultural, its settlement system consists of villages or homesteads Socially it signifies greater inter dependence among people, more deeply rooted community life and a slow-moving rhythm of life built around nature and natural phenomenon; and occupationally it is highly dependent on crop farming, animal enterprises, tree crops and related activities.
- An urban area or urban agglomeration 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.

2.2. Importance of rural development:-

Importance:-

- The National Rurban Mission (NRuM) follows the vision of "Development of a cluster of villages that preserve and nurture the essence of rural community life with focus on equity and inclusiveness without compromising with the facilities perceived to be essentially urban in nature, thus creating a cluster of "Rurban Villages".
- The objective of the National Rurban Mission (NRuM) is to stimulate local economic development, enhance basic services, and create well planned Rurban clusters.
- Bridging the rural-urban divide viz: economic, technological and those related to facilities and services.
- Spreading development in the region.
- Rural development is the national necessity and it has following measures:
- To develop rural youths, children and women.
- To develop and empower human resource of rural area in terms of their psychology, skill, knowledge, attitude and other abilities.
- To develop infrastructure facility of rural area.
- To develop rural institutions like Panchayat, cooperatives, post, banking and credit.
- To provide financial assist to develop the artisans in the rural areas, farmers and agrarian unskilled labor, small and big rural entrepreneurs to improve their economy.
- Spreading development in the region.
- Rural development is the national necessity and it has following measures:
- To develop rural youths, children and women.
- To develop and empower human resource of rural area in terms of their psychology, skill, knowledge, attitude and other abilities.
- To develop infrastructure facility of rural area.

- To provide minimum facility to rural mass in terms of drinking water, education, transport, electricity and communication.
- To develop rural institutions like Panchayat, cooperatives, post, banking and credit.
- To provide financial assist to develop the artisans in the rural areas, farmers and agrarian unskilled labor, small and big rural entrepreneurs to improve their economy

2.3. Ancient Villages:-

- A village is a clustered human settlement or community, larger, than a hamlet but smaller than a town, with a population 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.

RURAL VILLAGES:

- The basic unit for rural areas is the revenue village. In a rural area, there are fewer people, and their homes and businesses are located far away from one another. Agriculture is the primary industry in most rural areas. Most people live or work on farms or ranches.

URBAN VILLAGES:

- In urban planning and design, an urban village is an urban development typically characterized by medium density housing, mixed use zoning, good public transit and an emphasis on pedestrianization and public space.

2.4. Scenario:-

- Agenda of census of India is to release of provisional population totals-Rural urban distribution. Population of Rural and Urban area (in crore).

Table 5. Population of Rural and Urban areas as per census

	2001	2011	Difference
India	102.9	121.0	18.1
Rural	74.3	83.3	9.0
Urban	28.6	37.7	9.1

For the first in since independence, absolute increase in population is more in urban areas that in rural areas.

Rural-Urban Distribution: 68.84% & 31.16 Level of urbanization increased from 27.81% in 2001 census to 31.16% in 2011.

Literacy rates (in %)

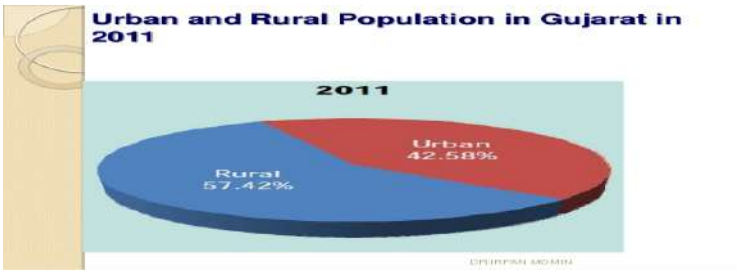


Fig 8. Population of Gujarat

2.5 Rural issues and concerns:-

Table 6. Population of Gujarat as per census 2001 and 2011

Description	Rural	Urban
Population Growth	9.31 %	36.00 %
Sex Ratio	949	880
Child Sex Ratio (0-6)	914	852
Child Population (0-6)	4,824,903	2,952,359

- **Poor sanitation:**

  Because of the illiteracy and poverty of the people in rural area, they do not know the importance of sanitation and hygiene. Such an ignorance causes environmental pollution leading to the breakout of a number of epidemics like cholera, typhoid etc.

- **Conversion of Farmland to housing land:**

  To provide shelter to the increased population in rural areas, more and more agricultural lands are being utilized for housing purposes by rural peoples. This results in decreased per capita availability of cultivated land which ultimately induces over cultivation.

- **Lack of drainage facilities:**

  To increase the crop productivity for providing food to increased population, the illiterate rural farmers used a number of pesticides and fertilizers, not in proper amount. The excess of pesticides and agrochemicals accumulate in water bodies and soil causing potential health hazards in humans and other aquatic and terrestrial living organisms (animals).

2.6 Various guidelines/ norms for village for the provisions of different infrastructure facilities:-

After surveying the village we found that according to population it has primary school and anganvadi. And water tank also available to fulfill their daily needs. But the hospital we not enough for the population. Post office and bank is not present in the village.
So we decided to make hospital bank and post office.

2.7. Ancient study as Literature Review for village development:-

- Sustainable development is the organizing principle for sustaining finite resources necessary to provide for the needs of future generations of life on the planet.
- It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the "integrity stability and beauty" of natural biotic systems.
- Sustainable development is a process for meeting human development goals while sustaining the ability of natural systems to continue to provide the natural resources and ecosystem services upon which the economy and society depend.
- While the modern concept of sustainable development is derived most strongly from the 1987 Brundtland Report, it is rooted in earlier ideas about sustainable forest management and twentieth century environmental concerns.
- It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the "integrity stability and beauty" of natural biotic systems.

2.8 Other Projects / Schemes:-

- In other projects for the development of the rural area is the Public Private Partnership (PPP).

❖ Public-Private-Partnership - The Concept:

- Public-private partnerships involve collaboration between a government agency and a private-sector company that can be used to finance, build, and operate projects, such as public transportation networks, parks, and convention centers. Financing a project through a public-private partnership can allow a project to be completed sooner or make it a possibility in the first place.
- Public-private partnerships often involve concessions of tax or other operating revenue, protection from liability, or partial ownership rights over nominally public services and property to private sector, for-profit entities.

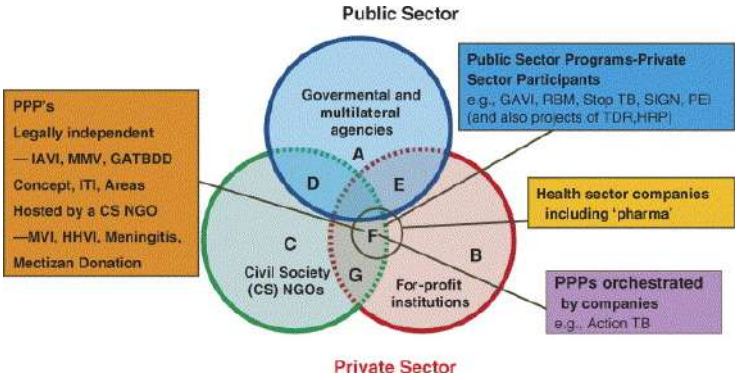


Fig 9. PPP model

2.9 Other Project / Schemes of Gujarat / Indian Government

Sr. No.	Govt. Schemes	Description
1.	Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY)	It focuses on integrated development of 100 villages with a 50 per cent population of SCs.
2.	Bharat Nirman Yojana	It was launched in 2005 for building infrastructure and basic amenities in rural areas. It comprises of six components-rural housing, irrigation, drinking water, rural roads, electrification and rural telephony.
3.	Indira Awas Yojana	It is one of the six components of Bharat Nirman Yojana. It was introduced in 1985-86. It aims to help built or upgrade the households of people living under BPL.
4.	Jawaharlal Nehru National Urban Renewal Mission (JNNURM)	It was launched on 3rd December, 2005. The main objective of this scheme was fast track development of cities across the country.

Chapter 3. Smart Village Concept: -

3.1 Introduction smart cities: -

❖ **Concept**

Creating a "smart village" is necessary to solve the problems of urban population growth and rapid urbanization. In Smart village's, provision of good education and healthcare, access to clean water, sanitation and nutrition, and best security, gender equality and democratic engagement.

❖ **Definition**

Smart village means all the facilities like; drainage system, sanitation system, transportation facilities, electricity are available in the village.

3.2 Vision-Goals, Standard and Performance Measurement Indicators: -

Sr. No.	Parameter	Benchmark
1.	Transport	• Maximum travel time of 30 minutes in small & medium size cities and 45 minutes in metropolitan areas. • Dedicated and physically segregated bicycle tracks with width of 2 m or more, one in each direction, should be provided on all streets with carriage way larger than 10 m. • High quality and high frequency mass transport within 800 m (10- 15-minute walking distance) of all residences in areas over 175persons / ha of built area. • Continuous unobstructed footpath for 2 m wide on either side of all street with Row 12 m more
2.	Spatial Planning	• 175 persons per Ha along transit corridors. • At least 30% residential and 30 commercial/institutional in every TOD Zone within 800m of Transit Stations • 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
3.	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

4.	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
5.	Solid management	• 100% collection of municipal solid waste • 100% collection of municipal solid waste • 100% households are covered by daily door-step Collection system. • 100% segregation of waste at source, i.e. bio- degradable and non-degradable waste • 100% recycling of solid waste
6.	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
7.	Electricity	• 100% households have electricity connection 24 x 7 supply of electricity • 100% metering of electricity supply • 100% recovery of cost • Tariff slabs that work towards minimizing waste
8.	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. • center - 25 to 30 beds per lakh population
9.	Telephone connections	• 100% households have a telephone connection including mobile

3.3 Technological Options: -

- Smart mobility: Intelligent mobility; Advanced traffic management system (ATMS), Parking management, ITS-enabled transportation pricing system.
- Smart infrastructure: Automated Intelligent Buildings, Advanced Heating Ventilation and Air conditioning systems (HVAC), Lighting Equipment.
- Smart healthcare: - Intelligent Healthcare, Technology, use of e-Health and m-Health systems, Intelligent and connected medical devices.
- Smart governance and smart education: - Government on the Go, e-

Government, education, Disaster management solutions.

3.4 Road Maps and Safeguards: -

- The first step in establishing a road map for a smart city is to know why there is a need for a smart city initiative.
- GIS is an essential economic development tool that many cities use for planning, analyses, and building lively communities that attract businesses and residents
- The second step in establishing a smart city roadmap is by developing a policy that drives the whole initiatives.
- The policy needs to define the roles, responsibilities, strategies, and objectives of the smart cities.
- The third element in developing a smart city roadmap is engaging the citizens through the use of e-government and effective governance, which leads to the increase of efficiency and enhancing delivery of services.
- One goal of engaging the citizens is to build trust and make them part of the solution.
- Open data through the use of mobile applications is one way to establish such engagement- mobility is a gateway to building a civic engagement, as it allows the public to connect to the city's infrastructure to perform services whenever they want from wherever they are.
- Another method to engage the citizens is by granting access to high-speed Internet and building Wi-Fi wireless infrastructure city wide.

3.5 Issues and Challenges: -

- Smart infrastructure has many components like Digital management of infrastructure, sensor networks, digital water and waste management, institutional, physical, social, economic infrastructure.
- Social Infrastructure relates to components that enable development of human and social capital, such as the education, healthcare, entertainment, etc.
- Economic Infrastructure include developing proper infrastructure that generates employment opportunities and attract investments.
- Smart Information and Communications Technology (smart ICT) has the potential to transform the way we plan and manage infrastructure. New developments in computer hardware, new applications and software are changing the face of the infrastructure sector and society.

3.6 Smart Infrastructure: -

Smart Infrastructures comprise several operators from different domains of activity, such as energy, public transport, public safety. They deploy and operate "cyber-physical systems", that are data-controlled equipment which interact with the physical world. They collaborate and exchange data under several schemes, depending on their level of maturity.

- Smart building
- Smart mobility
- Smart energy

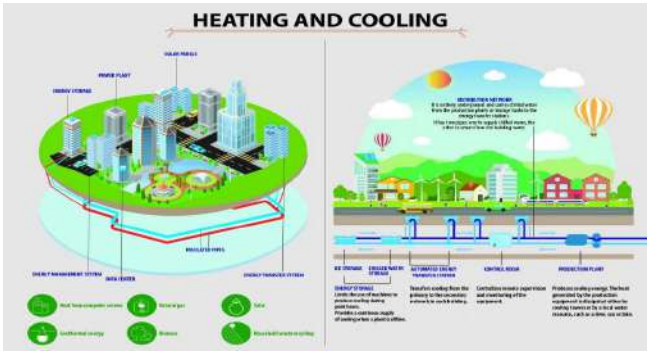
- ❖ Smart waste management
- ❖ Smart health.

3.7 Cyber security: -

Cyber security is the one of the key components of smart cities. It is important to remember that cyber security is a citywide issue and not just a technology risk. Cyber security is a prerequisite for all smart cities in existence, development or in plans of development.

- ➢ SMART cities are the future of urban living, harnessing the power of three D's digital technologies, data, and design thinking to boost the efficiency and effectiveness of city services.
- ➢ Smart cities are comprised of a highly complex, interdependent network of devices, systems, platforms, and users. Smart energy, utilities, water and wastage, parking and automotive, industrial and manufacturing, building automation, e- government and telemedicine, surveillance and public safety are just some of the verticals that vendors and governments must secure.
- ➢ According to ABI Research there will be approximately 1.3 billion wide-area network smart city connections by 2024.

3.8 District cooling and heating: -



- ➢ As per the ERKC (energy research knowledge center) district heating and cooling covers the generation and distribution of thermal energy in district networks.
- ➢ The United States of America (USA) and Canada have developed demonstration projects on a large scale for DH or DC
- ➢ Green building is the practice of increasing the efficiency with which buildings andtheir sites use energy, water, and materials, and of reducing impacts on human health and the environment for the entire life-cycle of a building.
- ➢ Pollution's devastating effects on the environment have become more obvious in recent years, sparking a movement to promote energy efficiency, less reliance on fossil fuels, and a reduction in air and water pollution.
- ➢ In the United States, building and development account for 39% of the country's total energy use, 12% of total water consumption, 68% of total electricity consumption, and 38% of carbon dioxide emissions, according to the Environment

Protection Agency.

3.9 Strategic Options for Fast Smart Cities Development

- There are some solutions which may be considered strategically and economically for . faster development of smart cities.
- E-governance and citizen services.
- Energy Management.
- Urban mobility.

3.10. India's Urban water and sanitation challenges and role of indigenous technologies: -

- Multi Stage Biological Treatment Solution (MSBT) can be implemented on existing STP which is not able to process Sewage to optimum efficiency.
- MSBT can be implemented as a modular or container on the banks of rivers on Drains/Nalas which discharge waste water to the river. It can also be implanted in small urban societies and housing complex for better water management.
- Benefits of MSBT are: No Surplus of Organic Sludge, no odor problem, Drastic reduction of electrical Power usage which minimizes operating costs, no need for return sludge pumping (minimizing electromechanical component which ultimately reduces operating cost.

3.11 Initiatives in village development by local self-government

- Since 1992, local governance in India takes place in two very distinct forms.
- The Panchayat raj system with elected body at the village, Talukas and district levels.
- In the past "government as provider" approach, the priorities were to secure budget allocations and develop projects.
- The modern system is based imparts on traditional Panchayat governance, in part on the vision of mahatma Gandhi and in part by the work of various committees to harmonize the highly centralized in Indian governmental administration with a degree of local autonomy the result was intended to create greater participation in local government by people and more effective implementation of rural development programs.
- The NCU recognizes reforms of internal management as vital. This is likely to entail implementing more systematic and efficient approaches in many areas: for example, budgeting and financial management; project management and control; billing and collections; infrastructure systems maintenance; and personnel management.
- Financial Systems. Constraints on government budgets and the rigidities of the present system of intergovernmental transfers prevent an adequate response of traditional arrangements to the challenge of urbanization.

3.12 Smart Initiatives by District Municipal Corporation

- Publicize the scheme in the district.
- Give in principle/administrative approval to works under Smart Village.
- Guide the Gram Panchayat and help it achieve the goals of Smart Village.

- Prepare smart village wise annual report and submit at the state level.

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.

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

- **Kisan Suryodaya Yojana**
- To provide day-time power supply for irrigation, the Gujarat Government under Chief Minister
- Vijay Rupani had recently announced the 'Kisan Suryodaya Yojana'. Under this scheme, farmers will be able to avail power supply from 5 AM to 9 PM. The state government has allocated a budget of ₹3,500 crore for installing transmission infrastructure under this scheme by 2023. 234 '66-Kilowatt' transmission lines, with a total length of 3490 circuit kilometers (CKM) will be established under the project, in addition to 220 KV substations.
- Dahod, Patan, Mahisagar, Panchmahal, Chhota Udepur, Kheda, Tapi, Valsad, Anand and Gir-Somnath have been included under the Scheme for 2020-21. The remaining districts will be covered in a phase-wise manner by 2022-23.
- **Paediatric Heart Hospital attached with the U.N Mehta Institute of Cardiology and Research**
- The building is equipped with safety precautions like earthquake proof construction, fire fighting hydrant system and fire mist system. The research centre will house India's first Advanced Cardiac ICU on Wheels with O.T., which is equipped with ventilators, IABP, haemodialysis, ECMO etc. 14 operation centres and 7 cardiac catheterization labs will also be started at the institute.
- **Girnar Ropeway**
- Gujarat will once again be highlighted on the global tourism map with the inauguration of the Ropeway at Girnar on 24th October, 2020. Initially, there will be 25-30 cabins, with a capacity of 8 people per cabin. A distance of 2.3 kms will now be covered in just 7.5 minutes through the ropeway. In addition to this, the ropeway will also provide a scenic view of the lush green beauty surrounding the Girnar mountain.

3.14 How to Implement other Countries smart village project in indian village context :

- Over recent years, the challenges arising from the social and economic, but also wider changes of people's communities—rural and urban—have been increasingly addressed through the lenses of technological developments and digitalization. In this paper, we have focused on the applications of the Smart Village concept and the importance of digital transformation for rural areas, always drawing parallels between the findings and insights from different regions. We aim to use these new insights in developing the

framework of the international project Smart digital transformation of villages in the Alpine Space.

- At the most basic level, households in smart villages will be able to consume potable water and a more nutritious diet due to the reduced cost of boiling water and cooking food, and enhanced agricultural productivity arising from associated development initiatives and reduced wastage. Furthermore, modern technologies and cleaner fuel sources will replace the traditional biomass cook stoves that currently result in harmful indoor pollution.
- Smart villages, through the provision of modern energy access, will bolster rural industry through a variety of channels, including the ability to use mechanical power, the availability of a more skilled workforce through ICT-enabled education, and extended working hours through high-quality lighting. ICT will provide access to mobile financial services and up-to-date market information to enable integration with more complex value chains, and to carve out niches in international markets through identifying and transacting directly with previously unreached customer bases

3.15 Electrical Concept

Education

- Smart villages aim to increase the time available for students to study and will address prevalent factors that negatively affect the ability of students to acquire the knowledge and skills necessary to achieve economic goals and improve labour productivity. These include eliminating the need to spend time collecting traditional biomass, reducing respiratory illness caused by indoor air pollution, and ensuring that lighting is both safe and of sufficient quality.
- ICT-equipped schools will provide a good level of access to the internet and consequently the world's knowledge base, ending the information isolation experienced by many rural communities. New opportunities will be generated for distance and adaptive learning, reducing the need to move to towns or cities to achieve higher levels of education. In addition, ICT and internet access also have a "pull factor", providing incentives for school attendance and for attracting and retaining good teachers
- Smart villages, through the provision of modern energy access, will bolster rural industry through a variety of channels, including the ability to use mechanical power, the availability of a more skilled workforce through ICT-enabled education, and extended working hours through high-quality lighting. ICT will provide access to mobile financial services and up-to-date market information to enable integration with more complex value chains, and to carve out niches in international markets through identifying and transacting directly with previously unreached customer bases.

Health

- At the most basic level, households in smart villages will be able to consume potable water and a more nutritious diet due to the reduced cost of boiling water and cooking food, and enhanced agricultural productivity arising from associated development initiatives and reduced wastage. Furthermore, modern technologies and cleaner fuel

sources will replace the traditional biomass cook stoves that currently result in harmful indoor pollution.

- ICT-enabled m-health initiatives such as the Swasthya Slate will enable mobile health diagnostic solutions, requiring relatively low levels of local medical skill and providing access to specialist health-care services based in urban communities where necessary. Epidemiological data will be gathered, providing the opportunity for more effective interventions and early warning capability in case of outbreaks of contagious diseases such as cholera and Ebola.

Productive enterprise

- Productive enterprise in rural areas generally consists of small and medium-sized enterprises such as agro-processing, textiles, furniture, chemicals, electronics and machinery. Energy access promises participation in knowledge-based activities ranging from handicraft shops to factories, operated informally or organised as a formal business, and using traditional production processes or even employing cutting-edge modern technology. Participation in primary manufacturing, however, will be limited in off-grid villages by the scale of energy required relative to that available from local sources
- Smart villages, through the provision of modern energy access, will bolster rural industry through a variety of channels, including the ability to use mechanical power, the availability of a more skilled workforce through ICT-enabled education, and extended working hours through high-quality lighting. ICT will provide access to mobile financial services and up-to-date market information to enable integration with more complex value chains, and to carve out niches in international markets through identifying and transacting directly with previously unreached customer bases.

Environment

- Smart villages will be stewards of the environment aided by technologies to monitor key environmental indicators such as forest health, water quality, soil conditions and changes to the landscape. They will also reduce pressure on deforestation through the use of efficient cook stoves to decrease the need for traditional biomass energy sources such as charcoal, a key driver of unsustainable forest use.
- Smart villages aim to increase the time available for students to study and will address prevalent factors that negatively affect the ability of students to acquire the knowledge and skills necessary to achieve economic goals and improve labour productivity. These include eliminating the need to spend time collecting traditional biomass, reducing respiratory illness caused by indoor air pollution, and ensuring that lighting is both safe and of sufficient quality.
- Smart villages will host community-run recycling facilities ranging from those equipped to recycle wastewater and organic waste from agro-processing, to next-generation facilities for the recycling of e-waste including energy-storage and generation technologies such as batteries and solar panels. Depending on geographical endowments, some smart villages will be able to operate as regional ecotourism hubs, an activity that can improve the welfare and connectivity of rural and urban communities.

Chapter 4: About<BAREJADI-Allocated village>

4.1 Introduction:-

4.1.1 Introduction about <BAREJADI>village details:-

"BAREJADI"is a village in Daskroi Taluka in Ahmedabad District of Gujarat State,India.It is located 20 km west from District Headquatersahmedabad 45km from state capital Gandhinagar. Demographics of BAREJADI:Gujarati is the local language here.
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Fig 10. Barejadi village Direction Board

4.1.2 Need of the study:-

- Rural development which is concerned with economic growth and social justice, improvement in the living standards of the rural people by providing adequate and quality social services and minimum basic needs becomes essential.
- The present study deals with the same. In vishwakarmaYojana,the students and faculty members meet all the stake holders in a village,survey the existing facilities.

4.1.3 Study Area:-

- BAREJADI village is located in daskroi Taluka of Ahmedabad District in Gujarat, India. It is situated 25km away from Ahmedabad.

4.1.4 Objectives of the study:-

1. To provide basic amenities in the village like transportation, sanitation, educational, health care facilities.
2. To reduce migration from rural to urban.
3. To promote integrated development.
4. To provide sustainable development.
5. To propose the comprehensive planning suited for ideal village.

4.1.5 Scope of the Study:

- By the analysing present conditions, we can improve the basic amenities and facilities like agricultural facilities, milk cooperative facility, education facilities.
- To improve life style of the villagers by helping them to develop their skills by assisting them in implementing income generating activities in close coordination and cooperation with national and international organizations.

4.1.6 Methodology Framework for development of BAREJADI village:

Fig 11. Methodology framework

4.1.7 List of Objects Available related to Civil / Electrical Methodology

- Make special efforts to increase production of pulses and vegetable oil seeds
- Implement agricultural land ceiling, distribute surplus land and complete compilation of land records by removing all administrative and legal obstacles
- Increase irrigation potential, develop and disseminate technologies and inputs for dry land agriculture
- Supply drinking water to all problem villages
- Strengthen and expand coverage of integrated rural development and national rural employment programmes
- Allot house sites to rural families who are without them and expand programmes for construction assistance to them
- Rehabilitate Bonded labour
- Pursue vigorously programmes of afforestation, social, farm forestry, the development of bio-gas, and other alternative energy sources.
- By the analysing present conditions, we can improve the basic amenities and facilities like agricultural facilities, milk cooperative facility, education facilities.
- To improve life style of the villagers by helping them to develop their skills by assisting them in implementing income generating activities in close coordination and cooperation with national and international organizations.

4.2 <ALLOCATED VILLAGE> Study Area Profile:

4.2.1 Study Area Location:

- We allocated one village for surveying which is BAREJADI near Ahmedabad District.
- This is our study area to find problems related to structure and general amenities. BAREJADI is 14km away from Ahmedabad.

Table 7. Details of Barejadi

Village Name	BAREJADI
Taluka Name	Daskroi
District	Ahmedabad
State	Gujarat
Language	Gujarati, Hindi
Pin code	382435

4.2.2 Base location map, land map, gram tal map:

Fig 12. Gram Tal Map

Fig 13 Location Map

4.2.3 Physical and Demographic growth:

- BAREJADI is 20km away from Ahmedabad. BAREJADI is in Ahmedabad district located near Vehlal. Nearby Hasmukh Goswami college by 1 km, and Apollo Engineering College by 3 km. Vehlal, Huka, Pardhol, Janu are the closed to locality to BAREJADI. Ahmedabad and Gandhinagar are the near cities of BAREJADI. BAREJADI is a locality in Ahmedabad city in Gujarat state, India. Naroda railway station is the very nearby railway station to BAREJADI . Kalupur junction railway station is major railway station near to BAREJADI.

4.2.4 Economic generation profile:

- About the economic profile of this village, many citizens work interest is Farming, labor work and business.
- The village does not 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. Dairy and Milk production is also prime source of income.

4.2.5 Actual problem faced by villagers:

Problems:

1. No Hospital or doctor clinic
2. No Transportation
3. Less electricity
4. Low quality network at all
5. Worst condition of street road
6. Low quality education

4.2.6 Social scenario:

Table 8. Social scenario of Barejadi

Sr no	Detail	Population
	Total Population	1602
1.	Male	807
2.	Female	795
	Total no. of family	
1.	Total B.P.L Family	238
	Village literacy rate	
1.	Male literacy rate	77.00%
2.	Female literacy rate	64.00%
3.	Total literacy rate	61.00%

4.2.7 To know the reasons of migration/Trends:

- Employment opportunities are the most common reason due to which people migrate. Expect this, lack of opportunities, better education, construction of dam, globalization, natural disaster(flood and drought)and sometimes crop failure forced villagers to migrate to cities.

4.3 Data collection:

4.3.1 Methods for data collection:

- Base line survey is a standard for any intervention during and post application of any development programme.
- This gave in the details of the demographic profile of the village, the literacy percentage, Sc/St population, cattle population, and net consumption rate of the village, average milk production of the cattle and various schemes running and their benefits.
- Bio-physical survey was undertaken to identifying various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, cropping pattern, fertilizer used and various sources of irrigation in the field.

❖ **Primary Survey Data:**

- The Primary survey was conducted to identify the various general problems of the villagers by interacting with them and enquiring about the problems faced by them in daily life.

- They were asked to suggest the possible and desirable solutions for these problems as well as other infrastructural facilities they would like to have in their village. The data is collected by the following methods:

- Questionnaire method.
- Focus group discussion.
- Survey method.
- Diaries method.

❖ **Secondary Survey Data:**

- The Secondary survey was conducted to identify the working condition of existing structures of village like school building, panchayat building, drainage facility etc.
- For this purpose we have taken photos of all existing infrastructure facilities in village and also asked question related to the various structures of to the deputy sarpanch and sarpanch of village. The data is collected by the following methods:
- Bio-physical survey was undertaken to identifying various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, cropping pattern, fertilizer used and various sources of irrigation in the field.

- Published printed sources.
- Books.
- Journals.
- Gov. records.

4.3.2 Primary survey details:

- According to Census 2011 information the location code or village code of Barejadi village is 511673. Barejadi village is located in Daskroi Tehsil of Ahmadabad district in Gujarat, India. It is situated 20km away from Ahmadabad, which is both district & sub-districtheadquarter of Barejadi village. As per 2009 stats, Barejdi is the gram panchayat

  Barejadi village.

- The total geographical area of village is 138.3 hectares. Barejadi has a total population of 1,602 peoples. There are about 336 houses in Barejadi village. Ahmadabad is nearest town to Barejadi which is approximately 20km away.

4.3.3 Average size of the house:

- The average size of the house 700 square feet.

4.3.4 Number of human beings in one house:

- As per the sarpanch and our survey there are 4 to 5 persons in one house.

4.3.5 Material used locallyOut Sourced Material:

- The construction of the houses was made of stone, cement, sand, bricks and concrete. In this village kutchha houses are more than the pucca houses.
- Major economic option of the village is farming so there are no more locally material available like standard bricks, aggregates, concrete and reinforcements. So, this material is brought from nearest city for construction of the houses.

4.3.6 Geographical details:

Table 9. Geographical details

Gram panchayat	BAREJADI
Tehsil	Daskroi
District	Ahmedabad
State	Gujarat
pin code	382435
Area	138.3 hectare
Population	1602
Households	336
Nearest town	Ahmedabad

4.3.7 Demographical Details:

Table 10. Demographical details

Particular	Total	Male	Female
No. Of house	336	-	-
Population	1602	807	795
Child	209	106	103
Literacy	71.00%	77.00%	64.00%
Total workers	594	435	159
Schedule of cast	358	179	179
Schedule of trip	0	0	0

4.3.8 Occupational details:

- In this village 70 to 75 % people connected with agriculture activities it‘s the villages main source of income. But village has the milk production business so that‘s a income of source too there are approx. 20 to 25 % people are connected with milk production and other are doing labour work for money.
- Major economic option of the village is farming so there are no more locally material available like standard bricks, aggregates, concrete and reinforcements. So, this material is brought from nearest city for construction of the houses.

4.3.9 Agriculture Detail:

Description Type	Commodities
Agricultural Commodities (First)	PADDY
Manufacturers Commodities (First)	N/A
Agricultural Commodities (Second)	WHEAT
Agricultural Commodities (Third)	PEARLMILLET/BAJRA

4.3.10Physical Infrastructure details:

- Bus stand
- Primary school
- Water tank
- Open drainage
- WBM and CC road
- Panchay at building
- Street lighting

Fig 14. Water Tank

4.3.11 Tourism Cluster:-

- Village is not as good for tourism, So no tourist spots are there in Village.

4.4 Infrastructure Details:

4.4.1 Drinking water:

For drinking Purpose ground water tank, tube well and tap water available. Some people also use hand pump for water purpose.

4.4.2 Drainage Network:

Underground drainage facilities are available in all

areas of the village.

- No treatment is given to the waste water, it is directly disposed to the Nayari and Drainage Strom water facility is not available in village; due to that clogging of rain water on road is problem in monsoon.

4.4.3 Transportation & Road network:

- Main road of village is in good condition and all main roads are of black topped.
- Road maintenance is required in some areas of village. The internal street roads are also 90% of R.C.C. Buses are not easily available at the entrance of village Other transport facilities like Auto, chhakda and private vehicles are also available.
- Nearest railway station is at Naroda junction which is 14 km far from the village.

Fig 15. House condition

- **4.4.4 Housing condition:**
- There are households in the village. 60% households are kutcha and 40% are pucca.

4.4.5 Social Infrastructure Facilities:

- Primary School
- Panchayat Bhavan
- Anganwadi 1
- No private clinic
- Water tank 2

4.4.6 Existing Condition of Public Buildings:

- In BAREJADI public building like gram panchyat, school etc are good in condition. But anganvadis condition is well so maintenance.

Fig 16. Panchayat office

4.4.7 Technology Mobile/WIFI/Internet Usage Details:

- BAREJADI village is not a Wi-Fi village. Approximately only 30-40 % people use technology or mobile or internet.

4.4.8 Sport Activity:

- There is NO Any Sport Activity

4.4.9 Socio cultural facilities:

- There are NO socio-cultural facilities like public garden, park, playground etc.

4.4.10 Other facilities:

- Other facility like panchayat building and temples exists.

4.4.11 Any other details: There are agriculture co-operative building, 4 Wells, 5-8 tube well in farm or agriculture areas and a pump. The farmers have the farming equipment like Tractor etc in Barejadi Village

4.5 Electrical Concept:

- There is not so much facilities in village.
- The electrical control system generally provides not only the 'control', but also 'protection' and 'instrumentation'

❖ **System Control**

➢ Electrical control signals enable and trigger essential electrical functions like voltage build-up, load control and management, normal and emergency de-excitation of the generator or shut down of the plant.

➢ In basic electrical control systems is done manually through push buttons and switches.

❖ **Protection of Human Beings**

❖ Touching life parts is extremely dangerous and often even causes loss of life.

❖ **Basic Protection**

❖ Is ensured by the insulation of all life parts to prevent from a direct contact.

❖ **Direct Protection**

❖ Is ensured by simply placing electrical circuits and installations out of reach and by prevention of direct contact through enclosures, barriers or covers and housing.

❖ The degree of protection is best indicated with reference to the international IP classification.

❖ The IP-code consists of two figures: the first one indicates the degree of protection of persons from contact the second specifies protection against penetration of water.

4.5.1 Renewable energy:

➢ Renewable energy, often referred to as clean energy, comes from natural sources or processes that are constantly replenished.

➢ For example, sunlight or wind keep shining and blowing, even if their availability depends on time and weather.

➢ While renewable energy is often thought of as a new technology, harnessing nature's power has long been used for heating, transportation, lighting, and more.

➢ Wind has powered boats to sail the seas and windmills to grind grain.

4.5.2 Irrigation facalities:

Irrigation helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall.

- Nutrients may also be provided to the crops through irrigation. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells, and even dams. Irrigation

Surface Irrigation

- In this system, no irrigation pump is involved. Here, water is distributed across the land by gravity.

- **Sprinkler Irrigation**

- Water is distributed from a central location by overhead high-pressure sprinklers or from sprinklers from the moving platform.

- **Drip Irrigation**

- In this type, drops of water are delivered near the roots of the plants. This type of irrigation is rarely used as it requires more maintenance.

- **Centre Pivot Irrigation**

- In this, the water is distributed by a sprinkler system moving in a circular pattern.

- **Sub Irrigation**

- Water is distributed through a system of pumping stations gates, ditches and canals by raising the water

- **Modern Methods of Irrigation**

- The modern method compensates the disadvantages of traditional methods and thus helps in the proper way of water usage.

- The modern method involves two systems:
- Sprinkler system
- Drip system
- sprinkler System

Fig 17. Solar streetlight

4.5.3 Electricity facalities with area:

- There is a street LED lights which works on battery. Also there server type made in panchyat recently it is good.
- For a start, electric lighting makes the use of candles, kerosene and other polluting fuels for lighting redundant, not only saving money (and providing more light) but also seriously improving health.
- well being. It can also spur innovation and lead to entrepreneurial micro businesses ventures, and in time lead to greater agricultural yields.

4.6 Existing Institution like - Village Administration- Detail profile:

There is no existing institution like:

- BachatMandali
- DudhMandali
- Mahila Forum
- Plantation for air pollution

Chapter 5: Sustainable Technical Options with case study of existing village:

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

- 3D printing.
- Materials.
- Building information modelling (BIM).
- +Cladding systems.
- Computer aided design and computer aided manufacturing (CAD/CAM).
- Computer numerical control.
- Construction plant.
- Modern methods of construction
- Modular construction
- Smart technology
- Robotics

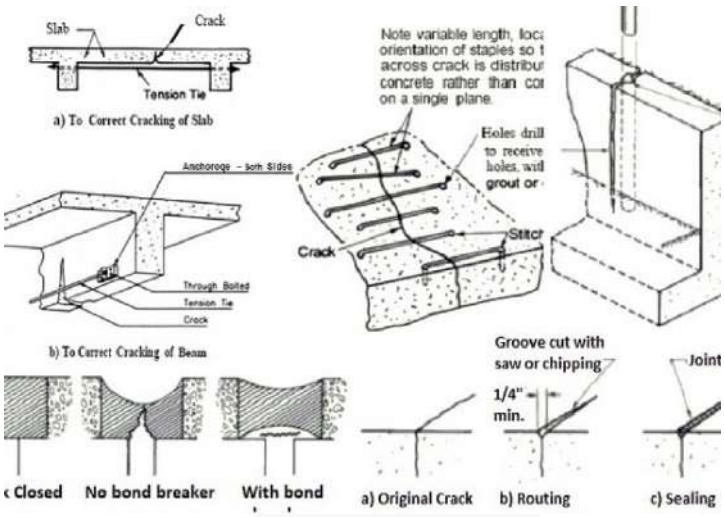


Fig 18 .Soil Liquefication

5.1.2 Soil Liquefication:

Repair of cracks:

The repair of cracks can be achieved with the following techniques:

1) By epoxy-injection grouting
2) By routing and sealing
3) By flexible sealing
4) By stitching
5) By providing additional reinforcement
6) By drilling and plugging
7) By prestressing steel
8) By grouting
9) Dry packing
10) Overlays
11) Auto generous healing
12) Surface coatings

Here we will discuss about most popular repair technique of cracks such as epoxy-injection method and grouting.

1) Crack Repair by Epoxy-injection Method

- Epoxy compounds are having very well compressive, tensile and bond strength.
- They can be used for preparing repair mortars but if used as bonding/binding materials for concrete i.e. epoxy concrete, the cost is prohibitic.
- Cracks as narrow as 0.05 mm can be bonded by the injections of epoxy.

- It is excellent material for repairing cracks because they have very good properties such as resistant against water penetration, resistant to crack formation and their very good adhesive properties.
- This method has been successfully used in the repair of cracks in building, bridges, and other types of concrete structures. The repair process by this method is as follow:

a) Clean the cracks

- The very first step is to clean the cracks that have Contaminants such as oil, grease, dirt or fine particles.
- Because such contaminants prevent epoxy penetration in the cracks to be repaired. For this reason, cleaning is required.

b) Sealing of the surfaces

- Surface cracks should be sealed. It is used to keep the epoxy from leaking out before it has gelled.
- This can be done by applying an epoxy, polyester or other appropriate sealing material to the surface of the crack and allowing it to harden.

c) Install the entry and venting ports

- When the cracks are v-grooved, drill holes are made in the groove of about 20mm diameter below the apex of the v-grooved section.
- Fittings such as pipe nipples are inserted in to the holes. But when the cracks are not v-grooved, an entry port is to be bond a fitting flush with the concrete face over the crack.

d) Mixing of epoxy

- It is done either by batch or continuous methods. In batch mixing, the adhesive components are premixed according to the manufacturer's instructions, usually with the use of mechanical stirrer, like a paint mixing paddle.
- In the continuous method, the two liquid adhesive components pass through metering and driving pumps prior to passing through an automatic mixing head.

5.1.3 Sustainable sanitation:

- 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.
- As India is a very large country,
- different regions are vulnerable to different natural disaster.

Fig 19. Sustainable sanitation

- The Disaster Management Act was passed by the Lok Sabha on 28 November 2005, and by the Rajya Sabha on 12 December 2005.
- It received the assent of the President of India on 9 January 2006. The Act calls for the establishment of a National Disaster Management Authority (NDMA), with the Prime Minister of India as chairperson.
- The NDMA has no more than nine members at a time, including a Vice-Chairperson.
- The tenure of the members of the NDMA is 5 years. The NDMA which was initially established on 30 May 2005 by an executive order, was constituted under Section-3(1) of the Disaster Management Act, on 27 September 2005.
- The NDMA is responsible for "laying down the policies, plans and guidelines for disaster management" and to ensure very timely and effective response to disaster".
- Under section 6 of the Act it is responsible for laying "down guidelines to be followed by the State Authorities in drawing up the country Plans".

❖ Disaster Management Plan:

- On 1 June 2016, Narendra Modi, the Prime Minister of India, launched the Disaster Management Plan of India, which seeks to provide a frame work and direction to government agencies for prevention, mitigation and management disasters.
- This is the first plan nationally since the enactment of the Disaster Management Act of 2005.

❖ About the Authority:

- National Disaster Management Authority (NDMA) is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response.
- NDMA was established through the Disaster Management Act enacted by the Government of India in December 2005. The Prime Minister is the ex-officio chairperson of NDMA.
- The agency is responsible for framing policies, laying down guidelines and best-practices and coordinating with the State Disaster Management Authorities (SDMAs) management.

5.1.4 Transport system:

Waste tyre and plastic use for cement concrete road construction

ABSTRACT

- Rubber has property of absorbing sound, which also help in reducing the sound pollution of heavy traffic roads. **Waste** rubber tyres thus can be put to **use** and it ultimately improves the quality and performance of **road**. Conventional stone aggregate can be saved to a certain quantity.

Calculations

16000 tyres required for the construct 500 m long road Width of road is 8m, height of the waste tyre layer 20m, height of the cement concrete slab (1:2:4) is 15m

Table 11. Measurement sheet

Item	Item description	No	L	B	H	Quantity	Remarks
1	**Box cutting in road crust & consolidating sub grade & camber**	1	500	8	0.35	1400m^3	**H=0.15+0.20** **= 0.35m**
2	**Supplying consolidating soil gravel in waste tyre & stacked a road side at regular intervals** **Labour for spreading & consolidating soil gravel**	1 1	500 500	8 8	0.30 0.30	1200m^3 1200m^3	**200mm compacted When the** **200+ 200/2 = 300 mm**
3	**Cement concrete (1:2:4) with 20 mm aggregate for Road slab including floating The concrete surface after compaction & belting after floating for skid resistance and including Brooming, edging etc**	1	500	8	0.15	600m^3	
4	**Providing necessary joints in Concrete slab and filling the joints with bitumen** **A. Longitudinal joints** **B. For transverse Joints @ 10 Joints**	1 50	500	- 8	-	500rm 400 rm	**Transverse joints** **400/10 = 40** **Total joints** **500+400 = 900rm**

❖ Table 12 Abstract sheet

Item no	Particulars of item	Unit	Quantity	Rate	Amount
1	**Box cutting**	M^ 3	1400	40	**56,000Rs**

2	**Supplying consolidating soil gravel in waste tyre & stacked a road side at regular intervals** **Labour for spreading & Consolidating Soil gravel**	M^3 M^3	1200 1200	150 20	**1,80,000Rs** **24,000Rs**
3	**Cement concrete (1:2:4) with 20 mm aggregate**	M^3	600	456	**2,73,600Rs**
4	**Providing necessary joint to concrete slab and filling with bitumen**	rm	900	10	**9000Rs** **Total= 5,42,600Rs +5% constitegies and work charged 27,130Rs** **Grand total= 5,69,730Rs**

Prototype and model

Fig 20 Mixture of platic and fine aggregate

Fig 21 Melted plastic

5.1.5 Vertical farming:

Fig 22. Vertical Farming

- Environmental factor or ecological factor or eco factor is any factor, abiotic or biotic, that influences living organisms.
- Abiotic factors include ambient temperature, amount of sunlight, and pH of the water soil in which an organism lives.
- Biotic factors would include the availability of food organisms and the presence of conspecifics, competitors, predators, and parasites.

Physical Environmental Factors

- The factors in the physical environment that are important to health include harmful substances, such as air pollution or proximity to toxic sites (the focus of classic environmental epidemiology); access to various health-related resources (e.g., healthy or unhealthy foods, recreational resources, medical care); and community design and the "built environment" (e.g., land use mix, street connectivity, transportation systems.

Social Environmental Factors

- Factors in the social environment that are important to health include those related to safety, violence, and social disorder in general, and more specific factors related to the type, quality, and stability of social connections, including social participation, social cohesion, social capital, and the collective efficacy of the neighborhood (or work) environment.
- Social participation and integration in the immediate social environment (e.g., school, work, neighborhood) appear to be important to both mental and physical health.

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

- The durability of concrete structures is affected by a number of factors such as environmental exposure, electrochemical reactions, mechanical loading, impact damage and others.
- Corrosion management is becoming increasingly necessary as a result of the growing number of ageing infrastructure assets (e.g. bridges, tunnels etc.) and the increased requirement for unplanned maintenance in order to keep these structures operational throughout their design life (and commonly, beyond). The main RC repair, refurbishment and rehabilitation approaches generally employed can be broadly categorized under a) conventional, b) surface treatments, c) electrochemical treatments and d) design solutions.

- The overarching aim of this research was to identify the key corrosion management techniques and undertake empirical investigations focused on full-scale RC structures to investigate their long-term performance.

5.1.7 Sewage treatement plant:

1. Preventing or reducing waste generation:

- Extensive use of new or unnecessary products is the root cause of unchecked waste formation.
- The rapid population growth makes it imperative to use secondhand products or judiciously use the existing ones because if not, there is a potential risk of people succumbing to the ill effects of toxic wastes.

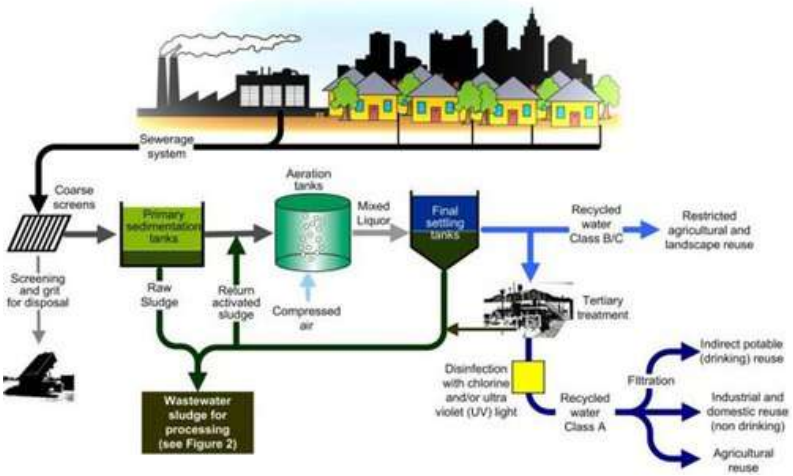


Fig 23 Sewage treatment plant

- Disposing of the wastes will also assume formidable shape. A conscious decision should be made at the personal and professional level to judiciously curb the menacing growth of wastes.

2. Recycling:

- Recycling serves to transform the wastes into products of their own genre through industrial processing.
- Paper, glass, aluminum, and plastics are commonly recycled.
- It is environmentally friendly to reuse the wastes instead of adding them to nature. However, processing technologies are pretty expensive.

3. Incineration:

- Incineration features combustion of wastes to transform them into base components, with the generated heat being trapped for deriving energy.
- Assorted gases inert ash are common by-products. Pollution is caused by varied degrees dependent on nature of waste combusted and incinerator design.
- Use of filters can check pollution.
- It is rather inexpensive to burn wastes and the waste volume is reduced by about 90%.
- The nutrient rich ash derived out of burning organic wastes can facilitate hydroponic solutions.
- Hazardous and toxic wastes can be easily be rid of by using this method.
- The energy extracted can be used for cooking, heating, and supplying power to turbines.
- However, strict vigilance and due diligence should be exercised to check the accidental leakage of micro level contaminants, such as dioxins from incinerator .

1. Composting:

- It involves decomposition of organic wastes by microbes by allowing the waste to stay accumulated in a pit for a long period of time.
- The nutrient rich compost can be used as plant manure.
- However, the process is slow and consumes a significant amount of land.
- Biological reprocessing tremendously improves the fertility of the soil.

2. Sanitary Landfill:

- This involves the dumping of wastes into a landfill.
- The base is prepared of a protective lining, which serves as a barrier between wastes and ground water, and prevents the separation of toxic chemicals into the water zone.
- Waste layers are subjected to compaction and subsequently coated with an earth layer.
- Soil that is non-porous is preferred to mitigate the vulnerability of accidental leakage of toxic chemicals.
- Landfills should be created in places with low groundwater level and far from sources of flooding.
- However, a sufficient number of skilled manpower is required to maintain sanitary landfills.

3. Disposal in ocean/sea:

- Wastes generally of radioactive nature are dumped in the oceans far from active human habitats.
- However, environmentalists are challenging this method, as such an action is believed to spell doom for aquatic life by depriving the ocean waters of its inherent nutrients.
- Effective waste disposal calls for concerted efforts from all, no matter how anxious or worried they may be about our environment.

5.2 Concept (Electrical):

EXISTING CONDITION

- As we know that the load graph is not constant it vary with different time period during the day. Due to which efficient of load decrease and price per unit increase, Hence by using this technique we can reduce per unit cost electricity and losses are also reduce.

ADVANTAGE TO VILLAGE

Load vary from day to day and season to season in village because of irrigation facilities and other industrial as well as residential use so by using this method it will save electricity and save cost of light also.

5.2.1 Programmable Load Shedding:

- INTRODUCTION It is an elementary case of „power economics", electric load demand versus generation supply. As we know , when a power system is stable at normal frequency the total mechanical power input from the prime movers to the generators is equal to the sum of all running load and all real power losses in the power system. The

frequency conditions of the overall power system will directly depend on the amount of active power that the generator could deliver to the system.

- Also, the prime mover"s stored energy plays an important role on the system behavior. This stored energy varies drastically from thermal, to hydro units. For gradual increases in electric load, or sudden but mild overloads, unit governors will sense speed change and therefore increase power input to the generator.
- Detaching of power is done to minimize the consumer load provided through several substations, Which are connected to the main power station. And the main station instructs the sub-stations to cut some of the feeders for a certain period of time & thus the shedding procedure continues.

METHODOLOGY

- Electric power is generated at 11kV, 50Hz in a power generating station. For transmitting over long distances, it is stepped-up to 400kV, 220 kV as it is necessary to reduce power losses while transmitting power. Power is carried through a high voltage lines of transmission network. Usually, these voltage lines run into hundreds of kilometers and it deliver to grid.

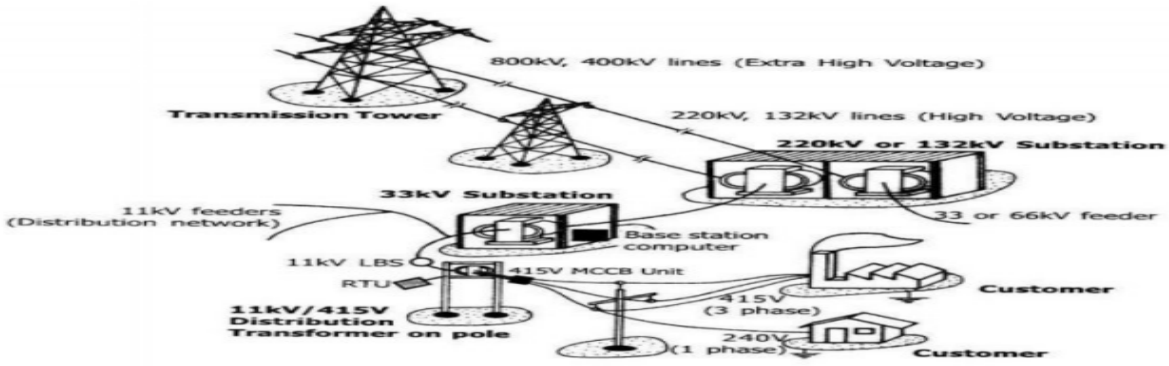


Fig 24. Methodology

2.2 BLOCK DIAGRAM

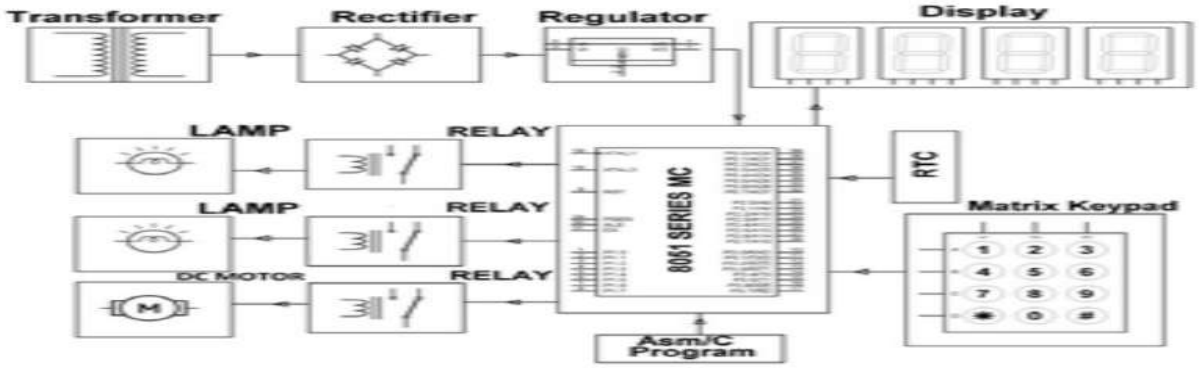


Fig 12 Block Diagram

2.3 COMPONENTS USED

A. AT89S52 Microcontroller The AT89S52 is an 8 bit low-power, high performance microcontroller with 8K bytes of programmable flash memory.

The on-chip flash permits the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a adaptable 8-bit CPU with in-system programmable flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller because of its high flexibility and cost-effective solutions to many embedded control applications. Relay Driver ULN2003 Relay Driver ULN2003 is a high voltage, high current Darlington transistor array comprising seven open collector Darlington pairs with common emitters.

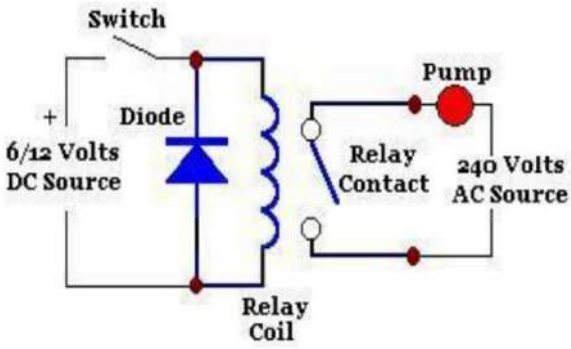


Fig 25. Circuit Diagram

Cost Estimation

Sr No	Components	Quantity	Price
1	ESP32	1	825
2	Bulb	1	30
3	PCB Board	1	40
4	Arduino UNO	1	550
5	OLED Display	1	675
6	Connecting Wires	1 Pack	525
	Total Cost	_	2644

CONCLUSION

So according to our observations real time clocks (RTC) work more accurate than other time-keeping alternatives, it allow the main system to perform important tasks, and they do not consume much power. Functionality of Electronic devices can even increase by using real-time clocks (RTC). Certain electronic devices can rely on realtime clocks when comparing the times of previous functions. If the functions have taken place within a selected period of time, device functions can be reduced drastically. Hence real time clocks interfaced with AT89S52 microcontrollers could be used extensively in load shedding time management system by utility departments.

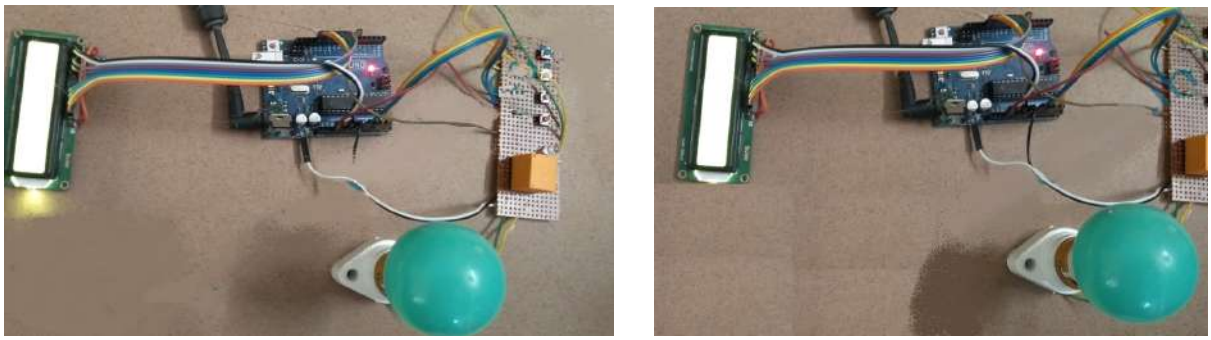


Fig 26. Working Prototype / Model

5.2.2 Railway Security System using IoT:

CURRENT SITUATION: Now a days this type of technology is very used in foreign country but we are not using such technology for securities of railway system.
This system will reduce man power and human error and it is also note very expensive.

- The objective of this project is to create a Security System for the goods that are carried in open top freight trains.
- The most efficient way to secure anything from thieves is to have a continuous observation. So for continuous observation of the open top freight train, Camera module2 has been used.
- Passive Infrared Sensor (PIR) 1 has been used to detect the motion or to sense movement of people, animals, or any object.
- So whenever a motion is detected by the PIR sensor, the Camera takes a picture of that particular instance.
- That picture will be send to the Raspberry PI which does Skin Detection Algorithm and specifies whether that motion was created by a human or not.
- If a human makes it, then that picture will send to the drop box. Any Official can have a look at the same.
- The existing system has a CCTV installed at various critical locations like bridges, railway stations etc. but they does not provide a continuous observation.
- This paper describes about the Security System that provides continuous observation for open top freight trains so that goods can be carried safely to its destination.

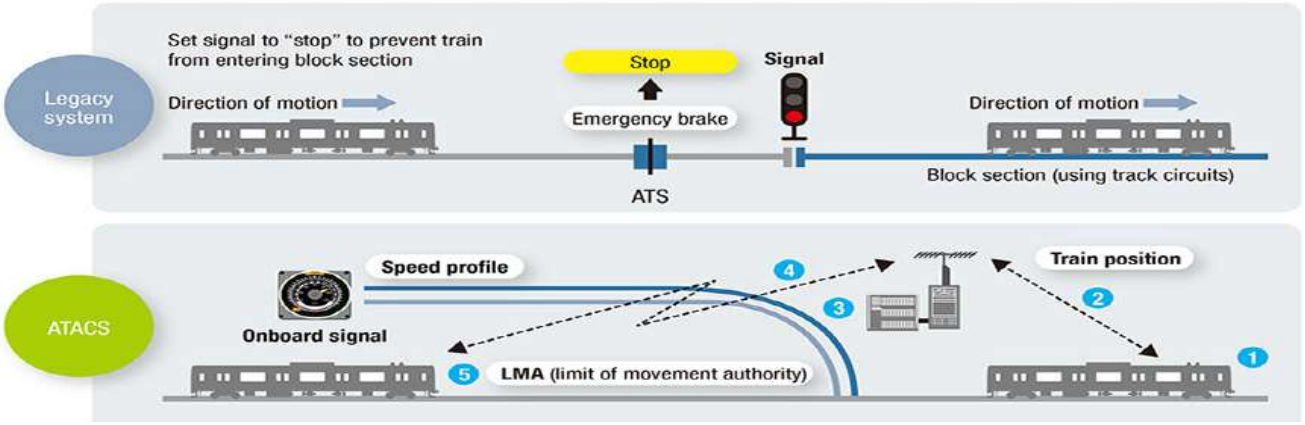


Fig 27. Schemetic Diagram of Railway Security System using IoT

5.2.3 Management through Energy Harvesting Concept:

- The objective of the Power Management through Energy Harvesting Concept project work has been designed and implemented in the power management through energy harvesting concept which deals with the power saving and optimization.
- The overall control is based on sensors of light and temperature. After installing the components the process becomes automatic.

- If a load at a particular zone is increased then the control will trip. To overcome these drawbacks we have designed and implemented the circuit.
- Passive Infrared Sensor (PIR) 1 has been used to detect the motion or to sense movement of people, animals, or any object.
- So whenever a motion is detected by the PIR sensor, the Camera takes a picture of that particular instance.
- That picture will be send to the Raspberry PI which does Skin Detection Algorithm and specifies whether that motion was created by a human or not.
- If a human makes it, then that picture will send to the drop box. Any Official can have a look at the same.
- The existing system has a CCTV installed at various critical locations like bridges, railway stations etc. but they does not provide a continuous observation.

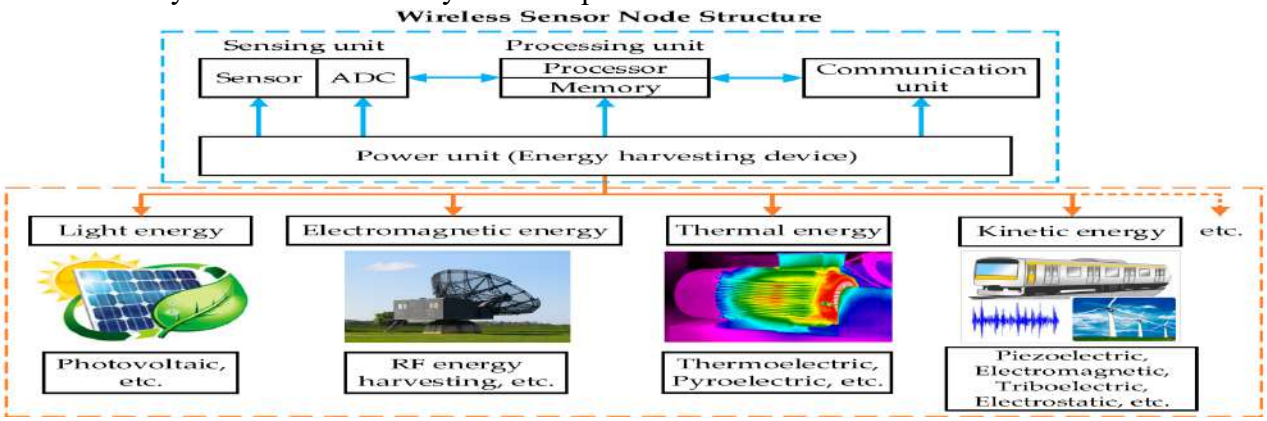


Fig 27. Management through Energy Harvesting

5.2.4 Moisture Monitoring System:

CURRENT SITUATION : Normally the water to plant or farm is given by checking its upper surface wetness but this method is not good for plant and lots of water is also wasted by this method.

So by using this technique water is given to plat according to their requirement, this will also save water.

- Planting a tree in an environment where the seed or the plant would not get water adequately through natural sources like rain or ground water in its initial phases has been always a matter of concern for tree planters.
- This is where an autonomous moisture monitor for plants system can help.
- The system timely monitors

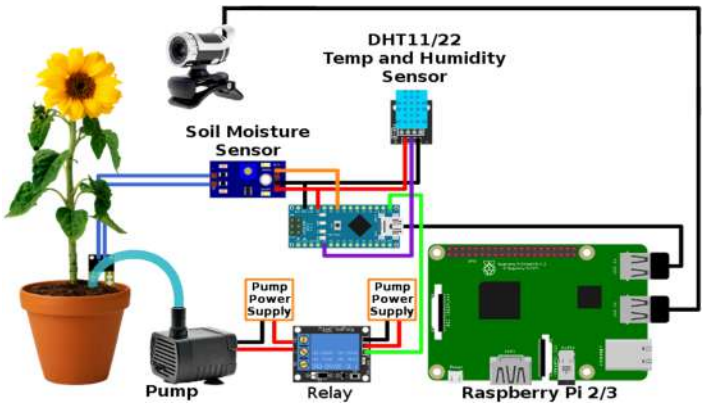


Fig 29.Moisture Monitoring system model

- If at the time of monitoring it comes to know that the moisture level of the soil is lower than recommended then it will raise an audio visual alert.
- This alert is then received by the care taker of the plant.
- When the care taker waters the plant the circuit alarm goes off and the monitoring cycle continues.
- In this system we use a timer IC to time the monitoring process. A moisture level sensor is used to detect the moisture level of the soil.
- An LED is used to give visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant.

5.2.5 Home Automation using IoT / Any other methodology:

CURRENT SITUATION : This technology is used in cities but not used in village. This technology is not only useful for cities but also for villagers.

- The data is then used for monitoring, controlling and transferring information to other devices via the internet.
- This allows specific actions to be automatically activated whenever certain situations arise.
- Such systems depend on the collection of data.
- The data is then used for monitoring, controlling and transferring information to other devices via the internet.
- This allows specific actions to be automatically activated whenever certain situations arise.
- In a simple example, consider a smart kettle.
- The kettle can be programmed to automatically turn off once it reaches a specific temperature.
- It might also send a notification to the user on the same.
- Now apply the same concept to the entire home and all the devices present.
- That is a smart home powered by IoT.
- Instead of manually going up to the device and taking action, those actions can be taken at the press of a button.
- These days, most smart IoT home automation devices allow you to control them via an app or even via voice commands.
- Now imagine if you did not even need to undertake such actions. In other words, the smart home will know when to take certain actions and automatically take them.
- This is where the future of home automation and IoT lies.

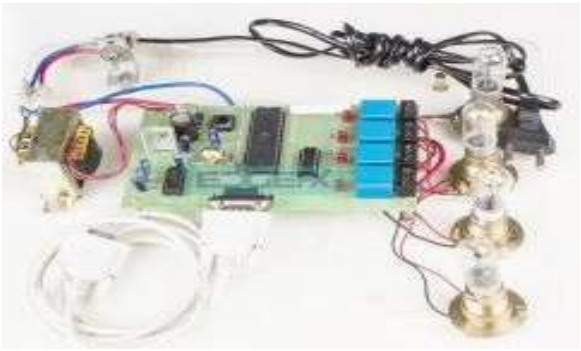
5.2.6 PC Based Electrical Load Control:

- Automation system is mostly depending upon the power systems in industrial, residential or commercial, which needs remote controlling and monitoring.

- By employing wireless technologies, it is more competent to execute a suitable technology depending upon the requirements of the proposed system like speed, cost, and distance.
- These days, most smart IoT home automation devices allow you to control them via an app or even via voice commands.
- Now imagine if you did not even need to undertake such actions. In other words, the smart home will know when to take certain actions and automatically take them.
- This is where the future of home automation and IoT lies.
- For distant controlling and monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based graphical user interface application.
- They give number of features like rapid data storage, transfer data and data securities.
- It might also send a notification to the user on the same.
- Now apply the same concept to the entire home and all the devices present.
- That is a smart home powered by IoT.
- Instead of manually going up to the device and taking action, those actions can be taken at the press of a button.
- These days, most smart IoT home automation devices allow you to control them via an app or even via voice commands.
- Now imagine if you did not even need to undertake such actions. In other words, the smart home will know when to take certain actions and automatically take them.
- This is where the future of home automation and IoT lies.

Project working:

- The main goal of this project is to control the electrical load through a PC (personal computer)..
- At present, they are physically controlled which makes it complex to organize the lighting with the particular scene.
- By employing this system, one can manage the electrical load ON/OFF by just being seated at one place using a PC.
- This system is incorporated with the electrical loads and also associated to the PC where centralized control takes place.
- It uses an MAX 232 protocol from the microcontroller to communicate with the PC.



- To switch the appliances, we employ Hyper Terminal on personal computer.
- Once the connection is established with the PC, then the system begins working.
- The 8051 family microcontroller is used in this project.
- The data is then used for monitoring, controlling and transferring information to other devices via the internet.
- This allows specific actions to be automatically activated whenever certain situations arise.

- Such systems depend on the collection of data.
- An LED is used to give visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant.

5.2.7 Electrical Parameters Measurements:

- Measurement of electrical quantities may be done to measure electrical parameters of a system.
- Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded.
- It is crucial to acquire these parameters in all environmental conditions to constantly identify the power drained from the contact line.
- An innovative sensor technology enables the operators to accurately measure the voltage and current used by rolling stock.
- All measurement devices implement digital technology and may be installed on the front panel of the switchboard (DIN format). The power meters are also capable of transmitting measurement data to a supervisor.
- By employing this system, one can manage the electrical load ON/OFF by just being seated at one place using a PC.
- This system is incorporated with the electrical loads and also associated to the PC where centralized control takes place.
- It uses an MAX 232 protocol from the microcontroller to communicate with the PC.
- To switch the appliances, we employ Hyper Terminal on personal computer.
- Once the connection is established with the PC, then the system begins working.
- The 8051 family microcontroller is used in this project.

Parameter	Measuring Unit	Relationship
Voltage	volt (V or E)	$E = I \times R$
Current	amp (I)	$I = \frac{E}{R}$
Resistance	ohm (R or Ω)	$R = \frac{E}{I}$
Conductance	mho (G or ℧)	$G = \frac{I}{R} = \frac{I}{E}$
Power	watt (W)	$P = I \times E$ or $P = I^2R$
Inductance	henry (L or H)	$V_L = -L\left(\frac{\Delta I}{\Delta t}\right)$
Capacitance	farad (C)	$C = \frac{Q}{E}$ (Q = charge)

Chapter 6:Swachh Bharat Abhiyan (Clean India)

Swachh Bharat Abhiyaan:

- Swachh Bharat Mission is a mass movement for cleanliness launched on 2nd October 2014 by the Prime Minister of India.
- The Swachhta Abhiyan has turned into a
- becoming active participants in cleanliness activities across the nation.
- The dream of a 'Clean India' once seen by Mahatma Gandhi is being realized with millions of people across the country joining the cleanliness initiatives of the government departments, NGOs and local community centres to make India clean as a part of this "**Jan Andolan".**

Fig 30. Low cost Toilet

6.1 Swatchhta needed in your village:

Low cost toilet in village:

- Low on cost and high on water efficiency, a smart toilet solution for rural India is what the National Environmental Engineering Research Institute (NEERI) has developed.
- This toilet system hopes to encourage rural India to invest in toilet and simplify maintenance.
- Given that cost of building a toilet and the need for sufficient water to maintain it are cited as common deterrents for building toilets.
- A traditional flush urinal uses 4 liters of water in a single flush. Unavailability of a flushing system also often results I more water required than usual to wash down the waste.
- Other problems in many rural toilets are manually operated urinals which are too high or improperly mounted and prone to getting dirty.
- Maintenance of toilets and urinals is also expensive, resulting in low interest in building these, especially in rural areas.
- The spring mechanism with which the flush system is fitted, allows the inlet to be opened filling the in-built water reservoir, which in turn releases the water into the urinal.
- Flusher thus works without electricity and is dependent on its in-built mechanisms.

Fig 30. Village Waste Disposal System

BAREJADI village system of waste disposal:

- In this photo, we can see this people are throwing garbage on the open ground because there is no waste disposal system in the village.
- And we have suggested a compost pit for all village to dump the waste so no pollution is occurred in that area and people don't get ill.
- Fertilizer that will be generated by compost pit will useful to the people of the village.
- In our village there are public toilet, individual toilet and community toilet.

But the maintenance of community toilet and public toilet is done in a proper way there is an issue regarding the cleanliness of the public and community toilet.

6.2 Guideline for the process of implementation of SBA:

Mission Objectives

- Elimination of open defecation
- Eradication of Manual Scavenging
- Modern and Scientific Municipal Solid Waste Management
- To effect behavioral change regarding healthy sanitation practices
- Generate awareness about sanitation and its linkage with public health Capacity Augmentation for ULBs to create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance) Mission Strategy.
- The estimated cost of implementation of SBM (Urban) based on unit and per capita costs for its various components is Rs. 62,009 Crore.
- Innovative revenue streams
- Swachh Bharat Kosh
- Corporate Social Responsibility
- Market Borrowing

❖ 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 Activites done by studentsfor village to clean:

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

Chapter 7 Village condition due to COVID-19:

Village is not much affected due to spreading of virus as in cities, but it may become as it is difficult to maintene social distancing in village and other medical facilities are not available in village,but most of people of village who work in cities are financially affected as their were fired from job.
Farmers are also not able to sell their vegetable in cities so they dont get satisfactory price by selling it .
So the financially they are suffering a lot as compare to corona virus.

7.1 Taken steps in allocated village related to existing situation:

Gram Yoddhas stand guard against corona:

- Ahmedabad: On the outskirts of BAREJADI village in Daskroi taluka, a group of youths stop a bike on Thursday morning.
- The man identifies himself as a health worker and shows his identity card after which his details are noted in a register and he is allowed to go.
- But first, his temperature is recorded with a thermal gun which was procured by the panchayat a fortnight ago.
- Harpalsinh Vaghela, talati-cum-mantri of the village, says that ever since the lockdown was announced, the village has been implementing it stringently.

“A group of village youths are stationed right at the entrance of the village with the temperature gun and a register.

7.2 Activities done by student in allocated village with clear photograph:


Fig 31. Sanitizer and mask Distribution

We have distributed mask and sanitizer to local villagers and also give them some important information regarding covid and tell them about the diet that they should follow daily to boost their immunity.

7.3Any other steps taken by villagers:

All people in village start drinking boiled water to increase immunity. We also suggest them to buy foot hand sanitizing machine for hospital , dairy and panchayat office . Most of people in village wear mask provided by the government.

Chapter-8: Sustainable Design Planning Proposal (Prototype Design):

8.1.1Sustainable design (Civil) Hospital plan

Objectives:

- Assure quality nursing care according to ANA/NLN Nursing Standards for Geriatric and Home Health Nursing.
- Offer home care as a reasonable alternative to acutely, chronically or terminally ill clients. Provide and promote continuity of care for clients at home, to and from the hospital, nursing home, or extended care facility.
- Promote the highest level of rehabilitation and independence through restorative nursing care using a team approach and collaborating with therapy disciplines as appropriate.
- Offer care and support for terminally ill clients and families, including but not limited to physical, psychosocial and spiritual care, as they desire.
- Provide quality care by teaching and monitoring client's response.
- Provide high quality health care services in a cost-effective manner.

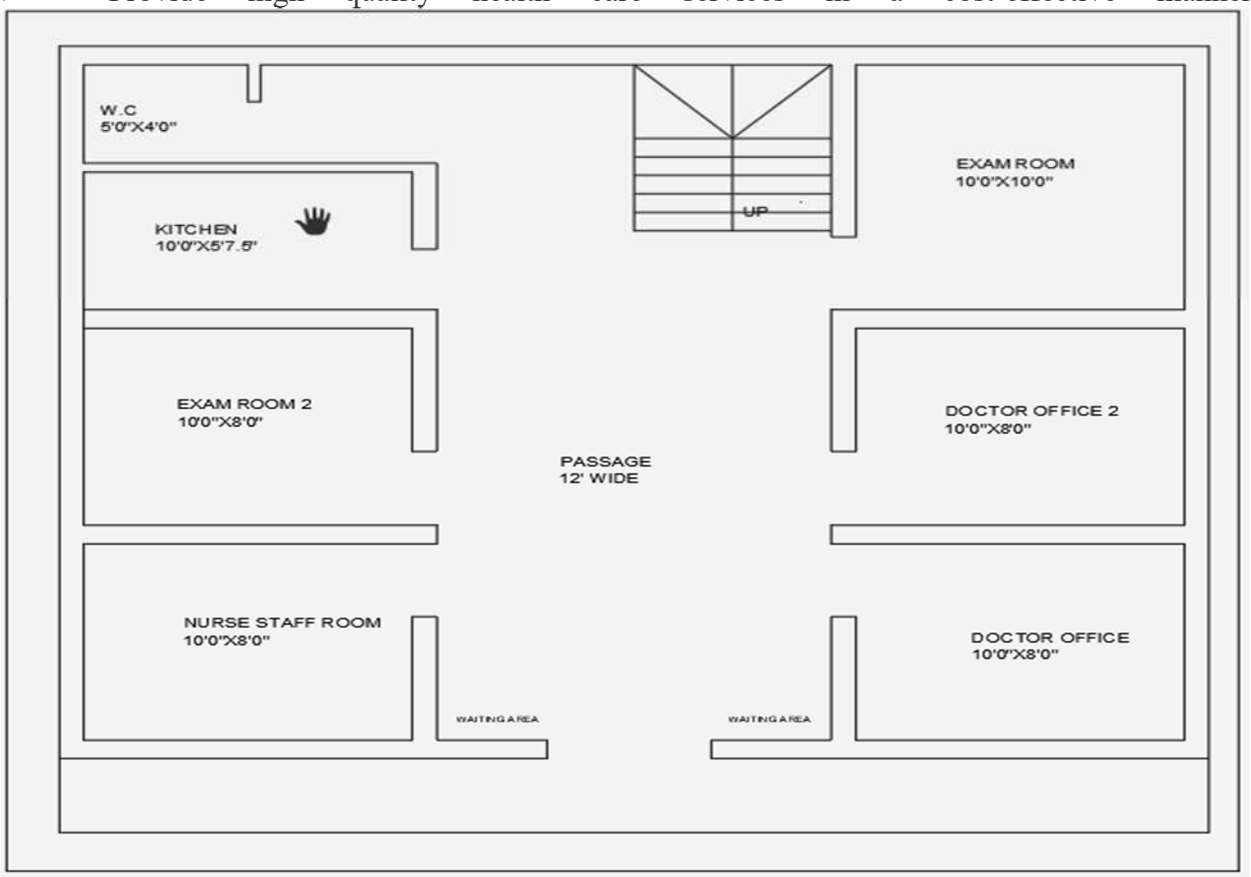


Fig 32. Floor plan-1

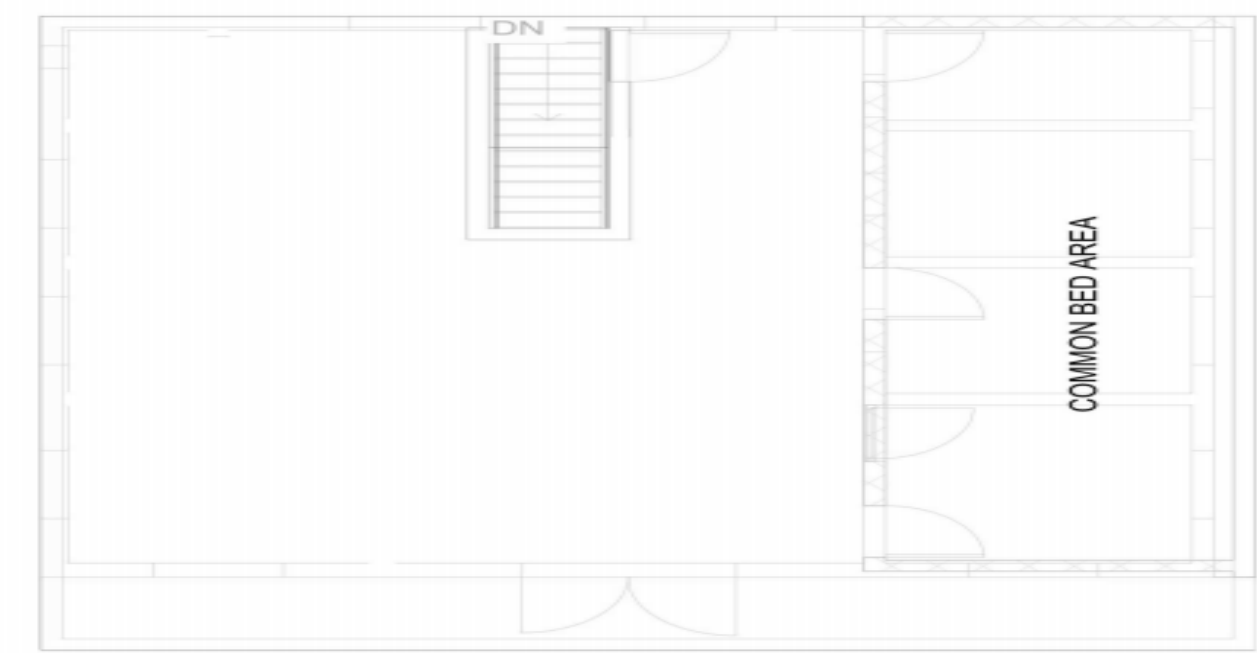


Fig 33. Floor plan-2

Table 13. FLOOR PLAN-1 MEASURMENT SHEET

Item no.	Item description	No	Length	Breadth	Height	Quantity
1	Earthwork in excavation for foundation					
	Long walls:- L=11+0.2+2×0.45 = 12.3m H=0.3+0.3+0.3+0.2 =1.1m	2	12.3	0.9	1.1	24.35m
	Short walls:- Short wall 1 L=10+0.2 – 2×0.45 =9.5m	4	9.5	0.9	1.1	37.62m
	Short wall 2 L=3+0.2 – 2×0.45 =2.3m	6	2.3	0.9	1.1	4.55m
	Short wall 3 L=2+0.2 – 2 ×0.45 =1.3m	2	1.3	0.9	1.1	2.57
	Short wall 4 L=1.6 +0.2 –2 ×0.45 =0.9m	1	0.9	0.9	1.1	0.89.m Total=69.98

2	Pcc (1:4:8) for foundation:- Long wall 1 Short wall 1 Short wall 2 Short wall 3 Short wall 4	 2 4 6 2 1	 12.3 9.5 2.3 1.3 0.9	 0.9 0.9 0.9 0.9 0.9	 0.2 0.2 0.2 0.2 0.2	 2.21 6.84 2.48 0.468 0.162 Total=12.16
3	Brick masonry up to Plinth level :- (1)Long walls : First step L=12.3 –2×0.2 =11.9m Second step L=11.9 –2×0.05 =11.8m Third step:- L=11.8 – 2×0.05 =11.7m (2) Short walls Short wall 1 First step L=9.5 – 2×0.2 =9.1 Second step L=9.1 – 2×0.05 =9m Third step L=9 – 2 ×0.05 =8.9m Short wall 2 First step L=2.3-2x0.2 =1.9 Second step L=1.9-2x0.05 =1.8 Third step L=1.8-2x0.05 =1.7 Short wall 3 First step L=1.3-2x0.2 =0.9	 2 2 2 4 4 4 6 6 6 2	 11.9 11.8 11.7 9.1 9 8.9 1.9 1.8 1.7 0.9	 0.5 0.4 0.3 0.5 0.4 0.3 0.5 0.4 0.3 0.5	 0.3 0.3 0.85 0.3 0.3 0.85 0.3 0.3 0.85 0.3	 3.57m 2.83m 5.96m 5.46m 4.32m 9.078m 1.71m 1.29m 2.60m 0.27m

	Second step L=0.9-2x0.05 =0.8 Third step L=0.8-2x0.05 =0.7 Short wall 4 First step L=0.9-2x0.2 =0.5 Second Step L=0.5-2x0.05 =0.4 Third step L=0.4-2x0.05 =0.3	2 2 1 1 1	0.8 0.7 0.5 0.4 0.3	0.4 0.3 0.5 0.4 0.3	0.3 0.85 0.3 0.3 0.85	0.19m 0.357m 0.075m 0.048m 0.076m Total=37.80
4	Earth filling Room1 (3×3) Room 2(3×2.3) Room 3(3×2.3) Room 4(3×2) Room 5(3×2.3) Room 6(3×2.3) Room 7(3×3) Room 8(1.6×2) Room 9(4.6×9)	 1 1 1 1 1 1 1 1 1	 3 3 3 3 3 3 3 1.6 4.6	 3 2.3 2.3 2 2.3 2.3 3 2 9	 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6	 5.14 4.14 4.14 3.6 4.14 4.14 5.4 1.92 24.84 Total =57.72
5	No. Of tiles Nos =(area of room /size of tiles Room 1 : = 9/0.25×0.25 Room 2: = 6.9/0.25×0.25 Room 3: = 6.9/0.25×0.25 Room 4: = 6/0.25×0.25 Room 5: = 6.9/0.25×0.25					 144 110 110 96 110

	Room 6: = 6.9/0.25×0.25 Room 7: =9/0.25×0.25 Room 8: = 3.2/0.25×0.25 Room 9: = 41.4/0.25×0.2					 110 144 51 662
6	Brick masonry in super structure:- Long wall L= 11.7– 2× 0.05 =11.6 Short wall Short wall 1 L= 8.9 – 2×0.05 = 8.8 Short wall 2 L= 1.7 –2×0.05 = 1.6 Short wall 3 L= 0.7 – 2×0.05 =0.8 Short wall 4 L= 0.3 –2×0.05 =0.2	 2 4 6 2 1	 11.6 8.8 1.6 0.8 0.2	 0.2 0.2 0.2 0.2 0.2	 3 3 3 3 3	 13.92 21.12 5.76 0.96 0.12 Total=41.88
7	Deduction for door and window D1 D2 D3 D4 D5 D6 D7 D8 D9 W Net quantity	 1 1 1 1 1 1 1 1 1 12	 1.10 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 1.8	 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 1.8	 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10 1.4	 0.693 0.567 0.567 0.567 0.567 0.567 0.567 0.567 0.567 9.072 (– 14.30)

	=41.88–14.30 =27.58					
8	Plastering Horizontal Wall Vertical Wall	 2 2	 11 10		 3 3	 66 60

Table 14. Abstract sheet

Item no.	Particular of item	Quantity	Per	Rate	Amount
1	Excavation in foundation	69.98	m^3	88	6,158 Rs
2	Earth filling in foundation	57.72	M	952	54950
3	Brick work in 1:6 superstructure	27.58		3532	97412
4	Pcc in foundation	15.61		3024	47204
5	Brick masonry work in foundation	37.80		3164	119599
6	Plastering Horizontal Wall Vertical Wall	 66 60		 134 134	 8,844 Rs 8,040 Rs
					Total = 3,42,207Rs +3% Contingencies charges 10,266Rs +2% work charge 6,844 Rs Grand total = 3,59,317 Rs

Table 15. Floor plan 2 estimation

Item no.	Item description	No	Length	Breadth	Height	Quantity
1	Earthwork in foundation Long wall L = 11+0.2 + 2×0.45 = 12.1m Short walls :- Short wall 1 L = 10 +0.2 –2× 0.45 = 9.3m Short wall 2 L = 3+0.2 –2× 0.45 =2.3m Short wall 3 L = 5 + 0.2 – 2×0.45 = 4.3m H= 0.3+0.3+0.3+0.2 = 1.1m	2 3 3 2	12.1 9.3 2.3 4.3	0.9 0.9 0.9 0.9	1.1 1.1 1.1 1.1	23.95 27.61 6.83 8.5 Total= 75.39m
2	P. C. C (1:4:8) for foundation Long wall:- Short walls:- Short wall 1 Short wall 2 Short wall 3	2 3 3 2	12.1 9.3 2.3 4.3	0.9 0.9 0.9 0.9	0.2 0.2 0.2 0.2	4.35 5.02 1.24 1.54 Total= 12.15m^3
3	Brick masonary up to plinth level Long wall First step L= 12.1 –2×0.2 = 11.7m Second step L= 11.7 – 2× 0.05 = 11.6m Third step L= 11.6 – 2×0.05 = 11.5m Short walls:- Short wall 1 First step L= 9.3 – 2× 0.2 = 8.9m Second step	 2 2 2 3	 11.7 11.6 11.5 8.9	 0.5 0.4 0.3 0.5	 0.3 0.3 0.85 0.3	 3.51 2.78 5.86 4

	L= 8.9 –2× 0.05 = 8.8m Third step L = 8.8 – 2 × 0.05 = 8.7m Short wall 2 First step L= 2.3 –2×0.2 = 1.9m Second step L= 1.9 – 2×0.05 = 1.8m Third step L = 1.8 – 2×0.05 =1.7m Short wall 3 First step L= 4.3 – 2×0.2 = 3.9m Second step L= 3.9 – 2 × 0.05 = 3.8 Third step L = 3.8 – 2 × 0.05 = 3.7m	3 3 3 3 3 2 2 2	8.8 8.7 1.9 1.8 1.7 3.9 3.8 3.7	0.4 0.3 0.5 0.4 0.3 0.5 0.4 0.3	0.3 0.85 0.3 0.3 0.85 0.3 0.3 0.85	3.16 6.65 0.85 0.64 1.3 1.17 0.91 1.88 Total= 32.71m^3
4	Earth filling Room 1 (3×2) Room2(3×2.3) Room 3 (3 × 2.3) Room 4 (3 × 3)	 1 1 1 1	 3 3 3 3	 2 2.3 2.3 3	 0.6 0.6 0.6 0.6	 3.6 4.14 4.14 5.4 Total= 17.28m^3
5	Brick masonary in super structure Long wall L= 11.5 – 2× 0.05 = 11.4m Short walls Short wall 1 L= 8.7 – 2 × 0.05 =8.6m	 2 3	 11.4 8.6	 0.2 0.2	 3 3	 13.68 15.48

	Short wall 2 L= 1.7 – 2 × 0.05 =1.6m Short wall 3 L = 3.7 – 2 × 0.05 = 3.6m	3 2	1.6 3.6	0.2 0.2	3 3	0.288 4.32 Total= 33.76m^3
6	Deduction for door and Windows D Net quantity = 33.76 –2.83 =30.93m	5	0.9	0.3	2.10	2.835
7	Plastering Horizontal walls Vertical walls	 2 3	 11 10		 3 3	 66 60

Table 16. Abstract sheet

Item no.	Particulars of items	Quantity	Per	Rate	Amount
1	Excavation in foundation	75.39	M^3	88	6634Rs
2	Earth filling in foundation	17.28	M^3	952	16450 Rs
3	Brick work in 1:6 super structure	30.93	M^3	3532	109244 Rs
4	P. C. C in foundation	12.15	M^3	3024	36741 Rs
5	Brick masonary work in foundation	32.71	M^3	3164	103494 Rs
6	Plastering Horizontal walls Vertical walls	 66 60	 M^2 M^2	 134 134	 8844 Rs 8040 Rs Total=2, 66,363 Rs + 3%constitengies 7,990Rs + 2% work charged 5,327 Rs

					Grand total= 2,79,680Rs

Total construction cost = floor plan 1 + floor plan 2
= 3,59,317 + 2,79,680
=6,38,997 Rs

8.1.2 Physical Design (Civil) POST OFFICE

Objectives:

- To sustain its position as the largest postal network in the world touching the lives of every citizen in the country.
- To provide mail parcel, money transfer, banking, insurance and retail services with speed and reliability.
- To provide services to the customers on value-for-money basis.

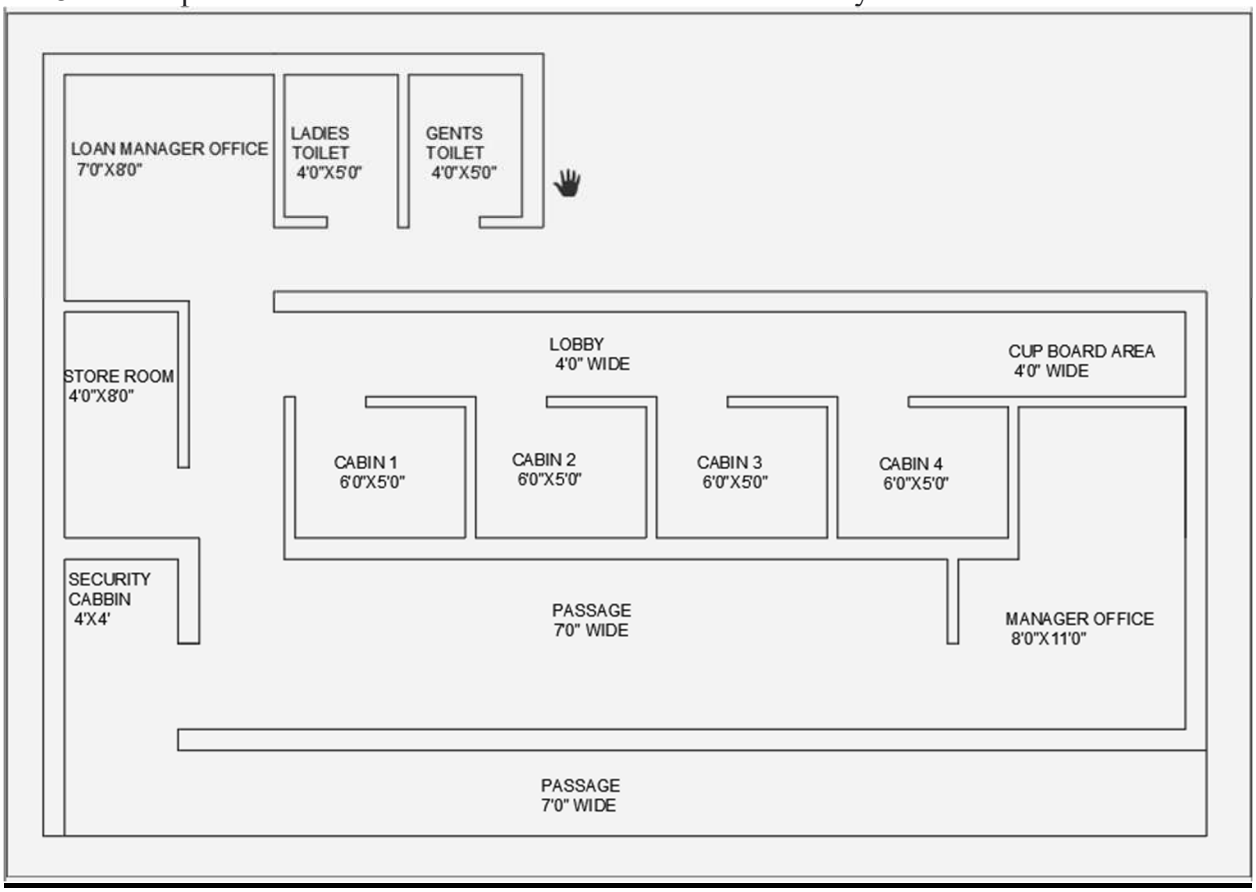


Fig 34. POST OFFICE ELEVATION

Table 17 Post office measurement

Item no	Item description	No	Length	Breadth	Height	Quantity
1	Excavation in foundation					

	Long wall :- L= 12.5 + 0.2 + 0.2+2× 0.45 = 12m Short walls Short wall 1:- L= 5.5+ 0.2 – 2 × 0.45 = 6.3m Short wall 2:- L=1.5+0.2 –2×0.45 =0.8m Short wall 3 :- L= 1.8 +0.2 –2× 0.45 = 1.1m H=0.3+0.3+0.3+0.2=1.1m	3 3 2 2	12 6.3 0.8 1.1	0.9 0.9 0.9 0.9	1.1 1.1 1.1 1.1	35.64 18.71 1.58 2.17 Total =58.1m^3
2	P. C. C (1:4:8) for foundation Long wall :- Short walls:- Short wall 1 Short wall 2 Short wall 3	 3 3 3 3	 12 6.3 0.8 1.1	 0.9 0.9 0.9 0.9	 0.2 0.2 0.2 0.2	 6.48 3.40 0.43 0.594 Total=10.90m
3	Brick masonary up to plinth level :- Long wall First step L= 12 –2 × 0.2 = 11.6m Second step L= 11.6 –2 × 0.05 = 11.5m Third step L= 11.5 – 2 × 0.05 = 11.4m Short walls: Short wall 1 First step L = 6.3 – 2 × 0.2 = 5.9m Second step L= 5.9 – 2× 0.05 = 5.8m Third step	 3 3 3 3 3	 11.6 11.5 11.4 5.9 5.8	 0.5 0.4 0.3 0.5 0.4	 0.3 0.3 0.85 0.3 0.3	 5.22 4.14 8.72 2.655 2.08

	L= 5.8 – 2× 0.05 = 5.7m Short wall 2 First step L= 0.8 –2× 0.2 = 0.4m Second step L= 0.4 – 2 × 0.05 = 0.3m Third step L = 0.3 – 2 × 0.05 = 0.2m Short wall 3 First step L = 1.1 – 2× 0.2 = 0.7m Second step L= 0.7 –2 × 0.05 = 0.6m Third step L = 0.6 –2× 0.05 = 0.5m	3 3 3 3 3 3 3	5.7 0.4 0.3 0.2 0.4 0.3 0.2	0.3 0.5 0.4 0.3 0.5 0.4 0.3	0.85 0.3 0.3 0.85 0.3 0.3 0.85	4.36 0.18 0.108 0.153 0.18 0.108 0.153 Total= 28.057 m^ 3
4	Earth filling Room 1 (9.4× 5.5) Room 2 (3.12× 5.5) Room 3 (12.1× 1.5)	1 1 1	9.4 3.12 12.1	5.5 5.5 1.5	0.6 0.6 0.6	31.02 10.3 10.9 Total = 52.22 m^3
5	Brick masonary in super structure Long wall Short wall 1 Short wall 2 Short wall 3	 3 3 3 3	 11.4 5.7 0.2 0.5	 0.2 0.2 0.2 0.2	 3 3 3 3	 20.52 10.26 0.36 0.9 Total=32.04 m^3
6	Deduction for door and windows D1 D2 D3	 1 1 1	 1.10 1.10 0.90	 0.30 0.30 0.30	 2.10 2.10 2.10	 0.693 0.693 0.567

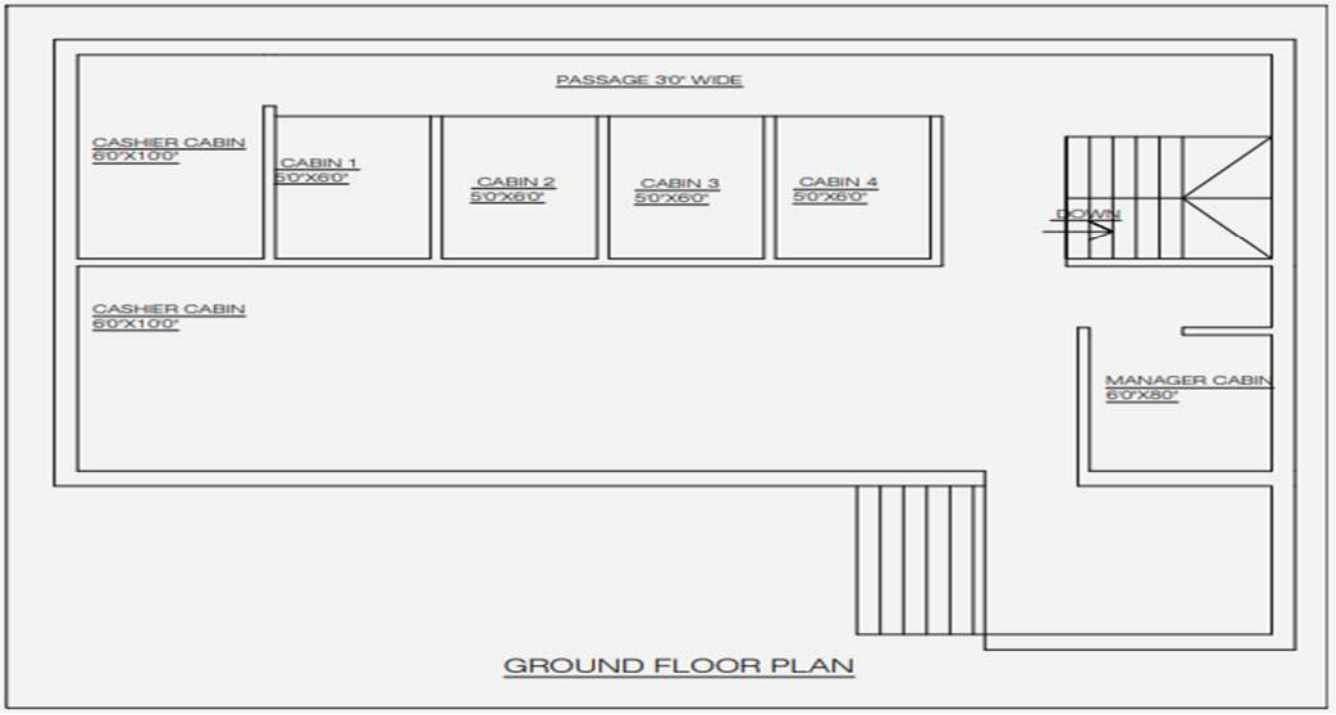
	D4 W1 W2 Net quantity = 32.04 –5.92 = 26.12m	1 2 3	0.90 1.80 1.5	0.30 0.30 0.30	2.10 2.10 2.10	0.567 1.512 1.89 Deduction (–5.92m)
7	Plastering(outside walls) Horizontal walls Vertical walls	 2 2	 12.55 8.9		 3 3	 75 53.4

Table 18 Abstract sheet

Item no	Particulars of items	Quantity	Per	Rate	Amount
1	Excavation in foundation	58.1	m^3	88	5112 RS
2	Earth filling	52.22	m^3	952	49713 Rs
3	Brick work in 1:6 super structure	26.12	m^3	3532	92255 Rs
4	P. C . C. In foundation	10.90	m^3	3024	32961 Rs
5	Brick masonary work in foundation	28.057	m^3	3164	88772 Rs
6	Plastering Horizontal walls Vertical walls	 75 53.4	m^2	 134 134	10050 7155 Total=286018 Rs+3% constatives 8580 Rs +2% work charged 5720Rs Grand total = 300318Rs

8.1.3 Social design (Civil) BANK

Fig 35 BANK LAYOUT



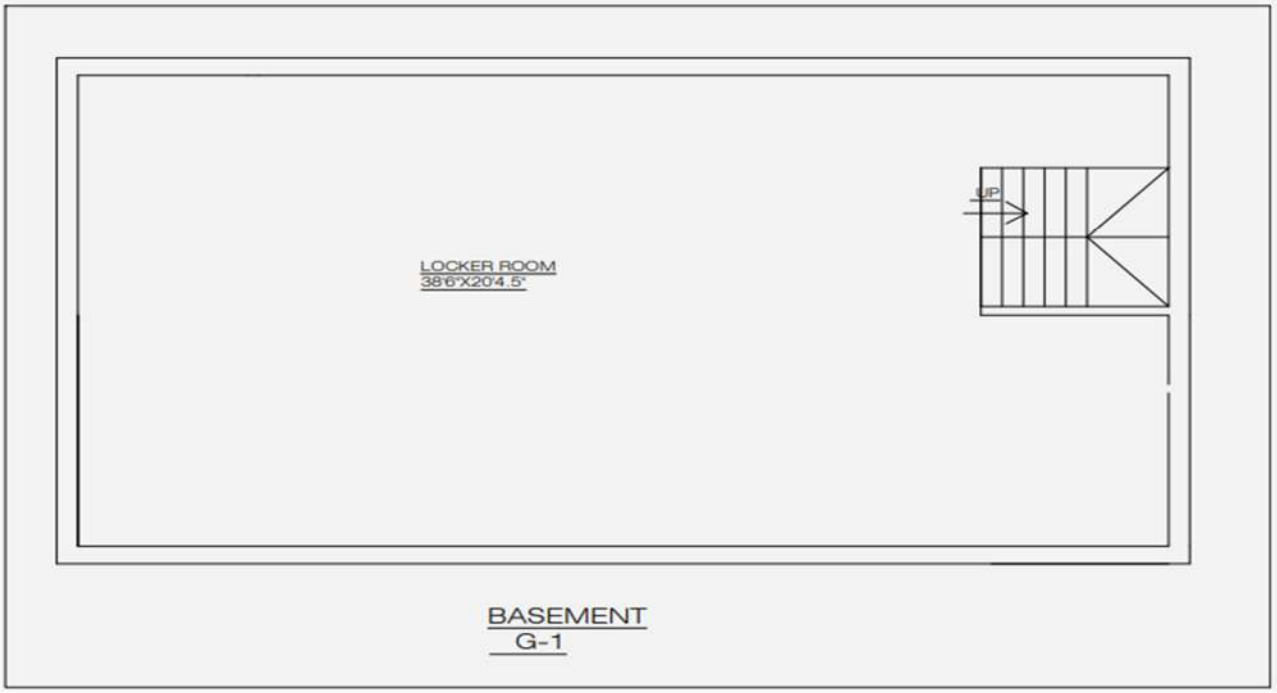


Table 19. Bank measurement sheet

Item no..	Item description	No	Length L	Breadth B	Height H	Quantity
1	Earthwork in					

	excavation for foundation 1 Long wall :- Long wall: L= 12+0.2+2×0.45 = 13.1m	2	13.1	0.9	1.1	25.93
	2 short wall :- Short wall 1: L=7.74+0.2 – 2× 0.45 =7.04m	3	7.04	0.9	1.1	20.90
	Short wall 3 :- L = 1.9+0.2 –2×0.45 = 1.2m	1	1.2	0.9	1.1	1.88
	Short wall 4:- L= 1.8+0.2 –2×0.45 =1.1m	1	1.1	0.9	1.1	1.089
	Short wall 5:- L= 2+0.2 – 2× 0.45 = 1.3m	1	1.3	0.9	1.1	1..287
	Short wall 6:- L= 2.5 + 0.3 – 2× 0.45 = 1.9m	1	1.9	0.9	1.1	1.81
	Short wall 7:- L= 3.2 +0.3 –2×0.45 =2.6m	1	2.6	0.9	1.1	2.574
	Short wall 8:- L= 3+0.2 –2×0.45 = 2.3m	1	2.3	0.9	1.1	2.277
	H= 0.3+0.3+0.3+0.2 = 1.1 m					Total=57.74m^3
2	Pcc (1:4:8) for foundation					
	Long wall	2	13.1	0.9	0.2	4.71
	Short wall 1	3	7.04	0.9	0.2	3.80
	Short wall 2	1	1.2	0.9	0.2	0.216
	Short wall 3	1	1.1	0.9	0.2	0.198
	Short wall 4	1	1.3	0.9	0.2	0.234

	Short wall 5 Short wall 6 Short wall 7	1 1 1	1.9 2.6 2.3	0.9 0.9 0.9	0.2 0.2 0.2	0.342 0.468 0.414 Total=10.454
3	Brick masonary up to plinth level Long wall First step: L=13.1 –2×0.2 = 12.7m Second step: L= 12.7 –2× 0.05 = 12.6m Third step: L= 12.6 –2×0.05 = 12.5 2. Short wall Short wall 1 First step: L= 7.04 –2× 0.2 = 6.64m Second step L= 6.64 –2×0.05 = 6.54m Third step: L= 6.54 – 2×0.05 = 6.44m Short wall 2 First step: L=1.2 –2× 0.2 = 0.8m Second step L= 0.8 –2 ×0.05 =0.7 Third step L= 0.7 –2× 0.05 = 0.6m Short wall 3 First step L= 1.1 –2× 0.2 = 0.7m	 2 2 2 3 3 3 1 1 1 1	 12.7 12.6 12.5 6.64 6.54 6.44 0.8 0.7 0.6 0.7	 0.5 0.4 0.3 0.5 0.4 0.3 0.5 0.4 0.3 0.5	 0.3 0.3 0.85 0.3 0.3 0.85 0.3 0.3 0.85 0.3	 3.81 3.024 6.375 2.98 2.35 4.92 0.12 0.084 0.153 0.105

	Second step L= 0.7 –2×0.05 =0.6m	1	0.6	0.4	0.3	0.072
	Third step L = 0.6 – 2× 0.05 = 0.5m	1	0.5	0.3	0.85	0.1275
	Short wall 4 First step L= 1.3 –2× 0.2 = 0.9m	1	0.9	0.5	0.3	0.135
	Second step L= 0.9 –2× 0.05 = 0.8m	1	0.8	0.4	0.3	0.096
	Third step L = 0.8 –2× 0.05 = 0.7m	1	0.7	0.3	0.85	0.1785
	Short Wall 5 First step L= 1.9 –2 × 0.2 = 1.5m	1	1.5	0.5	0.3	0.225
	Second step L = 1.5 –2× 0.05 = 1.4m	1	1.4	0.4	0.3	0.168
	Third step L= 1.4 –2× 0.05 = 1.3m	1	1.3	0.3	0.85	0.331
	Short wall 6 First step L= 2.6 –2 × 0.2 = 2.2m	1	2.2	0.5	0.3	0.33
	Second step L = 2.2 – 2 × 0.05 = 2.1m	1	2.1	0.4	0.3	0.252
	Third step L = 2.1 –2 × 0.05 = 2.0m	1	2.0	0.3	0.85	0.51
	Short wall 7 First step L = 2.3 –2 × 0.2 = 1.9m	1	1.9	0.5	0.3	0.285
	Second step L = 1.9 – 2× 0.05	1	1.8	0.4	0.3	0.216

	= 1.8m Third step L = 1.8 – 2 × 0.05 = 1.7m	1	1.7	0.3	0.85	0.433 Total = 27.28m^3
4	Earth filling Room1 (5.45 × 3) Room2 (2.09 × 3) Room 3(2.5 × 3.2) Room 4 (2× 1.8) Room 5 (1.9 × 1.6) Room 6 (1.14 × 1.95)	 1 1 1 1 1 1	 5.45 2.09 2.5 2 1.9 1.14	 3 3 3.2 1.8 1.6 1.95	 0.6 0.6 0.6 0.6 0.6 0.6	 9.81 3.76 4.8 2.16 1.824 1.33 Total = 23.68m ^3
6	Brick masonary in super structure Long wall :- L= 12.5 L = 12.5 – 2× 0.05 = 12.4 Short wall :- Short wall 1:- L = 6.44 + 2× 0.05 = 6.45 Short wall 2:- L = 0.6+ 2 × 0.05 = 0.7 Short wall 3:- L = 0.5 + 2× 0.05 = 0.6 Short wall 4:- L = 0.7 + 2 × 0.05 = 0.8 Short wall 5:- L = 1.3 + 2× 0.05 = 1.4 Short wall 6:- L = 2.0 + 2× 0.05 = 2.1 Short wall 7:- L = 1.7 + 2× 0.05	 2 3 1 1 1 1 1	 12.4 6.45 0.7 0.6 0.8 1.4 2.1	 0.2 0.2 0.2 0.2 0.2 0.2 0.2	 3 3 3 3 3 3 3	 14.88 11.6 0.42 0.36 0.48 0.084 1.26

	= 1.8	1	1.8	0.2	3	1.08 Total = 30.16m^3
7	Deduction for door and window D1 D2 W1 W2 Net quantity = 30.16 – 11.01 = 19.15m	 2 9 2 2	 1.10 0.9 1.8 1.8	 0.3 0.3 0.3 0.6	 2.1 2.10 1.4 1.4	 1.38 5.10 1.51 3.024 Deduction (– 11.01)
8	Plastering Horizontal walls Vertical walls	 2 2	 13.4 7.74		 3 3	 80.4 46.44

Table 20. Abstract sheet

Item no	Particulars of items	Quantity	Per	Rate	Amount
1	Excavation in foundation	**57.54**	**m^3**	**88**	**5064 Rs**
2	Earth filling in foundation	**23.68**	**m^3**	**952**	**22543 Rs**
3	Brick work in 1:6 super structure	**19.15**	**m^3**	**3532**	**67638 Rs**
4	P. C. C in foundation	**10.45**	**m^3**	**3024**	**31600 Rs**
5	Brick masonary work in foundation	**27.28**	**m^3**	**3164**	**86314 Rs**
6	Plastering Horizontal walls Vertical walls	 **80.4** **46.44**	 **m^2** **M^2**	 **134** **134**	 **10773Rs** **6223 Rs** **Total=2,30,155Rs +3 %constitengies 6905 Rs+ 2% work charged 4603Rs** **Grand total = 2,41,663Rs**

8.1.7 Electrical Design 1 :- Smart irrigation system

Irrigation system using solar energy and rain gun

Scenario :

India is endowed with a rich diversity of natural resources, however, the need for food and nutritional security is increasing due to rapid demographic and dietary changes. The annual food grain requirement is likely to reach 494 million tons by the year 2050. This would result in a significant reduction of per capita availability of land, water, forest and other forms of natural resources. The agriculture sector, the biggest consumer of freshwater, is under constant pressure to use water resources much more efficiently by improving the performance of both irrigated and rain-fed production.

To achieve the increased food production of 494 million tons by 2050, the irrigated area should increase from 79 million ha to 146 million ha (Soman, 2016). The cultivated land area can also not be increased significantly. India is entering a serious situation where without any possibility for increasing resources like water or land or energy for increased crop production it would be difficult to achieve food security. Irrigation is considered the most critical input for enhancing agricultural production to meet the food and fibre requirement of increasing population. Assured access to irrigation can increase crop yields by up to two to four times and is thus a key priority for both individual farmers and for meeting national development objectives (Shim, 2017).

With the rapid depletion of fossil fuels, the alternative clean sources of energy are beginning to make a solid footing in the energy sector. In recent years, solar energy has emerged as one of the cleanest, environmentally friendly and reliable sources of energy. Energy being one of the main inputs of agriculture, especially for irrigation, is becoming a focus in the agricultural water management agenda.

For sustainable agricultural and rural development, the SPIS has proven to be a boon for several pilot and near-commercial scale projects in India. The report elaborates these experiences and describes the local context in terms of policy, technology, business models and required capacities of various stakeholders. The SPIS' provide a reliable source of clean energy to the farmers to irrigate their lands. They reduce the operating cost and provide relief to the farmers from the financial burden of fluctuating fuel prices. The SPIS provide the opportunity to the farmers for an additional income in case of surplus power generation, where the excess electricity may be sold to the national electric grid and the farmers may draw the power back from the grid when required.

Existing Situation:

One of the main economic issues facing India is the condition of the agriculture. Being the source of livelihood for over 55 percent Indians, agricultural sector is an important element in our economy. Still, this sector is not as evolved as it should be and faces a lot of challenges resulting in low productivity.

In India, around 43 percent of the land is used for agricultural purposes; however, contributes only 18 percent to country's GDP. The poor state of agriculture in India is a

point of concern for its entire population. The farmers in rural India suffer greatly from illiteracy and poverty; hence, there is a lack of good continuous services. To help farmers with state-of-the-art agrochemicals and offer sound farming advice, HPM India, has an array of services. They are one of the leading chemical fertilizers suppliers around the world and manufactures effective chemical to enhance agricultural produce. Clodinafop-propargyl 15% WP, also known as CLODINO SUPER in the market, is a very popular chemical used to kill harmful insects and pests that can destroy plants and crops.

SPECIFICATION OF SOLAR PANEL

Table 21. Specification of Solar Panel

Specification	Value
Peak power output in voltage	1000 V
Maximum power voltage	660 V
Maximum power current	6.75 A
No. and type of cell	9 x 36 cells
Working temperature	-40°C~ 90°C

The perturbation of the output power is achieved by periodically changing (either increasing or decreasing) the controlled output power.

Photovoltaic pumping system

One promising area of research is the use of PV as the power source for pumping water. The use of photovoltaic power or water pumping is appropriate, as there is often a natural relationship between the availability of solar power and the water requirement increases during hot weather periods when the solar radiation levels are higher and the output of the solar array sis at a maximum.

The water requirement decreases when the weather is cool and the sunlight is less intense. The whole system of solar pumping includes the panels, support structure with tracking mechanism, electronic parts for regulation, cables, pipes and the pump itself [4].

i) Solar panels or modules: Solar panels are the main components used for driving the solar pump. Several solar panels connected together in arrays produce DC electricity, interconnections are made using series or parallel combinations to achieve desired voltage and power for the pump.

ii) Solar pump: Centrifugal or submersible pumps are connected directly to the solar array using DC power produced by the solar panels which is the covert AC as per requirement of AC induction motors. Solar pumps are available in several capacities depending upon the requirement of water.

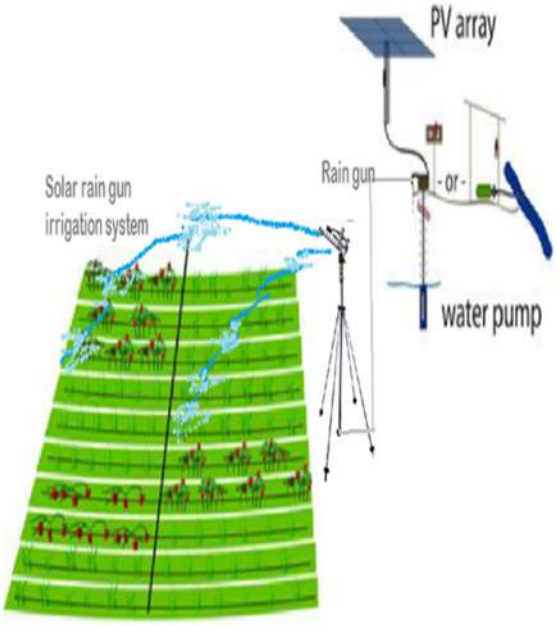


Fig 36. Solar PV irrigation System

iii) Support structure and tracking mechanism: Support structure provides stability to the mounted solar panels and protects them from theft or natural calamities. To obtain maximum output of water, a manual tracking device is fixed to the support structure. Tracking increases the output of water by allowing the panels to face the sun as it moves across

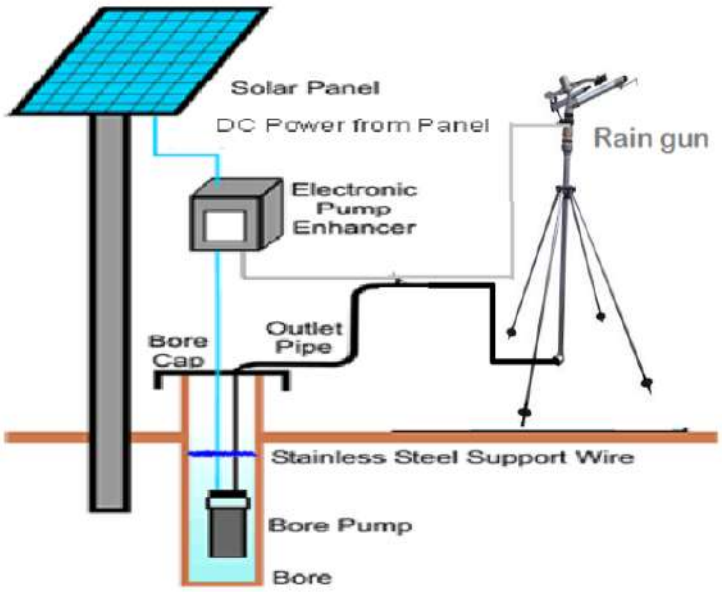


Fig. 18 Solar PV irrigation system Working

iv) Foundations (array and pump): Foundations are provided for support structures and . pump.

v) Electrical interconnections: A set of cables of appropriate size, junction boxes, connectors and switches are

Solar panels are used in a variety of applications. The applications vary from small simple lanterns to large elaborate power plants.

Rural and urban households for

i. domestic purposes like lighting.
ii. Communities, small industries and institutions like schools, for lighting as well as for powering television sets, computers, etc.
iii. Water pumping systems.
iv. Telecommunications, as these systems are often installed in isolated places with no other access to power.
v. Refrigeration of vaccines at health center in rural areas. Such solar refrigerators are also utilized to store blood plasma.

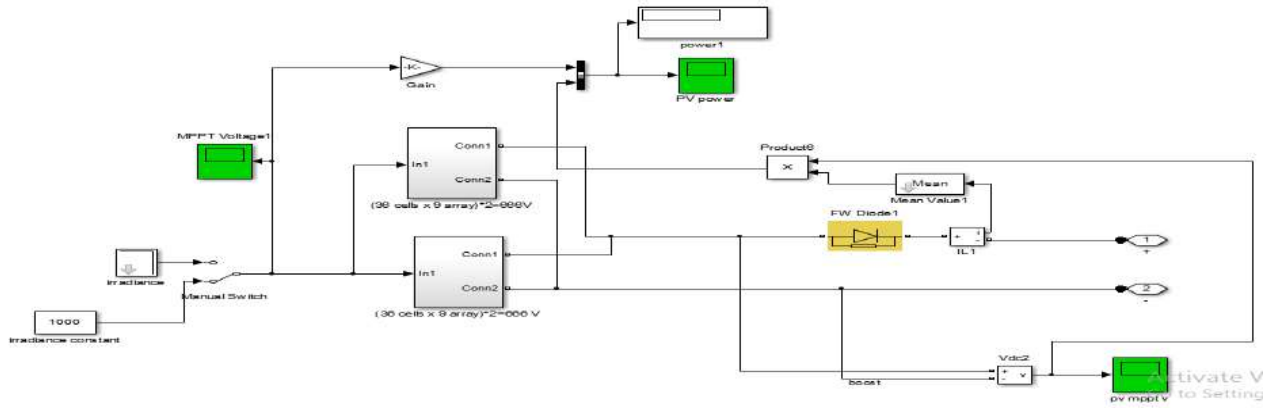


Fig. 38 The simulation of PV set

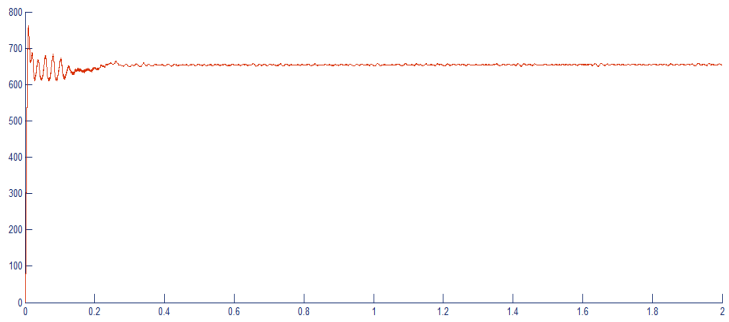


Fig. 39 Voltage output of 2 panel (9 x 36 cells)

The output voltage of 2 set panel (9 x 36 cells) is about 660 V within 0.2 sec.

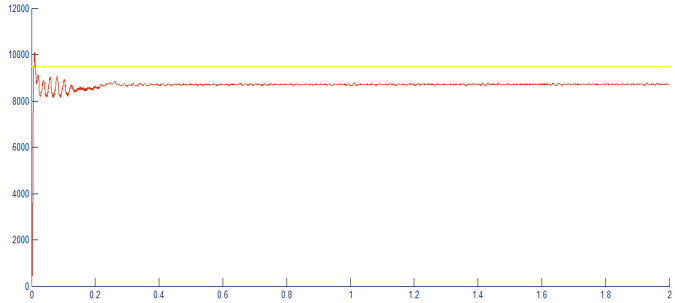


Fig. 40 Power output of 2 panel (9 x 36 cells)

The output power of 2 set panel (9 x 36 cells) should be about 9.5 KW within 0.2 sec. but it will be 8.5 KW within 0.2 sec. hence we can say that about 1 KW of power has been collaps in losses during generation.

The final simulation with battery storage and converter (PI with PWM controlled) is shown in fig 8.

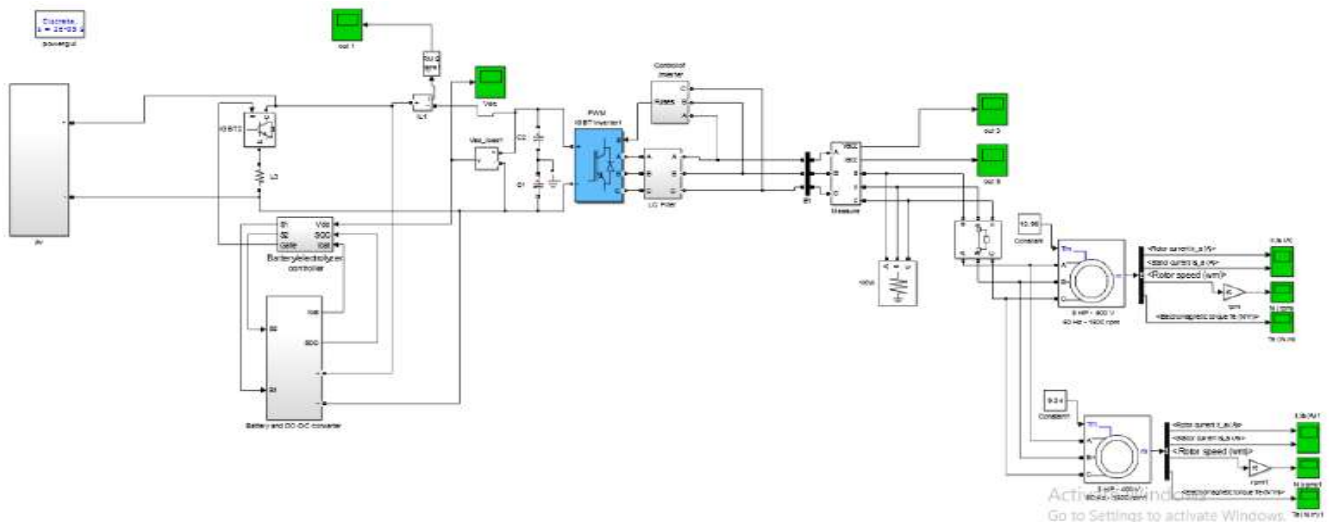


Fig.41 Simulation of PV based irrigation system

Fig. 9-10 represent simulation results after conversion of DC solar panel to AC form as per requirement of AC induction motors.

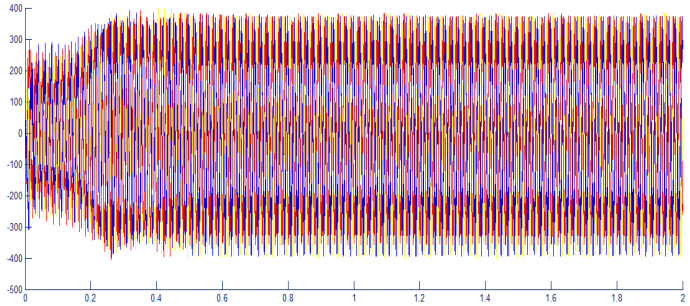


Fig. 42 AC voltage output after conversion

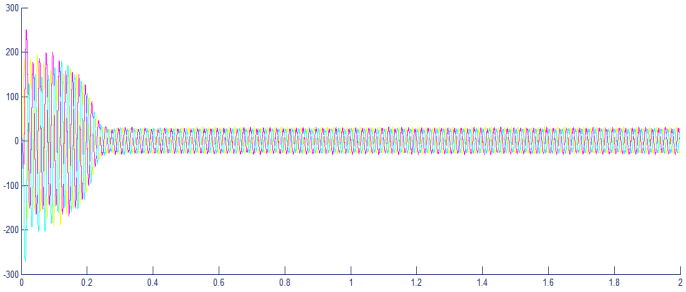


Fig. 43 AC current output after conversion

Generally for 5HP and 3 HP motors supply voltage and current should be 440V and 16A irrespectively. In here 8.5KW solar panel maintain about 400V and 15 A which is the comfortable supply for both motors in irrigation system of rural area Chhattisgarh.

Stator Current

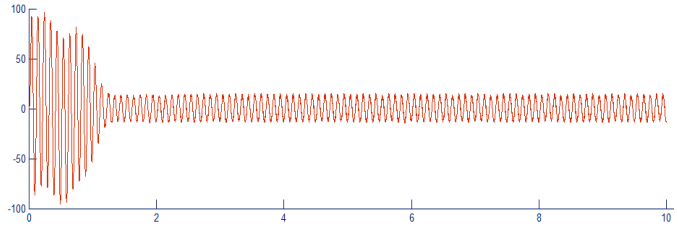


Fig 44 Stator current of 3 HP motor

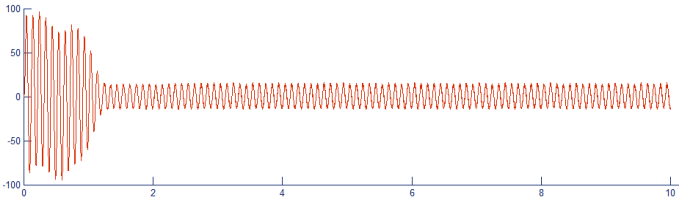


Fig 45 Stator current of 5 HP motor

Rotor Current

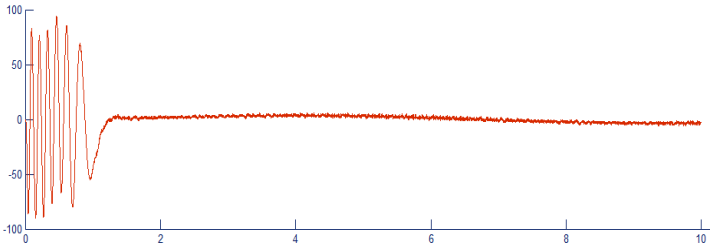


Fig 46 : Rotor current of 3 HP motor

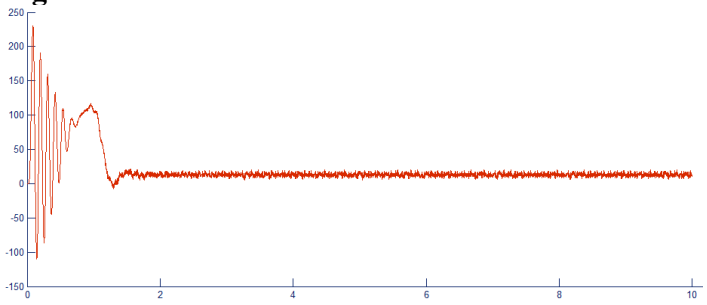


Fig 47 : Torque of 5 HP motor

Table 22 Comparision of 3HP and 5 HP motor

S. No.	Rating	I (stator)	I (rotor)	N (rpm)	T (N-m)	Irrigation output (per day)
1	3 HP	14A	4 A	1490	9.35	2 acre
2	5 HP	16 A	6 A	1480	12.95	3 acre

Cost Estimation

Table 23 Cost estimation

Particular	**Description**
Solar pump	5HP
Solar pump type	AC submersible
Pump head	60-120 meter
Solar panel	5 kW
Controller	1 Set
Open circuit voltage	90-140 V DC
Maximum peak voltage	110 V DC
Maximum input current	40 Amps

Output voltage	30-85 V
Input power	3000 w dc
Protections	Over current, high and low voltage, dry run, overflow etc.
Accessories	Structure, wires, nut bolt etc.
Discharge	45000 – 1, 00,000 Liters\day.
Warranty	5 years warranty for complete solar system and 25 years for solar panel.
Delivery	5 to 7 days
Price	**Rs. 3,10,000**

TOTAL COSTING OF SETUP WITH INSTALLATION IS 3,10,000 INR
(VARIOUS STATE GOV & NABAR SUBSIDY IS ALSO AVAILABLE ACCORDING TO THEIR STATE)

CONCLUSIONS

Photovoltaic systems are especially designed to supply water and irrigation in areas where there is no mains electricity supply. Their main advantages over hand pumps or internal combustion engine pumps are their practically zero maintenance, their long useful life, that they do not require fuel, that they do not contaminate, and finally that they are straightforward to install. Another important characteristic is that, as they use the sun as their energy source, the periods of maximum demand for water coincide with the periods of maximum solar radiation. When compared to diesel powered pumping systems, the cost of solar PV water pumping system without any subsidy works out to be 64.2% of the cost of the diesel pump, over a life cycle of ten years [9]. Solar pumps are available to pump from anywhere in the range of up to 200 m head and with outputs of up to 5 acre/day. 5 HP motor pump irrigate water about 3 acre/day and 3 HP motor pump irrigate water about 2 acre/day. The electrical characteristics represent with the help of simulation result which is shown in MATLAB program. In this paper we represent in form of comparison table II.

8.1.8 Electrical Design 2:

RENEWABLE ENERGY BASED WATER PURIFICATION SYSTEM FOR DOMESTIC / PUBLIC PLACE

ABSTRACT

In this paper, we are making a water purifier which works on solar energy. The basic principle behind this project is reverse osmosis. The solar radiations are collected by solar panel. This energy is then stored in a battery. The battery is connected to the purification unit through a electromagnetic relay. The purification unit consists of high pressure motor , reverse osmosis system and the water tank. The high pressure creates the necessary pressure

required to carry out reverse osmosis. The microcontroller 8051 keeps a watch to the level of water in the water tank and prevents it from over flow. Through this process we obtain the purified water in the water tank.

1. INTRODUCTION

The decreasing availability of water has necessitated in the search for fresh sources of drinking water. The available water in many areas in the country is brackish, saline or impure. Salinity is a major problem in the coastal areas of Kutch and Gujarat. In our country pure drinking water is a major problem in tribal/rural area .There are many processes available for purification of drinking water like Chlorine tablets , Pot chlorination of wells, Slow and rapid sand filters, Fluoride removal , Reverse osmosis plants, etc .In this project, we are making a water purifier which works on solar energy.[1-3] The basic principle behind this project is reverse osmosis. We are using solar energy which is a renewable source, abundant and cheap. In case of power failures, this purifier will continue to work as solar energy can be stored.

2. BLOCK DIAGRAM

The purification unit consists of high pressure motor , reverse osmosis system and the water tank. The high pressure creates the necessary pressure required to carry out reverse osmosis. The microcontroller 8051 keeps a watch to the level of water in the water tank and prevents it from over flow. Through this process we obtain the purified water in the water tank.

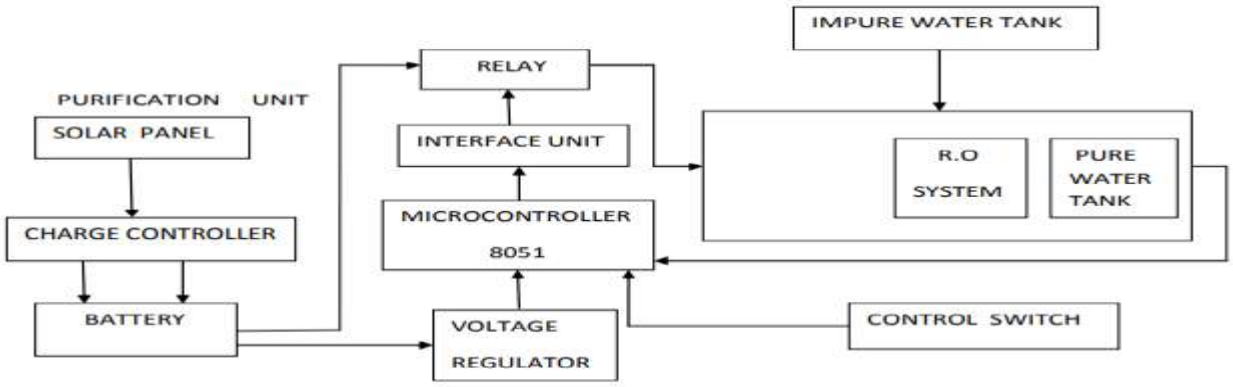


Figure 48 Block Diagram of Solar Energy Based Water Purification System

The solar radiations are collected by solar panel. This energy is then stored in a battery through a charge controller.[2-8]The charge controller prevents the battery from getting overcharged. The battery is connected to the purification unit through an electromagnetic relay.The battery is also connected to a voltage regulator.The voltage regulator converts 24V to +5V,which is required by the microcontroller. The purification unit consists

Figure 49 Solar Panel

of high pressure motor , reverse osmosis system and the water tank. The high pressure creates the necessary pressure required to carry out reverse osmosis. The microcontroller 8051 keeps a watch to the level of water in the water tank and prevents it from over flow. Through this process we obtain the purified water in the water tank.[3-10]

SOLAR ENERGY

Solar energy can be a major source of power.Its potential is 178 billion MW which is about 20,000 times the world's demand. But it cannot be developed on large scale. Sun's energy can be utilised as thermal and photovoltaic's.The solar power where sun hits atmosphere is 1017 watts, whereas the solar power on earth's surface is 1016 watts. The total world – wide power demand of all needs of civilization is 1013 watts. Therefore, the sun gives us 1000 times more power than we need.The energy radiated by the sun on a bright sunny day is approximately 1kw/m2 , which may be used in driving the prime movers for the purpose of generation of electrical energy.Some applications of solar energy aresolar water heater, solarcookers,Solar furnaces,Solar ponds,Solar energy collectors,Solar energy storage etc.[9-11]

2.2 SOLAR PANEL

In this paper, solar energy is being collected by using a solar panel. The collected solar energy is being stored in the battery. In case of rural and remote areas and the areas affected but natural disasters where electricity is a big problem, [12-14]this stored energy can be used for
the purification of water.

2.3 REVERSE OSMOSIS

When two solutions of different concentrations are separated by a semi-permeable membrane, solvent (water) flows from a region of lower concentration to higher concentration. This process is called osmosis. [25-23]This driving force in this called osmotic pressure.If a hydrostatic pressure in excess of osmotic pressure is applied on the higher concentration side, the solvent flow is reversed i.e., solvent flows from higher concentration to lower concentration. This process is called reverse osmosis. Thus, in the process of reverse osmosis pure water is separated from salt water.

3 HARDWAREDESCRIPTIONS

3.1 Power supply circuit

In this paper we are using 24V, 40W solar panel and a 24V, 7.5A battery. The battery is being charged by the solar panel through a charge control relay. The maximum charge holding capacity of the battery is27.6V.A charge controller has been connected across the battery to prevent it from getting overcharged i.e., above 27.6V.A diode has been used in this circuit to maintain the current in one direction.

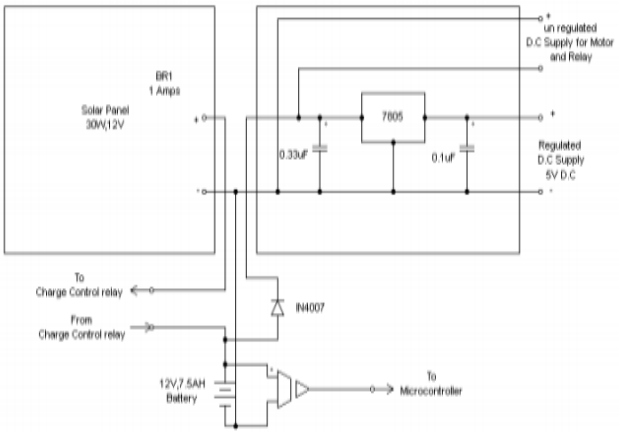


Figure 50 RO components

[17-19]The voltage regulator circuit has been used which converts 24V to +5V,as the microcontroller accepts a constant +5V.The regulated DC supply is used for the microcontroller and the unregulated DC supply is used for the motor and relay.

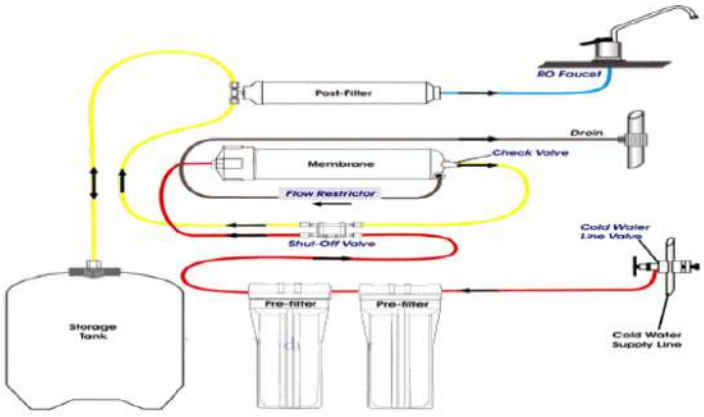


Figure 51 Circuit diagram of power supply circuit

3.2 Control Circuit

The control circuit mainly consists of the microcontroller P89V51RD2BN and an LCD display.The microcontroller accepts three inputs at the following situations :- i)When the battery is overcharged ii)When the water tank overflows iii)When the water tank is empty The manually operated.Whenever the tank is empty,the ON switch is operated and whenever it is filled, the OFF switch is operated.The RESET switch is automatically operated.[40-45]

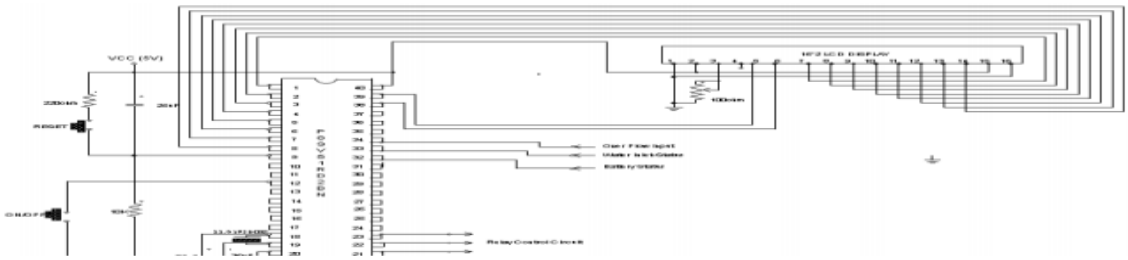


Figure 52 Circuit diagram for control circuit

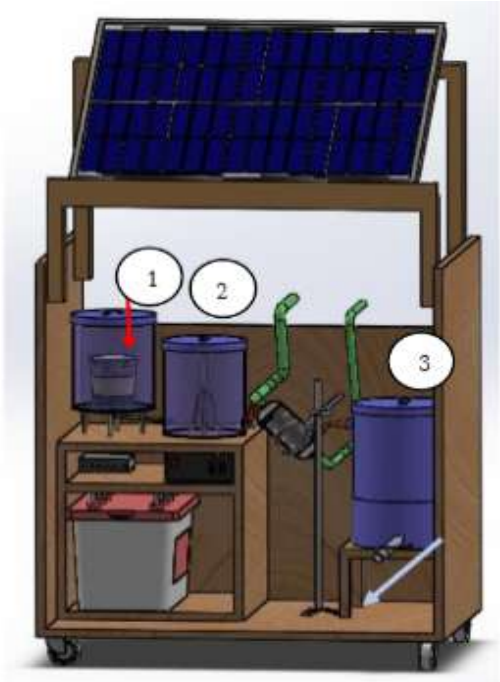


Fig 53 Prototype

3.4 HARDWARE KIT Prototype

Construction of a product is the trickiest part of developing a product. This step includes decision associated with material, production process and specification selection. Some critical decisions are specification of solar panel, battery and heating coil. These information defines the charging time of battery by solar panel and time to increase water temperature by heating coil.

In solar water purifier, 150 W solar panel is used. Battery capaity is 40 AH and voltage is 12 V. A 200 watt AC

Time Calculation

This calculation is done for 5 liter water.

So, total time needed to purify 5 liter water by solar water purifier is 171 minutes or 2 hours 51 minutes. In the meantime, battery is charged again. So, the next cycle can take place.

Estimation

Sr.	Component	Brand	Quantity	Cost(INR)
1	Solar Panel	Vikram solar	1	4500
2	Solar Battery + Inverter + Controller	Luminous	1	8250
3	Filtering Column	Aquaa care	1	599
4	Heating Coil	Water junction Pvt ltd	1	220
5	Condenser	JD Enterprice	1	275
6	Frame	-	1	10000
7	Others	-	-	1000
8	-	-	6	24844

Table no 23 Estimation

CONCLUSION

As solar energy is being used for the purification of water, which is cheap and abundant, it can be used everywhere where electricity is not available. Here, the microcontroller which is used also prevents the water from overflowing. Moreover, reverse osmosis is a good disinfectant process .This project has only capital cost and almost no running cost. Hence, It will prove to be useful in the near future.

8.1.9 Electrical Design 3:

Automatic Soil Moisture Control System For Herb Plant(Unique Plant)

An autonomous system is defined as a system that detects its operating environment and senses the operating parameters, changes its operating behavior in that environment, and adapts to the changes and events occurring in that environment. Autonomic systems provide the capabilities to solve system complexities by using technology to manage and control dynamical systems. These types of systems operate with independent and pre-defined conditions, protocols, and policies, without human intervention.

Autonomous Sensor Interface System Architecture

The low-cost autonomous sensor interface for the design of smart irrigation system architecture consists of the input and output processes, as illustrated in Figure 1. The

entire system operation is controlled by the Arduino Uno board, which is programmed on he behavior of other system components.

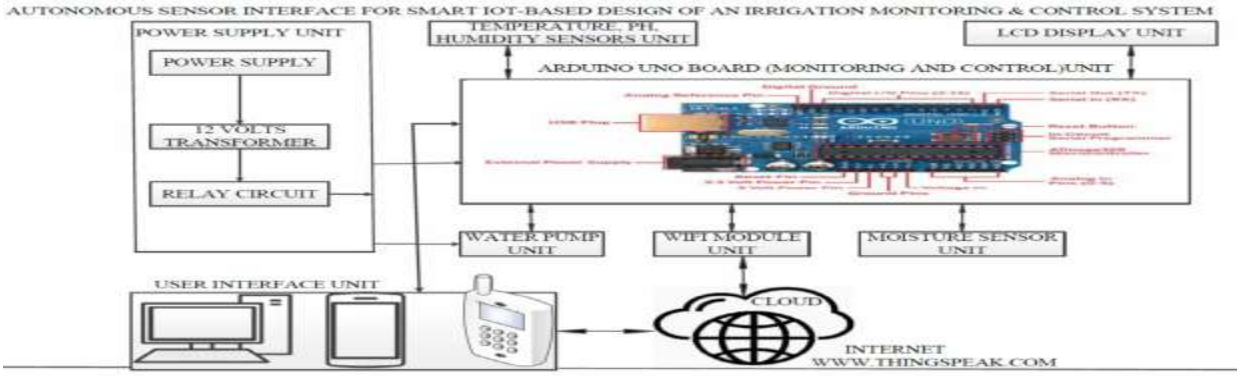


Fig 54 Architecture

Real-Time System Monitoring and Control

Figure 2 illustrates the real-time device monitoring and control system. The connected sensor components and ports are initialized to display the start-up information on the 16 × 2 LCD screen. The microcontroller subsequently attempts to establish connection with the different components of the system. As soon as the connection is established, the WiFi module and moisture sensors will authenticate the established connection and start reading the moisture content level of the soil.

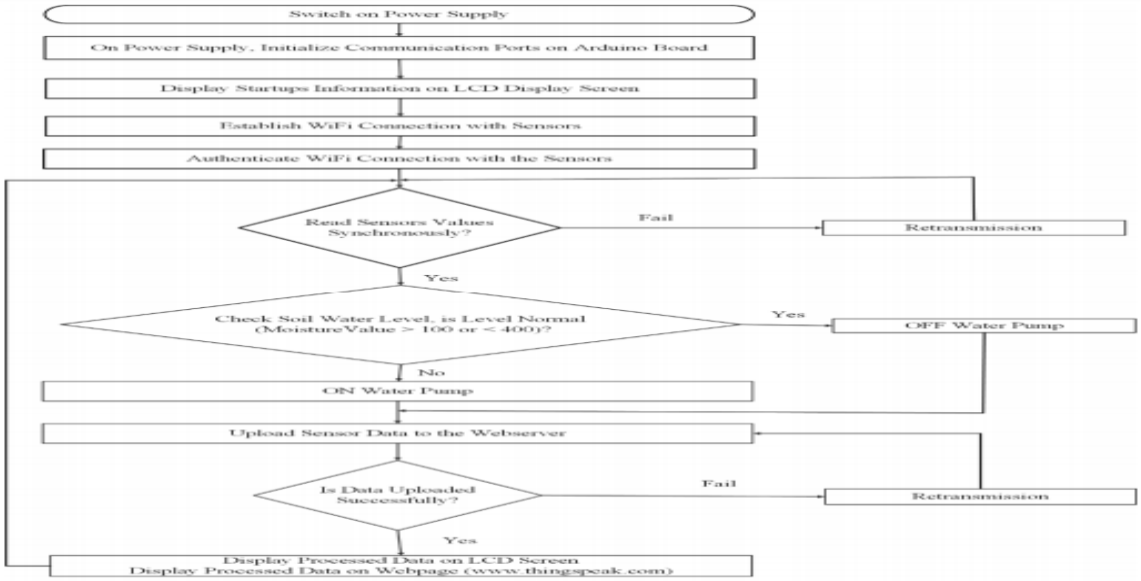


Figure 55 .(Real-time system monitoring and control

System Modeling and Simulation

The low-cost sensor interface, for the smart irrigation system, is simulated using the Proteus 8.5 design suite, Arduino Uno integrated development environment (IDE), and embedded C programming language. Proteus 8.5 Professional is an efficient tool and a high- performance design environment for simulating technical computing [25].

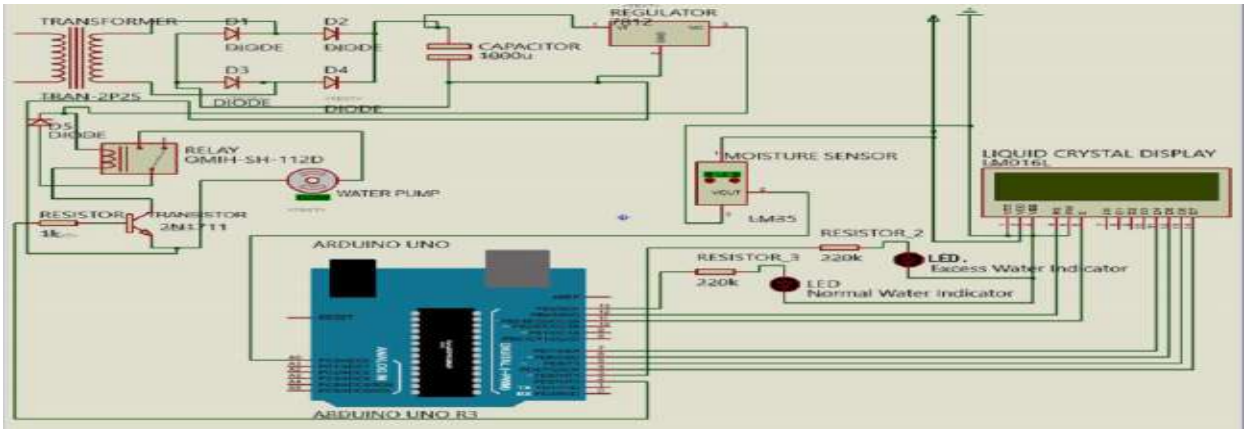
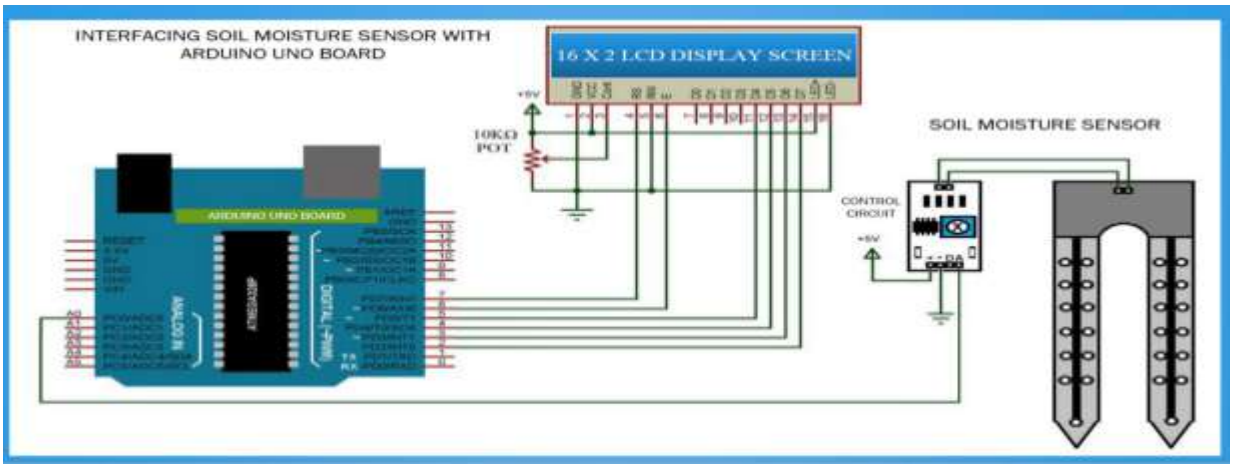


Figure 56 . Schematic diagram of a smart irrigation modeling and simulation system.

by which source codes can be written, verified, and uploaded to the .microcontroller. The embedded C programming language is suitable for the design of embedded systems and sensor components.

The Moisture Sensor Calibration



These sensor readings, taken during the first five seconds, are termed the minimum and maximum of the anticipated values for the readings taken during the system loop. A two-point calibration technique is applied to the raw moisture sensor outputs. This approach is very important to re-scaling the output and has the Sensors 2019, 19, 3643 12 of 25 potential to correct both slope and offset errors.

. **Figure 57. Low-cost sensor interface for smart irrigation modeling and simulation system**

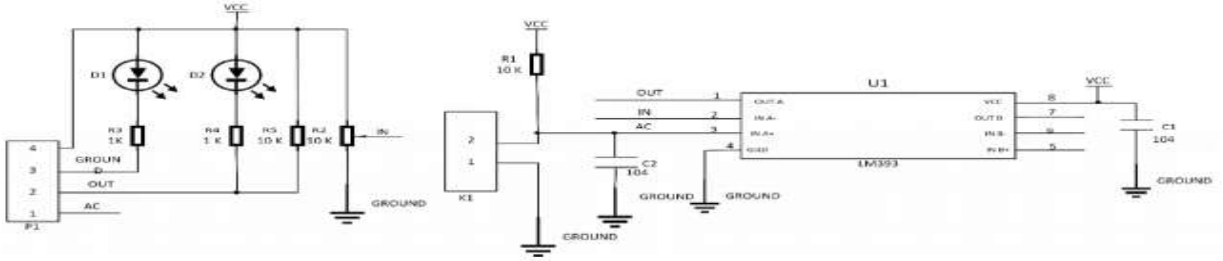


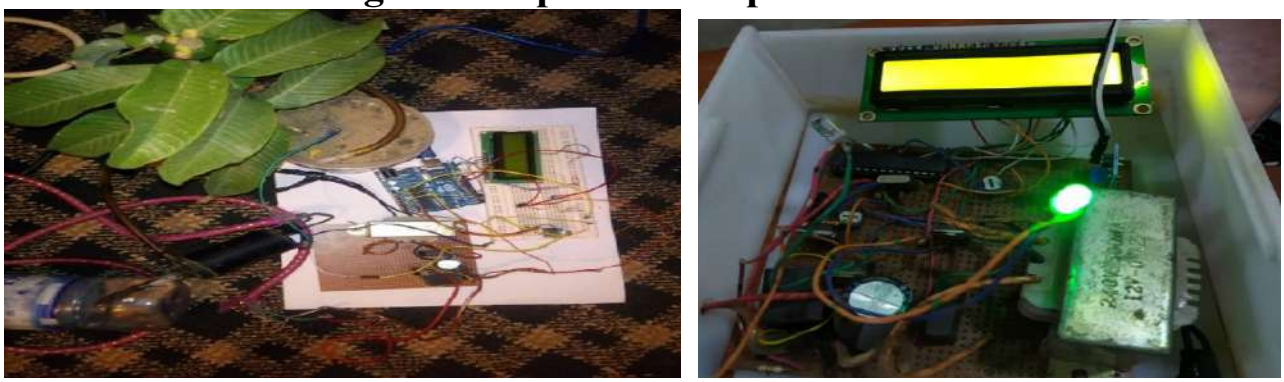
Figure 58. Circuit diagram of the moisture soil sensor operating principle.

System Implementation

The implementation can be tested in the designated location. These tests include, arranging the constructed system prototype at a strategic location in farmland, such that the environmental parameters would be monitored by the sensors. The processed sensor data transmitted to the web server through the website, www.thingspeak.com [27], where users can view the monitoring and control data.

Figures illustrate the experimental setup of the autonomous sensor interface for the IoT-based irrigation system. The components are interconnected via a smart interface, the water pump is connected to the plants to supply water when the moisture level of the soil is below normal, and the immersed moisture sensor, buried in the soil, monitors the moisture level and communicates the information to the microcontroller.

Fig 59 Component setup



The implemented prototype view

Table 24. Cost analysis of the implemented device prototype.

S/No.	Item Description	Unit Quantity	Unit Price (Rupee)	Amount (Rupee)
1	Arduino Uno Board	1	450	450
2	Generic EPS-01 ESP8266 2.4-GHz WiFi Module for Arduino	1	299	299
3	16 × 2 LCD Blue Screen Microcontroller Development Support for Arduino	1	225	225
4	LM393 Soil Moisture Sensor	1	315	315
5	Electrolytic capacitor (20 pcs)	1	160	160
6	Resistors 1 kΩ (50 pcs)	1	998	998
7	12-V Relay Module External Trigger Delay Adjustable	1	632	632
8	Diodes 10 mn RGB LED Module Light Emitting Diode for Arduino	3	45	135
9	Generic PCs Water Pump High Quality DC 12 V 3.8 m, Magnetic Electrical Centrifugal Hotsel	1	219	219

10	Breadboard and Jumper Cables	1	260	260
11	DHT 11 Digital Temperature, Humidity Sensor Module for Arduino	1	179	179
12	Generic AC 220 V to 12 V DC step down Power Supply Module for Arduino	1	264	264
	Total	15		4136

Conclusions

This article presents a low-cost autonomous sensor interface for the design of an IoT-based smart irrigation monitoring and control system. A real working prototype was designed and implemented. The main objective of this work was to enable farmers to have autonomous monitoring and control of remote farmland, to generate an increase in crop production. This study used a moisture sensor to
measure the water content in the soil, a water pump to supply the required amount of water to the plants, and a WiFi module to make the sensed data accessible through the Internet. The web server serves as the main base station for the storage of sensor readings. The data, stored on the web server, were rigorously analyzed.

8.2 Student recommendations of the Designs:

Post office : There is no any post office in the village so after asking from many villagers we think that they need it. It also help them if they want to invest or save their money post office is also work as a kind of bank.

Hospital : Hospital that is present in village is very small and mostly it remain close so for any emergency condition they have to travel a lot which take lots of time and time is very important during emergency condition.

Bank : We ask lots of villagers as well as staff of panchayat office and all of them want bank in their village so we decide to design small and low cost bank for village

Irrigation system using solar energy and rain gun : We know that lots of electrical energy s require in irrigation due to which the cost for irrigation also increase hence it will affect the farmer pocket. Hence we decide to design a solar irrigation system with low cost which help farmer as well as environment by using rain gun less quantity of water is require as compare to normal irrigation.

Solar energy based water purification system : Most of people in village drink tap water which is not good for health and they even don't know that it affect their health and various public placed have RO but some time its not working and its maintenance cost is also very high so we decide to design solar water purification system which is help full for domestic as well as public use.

Automatic Soil Moisture Control System For Herb Plant(Unique Plant) : This topic is something know that we thought because some time we find unique or helpful plant in village but due to not taking its proper care it exits from their and it is very difficult to grow that plant somewhere else and provide essential condition so this device will help plant to gain require moisture the plant needed like Stevia Plant , Moringa plant ,Hibiscus etc.

8.3 About design suggestion / Benefits

Post office Benefits : It help local people to take benefits of post office schemes like:

- Post Office regular savings account
- Post Office time deposit account (TD)
- Post Office recurring deposit account (RD)
- Post Office monthly income deposit account (MIS)
- Public Provident Fund account (PPF)
- Sukanya Samriddhi Yojana Account (SSY)
- Kisan Vikas Patra (KVP) account

Hospital Benefits :

- It help local people to get fast and easy treatment
- They also gets lots of benefits by the government schemes
- Pregnant Women don't have to travel more for regular checkup

Bank Benefits :

- People can do saving and investment very easily and quickly
- They can take benefits of financial schemes of farmer
- Taking loan for farming become easier for them

Irrigation system using solar energy and rain gun Benefits :

- Irrigation cost reduce
- Help environment
- Save water
- Their profit increase

Solar energy based water purification system Benefits :

- Save electricity
- Pure water is available for everyone
- Low maintenance cost
- Reliable and can easily shift
- Low cost water

Automatic Soil Moisture Control System For Herb Plant(Unique Plant) Benefits :

- Save man power
- Save water
- Protect species

Chapter 9: Proposing designs for future Development of the village(for the part -2 design):

In this phase, we design
1) Grain Storage
2) Vegetable Market
3) Sewage Treatment plant
4) Solar refrigeration room
5) E-cycle for local public
6) Automatic water level detector

1) higher secondary school: In Barejadi village only one government primary school upto 1to 8 standard so, the students are go to the outside of the Village for higher secondary education purpose. So, we plan to design secondary school upto 8 to 12 according village education condition

2) Intze water tank: In Barejadi village they not have any water tank so, we plan to design intze water tank according the villager's conditions.

3) Reading hall: In Barejadi village not any library for villagers so we plan to design reading hall.

4) Automatic Anchor Light: Federal and international regulations require boats to carry lights during sunset, sunrise and at conditions with restricted visibility. The number and colors of light vary with the size of vessel. A masthead anchor light is out of fashion as it is too high above the water level. This makes it difficult to judge the position of the boat, especially in a pitch-dark anchorage.

5) Programmable 3 Phase Controller For ON/OFF Motor: A programmable time switch is useful in designing an automatic on/off controller for 3 phase electric motor. This next project proposes a system with two programmable time switches for setting the starting and stopping times of the motor. Two control circuits interface with the start/stop switches of the 3-phase motor starter. There is provision for setting days of the week for the controller to function as well.

6) Automatic Water Pump Controller: Here's a automatic water pump controller circuit that controls the water pump motor. The motor gets automatically switched on when water in the overhead tank (OHT) falls below the lower limit.

7) This next project proposes a system with two programmable time switches for setting the starting and stopping times of the motor. Two control circuits interface with the start/stop switches of the 3-phase motor starter. There is provision for setting days of the week for the controller to function as well.

Chapter 10:Conclusion :-

After proper analysis the village we have decide to propose some electrical and civil design in first part. There is more scope or further development possible in this design that we will proceed in second part.

The motive of Vishwakarma Yojana phase - VIII is to uplift the lifestyle of the rural areas to its certain extent up to the level of an ideal village situated at the nearby location of that particular jurisdiction. It is an effective government scheme to develop the rural areas under economical cost with good workability and efficiency during its usage. The project tends to improve the physical, social as well as socio-cultural aspects of the village by implementing and improvising various infrastructures with regards to lesser or least hindrance to its rural authenticity. Main Smart Aim: Developing village with a rural soul 'but with all Smart urban amenities that a city may have. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question? The answer, which calls for change in both economics and politics, cloud make a real difference. With Gap Analysis, we conclude that some of different Smart Village facilities are required as basic or primary level which still lack in
village. So, according to Gap Analysis of Barejadi village, we observed condition of existing infrastructure facilities in village such as- Primary school, Aanganwadi etc. Smart Village can solve their problem itself can become a smart village example to another village too. According to UDPFI norms, lacking in basic amenities And Smart Amenities can be suggested as:

- Solid waste management
- primary health centre
- windmill
- meditation hall
- primary health centre
- Bio gas plant
- Cement concrete road
- Water level controller
- Higher secondary school
- Intze water tank
- E cycle for local public
- Automatic water level detector
- Solar refrigeration room
- Auto intensity control of street lights
- Solar battery charger

Chapter 11: References:-

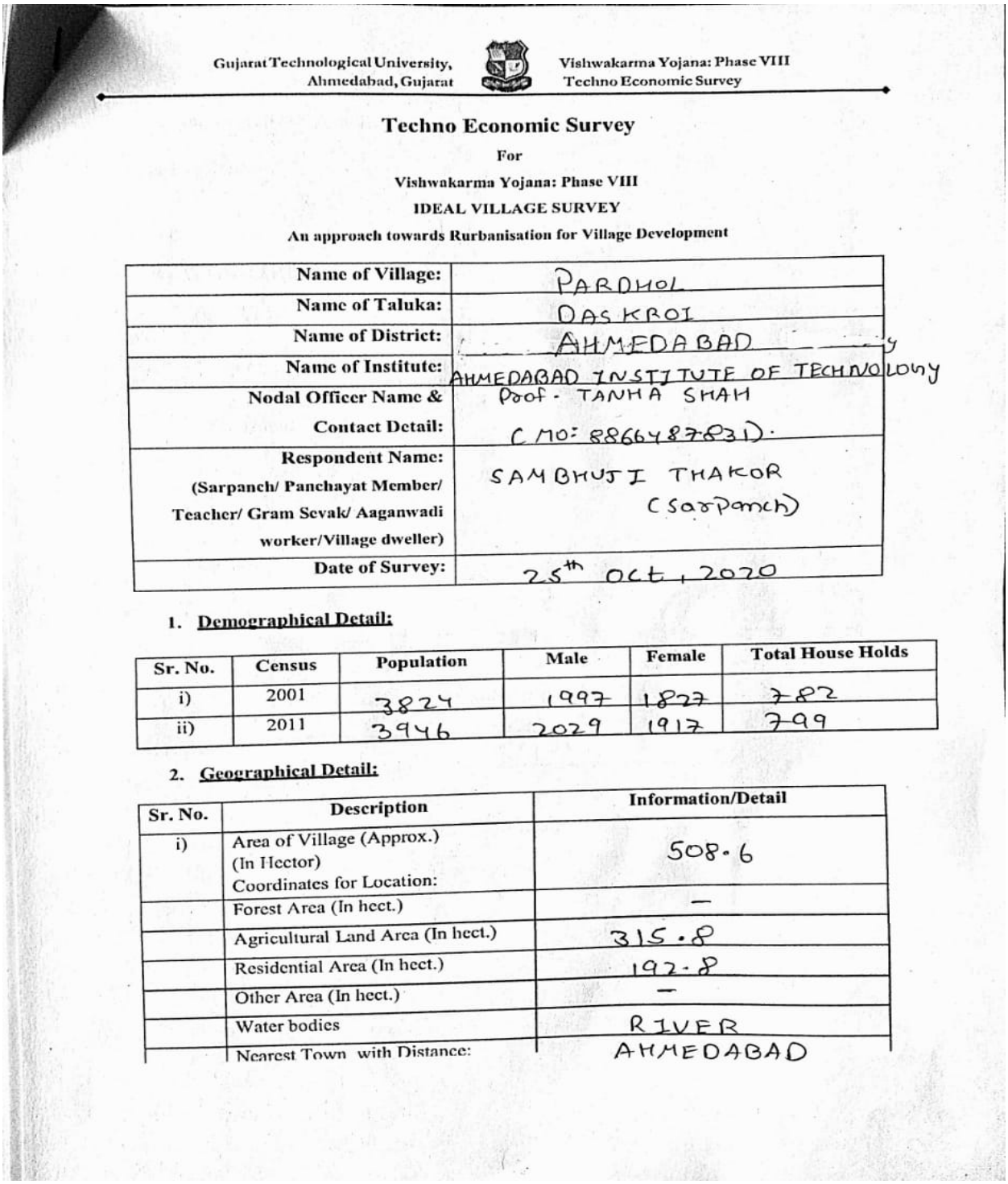
[1] http://www.fao.org/3/a-i6583e.pdf
[2] Moller, J. (2010). A Versatile Technology in automation of agriculture machinery. Computer virsion, 17.
[3] Clint Richards, T. (2017). Japan's Agriculture Dilemma. [online] The Diplomat. Available at: https://thediplomat.com/2014/09/japans-agriculture-dilemma .
[4] Anon, (2017). International Journal of Science and Research (IJSR). [online] Available at: https://pdfs.semanticscholar.org/e560/202dd4acba3429bc64deb811e67f20d6abbc.
[5] Jee.ro. (2017). Cite a Website - Cite This For Me. [online] Available at: http://www.jee.ro/covers/art.php?issue=WK1446219610W56338f5a49ec9
[6] Source: http://www.electronicshub.org/automatic-plant-irrigation-system/
[7] Iosrjournals.org. (2017). Cite a Website - Cite This For Me. [online] Available at: http://www.iosrjournals.org/iosr-jmce/papers/vol11-issue4/Version-1/I011414955 .pdf
[8] Anon, (2017). International Journal of Science and Research (IJSR). [online] Available at: http://ijcsit.com/docs/Volume%206/vol6issue06/ijcsit20150606104 .pdf
[9] SSRG, S. (2017). Engineering Science and Technology Journals, SSRG International Journal. [online] Internationaljournalssrg.org. Available at: http://www.internationaljournalssrg.org
[10] Scribd. (2017). Automatic Irrigation System on Sensing Soil Moisture Content | Irrigation | Soil. [online] Available at: https://www.scribd.com/document/362464538/Automatic-Irrigation-System-onSensing-Soil-Moisture-Content.
[11] Arresearchpublication.com. (2017). Cite a Website - Cite This For Me. [online] Available at: http://www.arresearchpublication.com/images/shortpdf/1478954748_161_ijeee .pdf
[12] Ijcit.com. (2017). Cite a Website - Cite This For Me. [online] Available at: https://www.ijcit.com/archives/volume4/issue3/Paper040304 .pdf
[13] Anon, (2017). Embedded Systems and Robotics with Open Source Tools. [online] Available at: https://vigyanashram.files.wordpress.com/2015/05/plant-watering-system .pdf
[14] Vagulabranan, R., Karthikeyan, M., & Sasikala, V. (2016). Automatic Irrigation System on Sensing Soil Moisture Content. International Research Journal of Engineering and Technology (IRJET), 3.
[15]Dr. Al Humairi, A. (2016). Introduction to Arduino. Embedded Systems Course Material. 45
[16] Arduino.cc. (2018). Arduino - LiquidCrystal: https://www.arduino.cc/en/Reference/LiquidCrystal .
[17] Arduino Project Hub. (2018). Arduino Bluetooth Basic Tutorial: https://create.arduino.cc/projecthub/user206876468/arduino-bluetooth-basic-tutorial-d8b737 .
[18] Arduino.cc. (2018). Arduino – SD https://www.arduino.cc/en/Reference/SD
[19] Psomas, S. (2007). The Five Competencies of User Experience Design :: UXmatters. Uxmatters.com. Retrieved 16 May 2017, from http://www.uxmatters.com/mt/archives/2007/11/the-fivecompetencies-of-user-experience-design.php
[20] Arduino.cc. (2018). Arduino – Introduction: https://www.arduino.cc/en/Guide/Introduction .
[21] Instructables.com. (2018). Arduino Soil Moisture Sensor: http://www.instructables.com/id/ArduinoSoil-Moisture-Sensor/

[22] (White), B., Pack), J., TMP36, T., SMD, A. and Arduino, S. (2018). SIK Experiment Guide for Arduino - V3.2 - learn.sparkfun.com. [online] Learn.sparkfun.com.: https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-7-reading-atemperature-sensor .
[23] Electronics Hub. (2018). Arduino Light Sensor: https://www.electronicshub.org/arduino-light-sensor/ .
[24] Instructables.com. (2018). WATER LEVEL INDICATOR USING ARDUINO: http://www.instructables.com/id/WATER-LEVEL-INDICATOR-USING-ARDUINO/ .
[25] Goodluckbuy.com. (2018). 12V DC Cooling Brushless Motor Water Pump 840mA, 4.0M $24.10 Free Shipping @GoodLuckBuy.com. [online]: http://www.goodluckbuy.com/12v-dc-cooling-brushlessmotor-water-pump-840ma-4-0m.html [Accessed 17 May 2018].
[26] Appinventor.mit.edu. (2018). About our new MIT App Inventor logo | Explore MIT App Inventor. [online] Available at: http://appinventor.mit.edu/explore/blogs/karen/2017/08/about.html [Accessed 23 May 2018]. [27] http://www.worldbank.org/en/news/feature/2012/05/17/india-agriculture-issues-priorities
[28] Clint Richards, T. (2018). Japan's Agriculture Dilemma. Available at: https://thediplomat.com/2014/09/japans-agriculture-dilemma/
[29] L. Prisilla, P.S.V. Rooban and L. Arockiam, "A novel method for water irrigation system for paddy fields using ANN," International Journal of Computer Science and Network, Vol.1, No. 2, April 2012.
[30] L. Longchang and W. Yanjun, "Pipeline Water Delivery Technology," China Water Power Press, pp. 33-35, March 1998.
[31] (2012) Banglapedia. [Online]. Available: http://www.banglapedia.org/httpdocs/HT/I_0095.HTM
[32] M.A. Salam, A. Ahmed, H. Ziedan, K. Sayed, M. Amery and M. Swi fy "A Solar-Wind Hybrid Power System for Irrigation in Toshka Area," IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies, pp. 1-6, Dec. 2011
[33] M. Dursun and S. Ozden, "A Prototype of PC Based Remote Control of Irrigation," International Conference on Environmental Engineering and Applications, Singapore, pp. 255-258, Sept. 2010.
[34] N.M. Sheikh, "Efficient Utilization of Solar Energy for Domestic Applications" 2nd International Conference on Electrical Engineering, Lahore, Pakistan, pp. 1-3, March 2008.
[35] G. Yang, Y. Liu, L. Zhao, S. Cui, Q. Meng and H. Chen, "Automatic Irrigation System Based on Wireless Network," 8th IEEE International Conference on Control and Automation, pp. 2120-2125, June 2010.
[36] J. Xiaohua and T. Fangpin, "The study and development of system for automatic irrigation," Irrigation and Drainage, Vol.21, No.4, pp. 25-27, Dec. 2002.
[37] C. Yi, "Technology and Application of Water Saving Irrigation," Chemical Industry Press, Beijing, China, pp. 345-349, 2005.
[38] (2012) Garden4less. [Online]. Available: http://www.garden4less.co.uk/automatic_watering_systems.asp
[39] B.C. Lailhacar, M.D. Dukes and G.L. Miller, "Sensor-Based Control of Irrigation in Bermuda grass," ASAE Annual International Meeting,

ASAE Tampa Convention Center, Tampa, Florida, pp. 1-14, July 2005.
[40] Y. Genghuang, G. Kairong, and L. Yawei, "Development of controller for automatic irrigation based on GSM network," Journal of Shenyang Agricultural University, Vol.36, No.6, pp. 753-755, Dec. 2005.
[41] H. Wu-quan, C. Ming-ke, W. Yu-bao and W. Xiao-jian, "Automatic Water Supply Control System of Graded Constant Pressure by Variable Frequency Speed and Its Application to Pipeline Irrigation," 2nd WRI Global Congress on Intelligent Systems, Vol.1, pp. 385-388, Dec. 2010.
[42] L. Wenyan, "Design of Wireless Water-Saving Irrigation System Based on Solar Energy," International Conference on Control, Automation and Systems Engineering, pp. 1-4, July 2011.
[43] [Online]. Available: http://www.scribd.com/doc/78645295/GSM-Based-Automatic-Irrigation-Water-Controller.
[44] S. Zeng, G. Qi, Q. Liu and Z. Wang, "Mobile irrigation systems for arid areas of Northeast China," International Conference on Water-Saving Agriculture and Sustainable Use of Water and Land Resources, Shaanxi, China, Oct. 2003.
[45] Yiming Zhou, Xianglong Yang, Liren Wang, Yibin Ying, A wireless design of low-cost irrigation system using ZigBee technology, International Conference on Networks Security, Wireless Communications and Trusted Computing , IEEE 2009.
[46] Zhang xihai, Zhang changli Fang junlong. Smart Sensor Nodes for Wireless Soil Temperature Monitoring Systems in Precision Agriculture 2009.
[47] R.Suresh, S.Gopinath, K.Govindaraju, T.Devika, N.SuthanthiraVanitha, "GSM based Automated Irrigation Control using Raingun Irrigation System", International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 2, February 2014.
[48] Pavithra D.S, M. S .Srinath, "GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by Using an Android Mobile", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) Vol 11, Issue I, Jul-Aug 2014, pp 49-55.
[49] LaxmiShabadi, NandiniPatil, Nikita. M, Shruti. J, Smitha. P&Swati. C, and Software Engineering, Volume4, Issue 7, July 2014. "Irrigation Control System Using Android and GSM for Efficient Use of Water and Power",International Journal of Advanced Research in Computer Science
[50] Shiraz Pasha B.R., Dr. B Yogesha, "Microcontroller Based Automated Irrigation System", The International Journal Of Engineering And Science (IJES), Volume3, Issue 7, pp 06-09, June2014.
[51] S. R. Kumbhar, Arjun P. Ghatule, "Microcontroller based Controlled Irrigation System for Plantation", Proceedings of the International MultiConference of Engineers and Computer Scientists 2013VolumeII, March 2013.
[52] Yunseop (James) Kim, Member, IEEE, Robert G. Evans, andWilliam M. Iversen, "Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network", IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, Volume 57, Number 7, JULY 2008.

Chapter 12: Annexure:-

12.1 Scanned copy for Ideal village:



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:	PARDHOL
Name of Taluka:	DASKROI
Name of District:	AHMEDABAD
Name of Institute:	AHMEDABAD INSTITUTE OF TECHNOLOGY
Nodal Officer Name & Contact Detail:	Prof - TANHA SHAH (M0: 8866487831).
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SAMBHUJI THAKOR (Sarpanch)
Date of Survey:	25th Oct, 2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	3824	1997	1827	782
ii)	2011	3946	2029	1917	799

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	508.6
	Forest Area (In hect.)	—
	Agricultural Land Area (In hect.)	315.8
	Residential Area (In hect.)	192.8
	Other Area (In hect.)	—
	Water bodies	RIVER
	Nearest Town with Distance:	AHMEDABAD

3. Occupational Details:

Name of Three Major Occupation groups in Village	1.	Farming
	2.	Labour work
	3.	Business

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	✓		
	• Tube well/ Borehole	yes	✓		
	• River/ Canal/ Spring/ Lake/ Pond	yes	✓		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: (200000L)	✓		
	Underground Sump	Capacity: (150000L)	✓		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	yes	✓		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	closed	✓		
	If Open than Pucca / Kutchcha	pucca			
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	In River			

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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	yes	✓		
	Main road	yes	✓		
	Internal streets	yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	15 km			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO (Nadoda)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	yes (1.5 km)	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	yes	✓		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. (more than 6 hrs)	✓		
	Power supply for Domestic Use	24 hrs	✓		
	Power supply for Agricultural Use	8 hrs	✓		
	Power supply for Commercial Use	24 hrs	✓		
	Road/ Street Lights	yes	✓		

	Electrification in Government Buildings/ Schools/ Hospitals	24 hrs	✓		
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	yes	✓		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	yes (10 No.)	✓		
	Location Condition	un hygie-ne	✓		
	Community Toilet (With bath/ without bath facilities)	yes (without bath)	✓		
	Solid & liquid waste Disposal system available	No			
	Any facility for Waste collection from road	No			
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	well & Tube well	✓		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Both (85%) Pucca (15%) Kutcha	✓		

5. **Social Infrastructural Facilities:**

Sr.	Descriptions	Information/	Adequate	Inadequate	Remarks

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K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	yes	✓		1 CHC
	Private Clinic/Private Hospital/ Nursing Home	yes	✓		1 private Clinic
	If any of the above Facility is not available in village than approx. distance from village: 2.5 kms.				
Suggestions if any:					

L.	**Education Facilities:**				
	Aaganwadi/ Play group	yes	✓		
	Primary School	yes	✓		
	Secondary school	yes	✓		
	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: 2.5 kms.				
Suggestions if any:					

M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV)	yes	✓		1 (private)

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	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			
	Public Garden Location: Condition:	No			
	Village Pond Location: Condition:	yes	✓		
	Recreation Center Location: Condition:	NO			
	Cinema/ Video Hall Location: Condition:	NO			
	Assembly Polling Station Location: Condition:	No			
	Birth & Death Registration Office Location: Condition:	yes (In panchayat building)	✓		

If any of the above Facility is not available in village than approx. distance from village: 2.5 kms.

Suggestions if any:

N.	Other Facilities				
	Post-office	yes	✓		
	Telecommunication	NO			

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	General Market	No			
	Shops (Public Distribution System)	yes	✓		
	Panchayat Building	yes	✓		
	Pharmacy/Medical Shop	NO			
	Bank & ATM Facility	yes	✓		1 Bank 1 ATM
	Agriculture Co-operative Society	yes			Krushi Sahkari Mandali
	Milk Co-operative Soc.	yes			
	Small Scale Industries	No			
	Internet Cafes/ Common Service Center/Wi Fi	No			
	Other Facility	NO			
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			
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	NO			
Q.	Any Other	NO			

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	NO

Gujarat Technological University, Ahmedabad, Gujarat — Vishwakarma Yojana: Phase-VI, Technical Component: Survey

Recent Projects going on for Development of Village	- Pradhan Mantri yoj Na - Viklang Sahay
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)	yes	- At Anganwadi - At water tank
2.	Additional Information Requirement	NO	

9. Smart Village Proposal Design

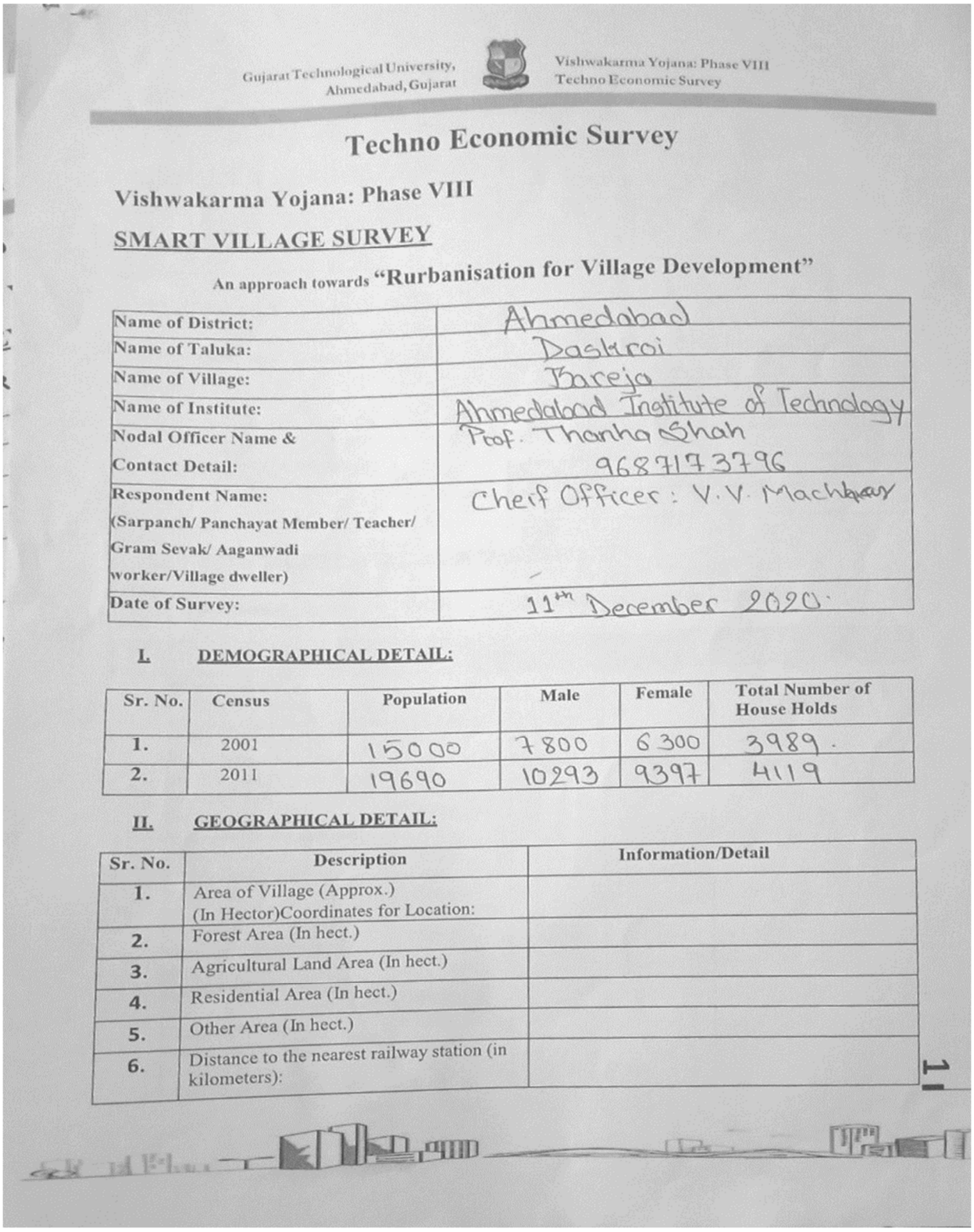
Sr. No.	Descriptions	Information Detail	Remarks
1.	Is their Any thing for the village enhancement possible?	yes (Green house Building).	

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

[illegible]
Contact No – 079 23267588
Email ID: rurban@gtu.edu.in

સરપંચ
પરઠોલ ગ્રામ પંચાયત
દસ્ક્રોઈ, જિ. અમદાવાદ.

12.2 Scanned copy for Smart village:



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:	Ahmedabad
Name of Taluka:	Daskroi
Name of Village:	Bareja
Name of Institute:	Ahmedabad Institute of Technology
Nodal Officer Name & Contact Detail:	Prof. Tanha Shah 9687173796
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Cherf Officer : V.V. Machhar
Date of Survey:	11th December 2020.

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	15000	7800	6300	3989.
2.	2011	19690	10293	9397	4119

II. GEOGRAPHICAL DETAIL:

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

7.	Name of Nearest Town with Distance:	Ahmedabad, Kheda
8.	Distance to the nearest bus station (in kilometers):	Bareja Chokdi (800m)
9.	Whether village is connected to all road for the any facility or town or City?	

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Agriculture
	2.	Industries
	3.	Information Technology
Major crops grown in the village:	1.	
	2.	
	3.	

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	Yes			
	Public Tap/Standpipe				
	Tube Well Or Bore Well				
2.	**DUG WELL**				
	Protected Well	Yes			
	Un Protected Well	(Protected)			
3.	**WATER FROM SPRING**				
	Protected Spring	NO			
	Unprotected Spring	NO			
	Rainwater	yes			
	Tanker Truck	yes			
	Cart With Small Tank	yes			
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**				
	Irrigation Channel	yes			
	Bottled Water	NO			
	Hand Pump	yes			
	Other(Specify)Lake/ Pond	yes			

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

B.	Water Tank Facility				
	Overhead Tank	Capacity:	Yes		
	Underground Sump	Capacity:	Yes		

Suggestions if any:

C.	The Type of Drainage Facility				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Yes Yes			

Suggestions if any:

D.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	Yes			
	Main road	Yes			
	Internal streets	Yes			
	Nearest NH/SH/MDR/ODR Dist. in kms.				

Suggestions if any:

E.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes			

Suggestions if any:

F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes			

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use				
	Power supply for Agricultural Use				
	Power supply for Commercial Use				
	Road Street Lights	Yes			
	Electrification in Government Buildings/ Schools/ Hospitals	Yes			
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	Yes			

Suggestions if any:

G.	Sanitation Facility				
	Public Latrine Blocks If available than Nos.	Yes			
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	Yes			
	Solid & liquid waste Disposal system available	NO			
	Any facility for Waste collection from road	Yes			Door to Door waste collection

Suggestions if any:

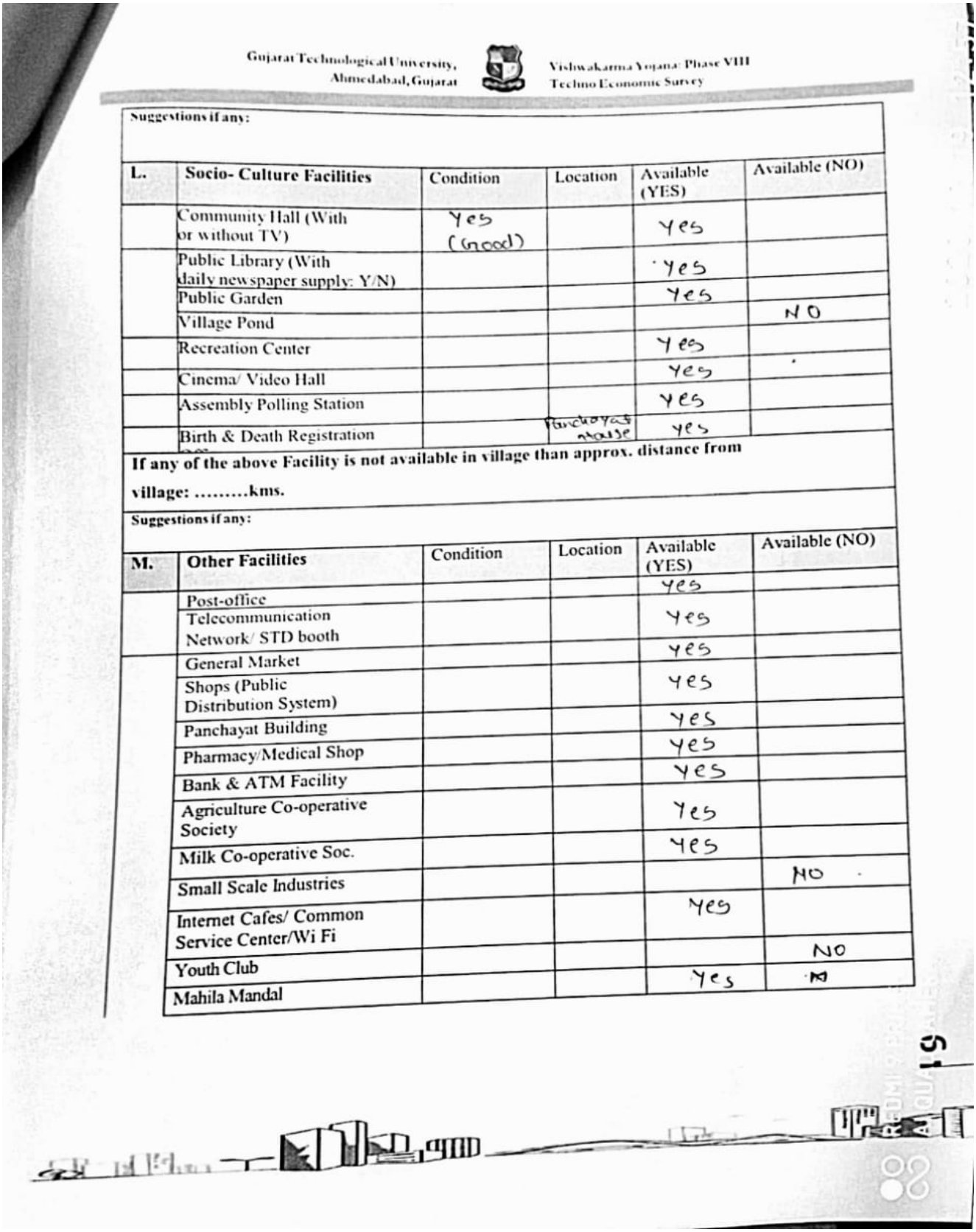
H.	Main Source of Irrigation Facility:				
	TANK/POND	Yes			
	STREAM/RIVER	No			
	CANAL	NO			
	WELL	Yes			
	TUBE WELL.	Yes			
	OTHER (SPECIFY)	NO			

Suggestions if any:

I.	Housing Condition:				
	Kutchha/Pucca (Approx. ratio)	80·1·Pucca 20·1·Kutchha			

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes			
	Sub-Centre	Yes			
	PHC	Yes			
	BLOCK PHC	Yes			
	CHC/RH	Yes			
	District/ Govt. Hospital	Yes			
	Govt. Dispensary	Yes			
	Private Clinic	Yes			
	Private Hospital/ Nursing Home	Yes			
	AYUSH Health Facility	NO			
	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	NO			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Yes			
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

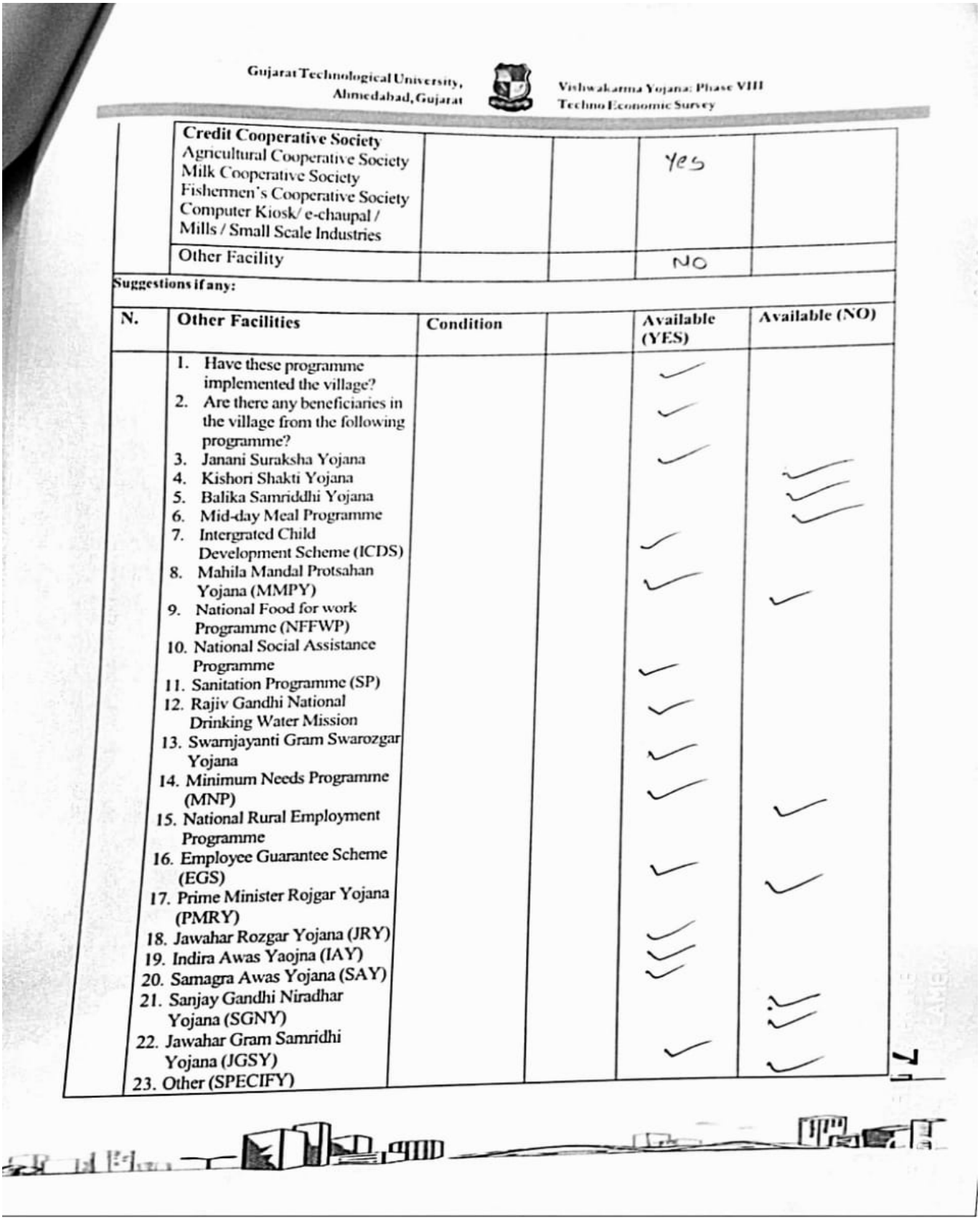
Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Yes (Good)		Yes	
	Public Library (With daily newspaper supply: Y/N)			Yes	
	Public Garden			Yes	
	Village Pond				NO
	Recreation Center			Yes	
	Cinema/ Video Hall			Yes	
	Assembly Polling Station			Yes	
	Birth & Death Registration		Panchayat House	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	
	Telecommunication Network/ STD booth			Yes	
	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				NO
	Internet Cafes/ Common Service Center/Wi Fi			Yes	
	Youth Club				NO
	Mahila Mandal			Yes	NO



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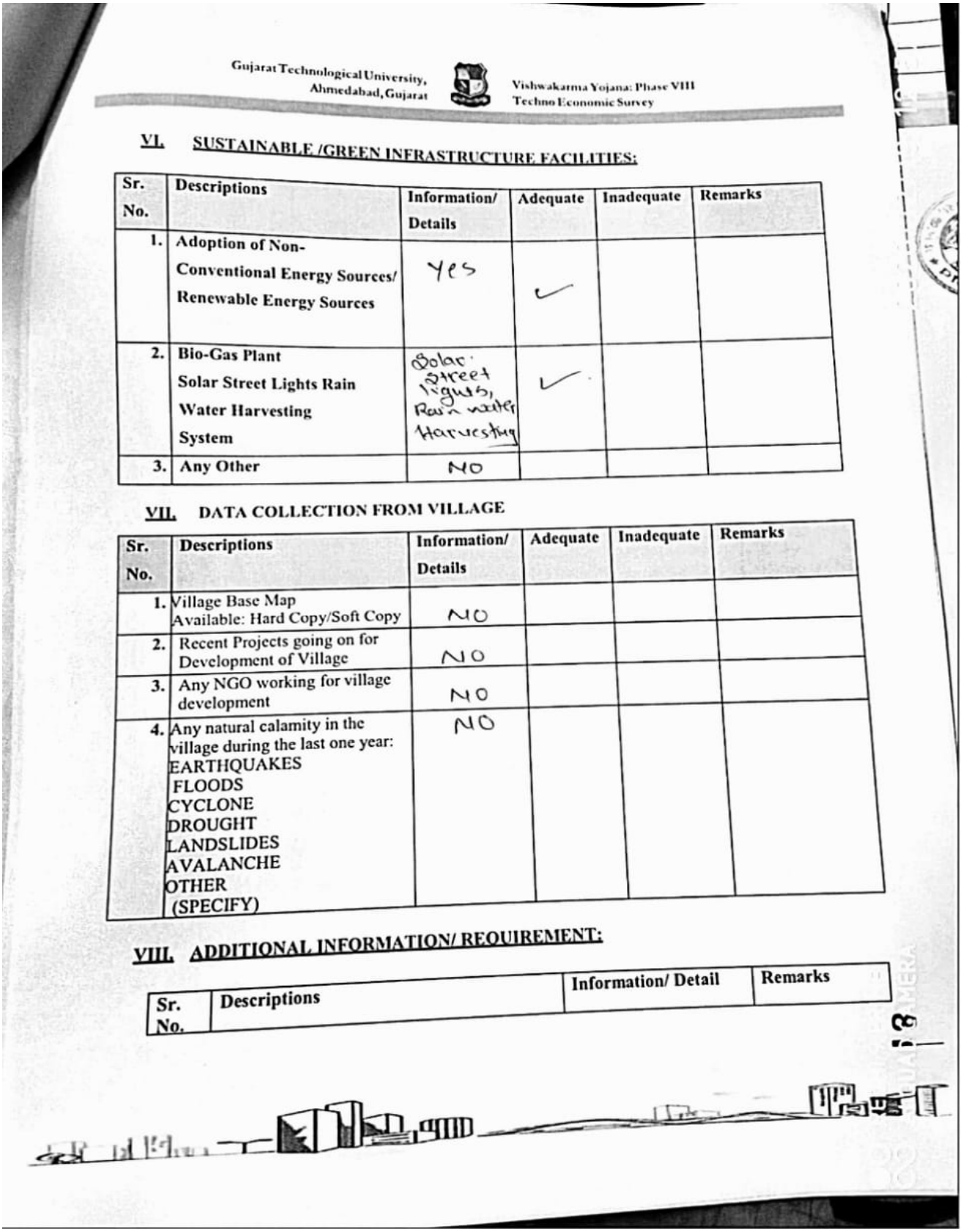
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

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



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	NO			
2.	Recent Projects going on for Development of Village	NO			
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	YES	
2.	Additional Information/ Requirement	NO	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	—	

IX. Smart Village / Heritage Details

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

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

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

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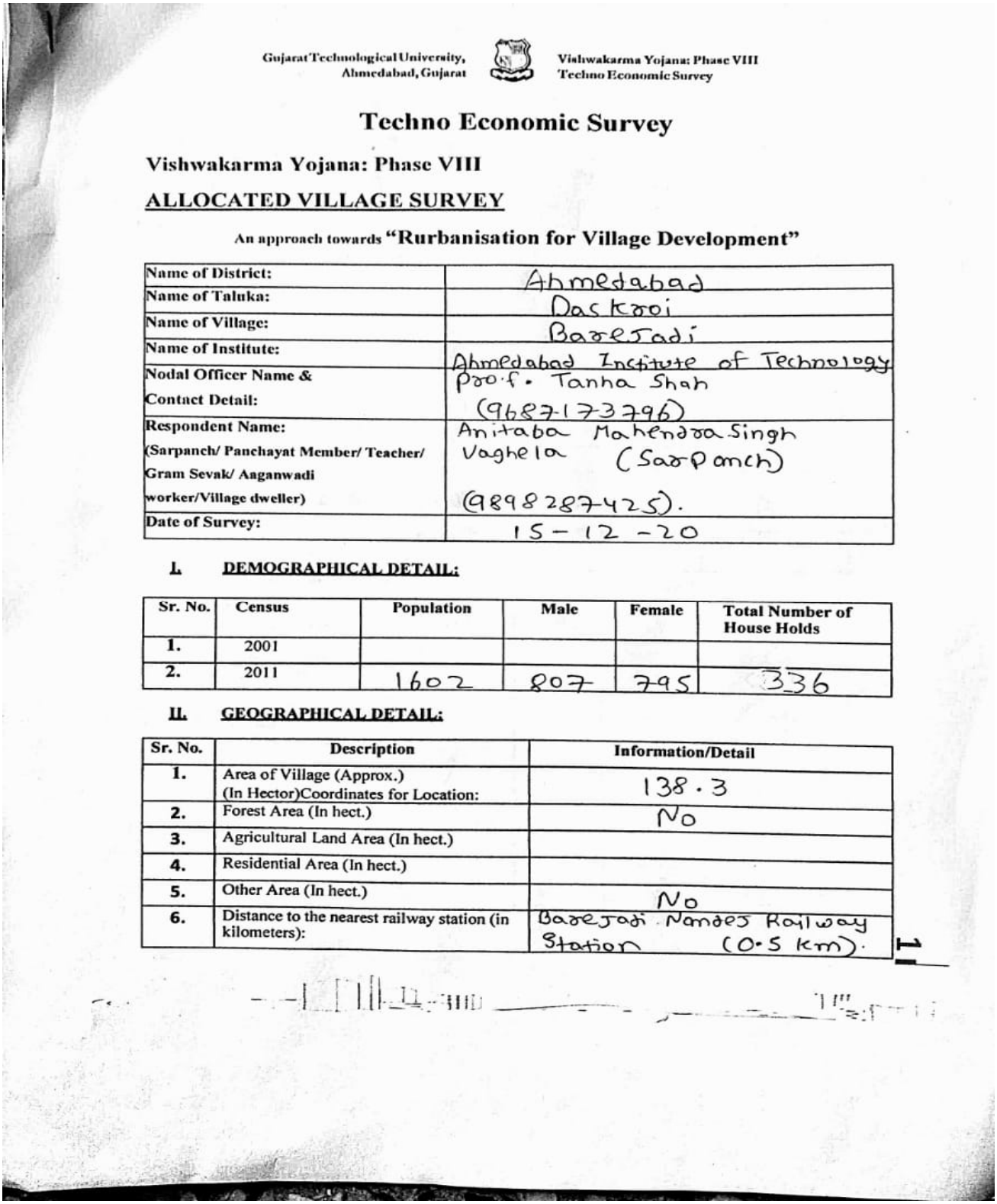
બારેજા નગર સેવા સદન

12.3 Scanned copy for Allocated village:



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Ahmedabad
Name of Taluka:	Daskroi
Name of Village:	Barejadi
Name of Institute:	Ahmedabad Institute of Technology
Nodal Officer Name & Contact Detail:	Prof. Tanha Shah (9687173796)
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Anitaba Mahendrasingh Vaghela (Sarpanch) (9898287425).
Date of Survey:	15-12-20

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	1602	807	795	336

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	138.3
2.	Forest Area (In hect.)	No
3.	Agricultural Land Area (In hect.)	
4.	Residential Area (In hect.)	
5.	Other Area (In hect.)	No
6.	Distance to the nearest railway station (in kilometers):	Barejadi Nandej Railway Station (0.5 km).

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7.	Name of Nearest Town with Distance:	Ahmedabad (20Km)
8.	Distance to the nearest bus station (in kilometers):	Nandej Barejadi Railway Station Bus Stop (0.5Km)
9.	Whether village is connected to all road for the any facility or town or City?	No

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Farming
	2.	labour work
	3.	Private Job.

Major crops grown in the village:	1.	Wheat
	2.	Arenta
	3.	Pearl Millet.

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	No			
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	NO			
	Rainwater	yes			
	Tanker Truck	yes			
	Cart With Small Tank	yes			
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	yes			

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Vishwakarma Yojana: Phase VIII
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	Other(Specify)Lake/ Pond	NO			
Suggestions if any:					
B.	Water Tank Facility	(1,50000Lit)			
	Overhead Tank	Capacity:	✓		2 tank
	Underground Sump	Capacity:	✓		
Suggestions if any:					
C.	The Type of Drainage Facility				
	A. UNDERGROUND DRAINAGE	yes			
Suggestions if any:					
D.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	yes	✓		
	Main road	yes	✓		
	Internal streets	yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH 144 (0.5km)	✓		
Suggestions if any:					
E.	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	✓		Barejadi Railway Station Bus Stop
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	yes	✓		Auto & private vehicle, etc
Suggestions if any:					
F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Gov more than 6 hrs	✓		UGVCL

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Vishwakarma Yojana: Phase VIII
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	Power supply for Domestic Use	24 hrs	✓		
	Power supply for Agricultural Use	8 hrs	✓		
	Power supply for Commercial Use	24 hrs	✓		
	Road/ Street Lights	yes	✓		Solar light / LED
	Electrification in Government Buildings/ Schools/ Hospitals	yes			
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	yes			
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			
	Any facility for Waste collection from road	NO			
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND	yes	✓		
	STREAM/RIVER	NO			
	CANAL				
	WELL				
	TUBE WELL	yes			
	OTHER (SPECIFY)				
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	70% Pucca 30% Kaccha	✓		

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	yes	✓		1 Angarwadi
	Sub-Centre				
	PHC				
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital	yes	✓		1 Gov Hospital
	Govt. Dispensary				
	Private Clinic				
	Private Hospital/ Nursing Home				
	AYUSH Health Facility	yes	✓		
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: ....2....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	NO	✓		
	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			

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	If any of the above Facility is not available in village than approx. distance from village: ..2....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	yes			
	Recreation Center	NO			
	Cinema/ Video Hall	NO			
	Assembly Polling Station	NO			
	Birth & Death Registration Office	yes			
If any of the above Facility is not available in village than approx. distance from village: ..2....kms.					
Suggestions if any:					
M.	**Other Facilities**	Condition	Location	Available (YES)	Available (NO)
	Post-office	No			
	Telecommunication Network/ STD booth	No			
	General Market	NO			
	Shops (Public Distribution System)	yes		V	
	Panchayat Building	yes		V	
	Pharmacy/Medical Shop	No			
	Bank & ATM Facility	NO			
	Agriculture Co-operative Society	yes			
	Milk Co-operative Soc.	yes			
	Small Scale Industries	NO			
	Internet Cafes/ Common Service Center/Wi Fi	NO			
	Youth Club	NO			
	Mahila Mandal	yes			

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	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				✓
	5. Balika Samriddhi Yojana	yes			
	6. Mid-day Meal Programme				
	7. Intergrated Child Development Scheme (ICDS)	yes		✓	
	8. Mahila Mandal Protsahan Yojana (MMPY)	yes			✓
	9. National Food for work Programme (NFFWP)				
	10. National Social Assistance Programme				
	11. Sanitation Programme (SP)	yes		✓	
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana				
	14. Minimum Needs Programme (MNP)				
	15. National Rural Employment Programme				
	16. Employee Guarantee Scheme (EGS)				
	17. Prime Minister Rojgar Yojana (PMRY)				
	18. Jawahar Rozgar Yojana (JRY)				
	19. Indira Awas Yaojna (IAY)	yes		✓	
	20. Samagra Awas Yojana (SAY)				
	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			
3.	Any Other	NO			

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	NO			
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			

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Vishwakarma Yojana: Phase VIII
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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	There are need to repair road office, hospital and bank building	
2.	Additional Information/ Requirement	No	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	There are two three cleaning in the village	

IX. Smart Village / Heritage Details

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

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:
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Contact No – 079-23267588
Email ID: rurban@gtu.edu.in

બારેજડી ગ્રામ પંચાયત
તા. સાણંદ, જિ. અમદાવાદ

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12.4 Gap Analysis:

Facilities	Planning commission /UDPFI Norms	Village	BAREJADI	
		Population		1602
		Existing	Required as per norms	
Social Infrastructural Facilities				
Education				
Aganwadi	Each or per 2500 population	1	1	0
Primary School	Each per 2500 population	1	1	0
Secondary School	Per 7500 population	0	0	0
Higher Secondary School	Per 15000 population	0	0	0
College	Per 125000 population	0	0	0
Technical training Institute	Per 100000 population	0	0	0
Agriculture Research center	Per 100000 population	0	0	0
Health Facility				
Govt/ Panchayat dispensaries or Sub PHC or Health center	Each village	0	1	-1
PHC and CHC	Per 20000 population	0	0	0
Child welfare and Maternity hall	Per 10000 population	0	0	0
Hospital	Per 1 lakh population	0	0	0
Public Latrines	One for fifty families(if toilet is not there in home, especially for slum pockets and kutccha house)	0	1	-1
Physical Infrastructure Facilities				
Transportation		**Adequate**	**Inadequate**	
Pucca village approach road	Each village	yes		
Bus/ Auto stand provision	All village connected by personal transport		Yes	

Drinking Water (min 70 lpcd)		**Adequate**	**Inadequate**	
Overhead tank	One third of total demand	yes		
Underground Sump	Tow third of total demand	yes		
Drainage Network		**Adequate**	**Inadequate**	
Open			Yes	
Cover		yes		
Waste Management System		**Adequate**	**Inadequate**	Inadequate
Electricity Network		**Adequate**	**Inadequate**	Adequate

12.5 Summary of All Villages Designs as Part-I and Part-II:

Sr no.	Village	Discipline	Part I	Part II
1.	BAREJADI	Civil & ELECTRICAL	1. Hospital 2. Post Office 3. Bank 4. Solar irrigation system 5. Solar RO system 6. Automatic Irrigation system	7. Community Hall Plus Theater 8. Public Garden 9. Vegetable Market 10. Solar A.C for Residential and Public Building 11. Agricultural Pest and Disease Monitoring Based on Internet-of-Things and Unmanned Aerial Vehicles 12. Design and Implementation of Farm Monitoring and Security System
2.	KANERA	Civil & ELECTRICAL	•Cement concrete road •Prathmic Aarogra kendra •Bio gas plant •Auto intensity of street lights •Water level controller	• Toilet Renovation • Green House Farming • Maternity Home • Temple • Mini Market
3.	ZANU	Civil & ELECTRICAL	•Entrance gate •Praathmik aarogy kendra •Post office (waste plastic Lego bricks panels) •Solar street LED light version •E-waste(electronic)	• Sub center • Compost pit • Fencing of human • Chabutro • E-Center

12.6 Drawings A3(If , A4 design is not visible than only)

- The designs that we proposed for the possible development of our allocated village Barejadi both fields design whether electrical or civil both designs are clearly visible
- The designs proposed in the Chapter 8 of our report are Visible, clear and one can thoroughly get a fairly understanding of it.

12.7Summary of Good photographs:

Fig60:BarejadiAnganwadi

Fig61:PrivateHospital

Fig62:UnderwaterTank

Fig63:Dairy


NATIONAL HEALTH MISSION
આયુષ્યમાન ભારત
હેલ્થ એન્ડ વેલનેસ સેન્ટર
બારેજડી


BHUDARPURA 02
ભુદરપુરા ૦૨
BAREJA 08
બારેજા ૦૮
BAREJADI 04
બારેજડી ૦૪
REDMI NOTE 9 PRO
AI QUAD CAMERA

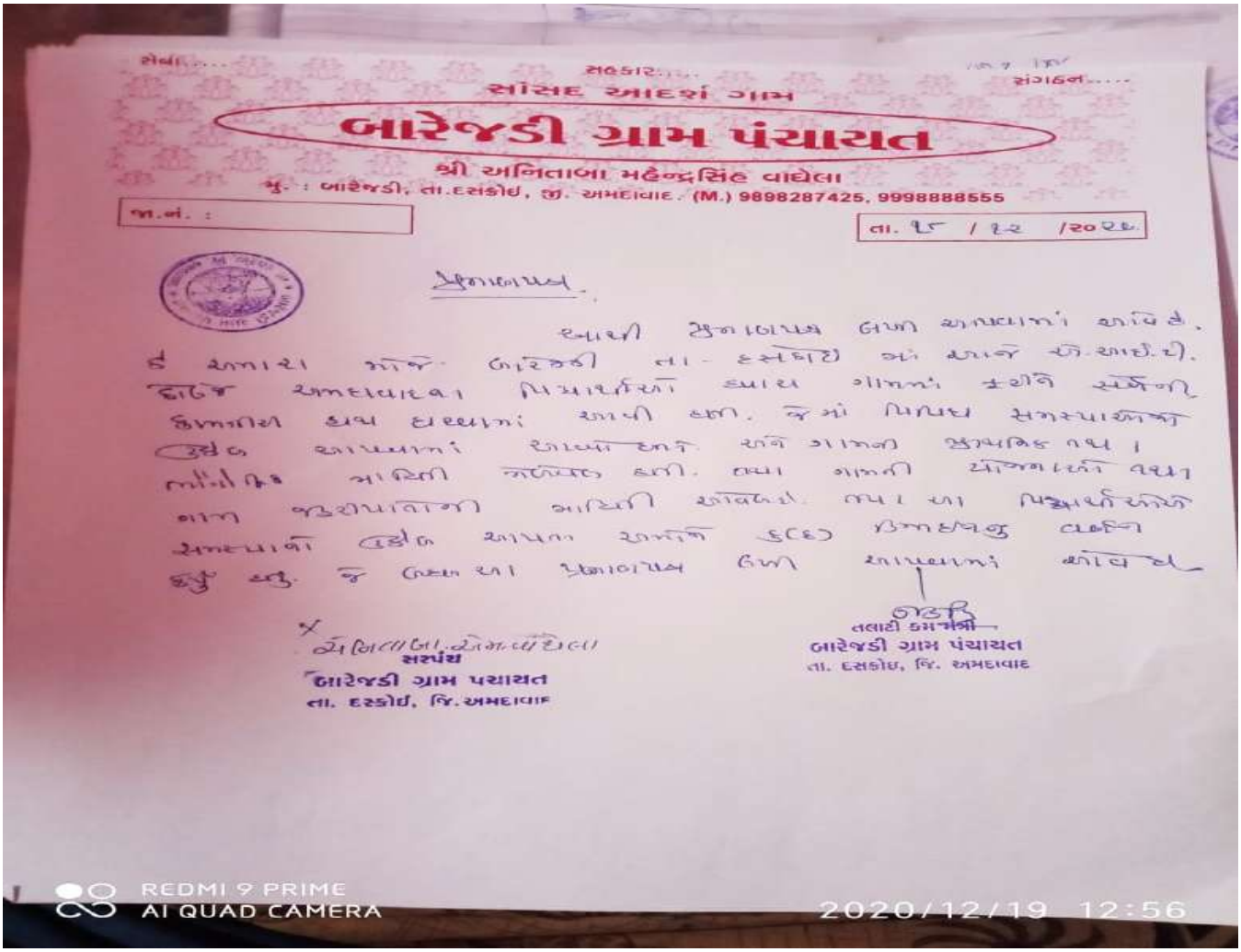
12.8 Village interaction Report:

A Report on Interactive Presentation (VishwakarmaYojana: Phase- VI) At BAREJADI Village, Ahmedabad District.

24th October, 2020

As per the guidelines given by the GTU we had visited to our allocated village BARAEJADI.
On that day we meet with the sarpanch of village Mr. Mahendra singh, he very politely welcome us and ask why we came. Then we told him that we are from AIT collage and we come regarding visvakarma yojna. After that we ask him about the current situation of village and also take his opinion on the development. So after the whole discussion he takes us to village visit and show various thing in his village .
After the village we tell him some project that we going to work, and he impress by our idea and also appreciate our work.

12.9 Sarpanch etter:



13.1.1 Sustainable design:
Movie Theater Plus Community Hall

Fig. No.64 : Plan, elevation & section for Movie Theater – The Village

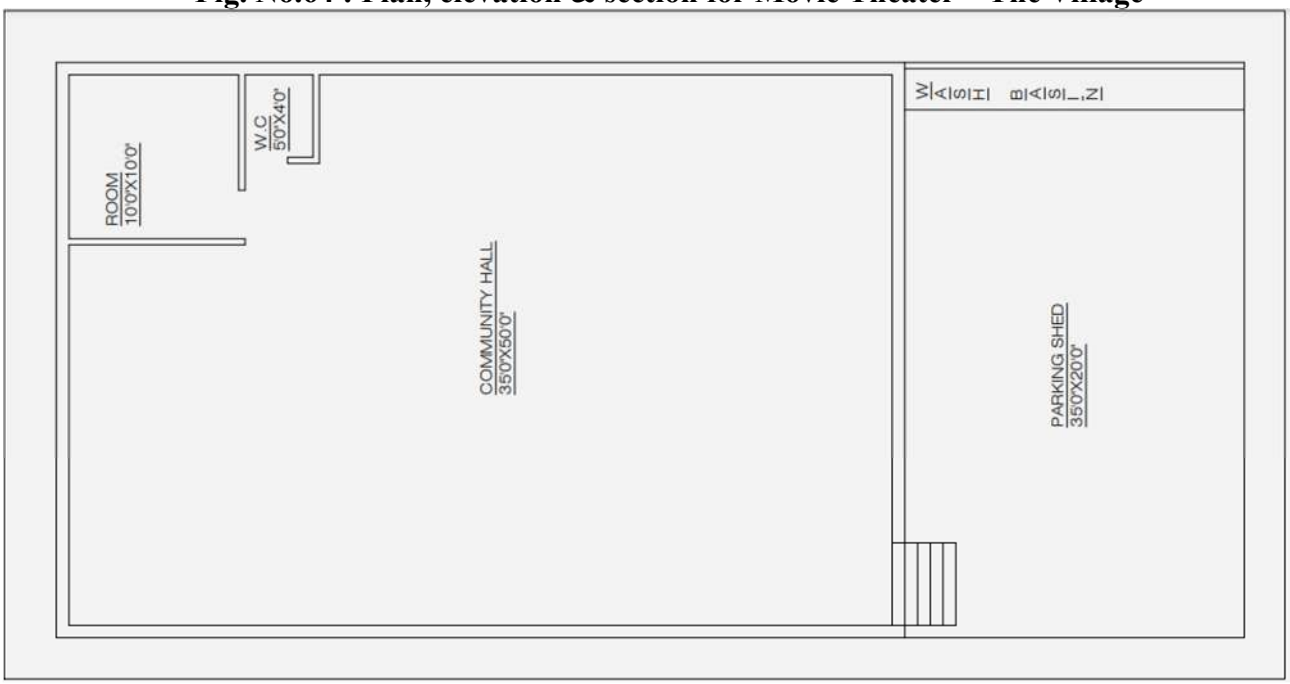


Table No.26 : Measurement sheet for Room in Movie Theater – The Village

Sr. No.	Items	No.	Length	Width	Height	Quantity	Total Quantity
1	Excavation for foundation in ordinary strata	1	10.78	0.9	1.1	10.6722	10.6722 m^3
2	Providing and laying B.B.C Work (1:4:8)	1	10.78	0.9	0.3	2.91	6.5716 m^3
	1st Layer	1	10.78	0.6	0.2	1.2936	
	2nd Layer	1	10.78	0.5	0.2	1.078	
	3rd layer	1	10.78	0.4	0.3	1.29	
3	Total BM in Foundation						1.98 m^3
	BM in Plinth	1	10.78	0.23	0.8	1.98	
	Total BBC + BM Footing						0.675 m^3
	Providing and Laying Floor	1	3	3	0.075	0.675	
4	Estimate of super structure						0.743 m^3
	Providing constructing BM CM (1:6)	1	10.78	0.23	3	0.743	
5	RCC Work						8.00 m^3

	RCC (1:1.5:3) Slab Work	1	10.78	5.56	0.15	8.99	
6	Deduction of opening in structure						0.434 m^3
	door	1	0.9	0.23	2.1	0.434	
7	Providing and Laying CM (1:4) 10mm Thick for Plastering						
	Long wall	2	10.78	1	3	64.68	101.7982 m^3
	Short Wall	2	5.56	1	3	33.36	
	Top Face	1	16.34	0.23	1	3.7582	

ABSTRACT SHEET (ROOM)

Table No. 27 : Abstract sheet for Room in Movie Theater – The Village

Sr. No.	Item	Quantity	Rate	Per	Amount
1	Cement	16.73	310	Bag	5,186/-
2	Sand	33.47	800	m3	26,776/-
3	Aggregate	66.95	1000	m3	66,950/-
4	Brick Masonry	6.3846	2746.7	m3	17,524/-
5	Steel (Beam)	1678	50	Kg	83,900/-
6	Steel (Column)	6701	50	Kg	3,35,050/-
7	Steel (Slab)	8469	50	Kg	4,23,450/-
	Total				Rs.5,58,836/-

ABSTRACT SHEET (HALL)

Table No. 28 : Abstract sheet for Hall in Movie Theater – The Village

No.	Item	Quantity	Rate	Per	Amount
	Cement	1470	310	Bag	4,55,700/-
	Sand	102.85	800	m3	82,280/-
3	Aggregate	205.71	1000	m3	2,05,710/-
4	Brick Masonry	39.87	2746.7	m3	1,09,511/-
5	Steel				
	Beam	2269	50	Kg	1,13,450/-
	Column	9326	50	Kg	4,66,300/-
	Slab	11500	50	Kg	5,75,000/-
7	Carpet	129.36	200	m	25,872/-
8	Chairs	100	55	Piece	5,500/-
	Total				Rs. 5,39,323/-

Table no 29: MEASUREMENT SHEET (HALL)

No.	Items	No.	Length	Width	Height	Quantity	Total Quantity
1	Excavation for foundation in ordinary strata	1	15	0.9	1.1	14.85	14.85 m^3

2	Providing and laying B.B.C Work (1:4:8)	1	15	0.9	0.3	4.05	9.15 m^3
	1st Layer	1	15	0.6	0.2	1.8	
	2nd Layer	1	15	0.5	0.2	1.5	
	3rd layer	1	15	0.4	0.3	1.8	
3	Total BM in Foundation						
	BM in Plinth	1	15	0.23	0.8	2.76	2.76 m^3
	Total BBC + BM Footing						
	Providing and Laying Floor	1	15	24	0.075	27	27 m^3
4	Estimate of super structure						
	Providing constructing BM CM (1:6)	1	15	0.23	3	10.35	10.35 m^3
5	RCC Work						
	RCC (1:1.5:3) Slab Work	1	15	24	0.15	54	54 m^3
6	Deduction of opening in structure						
	Door	1	5.13	0.9	2.1	9.6957	13.90 m^3
	Windows	2	1.3	0.9	1.8	4.212	
7	Providing and Laying CM (1:4) 10mm Thick for Plastering						
	Long wall	2	24	1	3	144	271.8 m^3
	Short Wall	1	15	1	3	45	
	Top Face	1	360	0.23	1	82.8	
	Total plaster work after deduction	0					
	Total carpet area					129.36	129.36
8		Seats in the hall/Sitting area			100	158.862 m2	
		Total stage area			63	63 m2	

ABSTRACT SHEET (TOILET)

Table No.30 : Abstract sheet for Toilet in Movie Theater – The Village

No.	Item	Quantity	Rate	Per	Amount
1	Cement	85	310	Bag	26,350/-
2	Sand	5.983	800	m3	4,787/-
3	Aggregate	11.683	1000	m3	11,683/-
4	Brick Masonry	17.496	2746.7	m3	48,056/-
5	Damp Water Proofing	5.832	350	m3	2,041/-
6	Steel (Beam)	3260	50	Kg	1,63,000/-
	Steel (Column)	6050	50	Kg	20,500/-
	Steel (Slab)	9000	50	Kg	50,000/-
7	Kamods	4	2300	Unit	9,200/-
8	Urinals	5	1300	Unit	6,500/-
9	Basins	3	3000	Unit	9,000/-
				Total	Rs.2,33,117/-

ABSTRACT SHEET (HALL + ROOM + TOILET)

Table No. 31 : Abstract sheet for Overall Cost Movie Theater – The Village

Sr. No.	Description	Amount
1	Hall	Rs. 5,39,323/-
2	Room	Rs. 9,58,836/-
3	Toilet	Rs. 2,33,117/-
Total Amount		Rs. 17,31,276/-
10% contractor charges		Rs. 1,17,127.6/-
5 % extra charges like painters, mixer, transport & labour charges		Rs. 50,563.8/-
Overall Cost		Rs. 25,576,274/-

13.1.2 Sustainable design:

Proposal Planning & Design of Public Garden

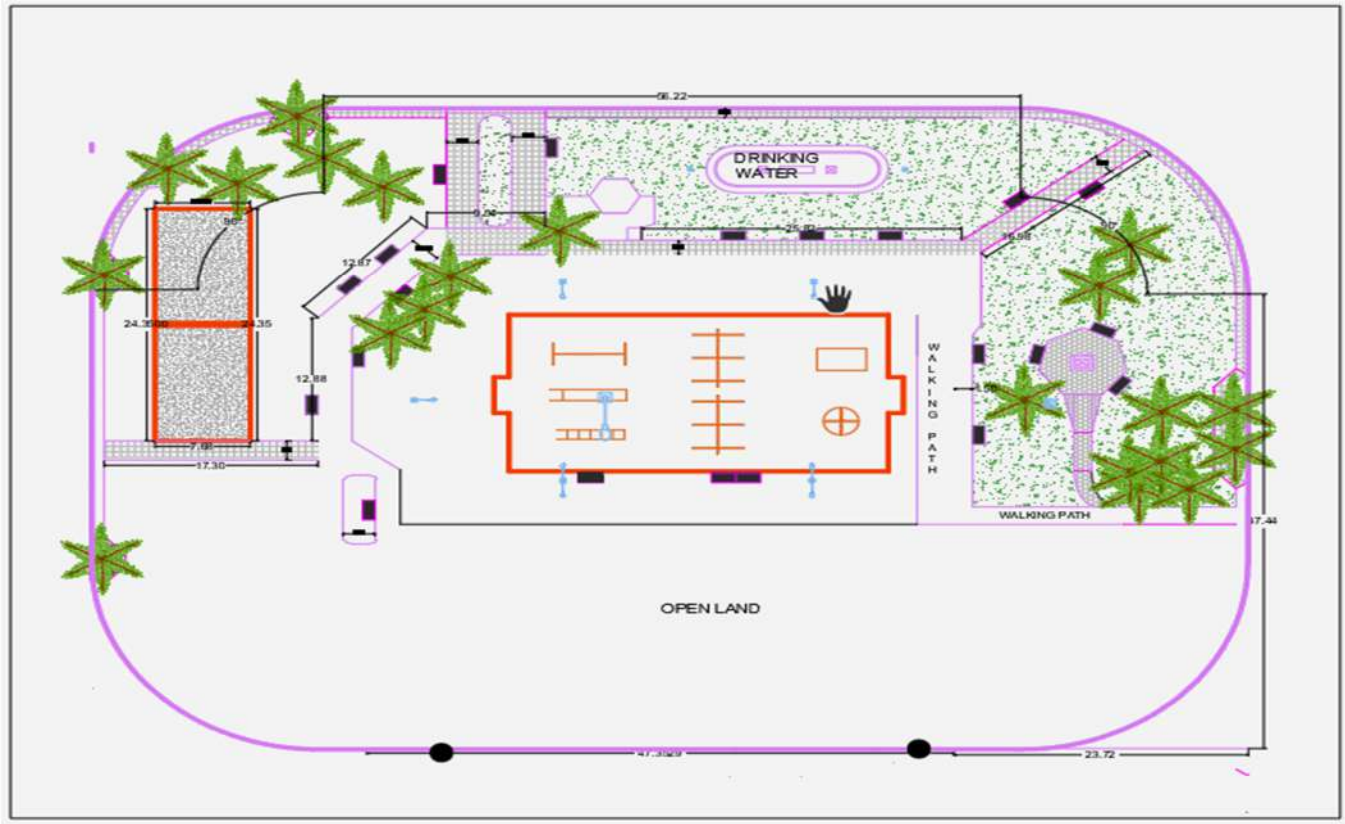


Fig. No. 65 : Plan, elevation & section for Public Garden

Table no 32 :Measurement sheet of public garden

Sr. No.	Item description	No.	Length (m)	Width(m)	Height (m)	Total Quantity
1	Providing Site clearance etc. complete	1	58	28	1	1624 Sq. M.
2	Excavating in boundary wall etc. complete	2	58	0.3	0.3	10.44 Cu. M.

3	Providing Brick Masonry in foundation wall to plinth CM (1:6) etc. complete	2	58	0.23	1	26.68 Cu. M.
4	Providing iron jali in periphery Boundary wall	2	28	1	2	112 Sq. M.
5	Providing walking track in garden periphery	2	58	1.46	1	169.36 Sq. M.
6	Providing Iceland circle in garden	1	0	0	0	9 Sq. M.
7	Providing Iceland in garden	2	0	0	0	50 Sq. M.
8	Providing Children Play Ground	1	0	0	0	10.86 Sq. M.
9	Filling pure sand in Children Play Ground	1	10.86	1	0.2	2.172 Cu. M.
10	Filling black cotton soil for grass in garden Iceland and circles	1	53.8	1	0.3	16.14 Cu. M.
11	Providing RCC seating benches in garden	12	0	0	0	12 Nos.
12	Providing Iron strip Gate	2	0	0	0	2 Nos.
13	Providing Tigard plants in periphery of garden	12	0	0	0	12 Nos.
14	Providing flower plantation in garden area periphery	2	13.89	3.57	1	99.17 R.mt.
15	Canteen	1	11.89	6.40	2.1	159.80 Sq. M.
16	Fountain	1	0	0	0	153.86 Sq. M.

Table no 33: Abstract sheet of public garden

Sr. No.	Item description	Total Quantity	Rate	Total Amounts
1	Providing Site clearance etc. complete	1624 Sq. M.	10	16240/-
2	Excavating in boundary wall etc. complete	10.44 Cu. M.	150	1566/-
3	Providing Brick Masonry in foundation wall to plinth CM (1:6) etc. complete	26.68 Cu. M.	3000	80040/-
4	Providing iron jali in periphery Boundary wall	112 Sq. M.	150	16800/-
5	Providing walking track in garden periphery	169.36 Sq. M.	0	0
6	Providing Iceland circle in garden	9 Sq. M.	0	0
7	Providing Iceland in garden	50 Sq. M.	0	0
8	Providing Children Play Ground	10.86 Sq. M.	0	0
9	Filling pure sand in Children Play Ground	2.172 Cu. M.	900	1954.8/-

10	Filling black cotton soil for grass in garden Iceland and circles	16.14 Cu. M.	350	564 9/-
11	Providing RCC seating benches in garden	12 Nos.	1200	144 00/ -
12	Providing Iron strip Gate	2 Nos.	900	180 0/-
13	Providing Tigard plants in periphery of garden	12 Nos.	500	600 0/-
14	Providing flower plantation in garden area periphery	99.17 R.mt.	40	3966.8/-
15	Canteen	159.80	250	399 50/ -
16	Fountain	153.86	70	107 70/ -

		Rs. 1,99,136.6/-
		Rs. 19,913.66/-
		Rs. 9,956.83/-
		Rs. 2,29,007.09/-

13.1.3 Sustainable design:

Planning: Vegetable Market

Fig. No. 66 : Plan, elevation & section for Vegetable Market Hub

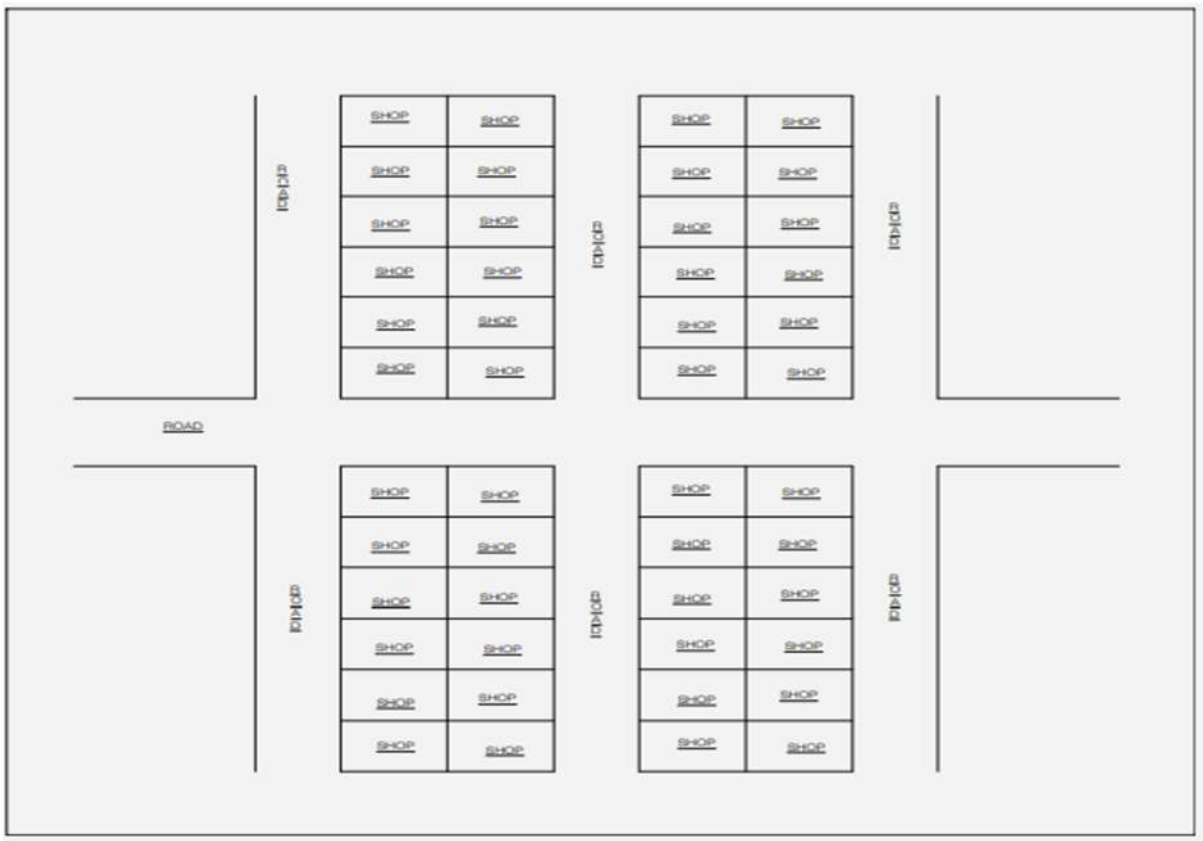


Table no 34: Measurement sheet of vegetable market hub

Sr. No.	DESCRIPTION	No.	LENGTH IN Mt.	WIDTH IN Mt.	DEPTH IN Mt.	QTY.	TOTAL QTY.	UNIT
	FOR WING A							
1	**EARTHWORK IN EXCAVATION**							
	SIDE LONGWALL	2.00	39.730	0.500	1.500	59.595	**54.380**	**C.MT.**
	SIDE SHORTWALL	2.00	20.730	0.500	1.500	31.095		
	MIDDLE LONGWALL	2.00	39.730	0.500	1.500	59.595		
	MIDDLE SHORTWALL	2.00	2.730	0.500	1.500	4.10		
2	**P.C.C(1:4:8) IN FOUNDTION**							
	SIDE LONGWALL	2.00	39.730	0.500	0.300	11.919	**30.876**	**C.MT.**
	SIDE SHORTWALL	2.00	20.730	0.500	0.300	6.219		
	MIDDLE LONGWALL	2.00	39.730	0.500	0.300	11.919		
	MIDDLE SHORTWALL	2.00	2.730	0.500	0.300	0.819		
3	**BRICK MASONRY UPTO PLINTH**							
	SIDE LONGWALL						**108.066**	**C.MT.**
	1ST STEP	2.00	39.330	0.500	0.300	11.799		
	2ND STEP	2.00	39.230	0.400	0.300	9.415		
	3RD STEP	2.00	39.130	0.300	0.850	19.956		
	SIDE SHORTWALL							
	1ST STEP	2.00	21.130	0.500	0.300	6.339		
	2ND STEP	2.00	21.230	0.400	0.300	5.095		
	3RD STEP	2.00	21.330	0.300	0.850	10.878		
	MIDDLE LONGWALL							
	1ST STEP	2.00	39.330	0.500	0.300	11.799		
	2ND STEP	2.00	39.230	0.400	0.300	9.415		
	3RD STEP	2.00	39.130	0.300	0.850	19.956		
	MIDDLE SHORTWALL							
	1ST STEP	2.00	3.130	0.500	0.300	0.939		
	2ND STEP	2.00	3.230	0.400	0.300	0.775		
	3RD STEP	2.00	3.330	0.300	0.850	1.698		
4	**SOIL FILLING**							
	SIDE LONGWALL	2.00	39.730	0.500	1.000	39.730	**102.920**	**C.MT.**
	SIDE SHORTWALL	2.00	20.730	0.500	1.000	20.730		
	MIDDLE LONGWALL	2.00	39.730	0.500	1.000	39.730		
5	**PLINTH FLOORING**							
	PLINTH FLOOR AREA	819.00					**819.000**	**S.MT.**
6	**OUT SIDE PLASTERING**							
	SIDE LONGWALL	2.00	39.730	1.000		79.460	**120.920**	**S.MT.**
	SIDE SHORTWALL	2.00	20.730	1.000		41.460		
7	**SHED WITH MATERIALS**							
	SHED AREA	819.00					**819.000**	**S.MT.**
8	**STAIRCASE PER RUNNING METER**							
		4.00	21.500			86.000	**86.000**	**S.MT.**

Table no 35 : Abstract sheet of vegetable market hub

SR.NO	PARTICULAR	QUNATITY	RATE	UNIT	AMOUNT
1	EARTHWORK IN EXCAVATION	154.38	276.45	Cu. Mt	42,678.35
2	P.C.C(1:4:8) IN FOUNDTION	30.88	700.00	Sq. Mt	21,613.20
3	BRICK MASONRY UPTO PLINTH	108.07	3,200.00	Sq. Mt	45,811.20
4	SOIL FILLING	102.92	750.00	Cu. Mt	77,190.00
5	PLINTH FLOORING	819.00	500.00	Sq. Mt	49,500.00
6	OUT SIDE PLASTERING	120.92	444.32	Sq. Mt	53,727.17
7	SHED WITH MATERIALS	819.00	3,500.00	Cu. Mt	66,500.00
8	STAIRCASE PER RUNNING METER	86.00	1,248.00	R. Mt	107,328.00
	TOTAL				Rs. 4,01,537.93/-
	ADD 1.5% WATER CHARGES				Rs. 6,023.06/-
	ADD 10% CONTRACTOR'S PROFIT				Rs. 4,6,156.09/-
	GRAND TOTAL				Rs. 4,67,717.08/-

13.1.7 Photovoltaic-Cell A.C for Residential and Public Building

Abstract:

The development of renewable energy is on the rise worldwide because of the growing demand on energy, high oil prices, and concerns of environmental impacts. In recent years, progress on solar-powered air conditioning has increased as nowadays, air conditioning system is almost a must in every building if we want to have a good indoor comfort inside the building. Therefore, this paper focuses in the design and construction of a direct charger, inverter and batteries. The air conditioning system can be operated on solar and can be used in non-electrified areas. As we all known, solar energy is cost effective, renewable and environmentally friendly.

Fig 67 Solar A.C for Residential and Public Building

1. Introduction

The demand of air conditioning is increasing due to the effect of climate change and global warming. If we still rely on the conventional electric air conditioning but electricity is generated form fossil fuels, the greenhouse gas emission would continuously worsen global warming, in turn the demand of air conditioning would be further increasing. In subtropical

cities, air conditioning is a standard provision for buildings. However, air conditioning would commonly take up half of building electricity consumption.

2. Methodology

a) Collection of the required meteorological data: meteorological data for Perlis was used. A typical meteorological year (TMY) was created and the hourly, monthly and annual values of solar radiation processed

b) Cooling load calculation: Determine what kind of cooling and how much of cooling needed.

c) Design and sizing of the air conditioning system: Using the weather data, and the selected design conditions, the components of the system could be sized.

d) Optimization of the system: The aim was to use least cost energy so the designed system was optimized with that in mind.

e) Material procurement and construction of the experimental system: Once the system had been optimized, the components were procured and the system was constructed and tested.

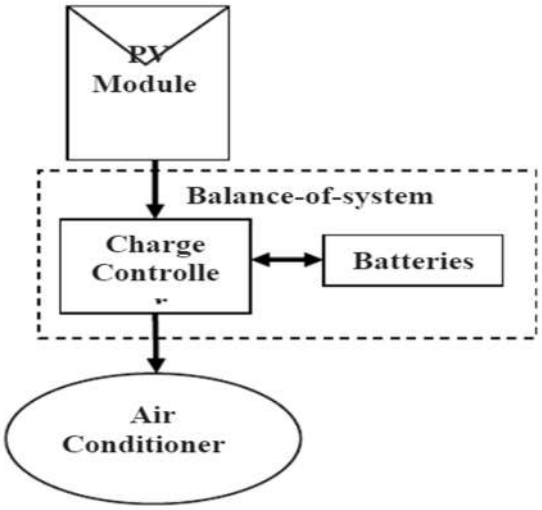


Fig 68 : Methodology

f) Performance evaluation and economic analysis: The energetic and economical effectiveness of the system was evaluated. The life cycle costs for solar cooling system were calculated and competitiveness with regards to price and thermal efficiency for domestic applications determined.

g) Analysis of results and making of recommendations: The results necessary improvements recommended. Options for improving technical effectiveness and economic competitiveness were suggested. Ways of improving research and develop ment efforts in this field were also investigated.

3. System Description

The proposed concept of the system consists of air conditioner and PV system is indicated in block diagram shown in Figure 1. In order to determine the characteristics and properties of all the components used, each component must be taken as a single unit. The complete system must be able to operate in stable condition, and if possible achieving the efficiency as conventional air conditioning system. For example, as for the cooling purpose, performance of the DC air conditioning should be the same as normal AC air conditioner.

3.1 Refrigeration Load

Heat naturally flows from warmer places to cooler places. In other words, the heat is called as refrigeration load. Refrigeration equipment such as air conditioner is used to transfer heat from a cooler place to a warmer place. For example, the heat inside a house is

absorbed and been transferred to the outside. The refrigeration load is the rate at which heat must be removed from the refrigerated space in order to produce and maintain the desired temperature conditions. The total cooling load on the refrigerating equipment is the sum of heat-gain from several different sources which include the heat gained from walls, windows and doors.

3.2 Air Conditioning System

Either for a building or a vehicle, the air conditioner mainly consists of five key components which are compressor, refrigerant, expansion device, evaporator and condenser. As shown in Figure compressor is electrical

can be described as the heart of air conditioning

system as it pump refrigerant throughout the system. The main function of a compressor is to compress refrigerant vapour to a high pressure, making it hot for the circulation process of the refrigerant.

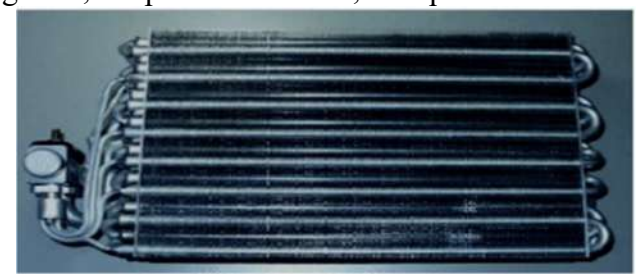


Fig 69: Air Conditioning System

3.3 PV System

Even though there is many differences of the PV processes now either in research of commercial areas, the basic principle is simple. Photovoltaic which is combination of two words; photo for light and voltaic for electricity, converts the energy of sunlight directly into electricity. The conversion from the sunlight into electricity is occurred.

Fig 70: PV System .

3.4 System Operation

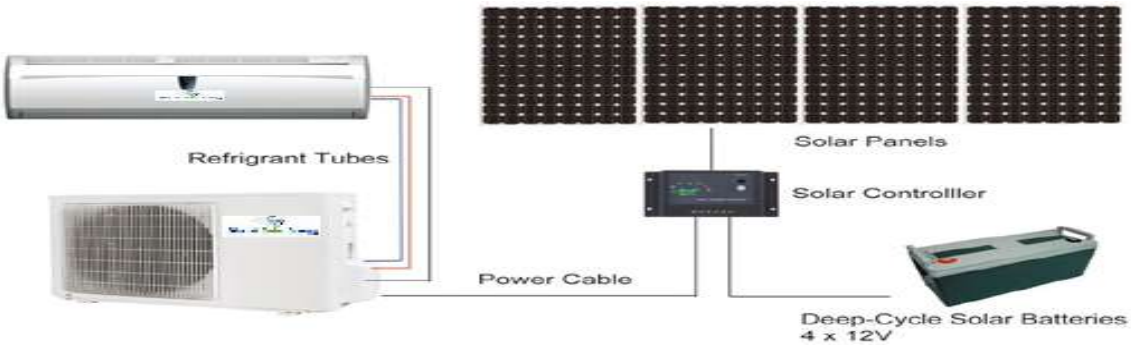


Fig 71: System Operation

The solar energy is received by the PV module and transform into electrical energy. The electrical energy is then being regulated by charge controller either by supplies it directly into the load or charges the batteries. As the electrical energy coming from the PV module is in DC, inverter will convert it into AC as the compressor needs AC to operate.
The most common type of air conditioning is technically referred to as direct expansion, mechanical, vapour-compression refrigeration system. The goal with air conditioning is to capture heat in the cooling space and throw it outside. The operation of the system starts when the cold, low pressure liquid (refrigerant) flows across the evaporator coil inside the cooling space to absorb heat. The cold liquid that went into the evaporator coil comes out as a low pressure gas.
There are several characteristics that are needed to know either on the PV system or air conditioning system. Electrical equivalent, IV characteristic curve and factors affect the output of PV cell is an important characteristic in photovoltaic. As for the air conditioning, cooling capacity must be determined first as it will give a rough idea on how to design and construct the system with enough electrical energy supplied to it.

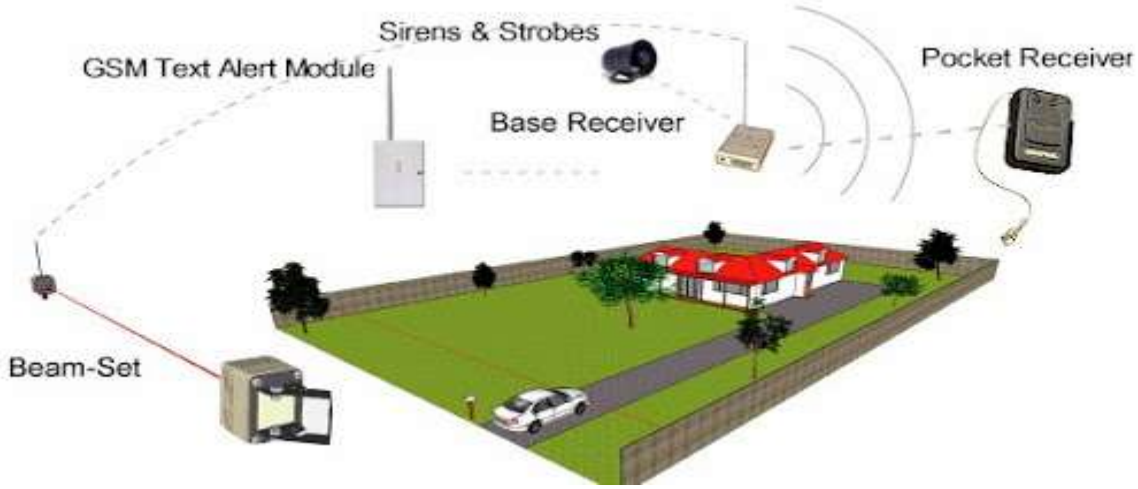
4. Conclusion

This paper concludes that the system design needs to consider both air conditioner and PV system in order to achieve the space cooling. There are several characteristics that are needed to know either on the PV system or air conditioning system. Electrical equivalent, IV characteristic curve and factors affect the output of PV cell is an important characteristic in photovoltaic. As for the air conditioning, cooling capacity must be determined first as it will give a rough idea on how to design and construct the system with enough electrical energy supplied to it.

Table 35: Cost Estimation

Particular	**Description**
Solar AC	1 ton
Solar panel	1500 watt
Solar Inverter	2 kVA (24 volt)
Solar Battery	2 Nos(24 volt)
Solar Accessories	Standard
Cooling Capacity	12000 btu
Compressor	Rotary
Remote Control	Yes
Auto Air Swing	Yes
Moisture Removal Rate	1.2 kg/hr
Power Requirement	AC 230 V, 50 Hz
Additional Filter	PM 2.5 Micron Filter (3M Brand)
Dust Filter	Yes
Condenser	Copper
Price	**Rs. 98000**

13.1.8 Design and Implementation of Farm Monitoring and Security System



. **Fig 72: Farm Monitoring and Security System**

Nigeria being an agricultural country needs some innovation in the field of agriculture. Monitoring and control of farming environment play an important role in farming production and management. Farm lands and plantations in Nigeria and African countries are usually very large scale running into hundreds of acres and in most cases fencing these large

expanses of land can be prohibitively expensive and very stressful. Farmers therefore resort to building fences using sticks and ropes and these provide the only security measure they can adopt. These security measures are trivial and very ineffective as intruders can easily jump over them and cart away with as much crops as they can carry without the knowledge of the owners, especially when such fences are built around dark crevices. Also, with the present situations in Africa where farmers are facing security threats in their farms, especially with the Fulani herdsmen, the wireless sensor networks technology can be used in this effect to get real time information of the farm and know when an intrusion occurs, the nature or type of intrusion with the necessary action(s) to follow.

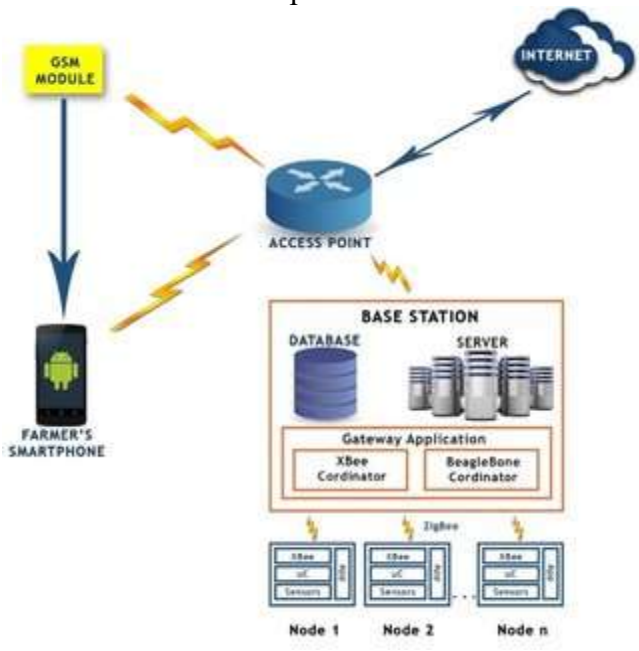


Fig 73: Overall System Architecture

1. INTRODUCTION

Generally, in the world, the economy of many countries is dependent upon agriculture.In spite of the economic growth and development, agriculture is the backbone of the economies all over the world. Agriculture contributes to the gross domestic product as it is the main stay of many countries. Agriculture meets food requirements of the people and serves as raw materials for several industries. There is always a huge loss of crops due to animal interference in agricultural land, crops are being destroyed and farmers are lost in large numbers [1]. Nigeria being an agricultural country needs some innovation in the field of agriculture. Farm lands and plantations in Nigeria and African countries are usually very large scale running into hundreds of acres and in most cases fencing these large expanses of land can be prohibitively expensive and very stressful. Farmers therefore resort to building fences using sticks and ropes and these provide the only security measure they can adopt. These security measures are trivial and very ineffective as intruders can easily jump over them and cart away with as much crops as they can carry them without the knowledge of the owners, especially when such fences are built around dark crevices. Wireless sensor networks (WSNs) empower monitoring and controlling of corresponding physical environments from remote area with better efficiency and accuracy [2]. This work presents the design and the Implementation of WSNs for farm monitoring and security, which is easy to install. It is a microcontroller-based circuit to monitor and control intrusion by alerting the farm owner after the use of alarm on the farmland in order to scare aware intruders. The system is optimized with the aim of achieving maximum plant growth and yield. This work is motivated by different views relating to farming security. The security measures employed by farmers in building fences using sticks and ropes as the only security measure, which can be very stressful and time consuming, and in turn limit farmers from farming on a large scale. The limitations of [1] and [3] as they only send alert to the farm owner on sensing intrusion without raising an alarm first before alerting the farmer. Many intruders which may be birds, animals or human will get scared and leave the farm premises immediately an alarm is raised. This will save the farm owner of the stress of going to the farm immediately after receiving an alert since an ordinary alarm will chase many animals away. Also, with the present situations in Africa where the farmers are facing security threats in their farms, especially with the herdsmen, the wireless sensor networks technology can be used in this effect to get real time information of the farm and know when an intrusion occurs with the necessary action(s) to follow.

2. Overall System Architecture

Existing web-based monitoring systems such as WAGRIT have a structure that separates data acquisition devices and the web server. However, the proposed Farm Security Monitoring System has a structure that integrates the WSN sensors, CCTVs, database server, web ameters and image information into a device for collecting various pieces of information on the environment, and provides real-time monitoring and various application services based on this information.

Nodes are XBee devices which are configurable for various sensors. XBee devices are capable of working on Solar Power as well as storage batteries. These devices are remotely configurable. The XBee module on the base station is configured as a coordinator and the XBee modules on the sensor nodes are configured as routers which accept values from various sensing nodes. Coordinator is connected to BeagleBone which is connected to internet. BeagleBone is a small low-power open-source hardware single-board computer. It can perform all operations which can be performed using any computer device. BB communicates with gateway/coordinator by serial interface and all accepted values will be sent to BB for processing. The smart phone application designed in Android is connected to Internet i.e. specifically to web server. From Smartphone, notifications can be received based on the events surrounding the farm parameters. Other devices like a buzzer alarm that will sound during the course of the intrusion; this creates a scary atmosphere for the intruder(s) in order to drive them away from the farm parameters. of intrusion to the farmer

3. Conceptual Framework of FMSS

The conceptual framework of the Farm Monitoring and Security System as shown in Figure, has a structure that will integrate the WSN

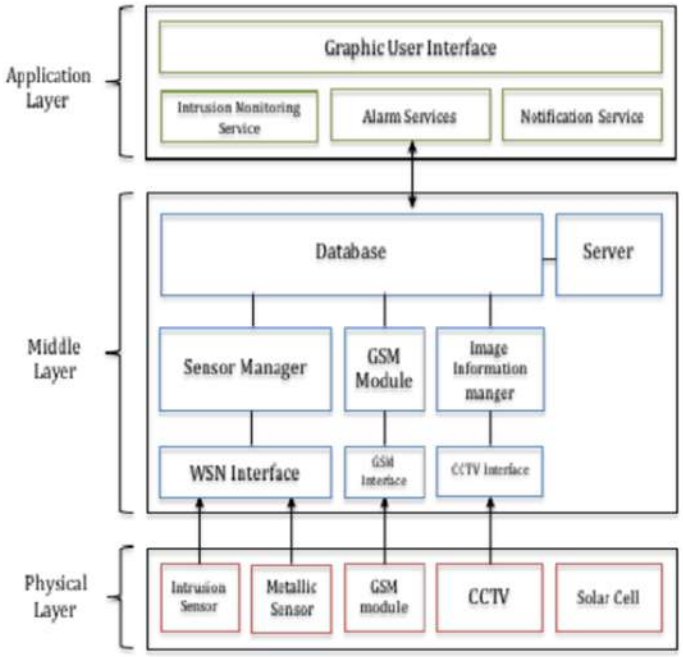


Fig 73: Conceptual Framework of FMSS

(the intrusion detection and metallic sensors), CCTVs, GSM modules, database server, web server, etc. to collect information on the parameters of the farm and image information from a device for collecting various pieces of information on the environment, and provides real-time monitoring and various application services based on this information

As described in [13], it is divided into three layers. The middle layer, which supports communications between the physical layer and the application layer and converts the outdoors information collected from the physical layer into a database to provide data requested from the application layer which is equipped with interfaces to support various services for the farmer. The sensor coordinator (i.e. XBee Module) manages data acquisition from the intrusion sensors, extracts the data by processing the collected data packets into a format which could be stored in the database, and used for other processes.

4. System Flowchart

As shown in figure, the sensor systems check for intrusions continuously and collect information in a real-time. When an intrusion on the farmland is detected, an alarm sounds for not more than 30 seconds in order to scare the intruder away from the farm parameter. In a case where the intruder stays more than expected and the cameras still gives information of an intruder, a notification is sent to the farmer, notifying him of a longer stay of the intruder on the farm. The notification system uses the GSM module or the android application in notifying the farmer of the intrusion.

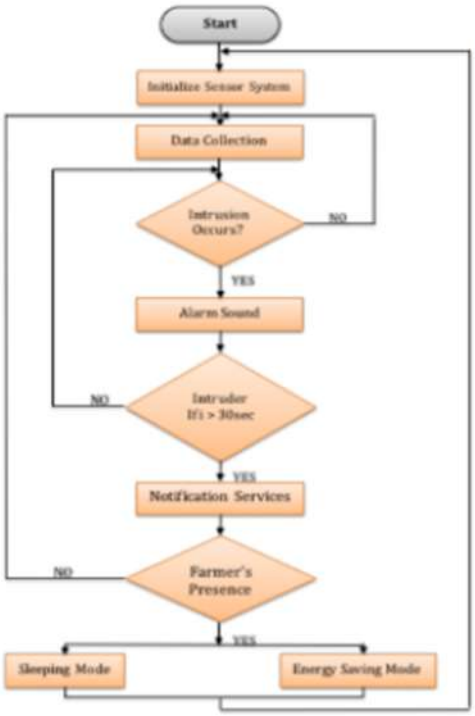


Fig 74: System Flowchart

5. SYSTEM IMPLEMENTATION

To verify the workability of the farm monitoring and security system presented in this paper, a prototype was developed, installed and the system was tested. A base station is developed using Arduino Due board which is connected to a system using USB connection. For security of the farm, intrusion detection system is deployed on each node. The FMSS monitors the environment and generates an alarm that scares intruders away, but at the longer stay of the intruders, it generates an alert notification that is sent to the farmers‟ smart phone app.

5.1 Base Station

The Base Station (BS) is responsible for receiving data from the sensor nodes and processing it as required. The microcontroller forms the heart of the BS and is responsible for enabling wireless communication, and displaying the received values on the android application and the on-board LCD. The microcontroller is connected to the sensors which consist of the motion detection sensor, alarm, electromagnetic sensor and camera. The microcontroller is interfaced with the XBee module. It is also interfaced with a mobile application using the gateway application. This is meant to forward the received data to the mobile app for displaying it on a GUI and further processing, decision making etc. as may be necessary. All the components in the BS are powered by a Power Unit. It consists of a battery or power supply (whichever is available).

Table 36: Cost Estimation

S/No.	Item Description	Unit Quantity	Unit Price (Rupee)	Amount (Rupee)
1.	Arduino Uno Board	1	450	450
2.	Generic EPS-01 ESP8266 2.4-GHz WiFi Module for	1	1500	1500

	Arduino			
3.	Buzzer	1	500	500
4.	Electrolytic capacitor (20 pcs)	1	160	160
5.	Resistors 1 kΩ (50 pcs)	1	998	998
6.	12-V Relay Module External Trigger Delay Adjustable	1	632	632
7.	Generic PCs Water Pump High Quality DC 12 V 3.8 m, Magnetic Electrical Centrifugal Hotsel	1	219	219
8.	Breadboard and Jumper Cables	1	260	260
9.	Generic AC 220 V to 12 V DC step down Power Supply Module for Arduino	1	264	264
	Total	9		4084

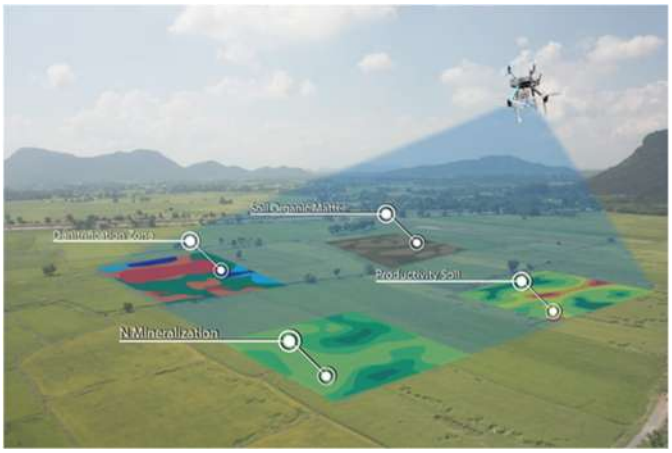
13.1.9 Agricultural Pest and Disease Monitoring Based on Internet-of-Things and Unmanned Aerial Vehicles

Abstract:

With the development of information technology, Internet-of-Things (IoT) and low-altitude remote-sensing technology represented by Unmanned Aerial Vehicles (UAVs) are widely used in environmental monitoring fields. In agricultural modernization, IoT and UAV can monitor the incidence of crop diseases and pests from the ground micro and air macro perspectives, respectively. IoT technology can collect real-time weather parameters of the crop growth by means of numerous inexpensive sensor nodes. While depending on spectral camera technology, UAVs can capture the images of farmland, and these images can be utilize for analyzing the occurrence of pests and diseases of crops. In this work, we attempt to design an agriculture framework for providing profound insights into the specific relationship between the occurrence of pests/diseases and weather parameters. Firstly, considering that most farms are usually located in remote areas and far away from infrastructure, making it hard to deploy agricultural IoT devices due to limited energy supplement, a sun tracker device is designed to adjust the angle automatically between the solar panel and the sunlight for improving the energy-harvesting rate. Secondly, for resolving the problem of short flight time of UAV, a flight mode is introduced to ensure the maximum utilization of wind force and prolong the fight time. Thirdly, the images captured by UAV are transmitted to the cloud data center for analyzing the degree of damage of pests and diseases based on spectrum analysis technology. Finally, the agriculture framework is deployed in the Yangtze River Zone of China and the results

demonstrate that wheat is susceptible to disease when the temperature is between 14 ◦C and 16 ◦C, and high rainfall decreases the spread of wheat powdery mildew

1. Introduction



Due to population growth and social development, world food demand is expected to double by 2050, but it is currently challenging to increase food production because of falling water levels, climate change, arable land reduction, and pests and diseases. Pests and diseases have always been among the critical factors that restrict the increase of grain production, causing substantial economic losses to agriculture. According to the statistics of the Food and Agriculture Organization of the United Nations (FAO), global grain production will be reduced by 10–16% annually owing to the occurrence of crop pests and diseases. In China, investigation shows that pests and diseases cause about 40 million tons of grain loss each year.

The contributions are summarized as follows:

- An automatic rotary-device based on angle perception of sun illumination is designed for ensuring the solar panel is always perpendicular to sunlight and improving the energy-harvesting rate from solar power.

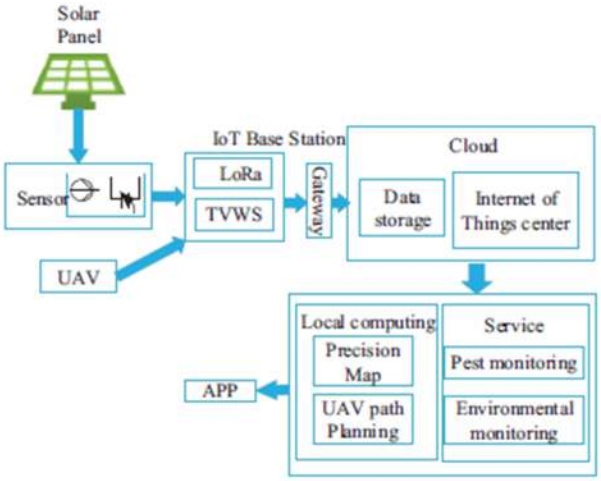


Fig 74: System Model

- An IoT framework containing multiple wireless technologies (e.g., LoRa, ZigBee, TVWS) is proposed for collecting information and transmitting the collected data to the base station/gateway.
- A strategy to prolong the flight time of a drone is introduced by planning the flying path with the largest proportion of downwind and ensuring the maximum utilization of wind force.

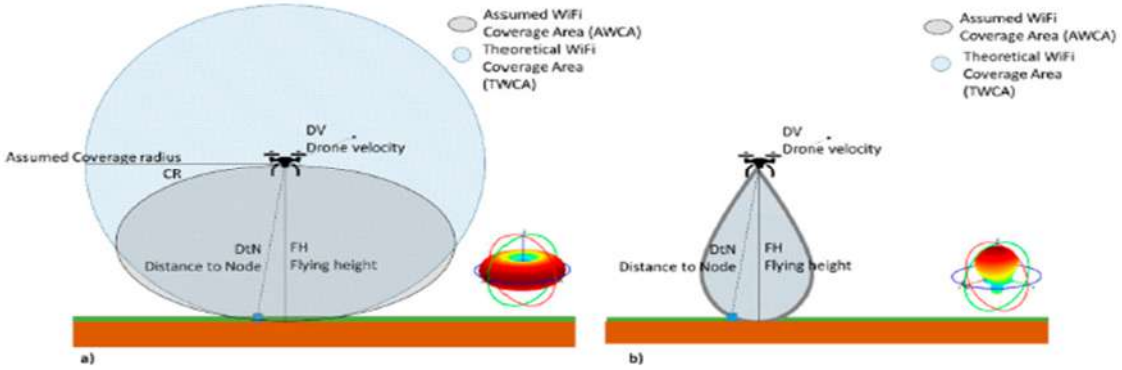
3. The remainder of this paper is organized as follows. Section 2 gives a review on the existing strategies for

- monitoring agricultural pests and diseases. Section 3 presents our method and design in detail. Section 4 contains experimental results and Conclusion is in Section 5.

4. System Model

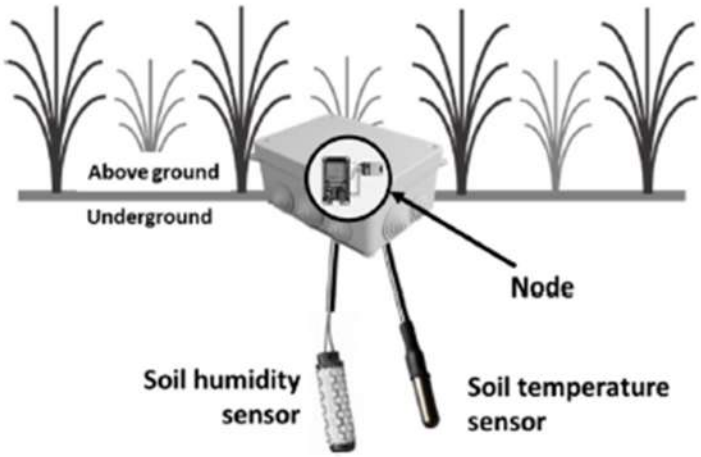
3.1. The Agricultural IoT Platform

Considering a farm is open and in outdoor generally, the agricultural IoT platform mainly contains the following parts: energy supplying devices, IoT base stations, gateways, a cloud data center, and APP (Application) software. An overview of the system is given in Figure 1. A smart solar power system based on angle perception of sun illumination is designed to provide power for the platform, the detail of energy supplying system is provided in Section 3.2. The IoT base station is mainly composed of TV White Spaces (TVWS) and LoRa sensor connection modules. LoRa technology with a long transmission range is used for collecting data from multiple sensors and transmitting the data to the gateway. TVWS technology with high-bandwidth is utilized for transmitting the videos or images from UAVs equipped
with special optical sensors. The communication of IoT base stations is introduced in Section 3.3



. **Fig 74 The Agricultural IoT Platform**

The cloud data center is responsible for providing services of data fusion and data analysis. Since the cloud data center is generally far away from the farms, the data from LoRa devices and TVWS will first be forwarded to the gateway. Currently, wired networks or wireless networks are widely deployed in China. According to the "CT China 2008 High Level Forum", the 4G network covers more than 98% of the population and 95% of the country's land area of China. Therefore, the gateway can be deployed in farmer houses to forward these data to cloud data centers relying on these networks. In cloud data centers, the data collected by LoRa devices are used for monitoring weather parameters, and the information provided by the TVWS communication system is utilized for generating a precision map and planning the UAV path. It is important to note that the cloud data center is one of the most important parts of the framework and is responsible



for processing the data. The results of data analysis will provide the real-time conditions of crops for farmers; details are provided in Sections 3.4 and 4.2. The system also provides an APP interface, which is more convenient for farmers to control their farms.

4.1. Architecture

The architecture of the precision agriculture scenario is divided into four layers, which are the Sensor Node Layer, the Drone Layer, the Internet Layer, and the Data Center Layer. Figure shows the dierent layers.store the obtained information, is located at the remote location. This information can be processed using Artificial The Sensors Node Layer is the bottom layer. All the sensor nodes deployed in the crops are located in this layer. The layer immediately above is the Drone Layer. It is comprised of the remote sensing drone that is responsible for obtaining images of the crops and collecting the information stored by the nodes through its wireless interface, the location where the drone has their base station, the IT equipment where the information that the drone has collected during its flight is stored, and the network devices that allow us to connect to the Internet. The connection to the Internet is performed by employing a Service Provider. De

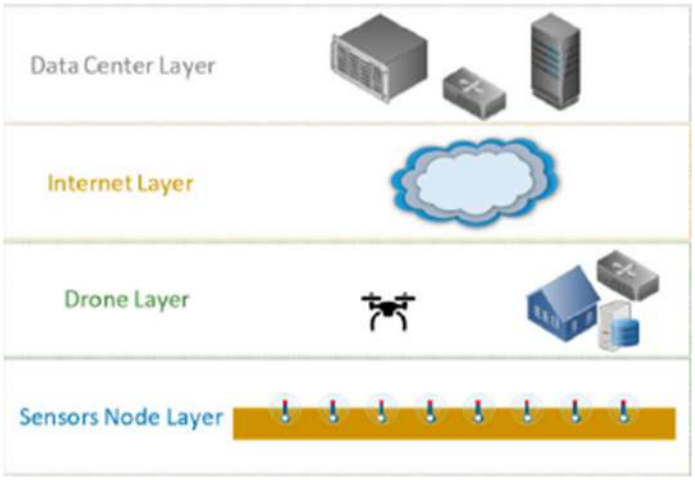


Fig75: Architecture

on the location of the crop fields, the technology used to connect to the Internet may vary, choosing among cable or wireless technologies to establish the connections. The following layer is the Internet. The Internet is accessed through the Operator to send all the acquired data to a remote location, where the information will be processed. The connection to the remote location is made by establishing a Virtual Private Network (VPN). This way, the data will be protected when crossing the Internet. Finally, the Data Center Layer, where we store obtained information, is located at the remote location. This information can be processed using Artificial Intelligence (AI) to ensure that decision making is optimal.

4.2. Algorithm

The drone is located on a base station, where the route begins and ends. The drone takes photographs of the fields and the terrain during its flight. When the drone reaches the base station, all the retrieved information is forwarded to the data center where the information is stored on database for further analysis.

A connection between the sensor node and the drone, with a good enough quality to ensure that the data is transmitted successfully, is one of the requirements of a PA system that employs a dron to gather data from the sensor nodes deployed on the field. Other requirements include low energy consumption for the drone to complete its route, the availability of the operating frequency band and good weather conditions to avoid signal attenuation and damages to the drone and sensor nodes.

Regarding the data rate, it is crucial to consider that the parameters measured in PA systems vary at a slow pace. Therefore, continuous monitoring is not necessary, and the data can be captured each minute or at larger time intervals such as 5, 10, or 30-min intervals.

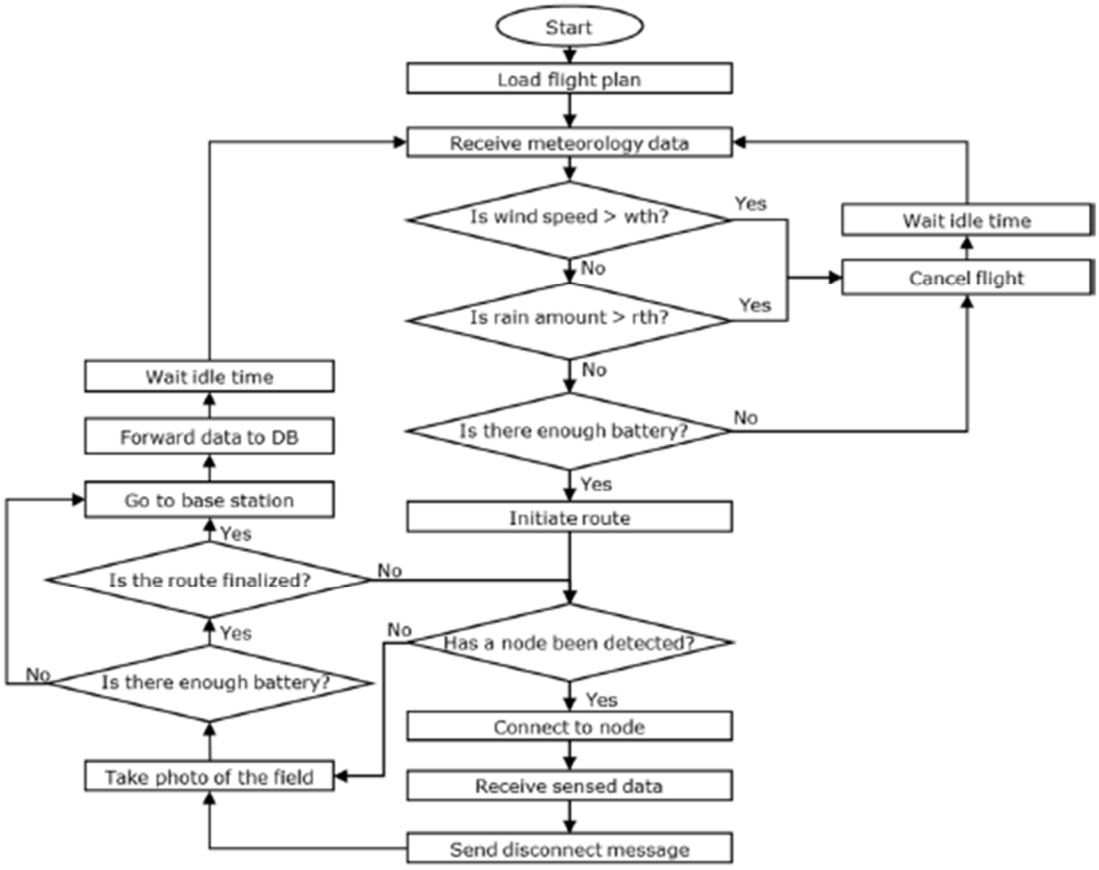


Fig 76: Algorithm

The functioning algorithm of the node is presented in Figure 7. After the setup has been completed the node starts gathering the data from the nodes and storing it on an SD card. If it is the schedule time for the drone flight, the node gets activated to wait for the drone. If it is not the scheduled time the node goes into sleep mode for the time specified in the setup parameters. If a drone is detected all the data stored on the SD card are forwarded to the drone. When the node receives a disconnect message, the node disconnects from the drone and deletes all the data stored in the SD card. Then, the node goes into sleep mode for the time stipulated on the settings so as to save energy and to avoid the drone having interferences with other nodes. While the node does not detect the drone, it checks if the maximum time activated time is reached to determine if it needs to go to sleep mode. This way, the node is not constantly activated if the drone decides to cancel the flight due to weather conditions.

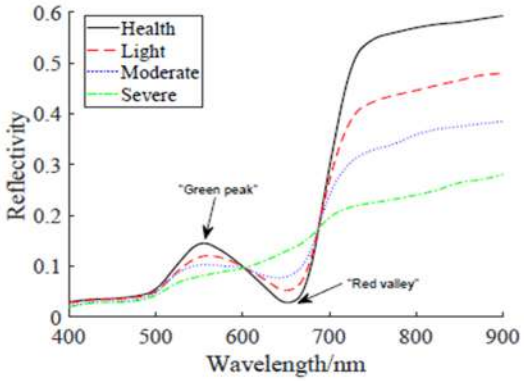
Then, it keeps gathering the data from the sensors each time the time interval between measures loaded from the setup has been reached. The message exchange between the

elements of the architecture is presented in Figure 8. The drone sends beacons so the nodes can detect it and ask for a connection. When the connection establishment is performed, the node sends the data to the drone. The drone then sends an Acknowledgment (ACK) and a Disconnect message to indicate that the node should go into sleep mode for the stipulated time.

After that, the node sends an ACK to the drone to indicate that the Disconnect message has been received correctly. The process is repeated with all the nodes deployed on the field within the coverage area of the drone as it follows its route. When the node reaches the base station, the data are forwarded to the database, and the database confirms the reception of the data with an ACK

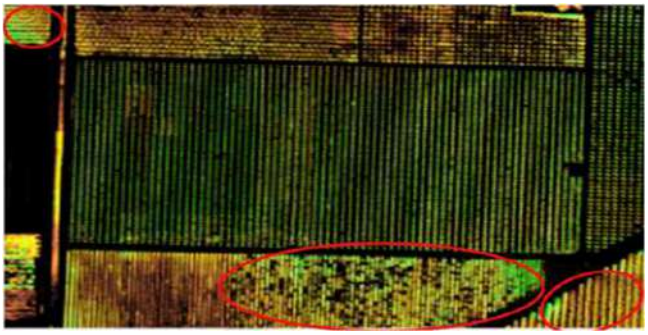
4.3. Pests and dIseases of Crops Are Analyzed Through Reflection Spectrum

If crops are infected by pests and diseases, their coverage, biomass, Leaf Area Index (LAI), leaf cell structure, nitrogen, moisture, pigment content, and appearance will change, which leads to changes in the reflectance spectrum of the visible to thermal infrared spectrum. In particular, the spectral characteristics of the infrared and red regions are different from those of healthy crops. Then, by monitoring the reflectance spectrum of crops, whose disease statuses can be obtained. shows the spectral characteristics of healthy and diseased wheat. The spectral reflectance of healthy wheat produces a trough in the red region (“red valley”) due to the large amount of radiation absorbed by chlorophyll. In the green zone, the absorption of chlorophyll is reduced, resulting in a robust green reflection zone (“green peak”)



In the near-infrared region, the spectral reflectance of infected wheat is significantly lower than that of healthy wheat. Through the analysis of the spectrum, the degree of damage of pests and diseases can be monitored to provide timely and accurate information for pest control.

Then, by monitoring the reflectance spectrum of crops, whose disease statuses can be obtained. shows the spectral characteristics of healthy and diseased wheat. The spectral reflectance of healthy wheat produces a trough in the red region (“red valley”) due to the large amount of radiation absorbed by chlorophyll. In the green zone, the absorption of chlorophyll is reduced, resulting in a robust green reflection zone (“green peak”)



Depending on the image processing technology, aerial pictures can be used to detect the occurrence of pests and diseases in crops. As shown in Figure 13, the crop is suffering fromthe disease, and the yellower the picture, the more serious the disease; the greener, the lighter the disease. Through sensors deployed in the farmland, the comprehensive environment around the crops can be analyzed, the temperature is 17 _C, the relative humidity is 68%, the wind speed is 2.3 m/s, and the light intensity is 554W/m2. After experiments and analysis of the above factors, if the crops grow in this environment or a relatively closed environment, the crops have a higher probability of occurrence of pests and diseases.

5. Conclusions And Future Planning

In this work, for providing energy to our IoT framework in remote farms, automatic rotary-device based on angle perception of sun illumination is added for improving utilization of solar energy, prolonging the use time of the sensor, and ensuring that the data collected by the sensor are valid in real time. The main contributions for the aspect of drones in this article are: (i) planing the flight route of the drone, (ii) adjusting the flight speed of the drone, (iii) making full use of the farm wind force, and (iv) extending the flight time of the drone to meet the low-altitude remote sensing demand for pests and diseases on large outdoor farms. It represents the macro and micro perspectives of modern agricultural techniques of low-altitude remote-sensing technology.

Table 37 : Cost Estimation

Sr no.	Description	Cost	Unit	Total
1	Drone	20000	1	20000
2	Pest detection sensor camera	5000	1	5000
3	Software	1000	1	1000
4	Ground sensor	200	10	2000
5			13	28,000

13.2 Reason for Student Recommending this Design

Community Hall Plus Theater: From the survey we get to know that there is no community hall or theater in the village so we decided to design a community hall plus theater which will benefits young as well as old person.

Public Garden: There is no public garden in the village so we decided to build the public garden in the village which will help small kid as well as old people for their health as well as they get good environment to sit and talk with their friends.

Vegetable Market: There is no vegetable market in the village so the vendors rise the vegetable rate at their own basis so the local people has to pay higher rate of the village so by making vegetable market it will help the people to buy vegetable at affordable rate.

Solar A.C for Residential and Public Building: As we all know that summer days is harder in Gujarat as we all live in cities we have A.C and Cooler but the villagers has to survive in the summer because they cant afford it, So we decided to build a low cost A.C which can buy by any person and gov. is also giving subsidy for solar power usage.

Agricultural Pest and Disease Monitoring Based on Internet-of- Things and Unmanned Aerial Vehicles: As we all know that pest is a problem that can't be control by human but for large area farm it is difficult to monitor peat and control pest, so by using this technology we can cover a large area in small time which will save time as well as money.

Design and Implementation of Farm Monitoring and Security System: Now a days due to development of road and highways it is difficult for farmers to protect their crop from the road people as they are now more easily accessible to their crop so we have design this prototype to protect their crop to be destroyed by human as well as animals.

13.3 About design Suggestion/ Benefit of the Villagers

Community Hall Plus Theater: It will help people to do their social easily and more economically. The social bonds that are created at **community centers** help build strong, safe and inclusive communities; social interaction, volunteerism, civic pride and aesthetics all play a role.

Public Garden: Public Garden will help small kid as well as old people for their health as well as they get good environment to sit and talk with their friends.

Vegetable Market: vegetable market will help the people to buy vegetable at affordable rate and they get fresh and varieties of food as well.

Solar A.C for Residential and Public Building: Solar cooling systems use ecological benefits including lower grid demand and load shifting throughout peak usage, decreased electrical power expenses, fewer power blackouts, off-the-grid abilities and minimized greenhouse gas emissions.

Agricultural Pest and Disease Monitoring Based on Internet-of- Things and Unmanned Aerial Vehicles: So by using this technology we can cover a large area in small time which will save time as well as money and save crop from pest and those who have small field they also buy this with other small field farmers.

Design and Implementation of Farm Monitoring and Security System:
So by using this prototype farmers they can protect their crop from the road people as they are now more easily accessible to their crop so we have design this prototype to protect their crop to be destroyed by human as well as animals.

14. Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. (See Figure 1.) A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction..

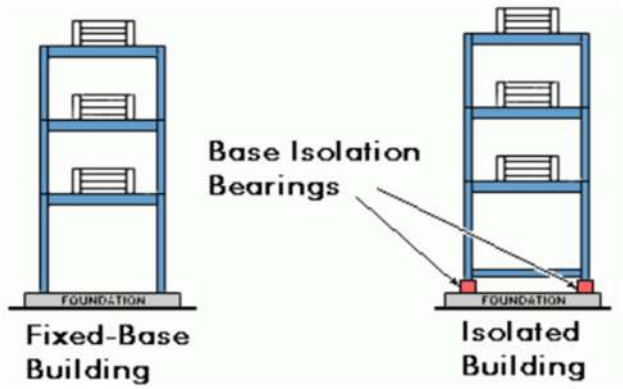


Fig 77:Advanced Earthquake Resistant

Earthquake Generated Forces

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

Energy Dissipation Devices

The second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead-rubber bearings. As we've said, a certain amount of vibration energy is transferred to the building by earthquake ground motion. Buildings themselves do possess an inherent ability

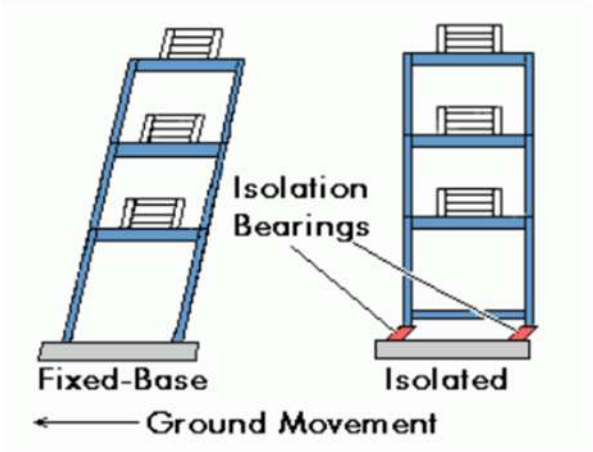


Fig 78 Energy dissipation device

to dissipate, or damp, this energy. However, the capacity of buildings to dissipate energy before they begin to suffer deformation and damage is quite limited. The building will dissipate energy either by undergoing large scale movement or sustaining increased internal

strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage. Accordingly, a wide range of energy dissipation devices have been developed and are now being installed in real buildings. Energy dissipation devices are also often called damping devices. The large number of damping devices that have been developed can be grouped into three broad categories:

- Friction Dampers: these utilize frictional forces to dissipate energy
- Metallic Dampers : utilize the deformation of metal elements within the damper
- Viscoelastic Dampers : utilize the controlled shearing of solids
- Viscous Dampers: utilized the forced movement (orificing) of fluids within the damper

Damping Devices and Bracing Systems

Damping devices are usually installed as part of **bracing systems.** Figure 3 shows one type of damper-brace arrangement, with one end attached to a column and one end attached to a floor beam. Primarily, this arrangement provides the **column** with additional support.

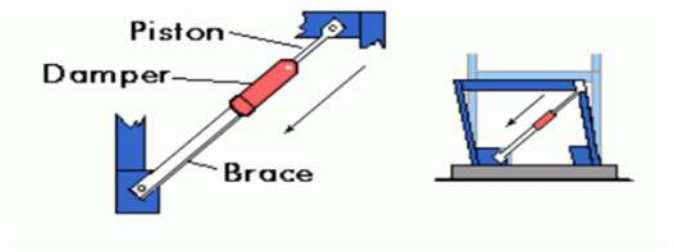


Fig 79: bracing system

Total Centre line length						
L=9.29x2=18.58 m						
L=9.30x2=18.6 m						
L=3.348x4=13.392 m						
L=1.52x2=3.04 m						
L=1.214x1=1.214 m						
Total Centre line length = 54.83 m						
Total no of Junction=8						
Sr No.	**Item Description**	**No.**	**Length (m)**	**Width (m)**	**Height (m)**	**Quantity (m^3)**
1	**Plain cement concrete in**					
	foundation in 1:3:6	1	51.23	0.9	0.3	**13.8321**
2	**Brickwork in foundation**					
	up to plinth					
	Step 1					
	L=54.83-0.5*0.6*8					
	=52.43m	1	52.43	0.6	0.2	6.2916
	Step 2					

	L=54.83-0.5*0.5*8					
	= 52.83m	1	52.83	0.5	0.2	5.283
	Step 3					
	L=54.83-0.5*0.4*8					
	=56.43 m	1	56.43	0.4	0.2	4.5144
	Step 4					
	L=54.83-0.5*0.3*8					
	=53.63 m	1	53.63	0.3	1.2	19.3068
	h= (1.5-0.3-3*0.2) +0.6 =1.2m					
				Total Quantity		**35.3958**
3	**Parapet wall**					
	L=38.38 m	1	38.38	0.3	0.91	**10.4777**

Table 39. Civil estimation of post office

Abstract sheet					
No.	**Item Description**	**Quantity**	**Rate**	**Per**	**Amount Rs.**
1	Plain cement concrete in	13.8321	600	m3	8299.66
	foundation in 1:3:6				
2	Waste plastic Lego brick brickwork up to plinth				
	in C.M. 1:6	35.3958 m^3	1500	m3	53093.7
3	Brickwork for parapet wall	10.4777 m^3	2200	m3	23050.94
		Add 5% contingencies			5899
				Rs.	**84444.3**

Hence to make a 2BHK house earthquake proof total cost of construction is approximately :RS84445.

We have shown typical construction in small wooden piece.

Prototype made of wooden piece

14.1.2 Seismic Retrofitting of Buildings

1. Introduction to Seismic Retrofitting Techniques:

- Earthquake creates great devastation in terms of life, money and failures of structures.
- Upgrading of certain building systems (existing structures) to make them more resistant to seismic activity (earthquake resistance) is really of more importance.
- Structures can be (a) Earthquake damaged, (b) Earthquake vulnerable
- Retrofitting proves to be a better economic consideration and immediate shelter to problems rather than replacement of building.

.

Fig 80: Seismic Retrofitting of Buildings

1.1 Adding New Shear Walls:

- Frequently used for retrofitting of non ductile reinforced concrete frame buildings.
- The added elements can be either cast?in?place or precast concrete elements.
- New elements preferably be placed at the exterior of the building.
- Not preferred in the interior of the structure to avoid interior mouldings.

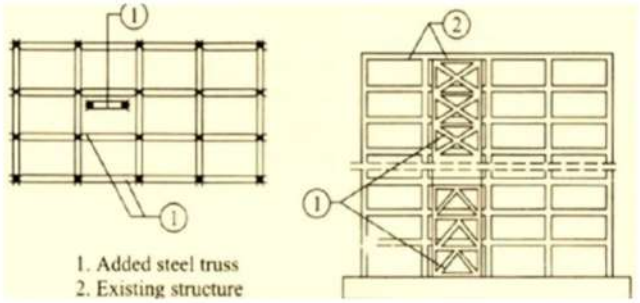


Fig 81: Adding New Shear Walls

1.2 Adding Steel Bracings

- An effective solution when large openings are required.
- Potential advantages due to higher strength and stiffness, opening for natural light can be provided, amount of work is less since foundation cost may be minimized and adds much less weight to the existing structure.

1.3 Jacketing (Local Retrofitting Technique):

This is the most popular method for strengthening of building columns.

Types of Jacketing:

1. 1.Steel jacket,
2. Reinforced Concrete jacket,
3. Fibre Reinforced Polymer Composite (FRPC) jacket

Purpose for jacketing:

- To increase concrete confinement
- To increase shear strength
- To increase flexural strength

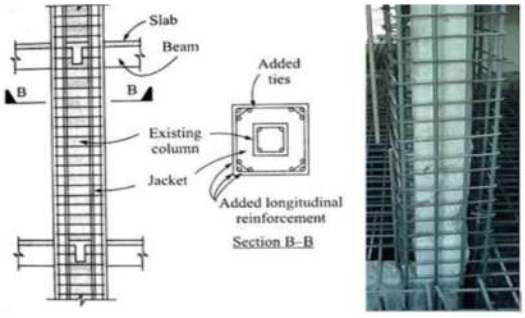


Fig 82: Jacketing

1.4 Base Isolation (or Seismic Isolation):
Isolation of superstructure from the foundation is known as base isolation. It is the most powerful tool for passive structural vibration control technique.

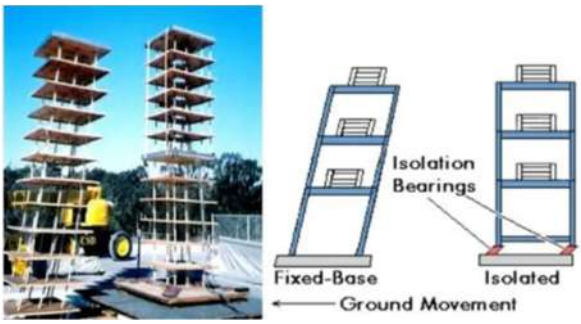


Fig 83: Seismic Isolation

1.5 Mass Reduction Technique of Retrofitting:
This may be achieved, for instance, by removal of one or more storey's as shown in Figure. In this case it is evident that the removal of the mass will lead to a decrease in the period, which will lead to an increase in the required strength.

1.6 Wall Thickening Technique of Retrofitting:
The existing walls of a building are added certain thickness by adding bricks, concrete and steel aligned at certain places as reinforcement, such that the weight of wall increases and it can bear more vertical and horizontal loads, and also its designed under special conditions that the transverse loads does not cause sudden failure of the wall.

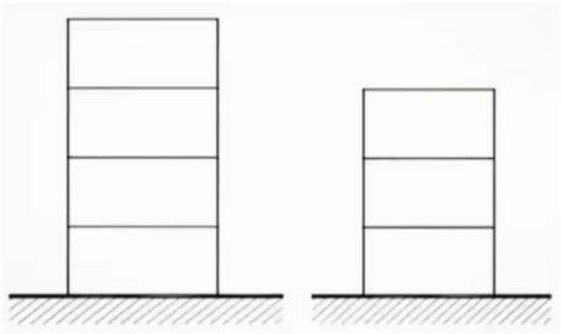


Fig 84: Retrofitting

Conclusion – Seismic Retrofitting Techniques for concrete structures:

- Seismic Retrofitting is a suitable technology for protection of a variety of structures.
- It has matured in the recent years to a highly reliable technology.
- But, the expertise needed is not available in the basic level.
- The main challenge is to achieve a desired performance level at a minimum cost, which can be achieved through a detailed nonlinear analysis.
- Optimization techniques are needed to know the most efficient retrofit for a particular structure.
- Proper Design Codes are needed to be published as code of practice for professionals related to this field.

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

What are Modern Methods of Construction?
Modern construction methods (MMC) are methods that are developed in construction industry with proper planning and design so that each project reduces the construction time, cost and maintain overall sustainability.

Types of Modern Methods of Construction

1. The different MMC used in construction field includes:
2. Precast Flat Panel System
3. 3D Volumetric Modules

4. Flat Slab Construction
5. Precast Cladding Panels
6. Concrete Wall and Floors
7. Twin Wall Technology
8. Precast Concrete Foundation
9. Concrete Formwork Insulation

Precast Flat Panel System

This method of construction involves the procedure of making floor and wall units off site. For this, separate factory outlets and facilities is required. Once the panel units are made as per the design specification and requirements, they are brought to the site and placed. This method is best suited for repetitive construction project activities.

The panels manufactured has the services of windows, doors and the finishes. This method also brings building envelope panels which are provided with insulation and decorative cladding that is fitted by the factory which can also be used as load – bearing elements.

Fig 85: Precast Flat Panel System

3D Volumetric Construction

As the name implies, the 3D volumetric construction involves the manufacture of 3D units in the form of modules in off site. At the time of installation, they are brought to the site and assembled module by module. Each modular unit manufactured are 3D units, hence this construction is called as 3D volumetric construction or modular construction.

The transportation of the modules can be carried out in various forms or methods. This can involve the transportation of the basic structure or a completed unit with all the internal and external finishes, services within it, that the only part remaining is the assembly.

The factory construction brings different unit of same product maintaining their quality throughout. Hence this method is best suited for repetitive projects so that rapid assembly of the products is possible.

Fig 86: Volumetric Construction

Flat Slab Construction

The flat slabs are structural elements that are highly versatile in nature. This is this versatility that it is used widely in construction. The flat slab provides minimum depth and faster construction. The system also provides column grids that are flexible.

Fig 87: Flat Slab Construction

Wherever it is necessary to seal the partitions to the slab soffit as a reason of acoustic and fire concerns, the flat slabs are a desirable solution. When compared with other forms of construction, the flat slabs are faster and more economic in nature. The construction of flat slabs can be completed with good surface finish for the soffit, this
to utilize he exposed soffits. The flat slab construction is also a means of increasing the energy efficiency as this allows the exploitation of building thermal mass in the design of ventilation, heating and the cooling requirements.

Twin Wall Technology

The twin wall technology is a hybrid solution of wall system that combines the qualities of erection speed and precast concrete with the structural integrity of in-situ concrete. This type of wall system guarantees structural integrity and waterproof reliability for the structure.

The twin wall system has two walls slabs that are separated as shown in the figure The two slabs are separated by a cast in lattice girders. The procedure involves:

Fig 88: Twin Wall Technology

1. The wall units are placed in the site.
2. The twin units are propped temporarily.
3. The wall units are later joined
4. The gap between the wall units are filled by means of concrete.
   This system of construction is faster than normal construction methods and economical. The twin wall system is mainly employed in association with the construction of precast floors.

14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment

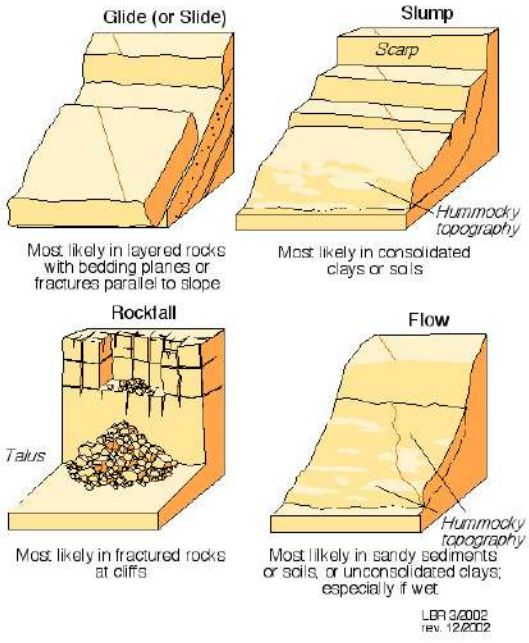
Introduction to Soil Mechanics

The term "soil" can have different meanings, depending upon the field in which it is considered.

To a geologist, it is the material in the relative thin zone of the Earth's surface within which roots occur, and which are formed as the products of past surface processes. The rest of the crust is grouped under the term "rock".

To a pedologist, it is the substance existing on the surface, which supports plant life.

To an engineer, it is a material that can be: built on: foundations of buildings, bridges built in: basements, culverts, tunnelsbuilt with: embankments, roads, dams supported: retaining walls Soil Mechanics is a discipline of Civil Engineering involving the study of soil, its behaviour and application as an engineering



material.
Soil Mechanics is the application of laws of mechanics and hydraulics to engineering problems dealing with sediments and other unconsolidated accumulations of solid particles, which are produced by the mechanical and chemical disintegration of rocks, regardless of whether or not they contain an admixture of organic constituents.
Soil consists of a multiphase aggregation of solid particles, water, and air. This fundamental composition gives rise to unique engineering properties, and the description of its mechanical behavior requires some of the most classic principles of engineering mechanics.
Engineers are concerned with soil's mechanical properties: permeability, stiffness, and strength. These depend primarily on the nature of the soil grains, the current stress, the water content and unit weight.

Formation of Soils

In the Earth's surface, rocks extend upto as much as 20 km depth. The major rock types are categorized as igneous, sedimentary, and metamorphic.
Igneous rocks: formed from crystalline bodies of cooled magma.
Sedimentary rocks: formed from layers of cemented sediments.
Metamorphic rocks: formed by the alteration of existing rocks due to heat from igneous intrusions or pressure due to crustal movement.
Soils are formed from materials that have resulted from the.

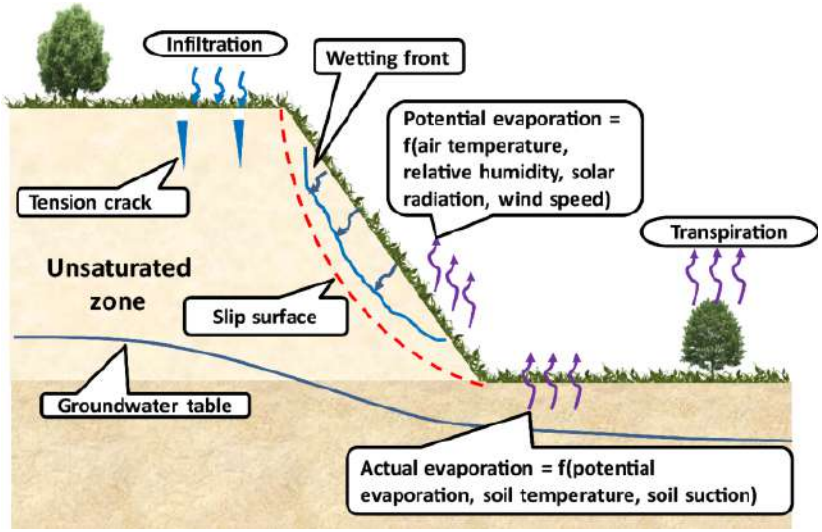


Fig 89: Formation of Soils

disintegration of rocks by various processes of physical and chemical weathering. The nature and structure of a given soil depends on the processes and conditions that formed it:
Breakdown of parent rock: weathering, decomposition, erosion.
Transportation to site of final deposition: gravity, flowing water, ice, wind.
Environment of final deposition: flood plain, river terrace, glacial moraine, lacustrine or marine.
Subsequent conditions of loading and drainage: little or no surcharge, heavy surcharge due to ice or overlying deposits, change from saline to freshwater, leaching, contamination.
All soils originate, directly or indirectly, from different rock types.

Physical weathering reduces the size of the parent rock material, without any change in the original composition of the parent rock. Physical or mechanical processes taking place on the earth's surface include the actions of water, frost, temperature changes, wind and ice. They cause disintegration and the products are mainly coarse soils.

The main processes involved are exfoliation, unloading, erosion, freezing, and thawing. The principal cause is climatic change. In exfoliation, the outer shell separates from the main rock. Heavy rain and wind cause erosion of the rock surface. Adverse temperarture changes produce

fragments due to different thermal coefficients of rock minerals. The effect is more for freeze-thaw cycles.

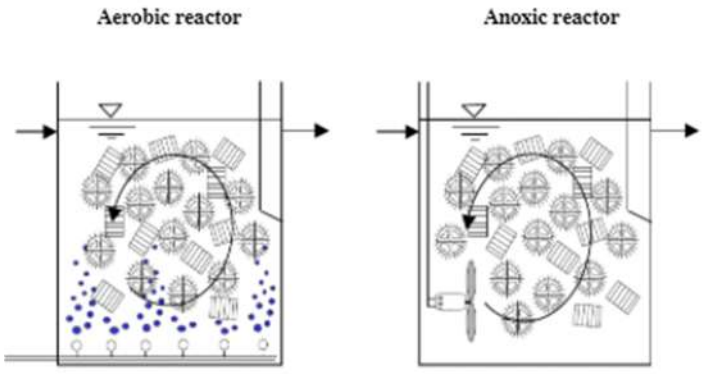
Chemical weathering not only breaks up the material into smaller particles but alters the nature of the original parent rock itself. The main processes responsible are hydration, oxidation, and carbonation. New compounds are formed due to the chemical alterations.

Rain water that comes in contact with the rock surface reacts to form hydrated oxides, carbonates and sulphates. If there is a volume increase, the disintegration continues. Due to leaching, water-soluble materials are washed away and rocks lose their cementing properties.

Chemical weathering occurs in wet and warm conditions and consists of degradation by decomposition and/or alteration. The results of chemical weathering are generally fine soils with altered mineral grains.

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

INTRODUCTION



In order to develop sustainable wastewater treatment it is needed to view the wastewater treatment systems using a holistic approach. A holistic approach implies considering the primary and secondary environmental effects and costs that the systems produce. Examples are the pollution produced at the power plant (generating electricity for wastewater treatment) and the energy cost of producing treatment chemicals. Designing or selecting a treatment system based on sustainability criteria involves a multidisciplinary approach where engineers cooperate with social scientists, economists, biologists, health officials and the public.

New nitrogen removal processes

The KMTTM process The KMTTM system is the most frequently used system The KMTTM system uses three plastic biomedia with a specific surface area from 310–500 m2/m3. The biomedia enhances the efficiency of the system so that smaller volumes are needed compared to a traditional activated sludge process, thus the energy process is also improved. Other advantages are robustness to load variations and low sensitivity to the tank shape and flexibility to operation.

SOURCE SEPARATING - RECYCLING SYSTEMS

Designing or selecting a treatment system based on sustainability criteria involves a multidisciplinary approach where engineers cooperate with social scientists, economists, biologists, health officials and the public

Blackwater (toilet wastewater) contains , 90% of the nitrogen, 74% of the phosphorus, 79% of the potassium (Vinnerås 2002). In addition 30–75 % of the organic matter in the wastewater is in the toilet waste (Jenssen and Skjelhaugen 1994). By the use of urine separating, composting, or extremely water saving toilets, nutrients can be collected and recycling facilitated (Jenssen 1999). Urine is an excellent fertilizer and needs only 6 months of storage to obtain hygienic safety for agricultural use.

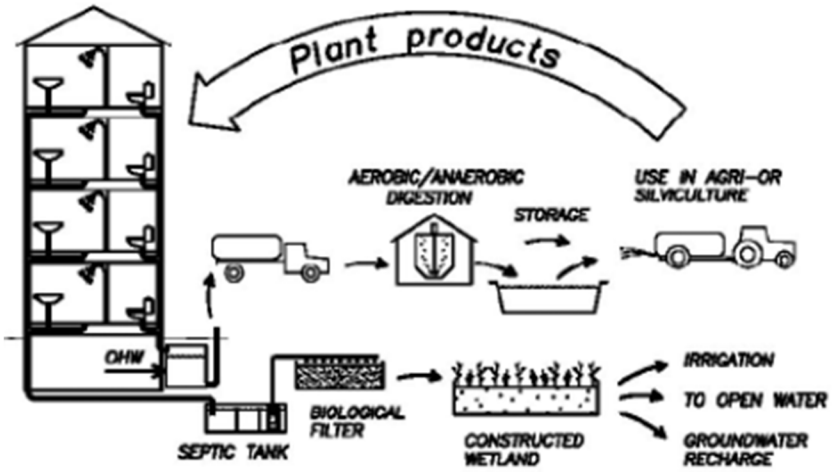


Fig 90: Recycling systems

Concentrated toilet and organic household waste can also produce energy via aerobic or anaerobic processes (Jenssen et al. 2003). In Norway the main focus has been on the use of extreme water saving (e.g. vacuum) and composting toilets. Substantial efforts are also devoted to the development of simple greywater treatment systems as wetlands, biofilters or soil infiltration systems or a combination of such.

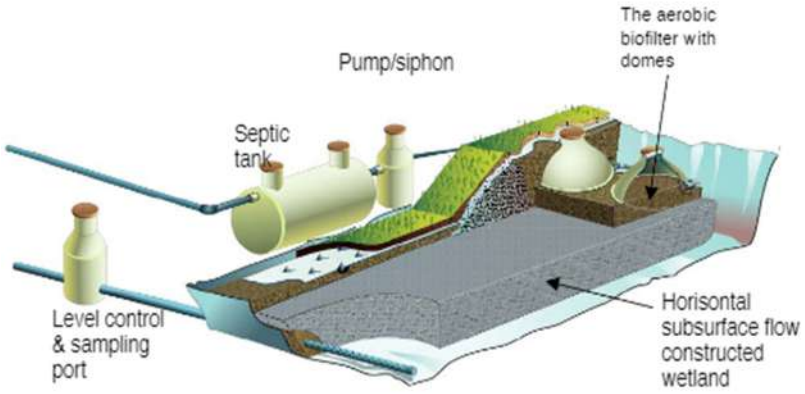
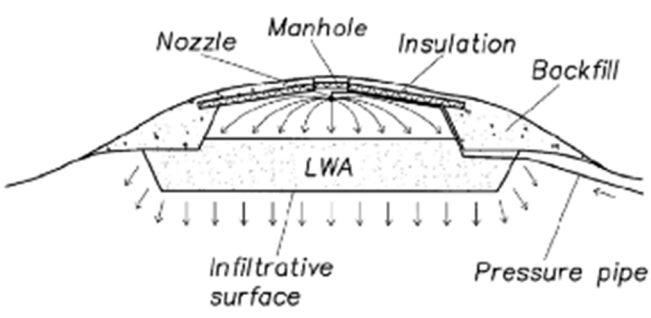


Fig 91: Greywater treatment

Greywater treatment is an important part of a complete ecological sanitation system. Greywater treatment options were considered by Rasmussen et al. (1996). In Norway greywater treatment systems using simple LWA biofilter systems or a combination of LWA biofilters and subsurface flow LWA constructed wetlands have been developed (Jenssen and Krogstad 2001, Jenssen and Vråle 2004). The principle of a source separating fully recycling system is shown in Fig.

Greywater treatment

Greywater contains minor amounts of nitrogen and phosphorus, but substantial amounts of organic matter (Rasmussen et al. 1996). Indicator bacteria are present in large numbers (Ottosen 2003). The need for treatment of the greywater depends upon its final discharge or use. For discharge to the sea no or primary treatment is sufficient. When the discharge is to inland lakes or



rivers the authors recommend secondary treatment.
This may be achieved using a simple biofilter system. In order to be able to discharge the greywater to small local streams or use it for irrigation or groundwater recharge, reduction of the hygienic parameters as bacteria is important. This can be obtained using a sand filter or a combination of a biofilter and a subsurface flow constructed. Biofilters and constructed wetlands using lightweight expanded clay aggregates (LWA) or similar porous media are pioneered in Norway (Jenssen et al. 2005).
A single pass biofilter aerates the wastewater and reduces oxygen demand (BOD) and bacteria, thus, higher loading rates can be used for a subsequent infiltration system (Heistad et al. 2001). The use of a single pass biofilter also provides new designs of onsite natural systems (Fig. 3). In sloping terrain such filters can be operated by the use of a siphon. Using such filters a 70 % BOD reduction and 2-5 log reduction of indicator bacteria has been obtained at a loading rate for greywater of 115 cm/d.
Assuming a greywater production of 100 liters/person/day (Table 4) a biofilter of 1 m2 surface area can treat greywater from about 10 persons, hence, very compact biofilters can be made. The key to successful operation of the biofilter is uniform distribution of the liquid over the filter media and intermittent dosing Fig. For locations where traditional soil infiltration is not possible a simple biofilter alone or a biofilter prior to soil infiltration or a constructed wetland system may be used .For cities a biofilter preceding a subsurface flow constructed wetland has been used with success (Jenssen and Vråle 2004).

14.2 Electrical Engineering

14.1.1 Design of Power Electronics converter

Power electronics have already found an important place in modern technology and are now used in a great variety of high-power product, including heat controls, light controls, electric motor control, power supplies, vehicle propulsion system and high voltage direct current (HVDC) systems. Nowadays, power electronic converters play an essential role in the majority of consumer electronic devices and are widely used in industrial applications. Since most of these applications are supplied through the AC grid, the use of rectifiers and DC-DC converters are mandatory to adapt the grid voltage to the application requirements.
1. Uncontrolled turn on and off (Power Diode)
2. Controlled turn on uncontrolled turn off (Thyristors)
3. Controlled turn on and off characteristic (Power Transistor, BJT, MOSFET, GTO, IGBT)
4. Continuous gate signal requirement (BJT, MOSFET, IGBT)
5. Pulse gate requirement (SCR, GTO)
6. Bipolar voltage-withstanding capability (SCR, GTO)
7. Unipolar voltage-withstanding capability (BJT, MOSFET, GTO, IGBT)
8. Bidirectional current capability (TRIAC)
9. Unidirectional current capability (SCR, GTO, BJT, MOSFET, IGBT)

Nowadays, power electronic converters play an essential role in the majority of consumer electronic devices and are widely used in industrial applications. Since most of these applications are supplied through the AC grid, the use of rectifiers and DC-DC converters are mandatory to adapt the grid voltage to the application requirements.

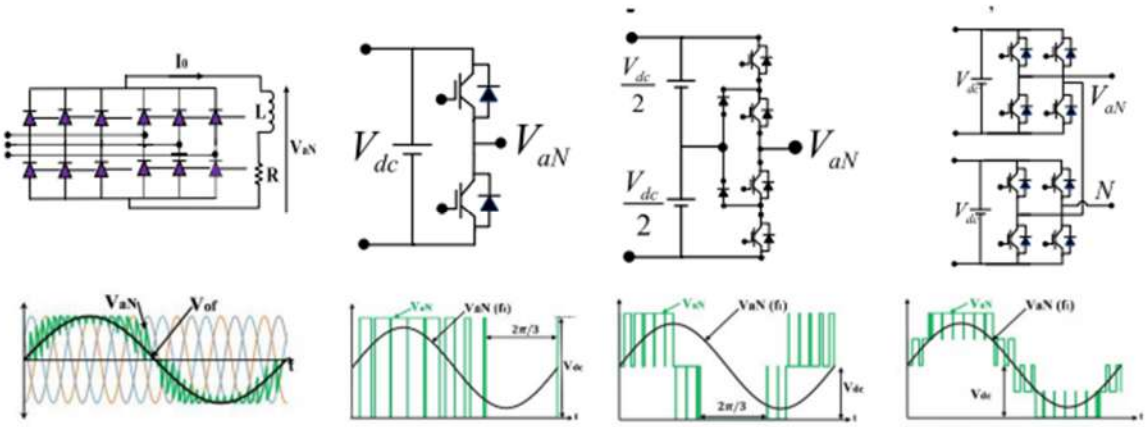


Fig 92:AC-DC Rectifiers Signals Modification

1) AC-DC Rectifiers: -

Three-phase diode front end - In this figure it shows a three-phase diode front end (DFE) rectifier composed of a DC bus capacitor (Cbus) and three legs with two diodes in each leg. As it is composed of diodes, the power flow is unidirectional (from AC source to DC bus) and the bus voltage cannot be controlled (it depends on the AC supply and the load). This rectifier is widely used in industry due to its low manufacturing cost and high efficiency and reliability.

However, they generate current harmonics in the AC side, which are detrimental for electrical generators. Under the assumption of a highly inductive AC side, the rectifier operates in a continuous current mode (CCM) and the DC bus current (ibus) can be considered constant. Each diode conducts when it is forward-biased and two diodes are always current conducting in the bridge. Assuming a highly inductive AC side, the current ripple in the DC side can be neglected. The reference voltages are 120 degrees phase shifted each other. When the reference voltage is higher than the triangular carrier, the upper transistor of that leg is turned-on while the lower transistor is turned-off. Conversely, when the reference voltage is lower than the triangular carrier, the upper transistor of that leg is turned-off and the lower transistor is turned-on. Thus, two different voltage levels can be synthesized in each phase [0, vbus]. Line to line voltage is obtained by subtracting two-phase voltages as shown in figure. This resulting line to line voltage has three voltage levels.

2) DC-DC Converters: -

Switch mode DC-DC converters - Generally speaking, switch mode DC-DC converter semiconductors are operated under hard switching conditions. However, soft switching operation conditions can also be achieved if specific converter topologies (e.g., single-active-bridge and dual-active bridge), modulation techniques (e.g., phase-shifting) or additional circuitry (e.g., snubbers) are considered. In this section, converter design and power loss estimation expressions are presented for different converter topologies. On the one hand, it is assumed that main power losses of the converter come from the power semiconductors. In consequence, power losses in the passive elements are neglected.

Therefore, total average power losses of the converters are calculated by the sum of average conduction power losses and average switching power losses of the semiconductors. Average conduction power losses depend on rms and average currents (Irms, Iave) through the semiconductors and the output characteristic of the semiconductor (rd, Vth). In turn, average switching power losses depend on switched voltages (vsw) and currents (isw) and the switching

loss characteristic provided by the manufacturer. Additionally, analytical expressions of the maximum current circulating through the semiconductors (imax) and their maximum reverse blocking voltage (vmax) are calculated. These calculations allow selecting semiconductors with appropriate voltage and current ratings for each converter.

Boost The boost converter is a well-known unidirectional step-up converter used in applications where no galvanic isolation is required. The converter has few components, which makes its structure to

be simple and reliable.

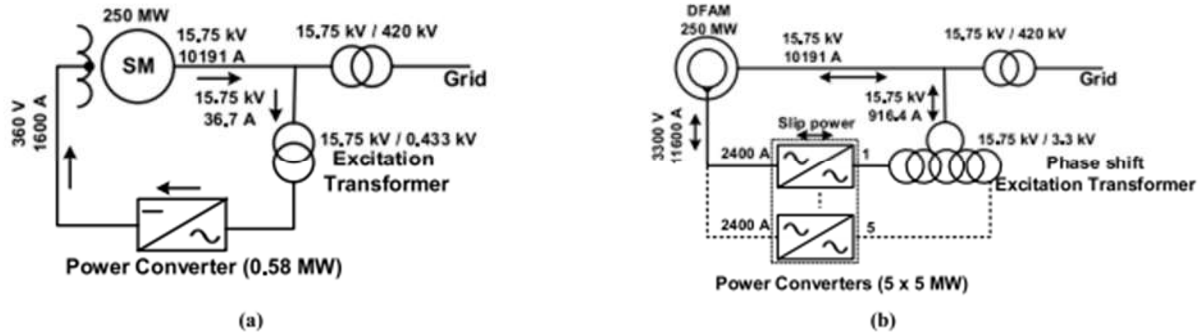
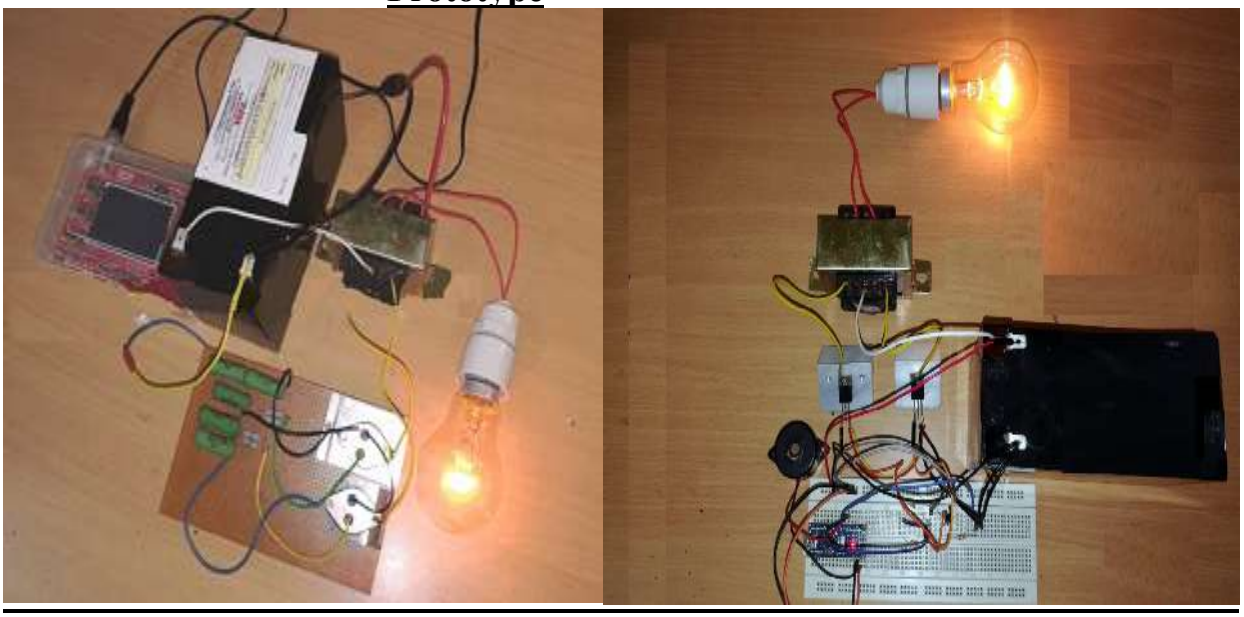


Fig 92:DC-DC Rectifiers Signals Modification

Prototype



Invertyer Cost Estimation

BILL OF MATERIALS			
Part	**Description**	**Quantity**	**Price**
Float Switch pack	5 pack	1	686
Relay	min 3Vdc ctrl, rated 24-380Vac	1	1026

Water Pump	.5W, 110Vac	1	2110
AC to DC converter	80 -264 VAC input, 3.3V output	1	1105
Fuse Holder Lid	For use with 36-4527-ND	1	20
Fuse Holder	for 5mm x 20mm fuses	1	50
Fuses	1A, SloBlo	5	661
Thread Tape	white	1	89
WD 40	Lubricant in can	1	208
Pipe Glue	Adhesive for use with PVC pipes	1	345
Pump Tubing + connectors	1" PVC pipes and 1" threaded connectors	1	807
Check Valve	1" for PVC Tubing	1	852
Large containers for water	intended for storage	2	1313
14 AWG wire	white, rated for up to 15A, 25'	1	454
14 AWG wire	Black, rated for up to 15A, 25'	1	454
Type B Socket	AC 125V 15A	1	395
Banana Socket pack	2 black, 2 red	1	437
Rocker Switch	5 pack	1	355
Preboard Set	Variety of sizes	1	559
Microcontroller	3.6V supply	1	189
22 AWG Wire	100' Stranded Black Wire	1	830
Enclosure Material	7.5"x4.3"x2.2", black, plastic	1	1106
3 wire Plug	NEMA 5-15 Grounded	1	409
Test Materials Total		6165	
Device Materials Total		8303	
Grand Total		**14,006**	

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

OPERATING PRINCIPLE 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

CIRCUIT DIAGRAM

The circuit diagram of soft-starting of three phase IM is shown in Fig.1. The circuit diagram comprises of voltage regulator, zero crossing detector, bridge rectifier, 4N25 opt-Isolator,

Atmega 328P microcontroller and TRIAC circuit. TRIAC circuit performs the role of soft starter in each phase of three phase induction motor. TRIAC circuit basically consists of two antiparallel SCRs connected back to back. This soft starter is used to give soft starring to Induction motor.

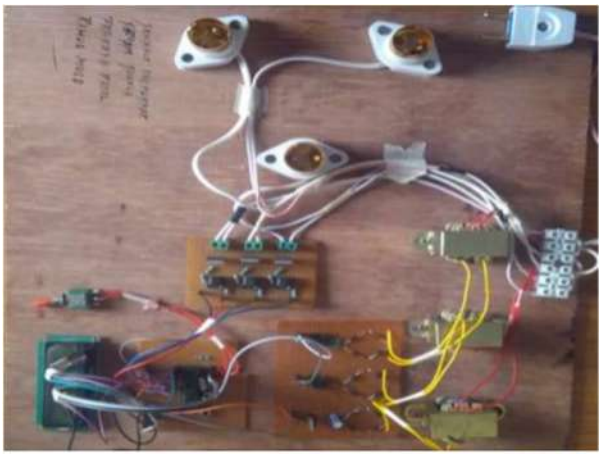


Fig 94: Circuit diagram

A 12 V DC regulated supply is obtained with the help of step-down transformer and bridge circuit. The step down transformer converts 230V to 12V ac supply and then it is fed to bridge circuit. The bridge circuit in turn converts ac supply to dc supply. This dc supply is given to regulator IC to get positive 12V dc regulated supply.

The main part of the circuit is zero crossing detector circuit which is made up of four diodes connected to form bridge rectifier circuit and output of bridge rectifier is fed to 4N25 optoIsolator. Then output of 4N25 optoIsolator is applied to interrupt pin of Atmega 328P. Whenever the input AC waveform crosses the zero reference point, a high pulse signal triggered from 4N25 optoIsolator is given to interrupt pin of Atmega 328P. When Atmega 328P receives high signal from interrupt pin, it interrupts Atmega 328P by providing high signal on interrupt pin and then it initiates delay counter from that point and hence it provides triggering pulse to gate signal of TRIAC through MOC3021 optoIsolator.

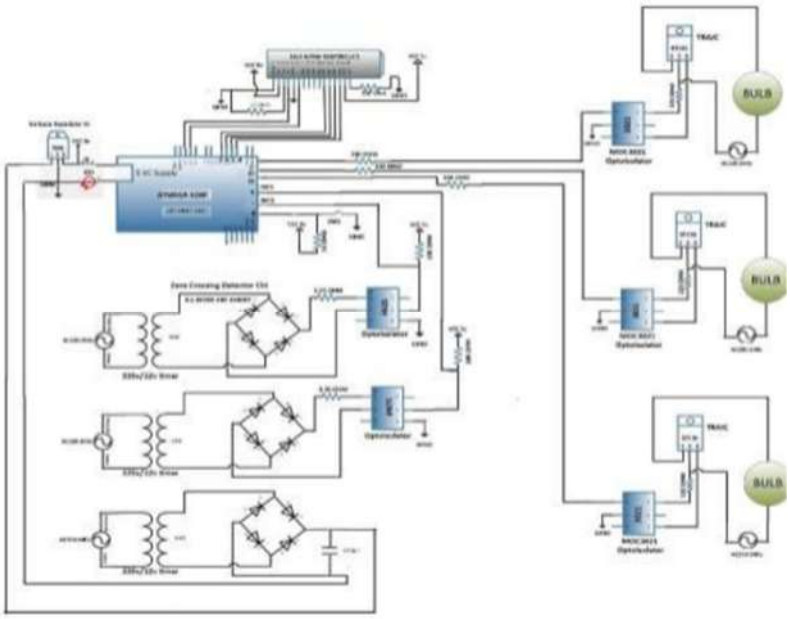


Fig 95: Hardware prototype

HARDWARE PROTOTYPE OF SOFT STARTING OF INDUCTION MOTOR

Fig. Experimental hardware prototype of soft-starting of three phase induction motor

The proposed soft starter is tested and hardware prototype is created to understand the operation of starter for three phase Induction motor. The hardware prototype for soft-starting is shown in Fig. The components used in soft-starters are shown in tabular form. The proposed soft starter is tested and hardware prototype is created to understand the operation of starter for three phase Induction motor. The main part of the circuit is zero crossing detector circuit which is made up of four diodes connected to form bridge rectifier circuit and output of bridge rectifier.

14.2.3 Advanced Wireless Power Transfer System

1. INTRODUCTION

The Transfer of electrical power in reliable and efficient way is always challenging for the designers and engineers. Presently all electrical power from the generating stations to the distribution station is transferred by the uses of wires and underground cables. One of the major issues in these types of systems is the losses due to resistance of the material. Generally the percentage of loss of power during the transmission and distribution is 26%.

In modern technology the use of portable device has increased such as mobile robots and electric vehicle. Mobility is the main concern of these equipment i.e. they are not connected to the main source of power.

All these problems are the main motivation for researchers. Nikola Tesla was the first who introduce the concept wireless power transfer [2]. But this technology from the time of Tesla is underdeveloped due to lack of funding and technology. But research from past few years has always going on and recent development has been observed in the field .

Fig 96: Wireless Power Transfer

Wireless power transfer can be achieved by several methods (discussed later). Here we discussed few methods such as induction coupling, resonating coupling, LASER technology for electrical power transfer.

1.1 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 upto few cm and separation distance is very less than the coil diameter

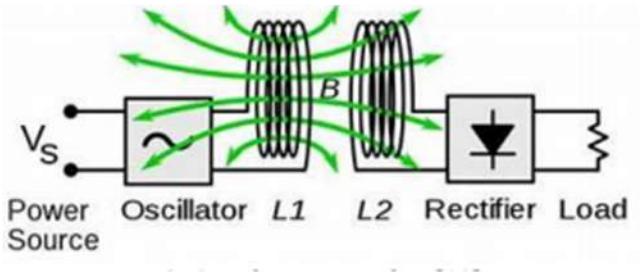


Fig 97: Inductive coupling

1.2 MAGNETIC RESONANCE COUPLING WPT

This is also one of the important method for transferring power based on near field technique. It generally overcome the disadvantage of upto some extent which

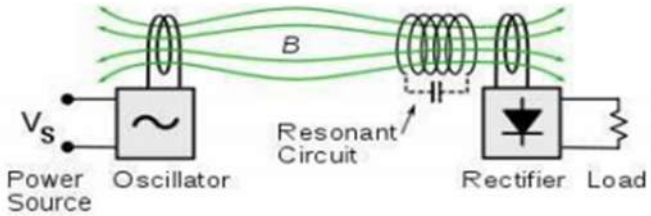


Fig 98: Magnetic resonance coupling wpt

arise in nonresonant 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 allow us to transfer significant amount of power by increasing distance between coils. These type of system are used for building mid range power transfer. Mid range can be specified by distance upto 10 times the diameter of the transmitting coil. Magnetic resonance coupling have several advantage such as efficiency increases with decrease in the radiation and power loss and range can be increase upto 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.

1.3 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 disadvantage i.e. why it is not used for electrical power transmission because LASER beams can easily harms human being if they cut LASER beam path. Therefore these are generally used for military weapon development and space research.

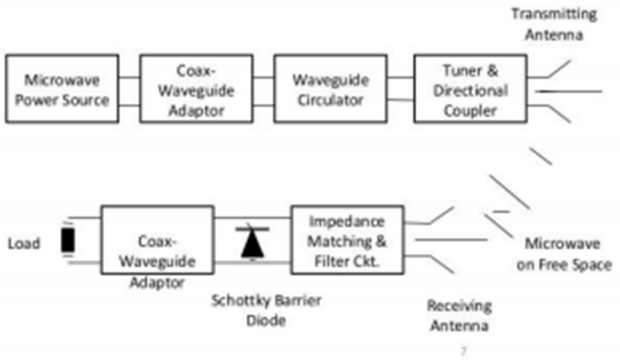


Fig 99: Laser wpt

14.2.4 Industrial Temperature Controller

1 Introduction

The modern sensing technology and control methods are undergoing continuous innovation, where the real-time temperature control is demanding higher accuracy and faster response more than ever. Temperature control is widely used in production and industrial control processes in all aspects. For example, in the iron and steel smelting process, iron and steel to be baked requires heat treatment in order to achieve their performance indicators; plastic qualitative process also needs to maintain a certain temperature range. The fact is that the temperature control system is a complex process object involving large inertia and pure delay with multi-variable and time-varying parameters. At present, the PID control methodology is adopted in most cases [1]. In this way, different PID parameters should be selected for different control objects, for which some practical experience is needed. As a language controller, the fuzzy PID control is to imitate the way of human thinking and experience to achieve its control process that can more closely reflect the best control behavior of the controller. With strong robustness and control stability, it can be applied to different control objects. The combination of fuzzy control and PLC, which is widely used in industrial control, is one of the hotspots in this research area. Therefore, this work involved the use of the PLC-based fuzzy PID control technology, by which the system temperature was set through the fan and the heating plate to control the box temperature.

1.1 System hardware

In the hardware part of the system, the acquisition module uses the temperature sensor to measure the measured object temperature, and the temperature signals are converted into electrical signals, which are then transmitted to the emperature transmitter, where the electrical signal is converted into a 4 ~ 20mA current signal, so that the module EM235 in the PLC expansion module can be facilitated as to the analog signal input. EM235 receives data, which will be sent directly to the PLC output control text display (display temperature) and the temperature control device(heating &cooling device). The system block diagram is shown in Figure.

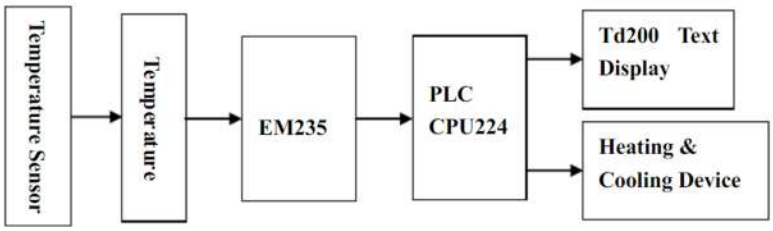


Fig 100: System hardware

1.2 System software

The software of this system adopts STEP7 for PLC200, the popular programming software by Siemens, for software compilation, and the temperature controller device adopts fuzzy PID algorithm for temperature control, with the simulation to be implemented by MATLAB simulation software.

1.3 Figure shows that the system consists of four modules, i.e., acquisition module, control module, display module and implementation module. The acquisition module includes PT100 temperature sensor and temperature transmitter. PT100 temperature sensor works with a temperature variable that can be converted into a standardized output signal. This instrument is mainly used for industrial process with measurement temperature and control parameters. The temperature transmitter is a signal conversion device, which is responsible for the signals collected by the temperature sensor to be converted to electrical signals of 4 ~ 20mA. This is quite convenient for PLC200's identification and collection of temperature signal. For control module, Siemens PLC200 is chosen as the core controller, playing the role of the completion of the temperature signal collection, signal processing and signal transmission. Display module using TD200 text display can be better compatible with the PLC to complete the data transmission. This display module displays the current temperature and the desired temperature. Implementation module works by using cold fan and heating resistor, through the PLC-controlled cold air fan and heating resistor to complete the instructions for the temperature rise or fall, and finally, the temperature reaches a constant value.

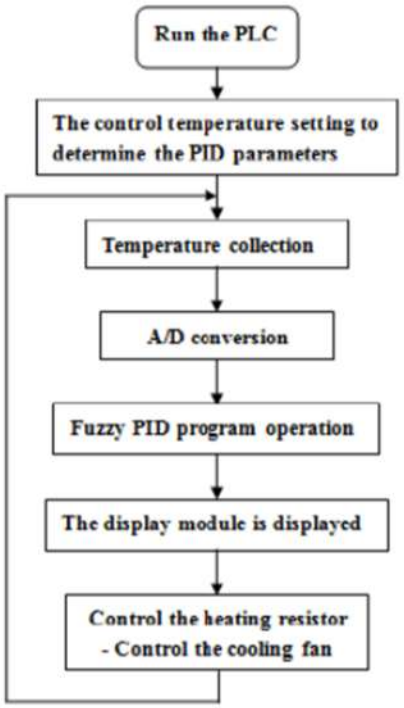


Fig 101: System software

2 Software design

According to the system design requirements, the software program flow is shown in Figure .

First of all, the parameters of the temperature control system undergoes wake-up initialization, mainly to set the control temperature and the PID initial value, including the value settings of PID gain, PID integral time, PID differential time and PID sampling time. Then, the ambient temperature is collected through the sensor in a range of 6400 ~ 320000, as the digital signal. As the fuzzy PID algorithm requires real-format temperature signal input, there is the need for A/D conversion of temperature signal prior to the PID algorithm process. The collected digital signal is converted into double integer signal, which is then transformed into a real figure. The actual temperature is calculated by the temperature calculation formula. The measured temperature is taken as the input signal for PID operation, and the output is ready for the control of the heating resistance and cold air fan.

3 Experiment and Simulation

Assume that the system has an open-loop transfer function as G (s) = 1/S (2*S + 5), and a fuzzy control system is established in Matlab, as shown in Figure 4. At this time, the amplifier Gain = -1000, Gain1 = 0.05, Gain2 = 0.01. Select the controlled object and its reference model, and we can get the simulation curve shown in Figure.

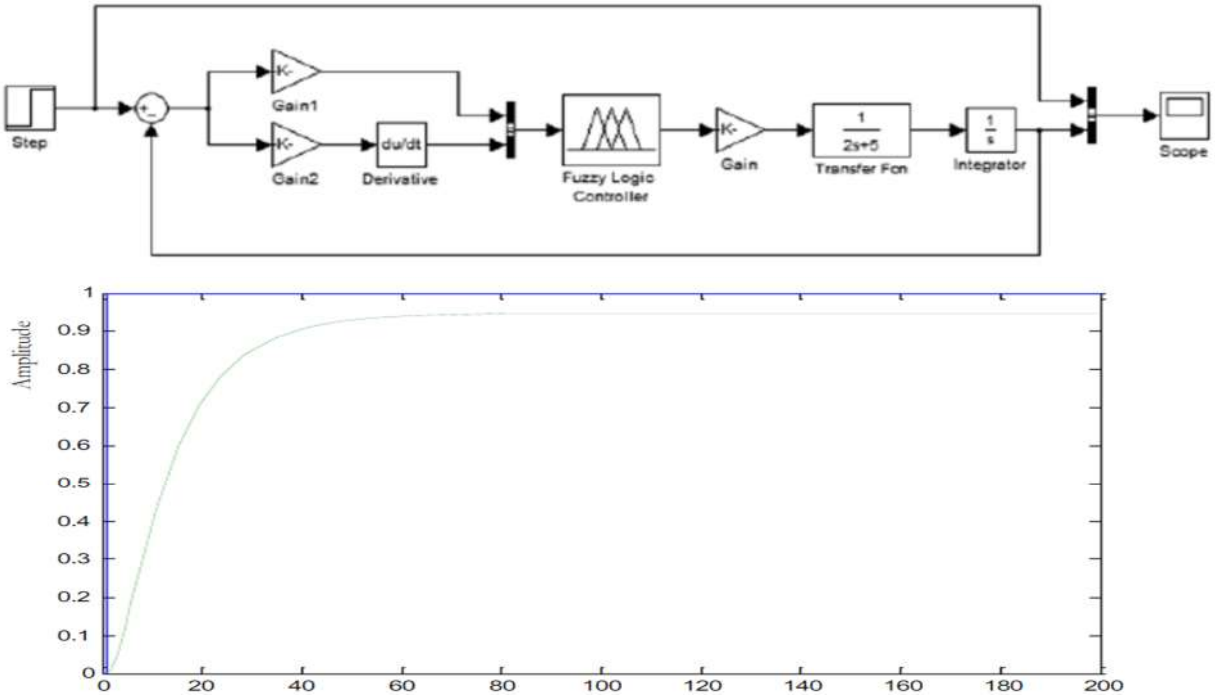


Fig 102: Experiment and Simulation

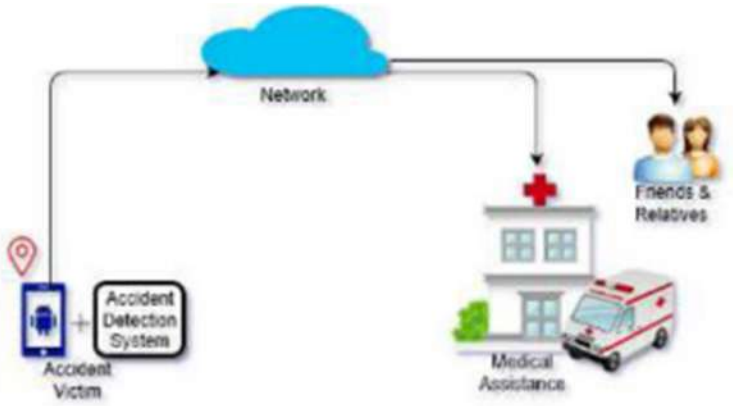
Conclusions

In this work, the temperature control system was available for real-time display of the temperature inside the box. By setting the temperature through the fan and the heating plate, PID control algorithm was introduced to control the temperature of the box to achieve the temperature control needs. With Siemens PLC200 as the controller, system control was quite impressive with high precision, stability and reliability, being not susceptible to outside

interference. On-site commissioning revealed that box temperature could be successfully controlled by the system. This work is expected to bring about a good application prospect.

14.2.5 Accident Alerts in Modern Traffic Signal Control System -Camera Surveillance System

INTRODUCTION



The motor vehicle population is growing at a faster rate than the economic and population growth. Accidents and the death rate due to road accidents, especially two wheelers are also increasing at an alarming rate. Most of the accident deaths that happens are due to the lack of immediate medical assistance, on the roads like express highways. A facility for providing immediate medical assistance to the accident area can reduce the fatality to a greater extend. Thus comes the idea of an alert system that senses the accident and its seriousness to alert the nearby medical center for providing ambulance or medical aid to the accident area.

The proposed system will check whether an accident has occurred and identify the seriousness of the injury to the accident victim/driver. Once the decision of serious accident has taken, the system will check for the nearest medical center and notify them about the incident. The rescue team can rush to the spot immediately without any delay as the correct location will be communicated by the mobile phone of the accident victim. The system will also send message to the friends and relatives to inform them about the incident.

Accident detection and alert system has been extensively studied over the past several years. Research work in this field has proposed a Telematics model which has three main modules . The system is intended to capture the location of the vehicle through GPS receiver, send the location information to vehicle owner's mobile number through SMS and also to the telematics operator server through GPRS. Another prototype proposes a system to detect and provide faster assistance to traffic accident victims. A prototype architecture to improve the chances of survival for passengers involved in car accidents has also been proposed. The proposed system offers automated detection, reports, and assistance to passengers involved in road accidents by exploiting the capabilities offered by vehicle to vehicle communication technologies. Here a low cost alert system is proposed to provide immediate medical aid to the accident victims by alerting the nearby medical assistance center with the exact place of accident and the details of the patient through SMS. This system also takes the medical condition of the accident victim by checking the heartbeat to understand the seriousness of the accident and inform the medical aid center.

Accident Detection System

The Accident Detection System consist of two main modules. The first module detects whether the vehicle has fallen down. It is mounted on the vehicle itself. This module consist of an accelerometer, MSP430 micro-controller and a Bluetooth module. Once the vehicle fall is detected the information is send to the second module. The second module consists of a Heartbeat sensor MSP430 microcontroller, Buzzer and Bluetooth module. Once the fall is detected the heartbeat of the driver is checked and if any abnormality is detected the decision that a serious accident has occurred is taken. Then the Buzzer in the Accident Detection System is turned ON and it will communicate with the Smart phone to alert the medical center. The Android application in the Smart phone will search for the nearest medical center and sends message about the accident location and accident victim details. The Application will also send the information to the emergency contact numbers of the friends and family that has been already saved in the application.

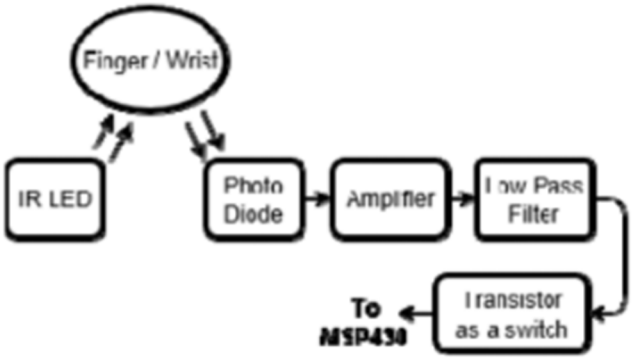


Fig 103: Accident Detection System

ALOGORITM FOR ACCIDENT DETECTION AND ALERT

The flowchart describing the operation of the proposed system is as shown in the figure.

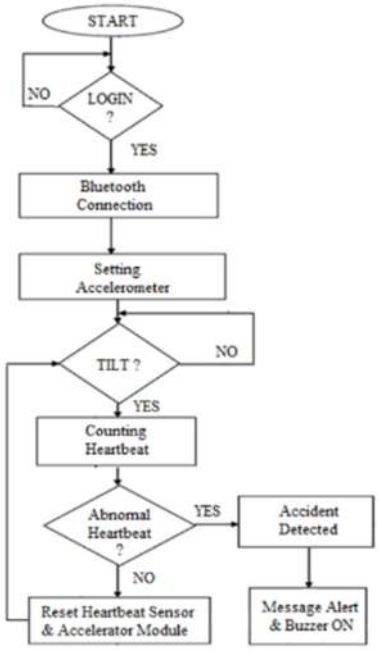


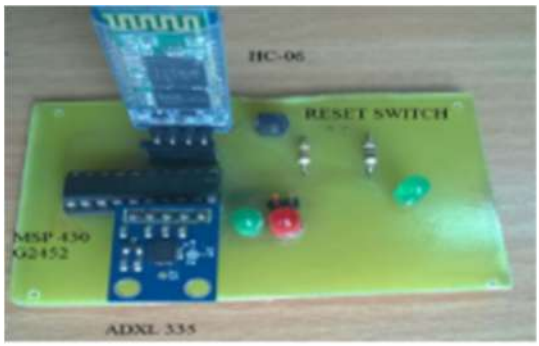
Fig 104: Alogoritm

FABRICATION, TESTING AND ANALYSIS

Each modules in the system are designed and fabricated separately and tested. Finally all the modules are interconnected together and tested for the complete functionality.

A. Fall Detection

The fall detection module is fabricated and tested for various angles. The accelerometer ADXL335 MSP430G2452 and Bluetooth modules are integrated and fabricated on a single board to mount on the bike as shown in the Figure. The Green and Red LEDs are used for testing purpose. The accelerometer is calibrated and mapped to corresponding voltage with MSP430. From the experiments the voltage level of the fall detection is found to be 0.33V and that of normal riding posture is about 3.24V as shown in the Table.



B. Heartbeat sensing

The heartbeat sensor is designed and fabricated to detect the heartbeat as shown in figure 9. The board consists of IR LED, Photodiode, and LM324 operational amplifier IC as main components. This board can be designed as a wearable smartwatch or smart-wristband on the user's hand. The heartbeat is detected as a spiking signal which is filtered, amplified and converted to pulse signal before giving to MSP430 micro-controller. This heartbeat sensor board can be integrated with the sensing module through the heartbeat sensor socket in the module in the Figure.

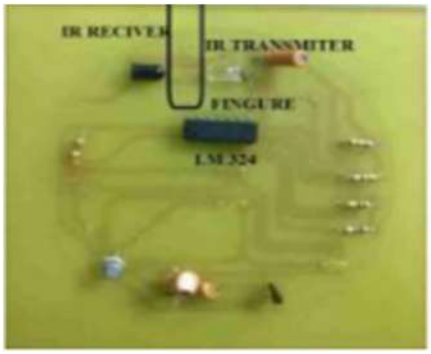


Fig 105: Heartbeat sensing Circuit

The fabricated heartbeat sensing module shown in the Figure consists of the socket for connecting heartbeat sensor board, Bluetooth module HC-05, Buzzer and MSP430G2452 micro-controller. The buzzer is tested for the alarm sound when the accident is detected. The Bluetooth communication with the smartphone is also tested. It will send the decision that whether the heartbeat rate is low or high comparing to the normal rate. LEDs are also provided for testing purpose at the time of design.

C. Message Alert to Medical Assist Center and Friends

Once the accident is detected and its seriousness is confirmed the Android application will alert the medical assist center with the basic victim details such as name, age and blood group together with the location of the accident. The Android application will also inform the victim's friends and relatives about the incident and the location of the accident as shown in the Figure.

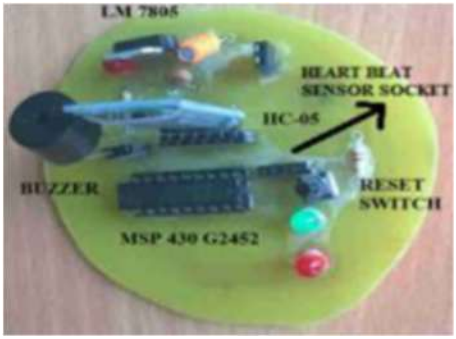


Fig 106: Message Alert Circuit

D. Buzzer and Alarm operation

Two types of alarms are used, one is the visible alarm and the other is audible alarm. The audible alarm is a buzzer. The buzzer will make sound when the microcontroller detects and confirms the accident. The visible alarms are the two LEDs, one LED is Red in colour and the other is Green. These LEDs are mainly used for the testing purpose of the board.

CONCLUSION

The system can detect the accident and confirms the seriousness of the accident and then alert the nearest medical assist center to provide emergency medical aid to accident victim. Accelerometer and heartbeat sensor are used to determine whether an accident had occurred. The communications between the modules are done by using Bluetooth. The smart phone with the android app will send message to the nearest medical center. The system will also inform the friends and family of the victim through message. A buzzer is also provided to alert the fellow passengers on the road that an accident has occurred to invite their help.

15. Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society. (For Allocated village development, villagers happiness, comfortable and for enhancement of the village) (With the Smart village development Concept As Per Your Idea And Village Visit, modern technology with innovation).

Post office : There is no any post office in the village so after asking from many villagers we think that they need it. It also help them if they want to invest or save their money post office is also work as a kind of bank.

Hospital : Hospital that is present in village is very small and mostly it remain close so for any emergency condition they have to travel a lot which take lots of time and time is very important during emergency condition.

Bank : We ask lots of villagers as well as staff of panchayat office and all of them want bank in their village so we decide to design small and low cost bank for village

Community Hall Plus Theater: It will help people to do their social easily and more economically. The social bonds that are created at **community centers** help build strong, safe and inclusive communities; social interaction, volunteerism, civic pride and aesthetics all play a role.

Public Garden: Public Garden will help small kid as well as old people for their health as well as they get good environment to sit and talk with their friends.

Vegetable Market: vegetable market will help the people to buy vegetable at affordable rate and they get fresh and varieties of food as well.

Irrigation system using solar energy and rain gun : We know that lots of electrical energy s require in irrigation due to which the cost for irrigation also increase hence it will affect the farmer pocket. Hence we decide to design a solar irrigation system with low cost which help farmer as well as environment by using rain gun less quantity of water is require as compare to normal irrigation.

Solar energy based water purification system : Most of people in village drink tap water which is not good for health and they even don't know that it affect their health and various public placed have RO but some time its not working and its maintenance cost is also very high so we decide to design solar water purification system which is help full for domestic as well as public use

Automatic Soil Moisture Control System For Herb Plant(Unique Plant) : This topic is something know that we thought because some time we find unique or helpful plant in village but due to not taking its proper care it exits from their and it is very difficult to

grow that plant somewhere else and provide essential condition so this device will help plant to gain require moisture the plant needed like Stevia Plant , Moringa plant ,Hibiscus etc.

Solar A.C for Residential and Public Building: Solar cooling systems use ecological benefits including lower grid demand and load shifting throughout peak usage, decreased electrical power expenses, fewer power blackouts, off-the-grid abilities and minimized greenhouse gas emissions.

Agricultural Pest and Disease Monitoring Based on Internet-of- Things and Unmanned Aerial Vehicles: So by using this technology we can cover a large area in small time which will save time as well as money and save crop from pest and those who have small field they also buy this with other small field farmers.

Design and Implementation of Farm Monitoring and Security System:

So by using this prototype farmers they can protect their crop from the road people as they are now more easily accessible to their crop so we have design this prototype to protect their crop to be destroyed by human as well as animals.

With doing small changes, Period, Amount Expenditure and Benefit –

a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.

b) If possible, List the sources of the funding available with the Village gram panchaya

Sr. No	Design Name	Period	Amount Expenditure	Benefit
8.1.1	Post office	Immediately	Rs. 3,00,318/-	There is no any post office in the village so after asking from many villagers we think that they need it. It also help them if they want to invest or save their money post office is also work as a kind of bank.
8.1.2	Hospital	Long term (1-3 years)	Rs. 6,38,997/-	Hospital that is present in village is very small and mostly it remain close so for any emergency condition they have to travel a lot which take lots of time and time is very important during emergency condition

8.1.3	Bank	Immediately	Rs. 2,41,663/-	We ask lots of villagers as well as staff of panchayat office and all of them want bank in their village so we decide to design small and low cost bank for village
8.1.4	Irrigation system using solar energy and rain gun	Immediately	Rs. 3.10.000/-	We know that lots of electrical energy s require in irrigation due to which the cost for irrigation also increase hence it will affect the farmer pocket. Hence we decide to design a solar irrigation system with low cost which help farmer as well as environment by using rain gun less quantity of water is require as compare to normal irrigation.
8.1.5	Solar energy based water purification system :	Immediately	Rs. 28,844/-	Most of people in village drink tap water which is not good for health and they even don't know that it affect their health and various public placed have RO but some time its not working and its maintenance cost is also very high so we decide to design solar water purification system which is help full for domestic as well as public use
8.1.6	Automatic Soil Moisture Control System For Herb Plant(Unique Plant)	Immediately	Rs. 4,136/-	This topic is something know that we thought because some time we find unique or helpful plant in village but due to not taking its proper care it exits from their and it is very difficult to grow that plant somewhere else and provide essential condition so this device will help plant to gain require moisture the plant needed like Stevia Plant , Moringa plant ,Hibiscus etc.
13.1.1	Community Hall Plus Theater	Long term (3-5 years)	Rs. 25,576,274/-	Village and movie theater halls are the smallest buildings that can accommodate a sports Programme alongside the customary social and arts pursuits. There are a wide variety of types and sizes, all with the following in common – a main activity and assembly space

				together with ancillary accommodation that might include additional
13.1.2	Public Garden	Long term (1-3 years)	Rs. 2,29,007.09	Aside from the natural beauty that they provide, there are many benefits to public gardens, especially if you are a gardener, or hope to be one. The whole purpose of a public garden is to provide the knowledge and love of plants to a community, something that every gardener needs.
13.1.3	Vegetable Market Hub	Immediately	Rs. 4,67,717.08 /-	Cooperatives can help farmers benefit from economies of scale by lowering their costs of acquiring inputs or hiring services such as storage and transport. Agricultural cooperatives also enable farmers to improve product and service quality and reduce risks.
13.1.4	Solar A.C for Residential and Public Building	Immediately	Rs. 98,000/-	Solar cooling systems use ecological benefits including lower grid demand and load shifting throughout peak usage, decreased electrical power expenses, fewer power blackouts, off-the-grid abilities and minimized greenhouse gas emissions.
13.1.5	Agricultural Pest and Disease Monitoring Based on Internet-of-Things and Unmanned Aerial Vehicles	Immediately	Rs. 28,000/-	So by using this technology we can cover a large area in small time which will save time as well as money and save crop from pest and those who have small field they also buy this with other small field farmers.
13.1.6	Design and Implementation of Farm Monitoring and Security System	Immediately	Rs. 4,084/-	So by using this prototype farmers they can protect their crop from the road people as they are now more easily accessible to their crop so we have design this prototype to protect their crop to be destroyed by human as well as animals.

16. Survey By Interviewing With Talati And/Or Sarpanch

Interactive Presentation (Vishwakarma Yojana: Phase: VII) At
Barejadi Village, Ahmedabad District.

- As per the circular GTU guideline, GTU informed all the teams of Vishwakarma Yojana to present their work in village for the effective implementation of Vishwakarma Yojana. Under this guideline Student's team of Barejadi village presented the village development plan of Barejadi village at Barejadi Panchayat office on 11th December, 2020. Sarpanch, Talati, All the Panchayat members and Village dwellers remained present to know how the development of Barejadi village is possible and to give their feedback.
- We presented our work under VY. We explained core theme of VY, various benefits of village development and issues prevailing in villages. We explained various designs under Physical infrastructure, Social infrastructure and Socio-Cultural facilities such as Vegetable market Hub, Public Garden, Bitumen Road, Bus stand and Animal House with drinking water tank.
- Barejadi village dwellers shared various problems faced by them while designing such a facilities, we gave various approaches and also presented management techniques of such facilities with proposed design.
- The presentation was very much interactive and helpful to understand various amenities to be designed at village level for the overall development of the Barejadi village as Rurban town (Rural Soul + Urban Amenities).
- Our team of VY thanked all the members of the village for their support during this work period and made them understand that the implementation of such facilities can build a better village and hence lead to build a strong nation.
- We also evaluate the ecological, economic, social and cultural sustainability of inorganic agriculture. This analysis points emerging issues such as environmental degradation, loss of ecosystem services, non-sustainability and threats to food security in the context of global population growth and climate change.
- We explained various designs under Physical infrastructure, Social infrastructure and Socio-Cultural facilities such as Vegetable market Hub, Public Garden, Bitumen Road, Bus stand and Animal House with drinking water tank.
- This analysis points emerging issues such as environmental degradation, loss of ecosystem services, non-sustainability and threats to food security in the context of global population growth and climate change.
- We explained core theme of this yojna, various benefits of village development and issues prevailing in villages. We explained various designs under Physical infrastructure, Social infrastructure and Socio-Cultural facilities such as Vegetable market Hub, Public Garden, Bitumen Road, Bus stand and Animal House with drinking water tank.
- Those general difficulties are illustrated by our two case studies investigating options, stimuli and difficulties to improve water-efficient practices.
- The two areas have strong stimuli for improvement but lack a knowledge-exchange system to help farmers and resource managers identify scope for improvements. Partly for this reason, farmers' responsibility for efficient water management has been displaced to hypothetical prospects, e.g., extra supplies from reuse of treated wastewater.

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?	Y	Farming, Retail Store
2	What are the chances of employment in village?	N	
3	What are the special technical facilities in village?	Y	Farming
4	Is any debt on village dwellers?	Y	
5	Are village people getting agricultural help?	Y	Govt Subsidy
6	Is women health awareness Program organized in village?	Y	
7	Are women having opportunity to work and income?	Y	MGNREGA
8	Child girl education is appreciated in village?	Y	
9	Facility of vaccination to child is available in village?	Y	PHC
10	Are village people aware about child vaccination and done to each and every child as per norms?	N	
11	Women help line number information is provided to village people?	Y	
12	Is water scarcity in village? How many days per year?	N	
13	Is village under any debt?	N	
14	Is any serious issue due to debt from bank or any person happened in village?	N	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	Y	
16	Is any death of patient occurred due to unavailability of medical facility in village?	Y	
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.	Y	
18	Is village improvement is observed in comparative scenario from past to present?	Y	Social developm... are there
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	N	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Y	

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

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

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Chapter – 17 Irrigation / Agriculture Activates and Argo Industry,Alternate Technics and Solution

Sustainability and food security are the major challenges faced by third world countries for the past several decades. Most of the third world countries are also facing problems of climate change, increasing population, overexploitation of natural resources and resource degradation associated with rapid economic growth. Among the scientific and policy circles there are controversies in using inorganic chemicals and biotechnology for sustaining the agricultural production.

There is no critical comprehensive review on sustainability of alternative farming systems and their relative advantages over conventional, chemicalized and hi-tech agriculture for decision making at various levels. This review tries to fulfill the knowledge gap in this vital sector. The first part of the review discusses the current status of agroecosystems, with emphasis on their threats in terms of food security, long term sustainability, impacts on ecosystem services and climate change. We also evaluate the ecological, economic, social and cultural sustainability of inorganic agriculture. This analysis points emerging issues such as environmental degradation, loss of ecosystem services, non-sustainability and threats to food security in the context of global population growth and climate change.

Those general difficulties are illustrated by our two case studies investigating options, stimuli and difficulties to improve water-efficient practices.

The two areas have strong stimuli for improvement but lack a knowledge-exchange system to help farmers and resource managers identify scope for improvements. Partly for this reason, farmers' responsibility for efficient water management has been displaced to hypothetical prospects, e.g., extra supplies from reuse of treated wastewater or a long-term low water pricing. In both cases a displaced responsibility complements the default assumption that farmers' irrigation practices already have adequate water-use efficiency.

Under current circumstances, agricultural water management will maintain the unknown waterefficiency level and farmers will have weaker incentives to make efforts for more efficient practices. A continuous knowledge-exchange is necessary so that all relevant stakeholders can share greater responsibility across the entire water-supply chain. On this basis, more waterefficient management could combine wider environmental benefits with economic advantage for farmers.

Farmers can better use technological systems already installed, adopt extra technologies, enhance their skills in soil and water management, tailor cropping patterns to lower water demand and usage, reduce agrochemical inputs, etc. Water-efficient practices potentially enhance the economic viability and environmental sustainability of irrigated agriculture, without necessarily reducing water usage. To inform such practices, experts have developed various models of water efficiency, yet these are little used by farmers.

18. Social Activities – Any Activates Planned By Students e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER

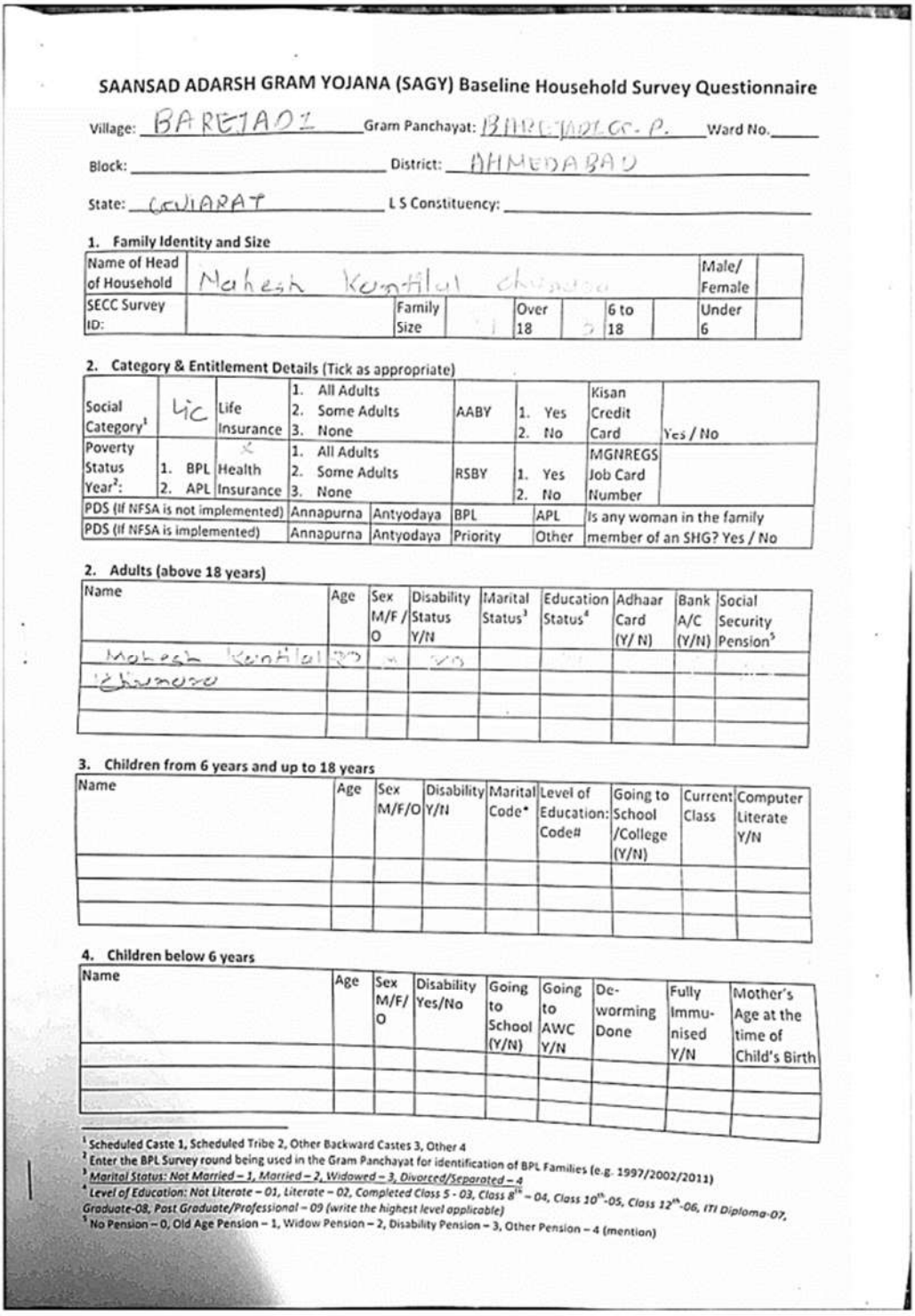
➢ Following activities were conducted recently:

- Creating awareness about SAVE WATER SAVE LIFE – A Social Awareness Program.
- Creating awareness about "Beti Bachao and Beti Padhao" - A Social Awareness Program.
- Creating awareness about what is Covid-19 virus, how it spreads and explaining how socialdistancing checks spread of coronavirus
- Demonstrating how wearing of masks can reduce the risk of infecting others and protectingourselves.
- Correct method of using and discarding the masks.
- Distribution of masks to the villagers & urban areas.
- Demonstration of correct method of washing with soap.
- Effective use of sanitizers
- Ahmedabad: On the outskirts of Barejadi village in Daskroi taluka, a group of youths stop a bike on Thursday morning.
- The man identifies himself as a health worker and shows his identity card after which his details are noted in a register and he is allowed to go.

"A group of village youths are stationed right at the entrance of the village with the temperature gun and a register

We have distributed mask and sanitizer to local villagers and also give them some important information regarding covid and tell them about the diet that they should follow daily to boost their immunity.

19. BAREJADI SAGY Questionnaire Survey form with the Sarpanch Signature



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: BAREJADI Gram Panchayat: BAREJADI G. P. Ward No.

Block: District: AHMEDABAD

State: GUJARAT L S Constituency:

1. Family Identity and Size

Name of Head of Household	Mahesh Kantilal Chavda						Male/ Female	
SECC Survey ID:		Family Size		Over 18		6 to 18	Under 6	

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	LIC	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	X Health Insurance	1. All Adults 2. Some Adults 3. None	RSBY	1. Yes 2. No	MGNREGS Job Card Number	
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]
Mahesh Kantilal Chavda	50	M	Y/N					

3. Children from 6 years and up to 18 years

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

4. Children below 6 years

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

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4

[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)

[3] *Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4*

[4] *Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)*

[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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	No	No
Children	No	No

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	
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	
Open Well(Public / Private)	Yes / No	
Other (mention):		

11. Source of Lighting and Power

Electricity Connection to Household: Yes / ~~No~~
Lighting: Electricity/Kerosene/Solar-Power
Mention if Any Other:
Cooking: LPG/~~Biogas~~/Kerosene/Wood/Electricity
Mention if Any Other:
If cooking in Chullah: Normal/ Smokeless

12. Landholding (Acres)

1. Total	2 hect	2. Cultivable Area	
3. Irrigated Area	2 h	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

17. Livestock Numbers

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

18. What games do Children Play

—

19. Do children play musical instrument (mention)

—

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: BAREJADI

b. Block: _____

c. District: AHMEDABAD

d. State: GUJARAT

e. Lok Sabha Constituency: _____

f. Number of Wards in the Gram Panchayat: _____

g. Number of Villages in the Gram Panchayat: _____

h. Names of Villages:

Demographic Information

Number of Households 336 Total Population [illegible] Male [illegible] Female [illegible]

SC HHs 594 ST HHs 13 OBC HHs [illegible] 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		
b.	Nearest Primary Health Centre (PHC)		
c.	Nearest Community Health Centre (CHC)		
d.	Nearest Post Office	✓	
e.	Nearest Bank Branch (Any)	✓	
f.	Nearest Bank with CBS Facility		
g.	Nearest ATM	✓	
h.	Nearest Primary School	✓	
i.	Nearest Middle School	✓	
j.	Nearest Secondary School	✓	
k.	Nearest Higher Secondary School / +2 College		
l.	Nearest Graduate College	✓	
m	Nearest ITI / Polytechnic Centre	✓	
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		
p	Nearest Agro Service Centre		
p	MSP based Government Procurement Centre		
q	Milk Cooperative /Collection Centre		
r	Veterinary Care Centre		
s	Ayurveda Centre		
t	E – Seva Kendra		
u	Bus Stop		
v	Railway Station		
w	Library		
x	Common Service Centre		

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total ___ Public_____ Private_____

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

V. Education, ICDS

a. Number of Angan Wadi Centres:_____

b. Number of villages without Angan Wadi Centres_____

Names of such villages: _____

_____

c. Schools (Number)

Primary Private: ___ Primary Govt.: 2

Middle Private:___ Middle Govt.:1

Secondary Private:___ Secondary Govt.:_____

Higher Secondary Private: 0 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)							
b.	Kerosene							
c.	Other (mention)							

2

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	BARETADI	
b.	Hand Pump Coverage in Villages:	Covered / Not Covered ✓	BARETADI	
c.	Coverage under Covered Drains:	Covered ✓ / Not Covered	BARETADI	
d.	Coverage under Open Drains:	Covered / Not Covered ✓	BARETADI	
e.	Villages with Household Electricity Connection (Numbers)	Connected 1000 / Not Connected	BARETADI	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	1200	d.	Pasture / Grazing Land		g.	Check Dam	
b.	Irrigated Land	1000 acre	e.	Forests/ Plantations	1200	h.	Wells/Bore Wells	
c.	Un-irrigated Land	600 acre	f.	Other Common Land		i	Tanks /Ponds	

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

3

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)	
b)	Number of Households receiving pension (old age, widow, disability)	
c)	Number of eligible Households who are not receiving pension	
d)	Number of Households eligible for Ration Card	
e)	Number of eligible HHs having ration cards	
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	
i)	Number of Job Card holders who completed 100 days of work during 2013-14	
j)	Number of shops selling alcohol	
k)	Number of BPL families	
l)	Number of landless households	
m)	Number of IAY beneficiaries	
n)	Number of FRA[4] beneficiaries	
o)	Number of Community Sanitary Complexes	
p)	Number of Households headed by single women	
q)	Number of Households headed by physically handicapped persons	
r)	Total number of Persons with Disability in the village	
s)	Number of SHGs	
t)	Number of active SHGs	
u)	Number of SHG Federations	
v)	Number of Youth Clubs	
w)	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

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[4] 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: BAREJADI

b. Ward Number: _____

c. Gram Panchayat: BAREJADI

d. Block: _____

e. District: AHMEDABAD

f. State: GUJARAT

g. Lok Sabha Constituency: –

h. Number of Habitations / Hamlets in the Gram Panchayat: –

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 330 Total Population 1602 Male 802 Female [illegible]

SC HHs 514 ST HHs 11 OBC HHs 232 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		
b.	Nearest Middle School		
c.	Nearest Secondary School		
d.	Kisan Seva Kendra	✓	
e.	Milk Cooperative /Collection Centre	✓	
g.	Health Sub Centre	✓	
h.	Bank	✓	
i.	ATM	✓	
j.	Bus Stop	✓	
k.	Railway Station	✓	

[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		
m	Common Service Centre		
n	Veterinary Care Centre		

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 :_____Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres:_____

c. Schools (Number)

Primary Private:_____ Primary Govt.:_____

Middle Private:_____ Middle Govt.:_____

Secondary Private:_____ Secondary Govt.:_____

Higher Secondary Private:_____ Higher Secondary Govt:_____

2

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	1000	d.	Pasture / Grazing Land		g.	Check Dam	0
b. Irrigated Land	400	e.	Forests/ Plnatations	1200	h.	Wells/Bore Wells	3
c. Un-irrigated Land	600	f.	Other Common Land		I	Tanks /Ponds	3

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

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

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

Gmail shah Tanha <shahtanha19@gmail.com>

Vishwakarma Yojana Village Report
1 message

shah Tanha <shahtanha19@gmail.com> Wed, Jun 23, 2021 at 2:19 PM
To: collector-ahm@gujarat.gov.in, dish-ahd@gujarat.gov.in, ddo-ahm@gujarat.gov.in, tdo-ahm@gujarat.gov.in, colahmed@guj.nic.in, gpdaskroi-gj@gov.in, do-dish-ahm@gujarat.gov.in

Hello Sir/Madam

I **Tanha Shah,** HOD in Ahmedabad Institute of Technology under my guidance **Sakir Qureshi & Nitin Shrivas** of**Ahmedabad Institute of Technology, Ahmedabad** affiliated to Gujarat technological university & Accredited by National board of Accreditation. GTU is allotted an important and prestigious project of **Vishwakarma Yojna (Phase-VIII)** by the Government of Gujarat, in which the students would study the identified villages and make recommendations to achieve integrated and comprehensive development through Technological options.

As a part of vishwakarma Yojana's guidelines, we have discussed and informed to all the respected officers about our project in which we will shortly notify about **Barejadi village** of Ahmedabad district, profile of issues for development and our design work for them which are as below:

Village:Barejadi		**Population: 1602(As of Census 2011)**
Key Issue	**Remark**	**Design Given**
Solid Waste Collection	● No arrangement or solid waste (garbage) collection.	● Compost pit
Sanitation	● There is available one public toilet in the village but it is in worst condition, so we will renovate it.	● Public toilet
Smart Technology	● There are no any Smart technology available in this village.	● Green House Farming ● Windmill
Health	● There are not a single primary health center in the village. In emergency situation villagers have to travel to next village. ● There are not any Maternity home in this village.	● Prathmic Aarogya Kendra ● Maternity Home
Community	● This is a problem related to study of students in the village and young people.	● Reading Hall

Place	● There are not any community hall to arranging meeting at all available in the village.	● Samaj seva mandal
Public Infrastructure	● There is not a single public infrastructure in the village.	● Temple ● Entrance Gate
Basic Amenity	● There are no any Market to buy basic things.	● Mini Market

Sr. No	Design Name	Period	Amount Expenditure	Benefit
1	Post office	Immediately	Rs. 3,00,318/-	There is no any post office in the village so after asking from many villagers we think that they need it. It also help them if they want to invest or save their money post office is also work as a kind of bank.
2	Hospital	Long term (1-3 years)	Rs. 6,38,997/-	Hospital that is present in village is very small and mostly it remain close so for any emergency condition they have to travel a lot which take lots of time and time is very important during emergency condition
3	Bank	Immediately	Rs. 2,41,663/-	We ask lots of villagers as well as staff of panchayat office and all of them want bank in their village so we decide to design small and low cost bank for village
4	Irrigation system using solar energy and rain gun	Immediately	Rs. 3.10.000/-	We know that lots of electrical energy is required in irrigation due to which the cost for irrigation also increases hence it will affect the farmer's pocket. Hence we decided to design a solar irrigation system with low cost which helps farmers as well as the environment by using rain guns. Less quantity of water is required as compared to normal irrigation.
5	Solar energy based water purification system :	Immediately	Rs. 28,844/-	Most of people in village drink tap water which is not good for health and they even don't know that it affect their health and various public places have RO but some time its not working and its maintenance cost is also very high so we decide to design

				solar water purification system which is help full for domestic as well as public use
6	Automatic Soil Moisture Control System For Herb Plant(Unique Plant)	Immediately	Rs. 4,136/-	This topic is something know that we thought because some time we find unique or helpful plant in village but due to not taking its proper care it exits from their and it is very difficult to grow that plant somewhere else and provide essential condition so this device will help plant to gain require moisture the plant needed like Stevia Plant , Moringa plant ,Hibiscus etc.
7	Community Hall Plus Theater	Long term (3-5 years)	Rs.25,576,274/-	Village and movie theater halls are the smallest buildings that can accommodate a sports Programme alongside the customary social and arts pursuits. There are a wide variety of types and sizes, all with the following in common – a main activity and assembly space together with ancillary accommodation that might include additional
8	Public Garden	Long term(1-3years)	Rs.2,29,007.09/-	Aside from the natural beauty that they provide, there are many benefits to public gardens, especially if you are a gardener, or hope to be one. The whole purpose of a public garden is to provide the knowledge and love of plants to a community, something that every gardener needs.
9	VegetableMarketHub	Immediately	Rs.4,67,717.08/-	Cooperatives can help farmers benefit from economies of scale by lowering their costs of acquiring inputs or hiring services such as storage and transport. Agricultural cooperatives also enable farmers to improve product and service quality and reduce risks.
10	Solar A.C for Residential and Public Building	Immediately	Rs. 98,000/-	Solar cooling systems use ecological benefits including lower grid demand and load shifting throughout peak usage, decreased electrical power expenses, fewer power blackouts, off-the-grid abilities and minimized greenhouse gas emissions.
11	Agricultural Pest and Disease Monitoring Based on Internet-of-Things and Unmanned Aerial Vehicles	Immediately	Rs. 28,000/-	So by using this technology we can cover a large area in small time which will save time as well as money and save crop from pests. Those who have small fields also buy this with other small field farmers.
12	Design and Implementation of	Immediately	Rs. 4,084/-	So by using this prototype farmers can protect their crop from the road people as

	Farm Monitoring and Security System			they are now more easily accessible to their crop so we have designed this prototype to protect their crop from being destroyed by humans as well as animals.

Please find herewith attached,

Detailed Project Report of **Barejadi Village**

Thanking you,

Tanha shah
HOD
Civil engineering Department
Ahmedabad Institute of Technology,
Ahmedabad.

Chapter 21: Comprehensive report for the entire village

Respected Sir/Madam,

I **Tanha Shah,** HOD in Ahmedabad Institute of Technology under my guidance **Sakir Qureshi & Nitin Shrivas** of **Ahmedabad Institute of Technology, Ahmedabad** affiliated to Gujarat technological university & accredited by National board of Accreditation. GTU is allotted important and prestigious project of **Vishwakarma Yojana (Phase-VIII)** by the Government of Gujarat, in which the students would study the identified villages and make recommendation to achieve integrated and comprehensive development through Technological options.

As a part of vishwakarma Yojana's guidelines, we have discussed and informed to all the respected officers about our project in which we will shortly notify about **Barejadi village** of Ahmedabad district, profile of issues for development and our design work for them which are as below:

Village: Barejadi		**Population: 1602(As of Census 2011)**
Key Issue	**Remark**	**Design Given**
Solid Waste Collection	● No arrangement or solid waste (garbage) collection.	● Compost pit
Sanitation	● There is available one public toilet in the village but it is in worst condition, so we will renovate it.	● Public toilet
Smart Technology	● There are no any Smart technology available in this village.	● Green House Farming ● Windmill
Health	● There are not a single primary health center in the village. In emergency situation villagers have to travel to next village. ● There are not any Maternity home in this village.	● Prathmic Aarogya Kendra ● Maternity Home
Community Place	● This is a problem related to study of students in the village and young people. ● There are not any community hall to arranging meeting at	● Reading Hall ● Samaj seva mandal

	all available in the village.	
Public Infrastructure	● There is not a single public infrastructure in the village.	● Temple ● Entrance Gate
Basic Amenity	● There are no any Market to buy basic things.	● Mini Market

Sr. No	Design Name	Period	Amount Expenditure	Benefit
1	Post office	Immediately	Rs. 3,00,318/-	There is no any post office in the village so after asking from many villagers we think that they need it. It also help them if they want to invest or save their money post office is also work as a kind of bank.
2	Hospital	Long term (1-3 years)	Rs. 6,38,997/-	Hospital that is present in village is very small and mostly it remain close so for any emergency condition they have to travel a lot which take lots of time and time is very important during emergency condition
3	Bank	Immediately	Rs. 2,41,663/-	We ask lots of villagers as well as staff of panchayat office and all of them want bank in their village so we decide to design small and low cost bank for village
4	Irrigation system using solar energy and rain gun	Immediately	Rs. 3.10.000/-	We know that lots of electrical energy s require in irrigation due to which the cost for irrigation also increase hence it will affect the farmer pocket. Hence we decide to design a solar irrigation system with low cost which help farmer as well as environment by using rain gun less quantity of water is require as compare to normal irrigation.
5	Solar energy based water purification system :	Immediately	Rs. 28,844/-	Most of people in village drink tap water which is not good for health and they even don't know that it affect their health and various public placed have RO but some time its not working and its maintenance cost is also very high so we

				decide to design solar water purification system which is help full for domestic as well as public use
6	Automatic Soil Moisture Control System For Herb Plant(Unique Plant)	Immediately	Rs. 4,136/-	This topic is something know that we thought because some time we find unique or helpful plant in village but due to not taking its proper care it exits from their and it is very difficult to grow that plant somewhere else and provide essential condition so this device will help plant to gain require moisture the plant needed like Stevia Plant , Moringa plant ,Hibiscus etc.
7	Community Hall Plus Theater	Long term (3-5 years)	Rs.25,576,274/-	Village and movie theater halls are the smallest buildings that can accommodate a sports Programme alongside the customary social and arts pursuits. There are a wide variety of types and sizes, all with the following in common – a main activity and assembly space together with ancillary accommodation that might include additional
8	Public Garden	Long term (1-3 years)	Rs.2,29,007.09/-	Aside from the natural beauty that they provide, there are many benefits to public gardens, especially if you are a gardener, or hope to be one. The whole purpose of a public garden is to provide the knowledge and love of plants to a community, something that every gardener needs.
9	Vegetable Market Hub	Immediately	Rs.4,67,717.08/-	Cooperatives can help farmers benefit from economies of scale by lowering their costs of acquiring inputs or hiring services such as storage and transport. Agricultural cooperatives also enable farmers to improve product and service quality and reduce risks.
10	Solar A.C for Residential and Public Building	Immediately	Rs. 98,000/-	Solar cooling systems use ecological benefits including lower grid demand and load shifting throughout peak usage, decreased electrical power expenses, fewer power blackouts, off-the-grid abilities and minimized greenhouse gas emissions.
11	Agricultural Pest and Disease Monitoring	Immediately	Rs. 28,000/-	So by using this technology we can cover a large area in small time which will save time as well as money and save crop from pest and those who have small field they also buy this

	Based on Internet-of-Things and Unmanned Aerial Vehicles			with other small field farmers.
12	Design and Implementation of Farm Monitoring and Security System	Immediately	Rs. 4,084/-	So by using this prototype farmers they can protect their crop from the road people as they are now more easily accessible to their crop so we have design this prototype to protect their crop to be destroyed by human as well as animals.

Please find here with attached,

Detailed Project Report of **Barejadi Village**

Thanking you,

Tanha shah

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