DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
KANERA -Village

KHEDA - District

PREPARED BY,

Name	Branch name	Enrollment number
Arvind Kumar Yadav	Civil engineering	170020106027
Malek Mohammad Sahil	Electric engineering	170020109004

COLLEGE NAME

Ahmedabad Institute Of Technology

COLLEGE LOGO

NODAL OFFICERS NAME

Prof. Tanha Shah

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 -KANERA

DISTRICT - KHEDA

Under,

Vishwakarma Yojana: Phase-VIII

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

Impartial 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.

Name	**Branch name**	**Enrollment number**
Arvind Kumar Yadav	Civil engineering	170020106027
Malek Mohammad Sahil	Electric engineering	170020109004

Date of Report Submission:	
Principal Name and Signature:	**Mrs. Sarda Devi**
VY-Nodal Officer Name and Signature:	**Prof. Tanha Shah**
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 Yojana is one the initiatives towards urbanization 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 Kanera village is 517492. Kanera village is located in Kheda Tehsil of Kheda district in Gujarat, India. It is situated 10km away from Nadiad, which is both district & sub-district headquarter of Kanera village. As per 2009 stats, Kanera village is also a gram panchayat. The total geographical area of village is 488.89 hectares. Kanera has a total population of 1,836 peoples. There are about 390 houses in Kanera village. Nadiad is nearest town to Kanera which is approximately 10km away. The total geographical area of village is 488.89 hectares. Kanera has a total population of 1,836 peoples. There are about 390 houses in Kanera village. Nadiad is nearest town to Kanera which is approximately 10km away.

About existing village condition:

There is closed type of drainage system in Kanera. 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 center, village main gate, solid waste management. All this design might help for the village development.

About future scope of the village development:

For future prospect, the village KANERA can for agricultural prospect and for another requirement also. development of the KANERA 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 Kheda city.

Key Words: Urbanization, 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.

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

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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
URDPFI	Urban and regional development plans formulation and implementation

@	At
FE500	Ferrous steel (strength 500 N/mm2)
M25	Concrete Mix (Strength 20 N/mm2 after 28 days curing)

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

1.1 Background

Pardhol village is located in Ahmedabad Taluka of Ahmedabad district in Gujarat, India. It is situated 15km away from Ahmedabad. The village connected with Delhi to Chennai national highway 48. This village is developed during recent years very efficiently and now this village have all basic amenities like, c.c. road, underground drainage, water supply, gram panchayat, all houses are pucca, transportation services, higher education etc. the education is very good in this village. This village has post office, school and bank.

Study area location:

- Name: Pardhol
- District: Ahmedabad
- Taluka: Ahmedabad
- Distance from Ahmedabad: 15 km
- Village Code: 511633
- Pin code: 382330
- Language: Gujarati, Hindi, English.
- Time zone: IST (UTC+5:30)

Fig.1 Pardhol map

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. Maximum houses are Pucca houses

The houses have sufficient windows to let in air and light.

Agriculture:

People of an ideal village are friendly in nature and are farmers and good in nature. Most of them grow seasonal crops etc.

Farmers of ideal village use modern technology for Farming

Educational facilities:

There are Primary schools and High schools in an ideal village. Primary education is free and compulsory. Schools are also built in a vast area

Medical facilities:

In an ideal village, there are many clinics for different tyoes of patients, and have sufficient staff and are open 24 by 7

Hospitals are equipped with modern day equipment's

Other facilities:

We can find post-office, public library, playground, garden, Skill Development Centre etc there.
People: People of an ideal village are very peace keeping and live-in harmony with each other
They have a spirit of joy and are very hardworking.

Conclusion: -

- An Ideal Village reflects the development of its people, and is example for development...
- 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: -

•To study the evils of Kanera village (Allocated village).

•Urbanization of 'Kanera' from the survey of ideal & smart villages.

•Analysis of existing structure at allocated village Kanera.

•Provide modified design for existing structure and new structure if require.

•Create and sustain a culture of cooperative living for inclusive and rapid development.

•Creating models of local development which can be example of other villages.

1.2.2 Live case studies of ideal village of Gujarat: -

- odanthurai is a village panchayat located in the Coimbatore district of tamilnadu state, india.

  The latitude 11.3164004 and longitude 76.9124465

  Are the geo coordinate of the odanthurai.chennai

  Is the state capital for odanthurai village .it is

  Located around 417.1 km away from odanthurai.

  The other nearest state capital from odanthuarai is

  Banglore and its distance is 198.0km. the other

  Surrounding state capitals are banglore 198.0 km.

  Thiruvananthapuram 303.5km, Pondicherry 325.2km.

Fig 2

The native language of odanthurai is tamil and most of the village people speak tamil. Odanthurai

People use tamil language for communication. odanthurai panchayat, which had virtually no

Development prior to 1996, saw dramatic changes after a panchayat president, R.shanmugam,

Worked on access to basic facilities water, energy and housing. the villagrs, who were living

In abject poverty, were uplifted over a decade through a host of development schemes.

Piped water

- At a national level, the plan was to implement the project in 52 districts. tamil nadu was announced as the first state to receive funding for this project. A water filtering station, a 13 km pipeline, and Overhead tanks were built in span of 11 months. By 2000, bacteria -free, 24/7 water was supplied to the villages. Now, with the water in pipe line, right at their homes, women in this villages are

Other developments

- Almost 90% of the people in the villages under the undanthurai panchayat are agriculture labours Trible communities lived here in 400-500 huts.
- Just then, the chief minister J. jayalithaa announced the pudhu vaazhvu thittam (employment and Poverty reduction scheme)."

Poverty reduction

- A village poverty reduction committee was set up in the panchayat, where every village had a President.social mapping was done, and the needy and poor people were identified.
- The pilot project under this scheme was implemented in odanthurai . In1997, 45 houses Were built. In 1999, 25 houses were built and in 2003, 135houses were built. Every year, houses were built like this, and by 2006, there were no make shifts in the villages .
- The panchayat leader then introduced a scheme through which people, in times of need, could available small loans.

Surplus power

- The panchayat has also set up its own wind mill and is generating income out of it every year the panchayat sells additional power generated from the wind mill to the satate electricity board and earns revenue of RS 19 lacks per year.
- this is also a corruption -free panchayat. every paisa was put into development of the villages, and that is the reason for the success of this panchayat**.**
- The population under the council was 1650 today, 9500 people are living in this villages "people now have access to water, energy, good roads and houses, and that is the reason why people are migrating to this villages .

1.2.3 The Idea of a model/ Smart village

- The scheme was implemented in pilot mode in 1000 villages of Assam, Bihar, Himachal Pradesh, Rajasthan and Tamil Nadu, with an allocation of Rs 10 lakh per village. This limit was later raised to Rs 20 lakh per village. The target villages under the scheme were those with more than 50% of the population belonging to Scheduled Castes (SCs). Additionally, State governments have also taken steps in this direction. Himachal Pradesh launched a Mukhiya Mantri Adarsh Gram Yojana along similar lines in 2011, with the allocation of Rs 10 lakh per village.

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. The ideas of ―smart

Fig 4 Smart Village

Objectives of Ideal village: -

- To study the existing growth, characteristics 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: -

- We have that found that all villagers of this village are much connecting with today technology and environment. Pardhol village, which is located some 15 km from Ahmedabad, characterizes development. Here villagers enjoy all the facilities that one living in the city does.

Physical Details: -

- According to census 2011 information, the location code or village code of PARDHOL is 511633. PARDHOL village is located in AHMEDABAD 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 1 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 amenities like,

- Sanitation facilities
- Banks
- Post office
- C.C. roads
- Street lights
- Anganwadi
- PHC
- Overhead water tank
- Primary school
- Community hall
- Public toilet

Economic Details: -

Table 2 Economic Details

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

- Kanera is a Village in Kheda Taluka in Kheda District of Gujarat State, India. It is located 12 KM towards North from District headquarters Kheda. 5 KM from. 53 KM from State capital Gandhinagar
- Most people of kanera are farmers and they are survived by their crops and by agriculture rearing
- A few people in the village are laborer's and they do a daily basis migration to Bareja or Barejadi or Ahmedabad for work
- Some people also run dairy in the village which sells both local and the city-based milk products
- Due to lack of higher education in the region the mostly peoples are labourers

➢ Infrastructure Details

F Fig 5 Gram Panchayat

Fig 6 Clinic

Fig 7 Houses of Kanera

Fig 8 Roads of Kanera

Fig 9 School

Fig 10 Milk Dairy

1.4 SWOT Analysis of Ideal village: -

Strength	Weakness	Opportunities	Threats
Transportation facilities	No public library	Improving in waste management	Lack of funds and technical knowledge in agricultural fields
Proper drainage facilities	No recreation center	Woman empowerment	Lack of awareness of villagers about educations
Bank facilities	No facilities for disposal of solid & liquid waste disposal	To rise the living standard of people	

Table 3 SWOT Analysis of ideal village

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: -

- We saw all type of basic and physical amenities available.
- By this visit, it has improved our communication skills and we knew how to interact with the peoples.
- To understand allocated village condition.
- We had seen much kind of new technologies which can be used in allocated village.

1.7 Electrical concept of Ideal village / Smart village:

- Smart villages will be connected to towns and cities through information and communication 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.

- 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.
- Key enablers of these development benefits in smart villages are sustainable electricity 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.
- 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.

- Rural areas have low population density and large amount of undeveloped land. Agricultural activities are more in rural areas.
- Rural areas are the opposite of urban areas. Rural areas, often called "the country", have low population density and large amounts of undeveloped land. Urban areas, often called "the country", have a density of human structures such as houses, commercial buildings, roads, bridges, and railways.
- For making smart village the biggest challenge is to have money. It was decided that each Smart City will receive 500 Crore over the period of 5 years by Central Government. But this amount won't be sufficient. There are many private firms that are providing funding but it requires to be in proper process.
- There are certain technologies that are a part of the project and it is expensive to use them. This hinders the success of smart city project. Another challenge is the need for a medium that can bring technology users and creators together to adopt faster platforms.

Chapter 2: About Village:-

2.1. Introduction: Urban & Rural Urban:

- **Urban:** Urban is that area where the population is more, new technology and good facilities are provided to the people. Most of inhabitants of urban areas have non-agricultural jobs. Urban area is the region surrounding a city. Urban areas have municipality, corporation, cantonment board or notified town area committee etc. According to census 2011, there are 7,935 towns, 4,041 statutory town and 3,894 census towns. "Urban area" can refer to towns and cities.
- **Rural**: Urban area is may be define where the 75% people of the total population depend or related with agriculture activities. A rural areas population density is very low. All the areas which are not characterized as urban area is called rural area.

2.2. Importance of rural development: -

- Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation.
- Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.
- The primitive task is to decrease the famine roughly about 70 percent of the rural population, implement sufficient and healthy food. Later, serve fair equipment of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication.
- Rural development usually relates to the method of enhancing the quality of life and financial well-being of an individual specifically living in populated and remote areas.
- Traditionally rural development is centered on the misuse of land-intensive natural resources such as forestry and agriculture. But today, increasing urbanization and change in global production, networks have transformed the nature of rural areas.
- Today, rural development still remains the core of the overall development of the country. It has become more than two-thirds of the country's people is dependent on agriculture for their livelihood and one-third of rural India is still below the poverty line. Therefore, it is important for the government to be productive and provide enough facility to upgrade their standard of living.
- Rural development is a complete term that concentrates on the action taken for the development of rural areas improve the village economy. However, few areas that demand more focused attention and new initiatives are.

1 Education
2 Public Health and Sanitation
3 Women Empowerment

3 Infrastructure Development (e.g., electricity, irrigation, etc.)
4 Facilities for agriculture extension and research
5 Availability of Credit

2.3Ancient village

- Rural areas have low population density and large amount of undeveloped land. Agricultural activities are more in rural areas.
- Rural areas are the opposite of urban areas. Rural areas, often called "the country", have low population density and large amounts of undeveloped land. Urban areas, often called "the country", have a density of human structures such as houses, commercial buildings, roads, bridges, and railways.
- Urban Villages an urban village is an urban development typically Characterized by medium density housing mixed.

2.4Scenario:

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

	2001	2011	Difference
India	102.90	121.0	18.1
Urban	28.6	37.7	9.1
Rural	74.3	83.3	9.0

Table 4 Population of Rural and Urban areas as per census 2001 and 2011

- For the first in since independence, the 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 %)
- The improvement in literacy rate in rural area is two times that in urban areas.
- The rural urban literacy gap which was 21.2% points in 2001, has come down to 16.1% points in 2011

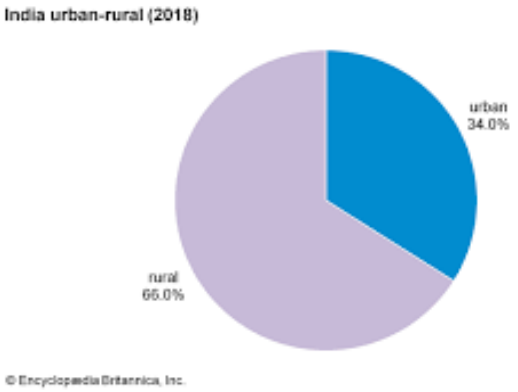


Fig 11 Population of Gujarat

- Total population 60,439,692
- Total population of male: - 31,491,260
- Total population of female: 28,948,432 Lack of recreational facilities.
- Farmers are not having market area for selling their goods directly to the market.
- Lower living standards.
- No transportation facility
- Less awareness.

	2001	2011	Difference
Male			
India	75.3	82.1	+6.8
Urban	86.3	89.7	+3.4
Rural	70.7	78.6	+7.9
Female			
India	53.7	65.5	+11.8
Urban	72.9	79.9	+7.0
Rural	46.1	58.8	+12.7

Table: 5 Literacy Rates in Rural and Urban area as per the males and females

2.5 Rural issues and Concerns

Following issues are concern with rural areas:

1 People are directly or indirectly dependent on agriculture and a large number of landowners have small and medium-sized landholding.
2 Economy of the people living in rural areas is low.
3 The price the farmers get for their produces less than in relation to the work they put in.
4 People have to migrate to the urban areas due to unavailability of education.
5 The other rural problems are due to the fact that since the rural people do not live-in concentrated masses, the availability of specialized service to them is minimum.
6 Very less people are employed in the rural areas.
7 Lack of physical facilities in rural areas.
8 Lack of recreational facilities.
9 Farmers are not having market area for selling their goods directly to the market.
10 Lower living standards.
11 No transportation facility.

Table 6 Population of Gujarat

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

12 Less awareness. 13 Less income opportunity.

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.

2.8 Other projects / schemes

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

Fig 12 PPP Model

Public-Private-Partnership - The Concept:

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

- Cost-effectiveness- since selection of the developer/ service provider depends on competition or some bench marking, the project is generally more cost effective than before. Higher Productivity- by linking payments to performance, productivity gains may be expected within the programme/project. Accelerated Delivery– since the contracts generally have incentive and penalty clauses is implementation of capital projects/programmes this leads to accelerated delivery of projects

2.9Other Project / Schemes of Gujarat / Indian Government

Gujarat Kisan Sarvoday Yojana 2020 Phase 1 to Provide Electricity to Farmers

- Gujarat Ganga Swarupa Yojana 2020 (Vidhva Sahay Yojna) Pension Amount / Income Eligibility
- Gujarat Digital Seva Setu Phase 1 to Connect Village Panchayats with Optical Fibre Network
- Gujarat Two-Wheeler Scheme 2020 – Subsidy on Purchase of Electric Scooters
- Gujarat Shramik Manpasand Pass Scheme 2020 – Construction Workers to Get Concessional Bus Passes
- Gujarat Mukhyamantri Mahila Kalyan (Utkarsh) Yojana 2020 – Interest Free Loans to Women SHGs
- Gujarat Saat Pagla Khedut Kalyanna Scheme 2020 to Raise Storage Capacity of Grains & Stop Crop Wastage
- Mukhyamantri Kisan Sahay Yojana Gujarat Application Form / Online Registrations & Benefits
- Gujarat Free Ration Scheme 2020 for 60 Lakh APL Families in Coronavirus (COVID-19) Lockdown

Gujarat PM Fasal Bima Yojana (PMFBY) Online Registration / Application Form

CHAPTER 3: SMART VILLAGE (BAREJA VILLAGE) CONCEPT

3.1 Concepts and Definitions

➢ 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:

Table 7 Benchmark of Smart Cities

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 energy
- Smart mobility
- Smart infrastructure
- Smart public services
- Smart care

Fig 13 Entrance

3.4 Road Maps and Safeguard

- For making smart village the biggest challenge is to have money. It was decided that each Smart City will receive 500 Crore over the period of 5 years by Central Government. But this amount won't be sufficient. There are many private firms that are providing funding but it requires to be in proper process.
- There are certain technologies that are a part of the project and it is expensive to use them. This hinders the success of smart city project. Another challenge is the need for a medium that can bring technology users and creators together to adopt faster platforms.

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

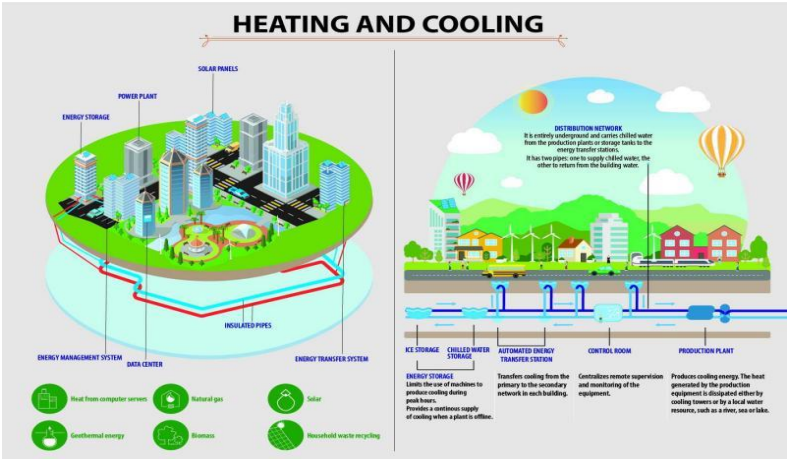
- Cyber security is the one of the key components of smart cities. It is important to remember that cyber security is a citywide issue and not just a technology risk. Cyber security is a prerequisite for all smart cities in existence, development or in plans of development.
  1. Security
  2. Alert system
  3. Smart automation

Fig 14 Cyber Security

3.8 District cooling and heating / Green building

- 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

Fig 15 Heating and Cooling



- 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 and. Urban mobility.

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

- 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.
- 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.

3.12Smart 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:

- One of the aims of our paper was also to make a qualitative evaluation of the projects and initiatives presented. Considering the initiatives active worldwide, we have made a comparison of the territories they cover and areas of actions they are focusing to and concluded that the most important issue to address when making the development strategies for the so-called un-developed countries is the access to the sources of energy. Furthermore, in order to make the concept of "smart development" more accessible and useful for our case of Smart Villages, we have made an evaluation of the projects and programs based on criteria that define "smartness" in the broader sense within the framework of EU policies. For deeper understanding of smart development in specific European regions, it is important to make an in-depth analysis of different possible approaches.

Below, we are presenting a short analysis of the chosen examples according to the EU pillars/drivers of Smart Villages: (i) Responding to depopulation and demographic change; (ii) Finding local solutions; (iii) Exploring linkages with small towns and cities; (iv) Accelerating the role of rural areas in low-carbon circular economy; and (v) Promoting digital transformation. All presented European cases have/are receiving funds from European Commission, although some of them are carried out within the single project/funding option, whereas others are actually an agglomeration of different projects directed toward achieving specific objective—such as, for example, the Arctic Smartness project, comprised of the clusters and financed by various funding schemes/mechanisms.

- 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

3.15 Electrical Concept

Education

- Education in Indian villages has always been one of the pillars of the society. The Indian people are well aware of the advantages of education since the ancient period and as a result, a proper educational structure was available in most of Indian villages in ancient period. The people used to send their children to schools at an early age and the children received education on different subjects.
- After the independence of India, education in Indian villages witnessed another massive change. The Government of India followed the education system set up by the British to a large extent and established new government schools in the villages. The government viewed rural education as an effective tool for bringing social change through community development. More emphasis was laid on primary education up to the age of 14 years and as a result, many new schools were established in the villages. The children in villages get their primary education from the government primary schools. They are taught various subjects including the languages, mathematics, science subjects, arts subjects, agricultural subjects, housekeeping subjects, etc.

Health

- Health is determined by many factors, including income, environmental conditions - such as access to adequate sanitation and safe water supplies - individual behaviour, and health services. More than half of the world's population lives in villages and rural areas and most of those without access to safe water sources or basic sanitation are rural dwellers. Enabling rural populations to protect and improve their health is a major challenge worldwide.
- 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.

Food security

- Approximately one in every seven people in the developing world is food insecure, unable to consume sufficient food to sustain a healthy and active life. Energy provision together with ICT can help smart villages become more food secure as farmers take advantage of improvements in irrigation systems, weather forecasting, cold-storage infrastructure, and agronomic and market information, and become fully informed of cognate environmental issues. Consequently, smart villages will be in a better position to gain from the benefits of agricultural modernization, reduce waste and capture more of the agricultural value chain

Productive enterprise

- A productive enterprise will buy, convert goods of one type into goods of another, and then sell back those goods on the exact moment of the weekly budget report, and markets will adjust their inventories at the same time.
- 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 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<KANERA-Allocated village>

4.1 Introduction: Kanera is a village in Kheda Taluka in Kheda District of Gujarat Stata, India. It is located 12km west from District Headquarters Ahmedabad 53km from state capital Gandhinagar. Demographics of KANERA: Gujarati is the local language here.

4.1.1 Introduction to Kanera village details

- Village Kanera located in Kheda district.
- Main language spoken in village is Gujarati.
- Ahmadabad, Bareja and Barejadi are the nearby cities.
- Village is located inside out and area is so small that is why it is not as developed.

4.1.2 Study justification/ need of the study

To development of village compare to the city area in the basic facility to needed for people and their amenities and to study whole village. For development the basic needed and their requirement. It should development anganvadi, road, drainage, school, hospital, Bank, PHC, Public toilet, etc...

- To reduce migration from rural to urban areas.
- To uplift the living standard of rural people by providing facilities and better infrastructure.
- To provide basic and sustainable facilities to rural area to reduce the pressure on urban areas.

4.1.3 Study Area (Broadly define)

- Gujarat Technological University allocated one village to us of Gujarat for surveying which is the Kanera near Kheda district. This is our study area to find problem related to structure and general amenities. Kanera is 15 km away from Ahmedabad.
- KANERA village is located in kheda Taluka of kheda District in Gujarat, India. It is situated 15km away from Ahmedabad.

4.1.4 Objectives of the study

1. To analyze the existing conditions
2. To collect socio-economic data through techno-economic survey.
3. To provide basic amenities in the village, like transportation, sanitation, educational, healthcare facilities.
4. To reduce migration from rural to urban.
5. To provide sustainable development.
6. To propose the comprehensive planning suited for ideal village.

4.1.5 Scope of the Study

- By the analyzing the present conditions we can improve the basic amenities and facilities like drainage facility, transportation facility, education facility.
- To improve life style of villagers by helping them to develop their skill.
- From the Gap analysis, development tactics for village development will be proposed and planning

suggestions for physical infrastructure, social infrastructure and renewable energy.

- Source will be suggested for the village..

4.1.6 Methodology Framework for development of Kanera village:

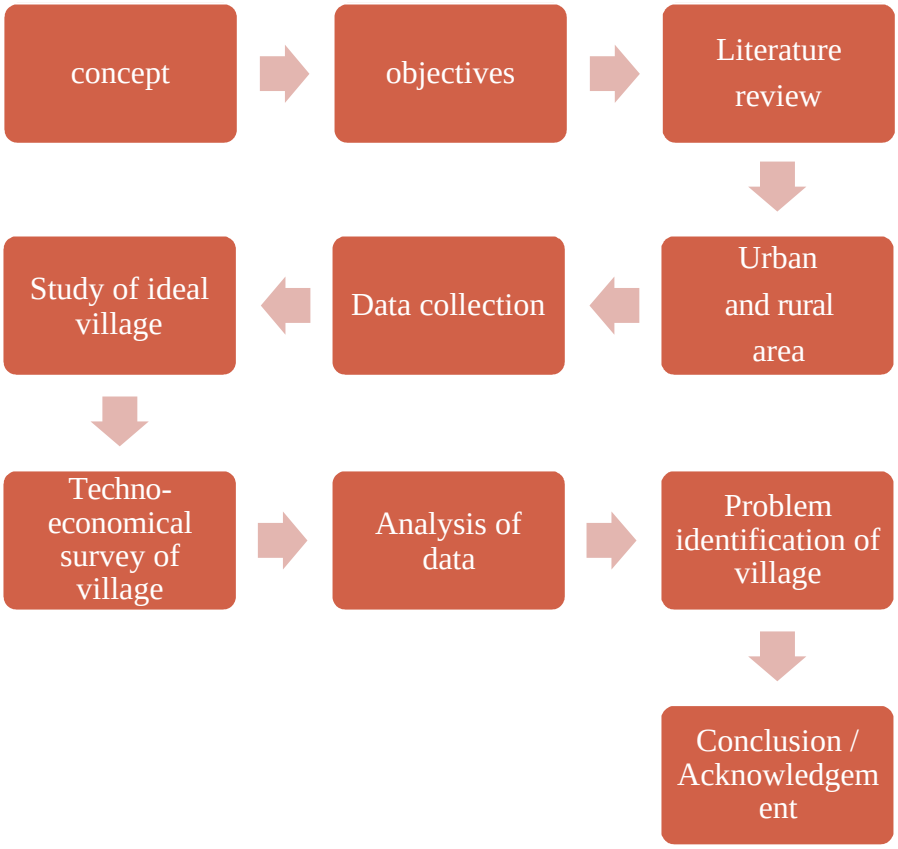


Fig. 16 Methodology

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.

4.2 <KANERA VILLAGE> Study Area Profile:

4.2.1Study Area Location

- Gujarat Technological University allocated one village to us of Gujarat for surveying which is the Kanera near kheda district. This is our study area to find problem related to structure and general amenities. Kanera is 15 km away from Ahmedabad.

Village name	Kanera
Taluka name	kheda
District	kheda
State	Gujarat
Language	Hindi, Gujarati
Time zone	IST (UTC+5:30)

Table 8 Study area location

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

- The maps of land map, a gram tall tap are on next pages which follows

Fig 17 Gram Tal Map

Fig 18 Location Map

4.2.3Physical & demographical growth

Table 9 Physical & demographical growth

Sr. No.	Census	Population	Male	Female	Total Number of House Holds

1.	**2011**	**1836**	**943**	**893**	**390**

Particular	**Total**	**Male**	**Female**
No. Of house	390	-	-
Population	1836	943	893
Child	264	145	119
Literacy	84.9%	94.24%	75.45%
Total workers	546	503	43
Schedule of cast	98	56	42
Schedule of trip	101	46	55

4.2.4Economic profile / Banks

- The main economic activity of this area is farming. The village doesn't have any better facilities regarding infrastructure but has good electrification system which distributed 24*7 hours for domestic use and 8 hours for agricultural use.
- 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:

1.No Hospital or doctor clinic
2.No Transportation
3.Less electricity
4 Worst condition of Street Road
6 Low quality Education
7 Not Connected with today's technology

4.2.6: Social Scenario

Figure 10 Details of Kanera

Sr no	**Detail**	**Population**
1	Total Population	1836
2	Male	943
3	Female	893
4	Total no. of family	
5	Total B.P.L Family	238
6	Village literacy rate	
7	Male literacy rate	77.00%
8	Female literacy rate	64.00%
9	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.
- A complete baseline survey was undertaken which involved household census survey, bio-physical survey, and village level data collection from sarpanch.
- 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. and to identify the various requirements of development in village.
- 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:
- 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 KANERA village is 511673. KANERA 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 KANERA village. As per 2009 stats, Barejdi is the gram panchayat KANERA village.
- The total geographical area of village is 138.3 hectares. KANERA has a total population of 1,602 peoples. There are about 336 houses in KANERA village. Ahmadabad is nearest town to KANERA which is approximately 20km away.

4.3.3 Average size of the house:

- The average size of the house 655 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 locally Out 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 11 Ggeographical details

Gram panchayat	KANERA
Tehsil	Kheda
District	Kheda
State	Gujarat
pin code	387540
Area	488.89 hectare
Population	1836
Households	390

4.3.7 Demographical Details:

Table 12 Demographical details

Particular	**Total**	**Male**	**Female**
No. Of house	390	-	-
Population	1836	943	893
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 an income of source too there are approx. 20 to 25 % people are connected with milk production and other are doing labour work for money.

4.3.9 Agriculture Detail:

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

Table 13 Agriculture Detail

4.3.10Physical Infrastructure details:

- Bus stand
- Primary school
- Water tank
- Open drainage
- Panchayat building
- Street lighting

4.3.11 Tourism Cluster: -

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

4.4Infrastructure 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.

Figure 19 drinking water

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.

Figure 20 Road of Kanera

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

Figure 21 Houses of Kanera

4.4.6 Existing Condition of Public Buildings:

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

Figure 22 Gram Panchayat

Figure 23 School

4.4.7 Technology Mobile/WIFI/Internet Usage Details:

- KANERA 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.

Figure 24 Dairy

Figure 25 Temple

4.4.11 Any other details: There are agriculture co-operative building, 2 Wells, 4-5 tube well in farm or agriculture areas and a pump. The farmers have the farming equipment like Tractor etc in Kanera Village

4.5 Electrical Concept:

- There are not so many 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.
- In schemes that are designed for a higher degree of automation, electronic, programmable logic controllers (PLCs) can provide fully automatic start-up and shutdown procedures.

❖ Protection

- While electricity is probably the most convenient form of energy presently available, its use involves certain risks.
- Reduce danger to a minimum, national rules and international standards form a base for electrical safety.

- Protection systems have to be designed accordingly to fulfil the specified requirements which can basically be categorized into two groups: the protection of human beings and the protection of property.

❖ 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.
- Widely adopted IP classes are summarized. In spite of providing basic protection, enclosures and barriers, accidents still may occur for instance in case of an insulation failure.
- In view of these cases direct protection can be enhanced by the use of residual current operated circuit breakers (RCCB) or earth leakage breakers/relays (ELB/R).

❖ Indirect Protection

- Is provided by a number of measures briefly mentioned hereunder.
- Earthing: electrical connection of all accessible, conducting parts like covers, frames or housings together and to earth (neutral potential see also chapter earthing).
- Also provide effective, automatic disconnection of the supply before a shock is likely to prove fatal.

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.
- The sun has provided warmth during the day and helped kindle fires to last into the evening. But over the past 500 years or so, humans increasingly turned to cheaper, dirtier energy sources such as coal and fracked gas.

4.5.2 Irrigation facilities:

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

- Irrigation also has other uses in crop production, including frost protection, suppressing weed growth in grain fields and preventing soil consolidation.
- Irrigation is the process of applying water to the crops artificially to fulfil their water requirements.
- 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 offers moisture required for growth and development, germination, and other related functions.
- The frequency, rate, amount and time of irrigation are different for different crops and also vary according to the types of soil and seasons. For example, summer crops require a higher amount of water as compared to winter crops.
- Let us have a look at different types of irrigation and the methods used for irrigation.
- Also Read: Modern Methods of irrigation
- The Irrigation Canal

Types of Irrigation

- There are different types of irrigation practised for improving crop yield.
- These types of irrigation systems are practised based on the different types of soils, climates, crops and resources.
- The main types of irrigation followed by farmers include:

Surface Irrigation

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

Localized Irrigation

- In this system, water is applied to each plant through a network of pipes under low pressure.

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 table.

Manual Irrigation

- This a labour intensive and time-consuming system of irrigation. Here, the water is distributed through watering cans by manual labour.

Methods of Irrigation

- Irrigation can be carried out by two different methods:
  - Traditional Methods
  - Modern Methods
- Traditional Methods of Irrigation
- In this method, irrigation is done manually.
- Here, a farmer pulls out water from wells or canals by himself or using cattle and carries to farming fields.
- This method can vary in different regions.
- The main advantage of this method is that it is cheap.
- But its efficiency is poor because of the uneven distribution of water.
- Also, the chances of water loss are very high.
- Some examples of the traditional system are pulley system, lever system, chain pump.
- Among these, the pump system is the most common and used widely..

4.5.3 Electricity facilities 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.
- Electricity can increase productive hours in a household leading to positive outcomes on education and economic well being. It can also spur innovation and lead to entrepreneurial micro businesses ventures, and in time lead to greater agricultural yields. Benefits also flow to the likes of schools, banking and medical services.

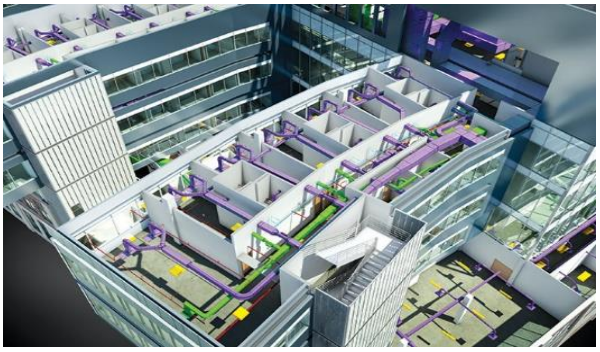
4.6 Existing Institution like - Village Administration- Detail profile:

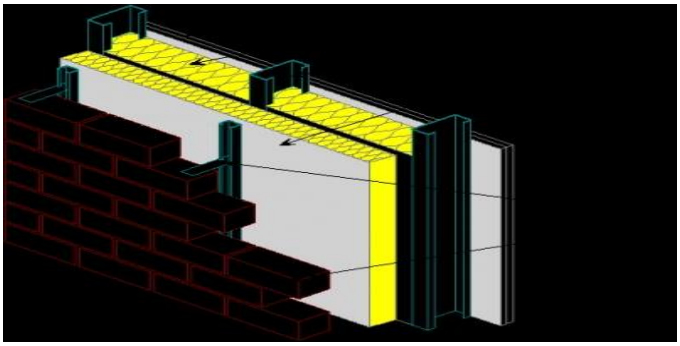
- There is no existing institution like:
- Bachat Mandali
- Mahila Forum
- Plantation for air pollution
- Rain water harvesting
- Agricultural Development etc.

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

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying:

- Stabilization ponds use a natural process for wastewater treatment is a combination of microbial plants, substrates and microorganisms in a more or less artificial pond to treat wastewater. Stabilization ponds are also known as oxidation ponds. The technique is frequently used to treat municipal waste water, industrial waste matter, and runoff or storm water. After treatment, the effluent may be returned to surface water or reused as irrigation water if the effluent quality is high enough.
- The definition of "Sustainable Construction" is a living concept and varies in different scenarios based on peoples' needs. Taken as the starting point, the definition above has been reinterpreted and expanded based on different approaches and priorities from country to country. In a study led by the International Council for Research and Innovation in Building and Construction (CIB) and carried out with the collaboration of experts from countries around the world, different definitions were given.
  Waste stabilization ponds types:
- Anaerobic pond
- Facultative pond
- Maturation pond
- **Sustainable construction in developing countries**
- 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





Figures 26,27,28 and 29 respectively Sustainable Developments

5.1.2 Soil Liquefaction

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

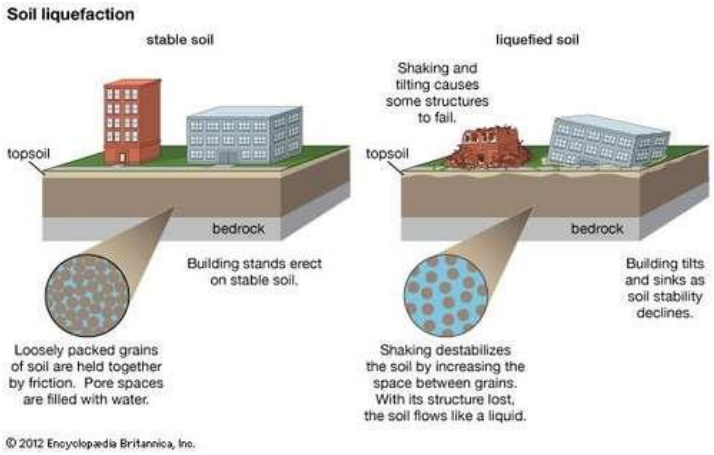


Figure 30 Soil Liquefication

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 prohibited.
- 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 31 Sustainable sanitation

- different regions are vulnerable to different natural disaster.

- 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 tier and plastic use for cement concrete road construction
- Rubber has property of absorbing sound, which also help in reducing the sound pollution of heavy traffic roads. Waste rubber tires 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.

ABSTRACT

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

Measurement Sheet

Item	Item description	No	L	B	H	Quantity	
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 14

❖ **Abstract sheet**

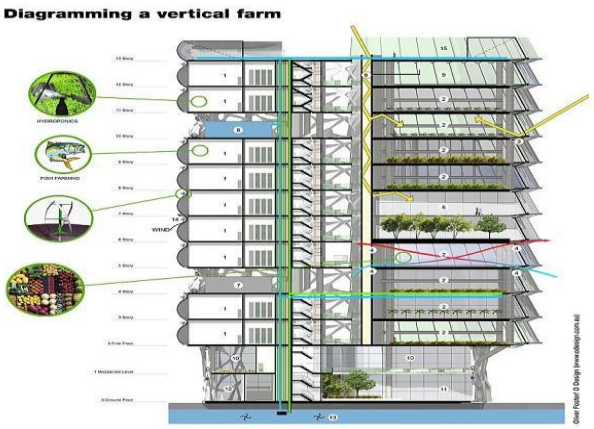
Item no	Particulars of item	Unit	Quantity	Rate	Amount
1	**Box cutting**	M^ 3	1400	40	**56,000Rs**
2	**Supplying consolidating soil gravel in waste tyre & stacked a road side at regular intervals** **Labour for spreading & Consolidating** **Soil gravel**	M^3 M^3	1200 1200	150 20	**1,80,000Rs** **24,000Rs**
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

Figure 32,33 and 34 Mixture of Plastic and fine aggregate

5.1.5 Vertical farming:

Fig 35 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 treatment 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 toxicwastes. **S**

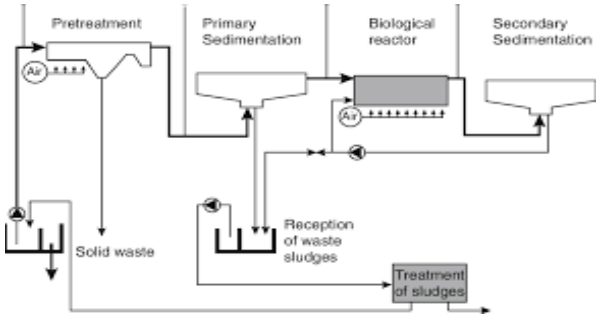


Fig 36 Sewage Treatment Plan

- 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 varies 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.

5.2.1 Programmable Load Shedding:

Fig 37 PLS

- 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.

- Intelligent Load Shedding means the monitoring and making decisions based on the state of the system model, value of the operation, criticality of the processes running, and environmental impact.
- Ensures that consumers or parts of the network have power as opposed to a total blackout. The planned schedules ensure that available capacity is shared fairly and each consumer gets power at one time or another.

Advantages of PLS

- Spend less time on devices
- Spend more time connecting with family and friends.
- Less noise pollution.
- Less light pollution
- It's atmospheric
- Play games instead of watching TV
- Have more conversations
- Go to sleep earlier
- Wake up earlier and get more out of the day
- Take a break from working
- Brings people together
- Load shedding gives us something to talk about
- Compels us to move towards alternative power sources.

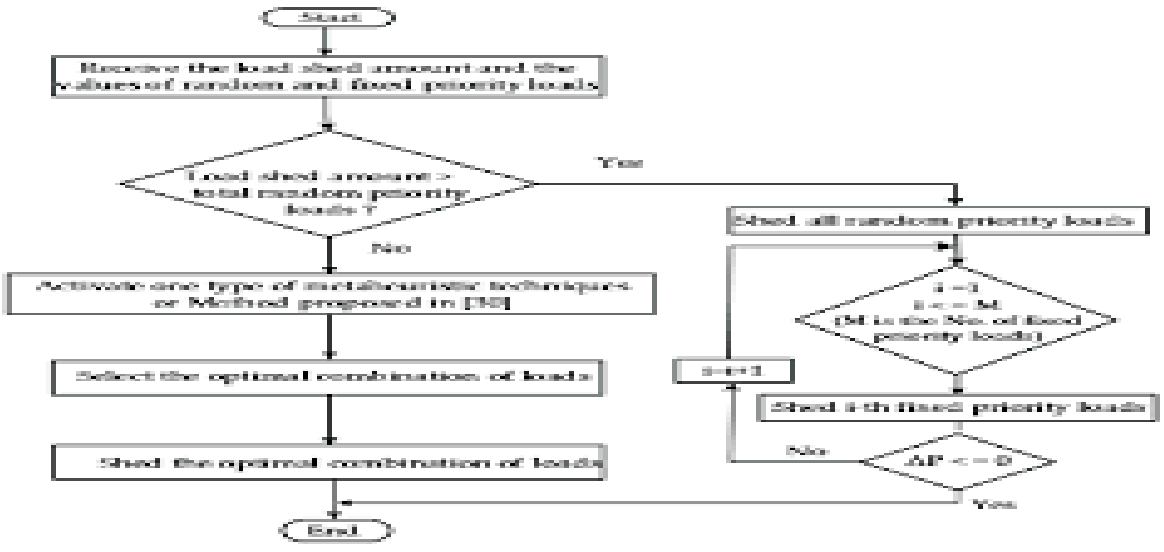


Fig 38 Block Diagram of Program Load Shedding

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.

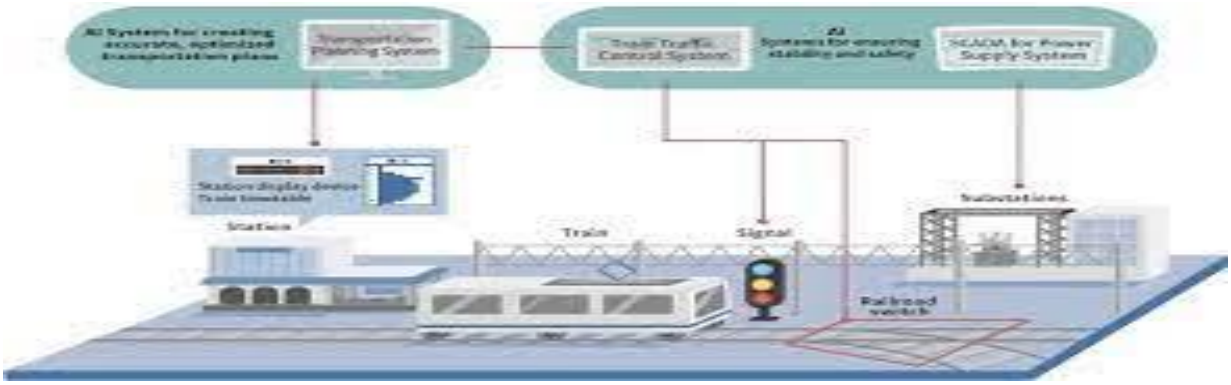


Fig 39 Railway Security System using IOT

- Railways is considered as one of the widely spread mode of transportation all over the globe. Nowadays there is an enormous increase in road and railway traffic. This rapid growth has given rise to more and more accidents at the level crossings. This is a serious concern for both railway and road traffic users. There are no easy ways for tackling this problem, but the main concern is regarding its feasibility for the fluctuating environmental conditions. In this paper, we are proposing an IoT based technique as an alternative and efficient solution for manned and unmanned level crossings.

- To implement this technology, we are fixing two Infrared Sensors at a pre-calculated distance to calculate the speed of train and time taken by the train to reach level crossings. With this data we are trying to automate closing and opening of gates at level crossings and to regulate road traffic users waiting time.
- This real time information is sent to database server with the help of Wi-Fi module through Internet of Things (IoT). With the help of GSM module, we send the intrusion detection information to the concerned train driver, station master and control room for efficient monitoring

Advantages of Railway Security System Using IOT

- Automatic railway gate control systems reduce the time for which gate remains closed.
- This type of gates can be employed in an unmanned level crossing where the chances of accidents is higher and reliable operation is required. Automatic operation prevents errors due to manual operation.

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.
- Energy harvesters provide a very small amount of power for low-energy electronics. While the input fuel to some large-scale generation costs resources (oil, coal, etc.), the energy source for energy harvesters is present as ambient background. For example, temperature gradients exist from the operation of a combustion engine and in urban areas, there is a large amount of electromagnetic energy in the environment because of radio and television broadcasting.
- 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.
- into electricity to be used by oceanographic monitoring sensors for autonomous operation. Future applications may include high power output devices (or arrays of such devices) deployed at remote locations to serve as reliable power stations for large systems. Another application is in wearable electronics, where energy harvesting devices can power or recharge cellphones, mobile computers, radio communication equipment, etc
- . Nowadays there is an enormous increase in road and railway traffic. This rapid growth has given rise to more and more accidents at the level crossings. This is a serious concern for both railway and road traffic users.

- 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.

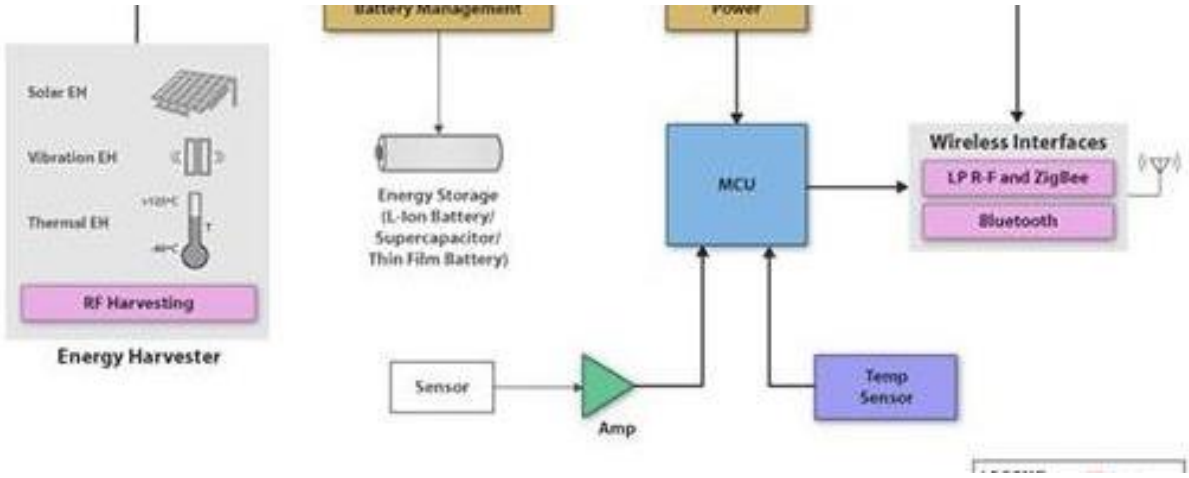


Fig 40 Block Diagram of Energy Harvesting Concept

The objective is to minimize the cost of supplied power to the load point.

- Energy harvesters provide a very small amount of power for low-energy electronics. While the input fuel to some large-scale generation costs resources (oil, coal, etc.), the energy source for energy harvesters is present as ambient background. For example, temperature gradients exist from the operation of a combustion engine and in urban areas, there is a large amount of electromagnetic energy in the environment because of radio and television broadcasting.

Operation of EHC

- Energy harvesting devices converting ambient energy into electrical energy have attracted much interest in both the military and commercial sectors. Some systems convert motion, such as that of ocean waves, into electricity to be used by oceanographic monitoring sensors for autonomous operation. Future applications may include high power output devices (or arrays of such devices) deployed at remote locations to serve as reliable power stations for large systems. Another application is in wearable electronics, where energy harvesting devices can power or recharge cellphones, mobile computers, radio communication equipment, etc. All of these devices must be sufficiently robust to endure long-term exposure to hostile environments and have a broad range of dynamic sensitivity to exploit the entire spectrum of wave motions.

Accumulating Energy of EHC

- Energy can also be harvested to power small autonomous sensors such as those developed using MEMS technology. These systems are often very small and require little power, but their applications are limited by the reliance on battery power. Scavenging energy from ambient vibrations, wind, heat or light could enable smart sensors to be functional indefinitely.
- Typical power densities available from energy harvesting devices are highly dependent upon the specific application (affecting the generator's size) and the design itself of the harvesting generator. In

general, for motion powered devices, typical values are a few μW/cm³ for human body powered applications and hundreds of μW/cm³ for generators powered from machinery.[3] Most energy scavenging devices for wearable electronics generate very little power

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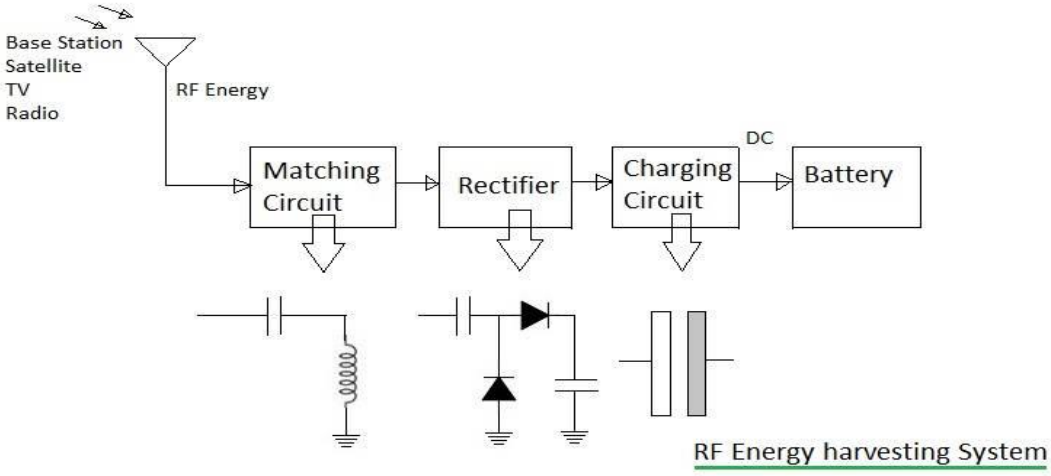


Fig 41 Circuit Diagram of Electric Harvesting Concept

➢ Advantages of EHC

- Instead of having to access the system to change batteries or hardwire power, having a different type of energy source enables the application to be placed in otherwise inaccessible areas and operate longer without requiring maintenance. One of the key applications for energy harvesting is wireless sensors.

5.2.4 Moisture Monitoring System:

- Systems, methods and apparatus are provided for moisture measurement. In some embodiments, a reflectance measurement is corrected based on a soil characteristic map. In other embodiments, a first reflectance measurement at a first depth is corrected based on a second reflectance measurement at a second depth.
- In recent years, increased input costs and an increased interest in precision agriculture practices have led to the development of in-field moisture measurement. However, existing systems generate moisture estimates that change with variables other than true moisture measurement. Thus the re is a need in the art for improved systems, methods and apparatus for soil moisture monitoring.
- The efficient irrigation management practices based on the monitoring of the moisture in the soil provide a great benefit for the appropriate amount of water applied in the fields. This paper presents design and development of a soil moisture sensor and a response monitoring system. The probes used in this sensor are made of nickel which is an anti-corrosive and robust material for use in agricultural related applications. The response monitoring system measure the moisture of the soil, compare it with the desired values given by the user and generate alert if soil moisture goes below desired value. It helps

in problems related to growing of crops in which irrigation is required at irregular interval. It is also helpful in monitoring of soil moisture in golf fields.

- **Prototype model**: Components Required

•ESP32
•Soil Moisture Sensor
•OLED Display
•Connecting Wires

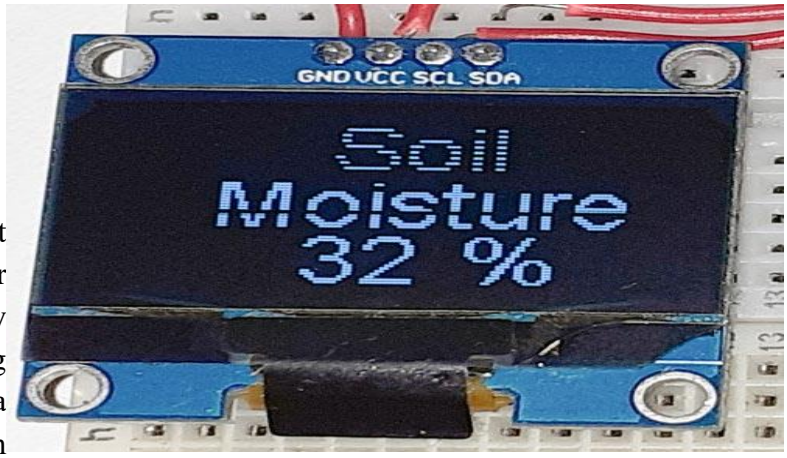


Fig 42 Soil Moisture

- **Description**

The OLED displays are one of the most common and easily available displays for a microcontroller. This display can easily be interfaced with microcontroller using IIC or using SPI communication and has a good view angle and pixel density which makes it reliable for displaying small level graphics. It is compatible with any 3.3V-5V microcontroller, such as Arduino. The OLED display comes with a powerful single-chip CMOS OLED driver controller – SSD1306 that handles the entire RAM buffering. The SSD1306 driver has a built-in 1KB Graphic Display Data RAM (GDDRAM). We previously interfaced OLED

- **Specifications**

- OLED Driver IC: SSD1306
- Resolution: 128 x 64
- Visual Angle: >160°
- Input Voltage: 3.3V ~ 6V
- Pixel Colour: Blue
- Working temperature: -30°C ~ 70°C

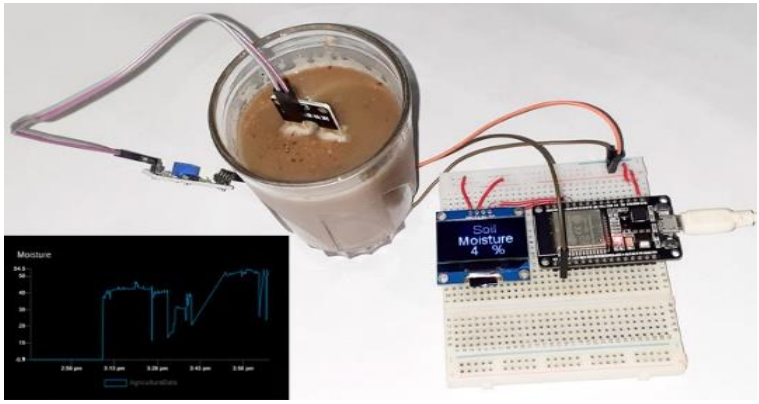


Fig 43 Final Practical Connection

Cost Estimation of Moisture Monitoring System

Sr No	Components	Quantity	Price
1	ESP32	1	Rs 825
2	Soil Moisture Sensor	1	Rs 624
3	OLED Display	1	Rs 675
4	Connecting Wires	1 Pack	Rs 525
5	Total Cost	_	Rs 2648

Table 15

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.

Fig 44 IOT

- 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.

Areas Where Home Automation through IOT can be achieved.

- Lighting control.

- HVAC.
- Lawn/Gardening management.
- Smart Home Appliances.
- Improved Home safety and security.
- Home air quality and water quality monitoring.
- Natural Language-based voice assistants.
- Better Infotainment delivery.

Home automation components

- We have talked about them before, but, let's clearly separate them into components that would finally help you build a realistic model of what major components are involved in building a smart home. The major components can be broken into:
- IoT Sensors
- IoT Gateways
- IoT Protocols
- IoT Firmware
- IoT Cloud and Databases
- IoT Middleware (if required)
- IoT sensors involved in home automation are in thousands, and there are hundreds of home automation gateways as well. Most of the firmware is either written in C, Python, Node.Js, or any other programming language.
- **Advantages of Home Automation using IOT**
  - Managing all of your home devices from one place. The convenience factor here is enormous. Being able to keep all of the technology in your home connected through one interface is a massive step forward for technology and home management. Theoretically, all you'll have to do is learn how to use one app on your smartphone and tablet, and you'll be able to tap into countless functions and devices throughout your home. This cuts way back on the learning curve for new users, makes it easier to access the functionality you truly want for your home.
  - Flexibility for new devices and appliances. Smart home systems tend to be wonderfully flexible when it comes to the accommodation of new devices and appliances and other technology. No matter how state-of-the-art your appliances seem today, there will be newer, more impressive models developed as time goes on. Beyond that, you'll probably add to your suite of devices as you replace the older ones or discover new technology to accompany your indoor and outdoor spaces. Being able to integrate these newcomers seamlessly will make your job as a homeowner much easier, and allow you to keep upgrading to the latest lifestyle technology.

5.2.6 PC Based Electrical Load Control:

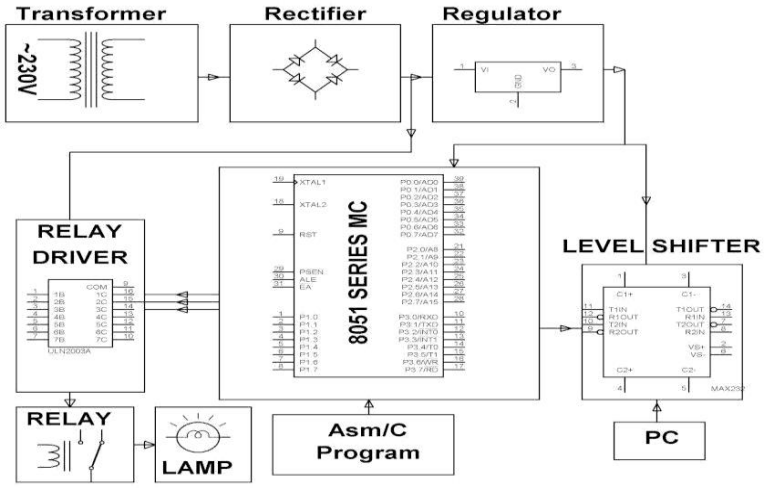


FIG 45 CIRCUIT DIAGRAM

- 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.
- 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

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**.**

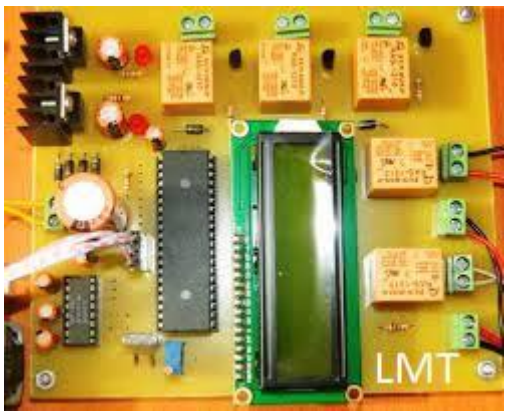


Fig 46 Practical Connection

- 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.

Working of PC based Electrical Load Control

- The system aims at controlling electrical loads through a central Pc. Considering a pc can be used to control the lights and fans of an auditorium or college from a single place.
  Currently, someone needs to manually switch of the lights on each floor and room. This system allows a single user to operate all those light fans, or other loads from a single PC. The project consists of lamps/loads to demonstrate as electrical appliances. These loads are then connected to an PC through an Rs 232 interface to a microcontroller circuit.

- The system once turned on allows users to switch the load on and off, submitting commands from a PC. This allows user to control a load through PC.
  The system may be further improved by implementing an effective GUI to control multiple loads from a pc within a glance.

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

Voltage	Volt	V or E	Unit of Electrical Potential V = I x R
Current	Ampere	I or i	Unit of Electrical Current I = V ÷ R
Resistance	Ohm	R or Ω	Unit of DC Current R = V÷I
Conductance	Siemen or Mho	G or Ʊ	Unit of Conductance G = 1÷R
Power	Watts	W	Unit of Power P = V x I

supervisor.

Table 47 Table of Electrical Parameters

- The standard units of electrical measurement used for the expression of voltage, current and resistance are the Volt [V], Ampere [A] and Ohm [Ω] respectively.
- These electrical units of measurement are based on the International (metric) System, also known as the SI System with other commonly used electrical units being derived from SI base units.

- Sometimes in electrical or electronic circuits and systems it is necessary to use multiples or sub-multiples (fractions) of these standard electrical measuring units when the quantities being measured are very large or very small.
- The following table gives a list of some of the standard electrical units of measure used in electrical formulas and component values.
- To convert from one prefix to another it is necessary to either multiply or divide by the difference between the two values. For example, convert 1MHz into kHz.
- Well we know from above that 1MHz is equal to one million (1,000,000) hertz and that 1kHz is equal to one thousand (1,000) hertz, so one 1MHz is one thousand times bigger than 1kHz. Then to convert Mega-hertz into Kilo-hertz we need to multiply mega-hertz by one thousand, as 1MHz is equal to 1000 kHz.
- The standard units of electrical measurement used for the expression of voltage, current and resistance are the Volt [V], Ampere [A] and Ohm [Ω] respectively.
- These electrical units of measurement are based on the International (metric) System, also known as the SI System with other commonly used electrical units being derived from SI base units.
- Sometimes in electrical or electronic circuits and systems it is necessary to use multiples or sub-multiples (fractions) of these standard electrical measuring units when the quantities being measured are very large or very small.
- The following table gives a list of some of the standard electrical units of measure used in electrical formulas and component values.
- Likewise, if we needed to convert kilo-hertz into mega-hertz we would need to divide by one thousand. A much simpler and quicker method would be to move the decimal point either left or right depending upon whether you need to multiply or divide.
- As well as the “Standard” electrical units of measure shown above, other units are also used in electrical engineering to denote other values and quantities such as:

Chapter 6: Swachh Bharat Abhiyan (Clean India)

Swachh Bharat Abhiyaan:

- To accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation, the Prime Minister of India, Shri Narendra Modi, launched the Swachh Bharat Mission on 2nd October, 2014. The Mission Coordinator shall be Secretary, Ministry of Drinking Water and Sanitation (MDWS) with two Sub-Missions – the Swachh Bharat Mission (Gramin) and the Swachh Bharat Mission (Urban). The Mission aims to achieve a Swachh Bharat by 2019, as a fitting tribute to Mahatma Gandhi on his 150th birth anniversary.
- As per an independent survey released by Quality Council of India in August 2017, overall national rural "household access to toilet" coverage increased to 62.5% and usage of toilets to 91.3%, with Haryana topping the national ranking with 99% of households in rural areas covered and usage of toilets of 100%. World Health Organization (WHO) has in its report stated that at least 180,000 diarrhoeal deaths were averted in rural India since the launch of the Swachh Bharat Mission. According to a survey carried
- In 2018 and published in 2019 by National Statistical Office (NSO), 71% of rural households had access to toilets as of 2018.
- The mission has two thrusts: Swachh Bharat Abhiyan ("gramin" or 'rural'), which operates under the Ministry of Drinking Water and Sanitation; and Swachh Bharat Abhiyan ('urban'), which operates under the
- Ministry of Housing and Urban Affairs.

Fig. 48 Low Cost Toilet

6.1 Swatch needed in kinara village

To achieve “Swachh Bharat” by October 2, 2019, the main objectives of the SBM(G) are as under:

- Bring about an improvement in the general quality of life in the rural areas, by promoting cleanliness, hygiene and eliminating open defecation.
- Accelerate sanitation coverage in rural areas to achieve the vision of Swachh Bharat by 2nd October 2019.
- Motivate communities and Panchayati Raj Institutions to adopt sustainable sanitation practices and facilities through awareness creation and health education.
- Encourage cost effective and appropriate technologies for ecologically safe and sustainable sanitation.
- Develop, wherever required, community managed sanitation systems focusing on scientific Solid & Liquid Waste Management systems for overall cleanliness in the rural area.
- Create significant positive impact on gender and promote social inclusion by improving sanitation

especially in marginalized communities.

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)
- Firstly we took a permission from village Talati and Sarpanch for doing one Swachhta awareness camp and then we have done one activity of swachhta awareness in the village and we have done an interaction with villagers and aware them about the importance of swachhta in our lifeand told them to keep the village
- Bring about an improvement in the general quality of life in the rural areas, by promoting cleanliness, hygiene and eliminating open defecation.
- Accelerate sanitation coverage in rural areas to achieve the vision of Swachh Bharat by 2nd October 2019.
- Motivate communities and Panchayati Raj Institutions to adopt sustainable sanitation practices and facilities through awareness creation and health education.
- Encourage cost effective and appropriate technologies for ecologically safe and sustainable sanitation.

6.3 Activities Done by Students for Kanera village with Photograph:

Fig 49 Cleaning Village

Fig 50 Interaction with Villagers

- Firstly we took a permission from village Talati and Sarpanch for doing one Swachhta awareness camp and then we have done one activity of swachhta awareness in the village and we have done an interaction with villagers and aware them about the importance of swachhta in our lifeand told them to keep the village and infrastructure clean and safe. We have also done a cleaning of village street. We have suggested them for not dumping the waste in village streets and dispose it at right place.
- So that we have also proposed one design of Solid Waste Management as part 2 design in the Kanera village.

- 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.
- Follow government's rules and regulations.
- If someone is breaking the rule then make them aware of it.

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 KANERA 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 Students for allocated village Clean with Photograph

Fig 51 Anganwaadi

Fig 52 With Locals

7.3Any other steps taken by villagers:

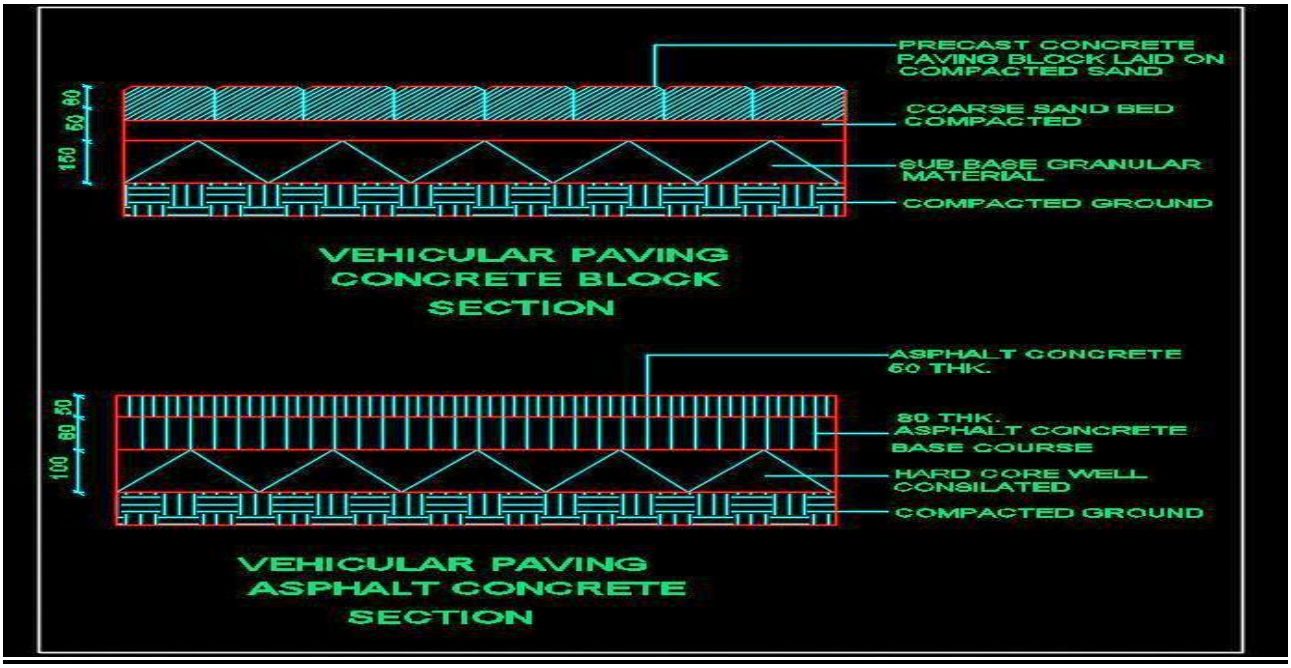
- All people in village start drinking boiled water to increase immunity. We also suggest them to buy foot hand sanitizing machine for hospital, dairy and panchayat office. Most of people in village wear mask provided by the government.

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

8.1.1Sustainable design (Civil) 400-meter Cement Concrete Road plan Objectives:

- Roads play a very important part in any nation's infrastructure. Their construction and maintenance, and the vehicles that travel over them, consume large amounts of energy.
- This energy use results in atmospheric emissions, the reduction of a non-renewable resource, and other environmental impacts. Any reduction of the lifetime energy use associated with roading, even if only by a small percentage, will have significantly positive implications for sustainable development.
- Concrete roads are durable and safe. They are considerably less prone to wear and tear defects like rutting, cracking, stripping, loss of texture, and potholes that can occur with flexible pavement surfaces.
- This low maintenance requirement is one of the principal advantages of concrete pavements. There are well-designed concrete pavements that have required little or no maintenance well beyond their 40-year design lives. Less maintenance also means fewer traffic delays, a huge advantage on some of our already congested highways.

Fig 53 Section of road



Measurement Sheet

Item	Item description	No	L	B	H	Quantity	Remarks
1	**Box cutting in road crust & consolidating sub grade & camber**	1	400	8	0.35	1120 m^3	**H=0.15+0.20 = 0.35m**
2	**Supplying consiladated soil Gravel & stacked A road side regular interaval** **Labour for spreading & consolidating soil gravel**	1 1	400 400	8 8	0.30 0.30	960 m^3 960 m^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	400	8	0.15	480 m^3	
4	**Providing necessary joints in Concrete slab and filling the joints with bitumen** **C. Longitudinal joints** **D. For transverse Joints @ 10 Joints**	 1 40	 400	 - 8	 -	 400 rm 320 rm	**Transverse joints 400/10 = 40** **Total joints** **400 + 320 = 720 rm**

Abstract sheet

Item no	Particulars of item	Unit	Quantity	Rate	Amount
1	**Box cutting**	M^ 3	1120	40	**44,800 Rs**
2	**Supplying consolidating soil gravel & stacked a road side at regular intervals** **Labour for spreading & Consolidating Soil gravel**	M^3 M^3	960 960	150 20	**1,44,000Rs** **19,200Rs**
3	**Cement concrete (1:2:4) with 20 mm aggregate**	M^3	480	600	**2,88,000Rs**
4	**Providing necessary joint to concrete slab and filling with bitume n**	rm	720	10	**7200Rs** **Total= 5,03,200Rs** **+5% constitegies and work charged** **25,165Rs** **Grand total= 5,28,365Rs**

- Roads play a very important part in any nation's infrastructure. Their construction and maintenance, and the vehicles that travel over them, consume large amounts of energy.
- This energy use results in atmospheric emissions, the reduction of a non-renewable resource, and other environmental impacts. Any reduction of the lifetime energy use associated with roading, even if only by a small percentage, will have significantly positive implications for sustainable development.

- To improve the standards of environmental sanitation and personal hygiene leading to reduction in the incidence of diseases and a healthier life; to improve maternal and child health services and to create such services; to control and eradicate common communicable and infectious disease
- To lower by about 50% maternal and infant mortality rates and other mortality rates. To achieve the general objectives, it is proposed to use certain specific indicators to plan and monitor the health programs. The indicators proposed, which are outlined, fall into the categories of health status indicators and indicators for provision of health services.

8.1.2Physical design (Civil) Primary Health Centre (PHC)

Objectives:

- In India a draft Health Policy has been formulated with the following objectives: to improve and expand the health care delivery system to make primary health care services available to each individual; to make people conscious of their health needs and to encourage their involvement and participation in the planning and implementation of the health programs;
- To improve the standards of environmental sanitation and personal hygiene leading to reduction in the incidence of diseases and a healthier life; to improve maternal and child health services and to create such services; to control and eradicate common communicable and infectious disease
- To lower by about 50% maternal and infant mortality rates and other mortality rates. To achieve the general objectives, it is proposed to use certain specific indicators to plan and monitor the health programs. The indicators proposed, which are outlined, fall into the categories of health status indicators and indicators for provision of health services.
- The main objective of primary health care will be to provide better health care services to the rural areas and urban slums. The population will be encouraged both individually and collectively to participate in the development of health.
- The government and the medical profession will help the people to realize their responsibility by providing a large band of health volunteers from among the community itself to take care of the basic health needs of the community.
- To improve the standards of environmental sanitation and personal hygiene leading to reduction in the incidence of diseases and a healthier life; to improve maternal and child health services and to create such services; to control and eradicate common communicable and infectious disease
- To lower by about 50% maternal and infant mortality rates and other mortality rates. To achieve the general objectives, it is proposed to use certain specific indicators to plan and monitor the health programs. The indicators proposed, which are outlined, fall into the categories of health status indicators and indicators for provision of health services.
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- To lower by about 50% maternal and infant mortality rates and other mortality rates.
- The main objective of primary health care will be to provide better health care services to the rural areas and urban slums. The population will be encouraged both individually and collectively to participate in the development of health.
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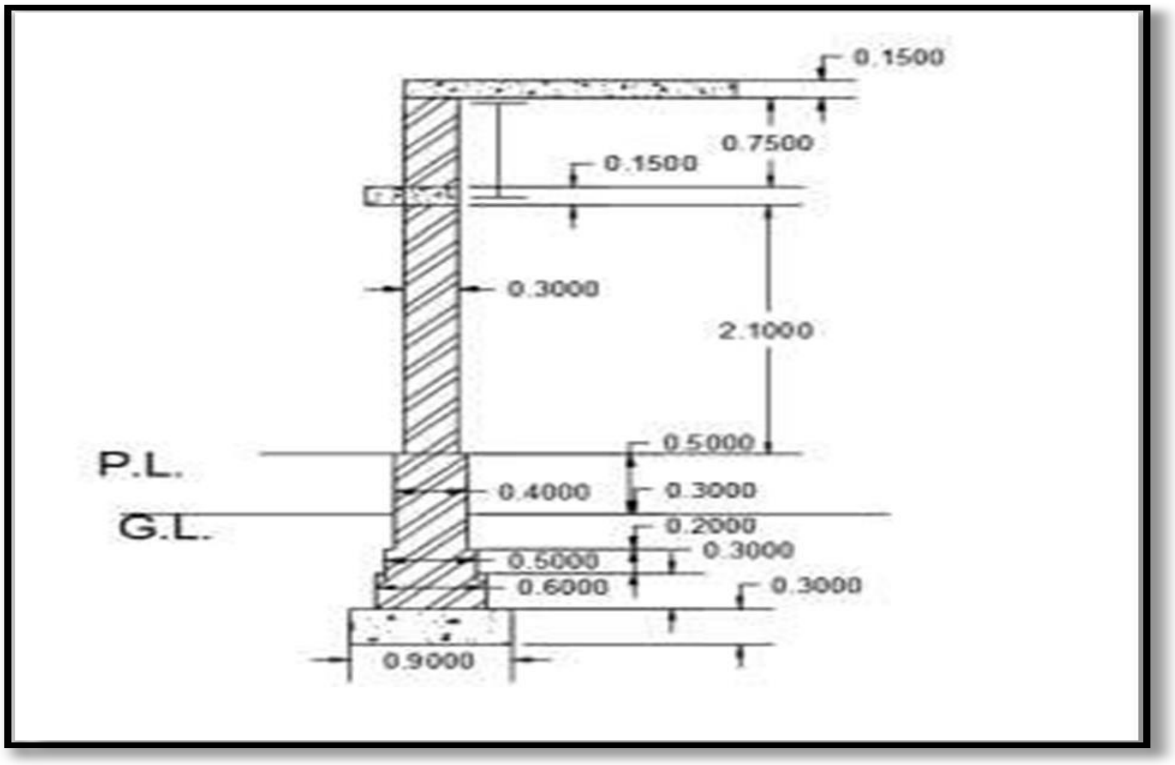


Fig 54 (a) Footing design of PHC

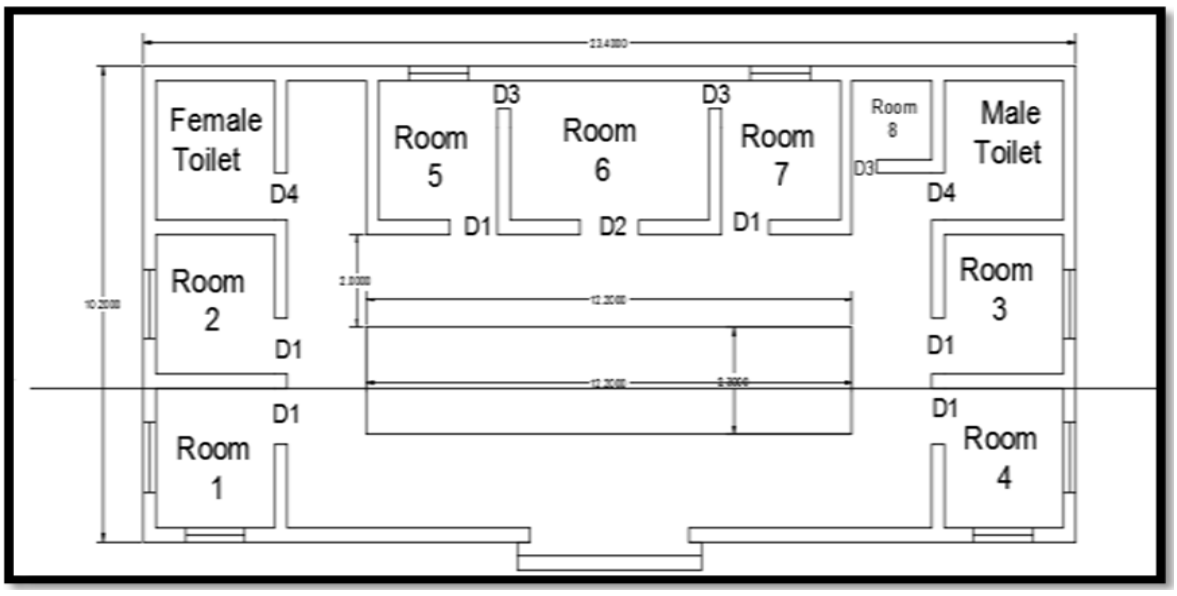


Fig. Plan of PHC

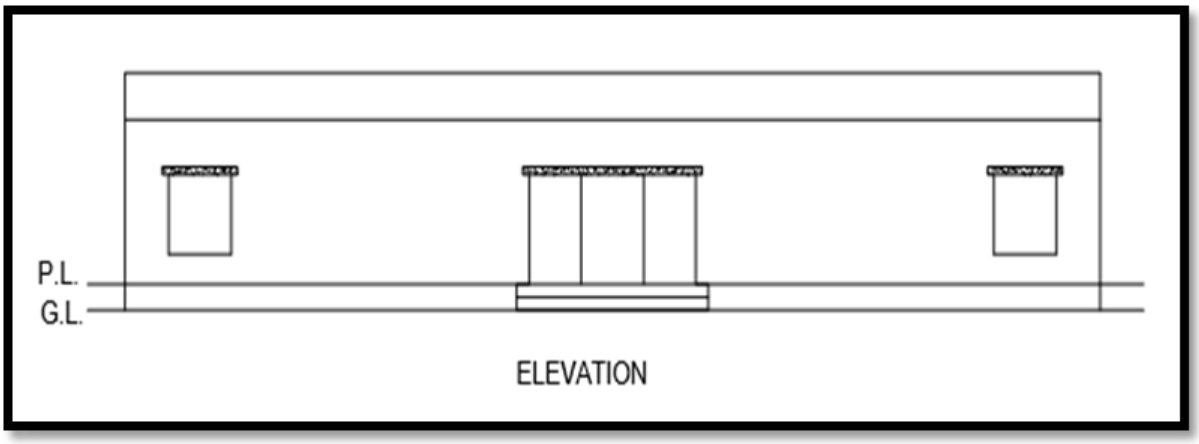


Fig. Elevation of PHC

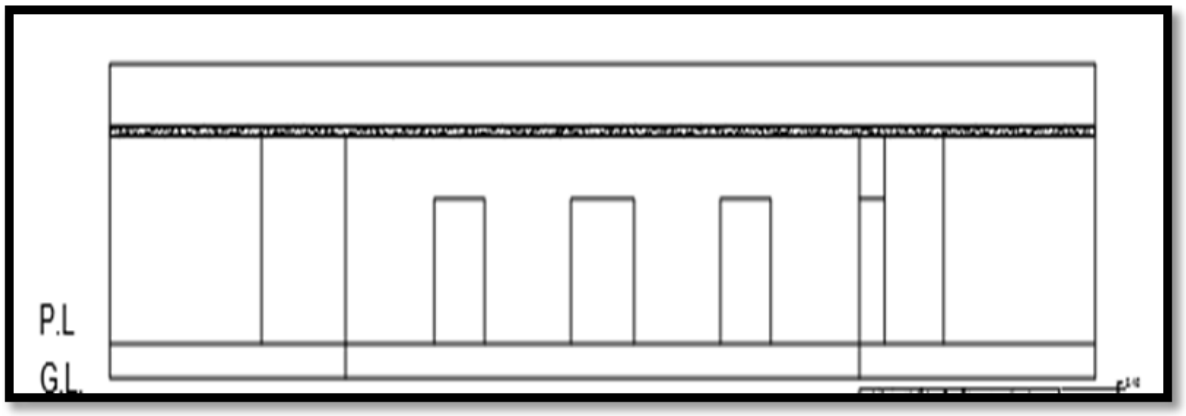


Fig. Section of PHC

Measurement Sheet

Total center line = 4(9.9) + 3(23.1) + 4(3.3) + 2(3.3) + 2 = 130.7 m, total junction = 19

Net center line = 130.7 – (0.5 x 19 x 0.3) = 127.85 m

Measurement sheet

Sr no	Item Description	Length (m)	Width (m)	Height (m)	Quantity (cu. m)	Total Quantity	

1	Excavation for foundation in Soft ordinary soil. Total length = 127.85 – (0.5 x 19 x 0.9) = 119.3	119.3	0.9	1.1	118.107	57.26
2	Providing and laying Foundation concrete (P.C.C.) (1:4:8) at Foundation.	119.3	0.9	0.3	32.22	32.21
3	Providing and laying Brick masonry at foundation up to G.L.					
3.1	1st footing Total length= 127.85 – 0.5x19x0.6	122.15	0.6	0.3	21.98	74 cu. M.
3.2	2nd footing Total length= 127.85 – 0.5x19x0.5	123.1	0.5	0.2	12.31	
3.3	3rd footing (up to G.L.) Total length= 127.85 – 0.5x19x0.4	124.05	0.4	0.3	14.90	
3.4	Brick masonry up to P.L.	124.05	0.4	0.5	24.81	
4	Providing refilling of the ordinary soil in foundation Trenches.	Refilling = Total Excavation – (P.C.C. + Brick masonry of 1st – 3rd footing + Brick masonry up to G.L.) = 12.63 cu. m. Total refilling = 12.36 cu. m.				
5	Providing and refilling of the Yellow soil up to the Plinth level.	Refilling = 8(0.5 x 3 x 3) + (0.5 x 2 x 1.7) + (0.5x5x3) = 45.42 cu. m.				

6	Providing and laying Brick masonry up to bottom of the Slab. Total length = 127.85 – 0.5x19x0.3	1	125	0.3	3	112.5	112.5
	Deduction						
	D	1	4	0.3	2.1	2.52	
	D1	6	1.2	0.3	2.1	4.536	
	D2	1	1.5	0.3	2.1	0.945	
	D3	1	0.6	0.3	2.1	0.378	13.95
	D4	2	1	0.3	2.1	1.26	
	W	8	1.5	0.3	1.2	4.32	
					Total brickwork = 98.54 cu. m.		
7	Providing and Laying R.C.C. (1:2:4) work for slab	Slab	10.2	23.4	0.15	35.80	8.64
	Deduction the open area		12.2	2.3	0.15	4.209	
		Total RCC = 31.591 cu. m.					
	R.C.C. Lintels (1:2:4)						
	D	1	4.3	0.3	0.15	0.193	
	D1	6	1.5	0.3	0.15	0.405	
	D2	1	1.8	0.3	0.15	0.081	
	D3	1	0.9	0.3	0.15	0.04	1.48
	D4	2	1.3	0.3	0.15	0.117	
	W	8	1.8	0.3	0.15	0.648	
	R.C.C. Chajja (1:2:4)						
	D	1	4.3	0.6	0.15	0.387	

	D1 D2 D3 D4	6 1 1 2	1.5 1.8 0.9 1.3	0.6 0.6 0.6 0.6	0.15 0.15 0.15 0.15	0.81 0.162 0.081 0.234	2.97
	W	8	1.8	0.6	0.15	1.296	
	Total R.C.C. (1:2:4) Work = 9.956 cu. m.						
8	Providing and laying Brick masonry CM (1:6) for parapet wall	1	67.2	0.3	0.9	18.144	18.14
9	Plaster						
9.1	Outside plaster Total length = (23.4+23.4+10.2+10.2)	1	67.2	4.55	-	305.76 Sq. m.	305.7 Sq.m.
	Deduction D W	 1 8	 4 1.5	 - -	 2.1 1.2	 8.4 14.44	 22.9 sq. m.
	Total outside plaster = 282.86 sq. m.						
9.2	Inside plaster						
	Total length = 6(5(3x3)) + 2(5(3x3)) + 3(5x3) + 2(3x3) + (2x1.7)+ 2(2x3)+ 2(1.7x3) + 2(9.6) + 2(2x3)+(9.6x3)	1	171.53	-	3	514.6	514.6 sq. m.
	Deduction D D1 D2 D3	 1 6 1 1	 4 1.2 1.5 0.6	 - - - -	 2.1 2.1 2.1 2.1	 8.4 15.12 3.15 1.26	 46.53

	D4 W	2 8	1 1.5	- -	2.1 1.2	4.2 14.4	
	Total inside plaster = 468.07 sq. m.						
10	Flooring Room (1,2,3,4,5,7)= 6(3x3 + (0.3x1.2)) = 56 Room 8 = (2x1.7 + (0.6x0.3)) = 3.58 Room 6 = (15 + (1.5x0.3) = 15.45 Female and male toilet = 2(9 + (1x0.3)) =2.6 Open area = (9.3 x 16.8 + 4x0.3) =120	-	-	-	-	56 3.58 15.45 18.6 104.5	198.23

Abstract sheet

Sr. No	Particulars	Total Qty.	Rate	Per	Amount
1	Excavation for foundation in soft ordinary soil.	57.26	89	M^3	5069
2	Providing and laying Foundation concrete (P.C.C.) (1:4:8) at foundation.	32.21	3200	M^3	103072
3	Providing and laying Brick masonry at foundation And plinth.	74	3200	M^3	236800
4	Providing refilling of the ordinary soil in foundation Trenches.	42.42	107	M3	4535

5	Providing and refilling of the Yellow soil at Plinth Level.	21.42	212	M^3	4536
6	Providing and laying Brick masonry up to bottom of The slab and parapet.	112.65	3500	M^3	397654
7	Providing and Laying R.C.C. (1:2:4) work	9.95	8800	M^3	87560
8	Providing 12 mm thick cement plaster in C.M. (1:4)	751	132	M^2	99132
9	Providing and fixing tile flooring	198.23	400	M2	79292
10	Providing and fixing 10 cm height tiles (Skirting)	144.77	40	RM	5790
					Total cost in Rupees = 11,41,165

Workout charges and contractor profit + contingency charges (1+0.02) X 886119.53 Cost = 992453.87 Rs.

Total cost = **992453.87 Rs.**

1) Workout for materials required for R.C.C. slab, Lintels and Chajja 1: 2: 4 with 1.2% steel.

Volume of cement concrete in RCC slab + lintels + Chajja = 9.95 cu. m. Taking 1.52 times more for dry volume of concrete = 1.52 X 9.95= 15.124 m^3 Proportion = 1:2:4 => 1+2+4 = 7

Cement = **62** bags.

Aggregate = 2/7x9.95x1.52= **4.35** cu. m. Weight of Steel = **785** kg

2) Workout for materials required for P.C.C. work 1:4:8.

Volume of concrete required = 32.21 m^3

Cement = **108** bags

Sand = **15** m3

Aggregate = **30 m**3

3) Workout for materials required for Plasterwork 1:4

Volume of concrete required = 751 X 0.012 = 9 m^3

4) Volume of wet mortar = 1.20 X 9 = 10.8 m^3

Volume of dry mortar = 1.35x10.8 m3 = 14.58 m3 Proportion = 1:4

Cement = **84** bags Sand = **12** m^3

5) Materials for brickwork (1:6)

Total brickwork = **187** cu. m. Cement = **260** bags

Sand (F.A.) = **52.78** m^3

Bricks = **93300** nos.

Material abstract Sheet

Table 19(c) material sheet for PHC

Sr. no.	Particulars	Qty	Rate	Per	Amount
1	Cement	514	280	Bag	143920
2	Aggregate	34.35	1000	M^3	34350
3	Bricks	93300	4000	1000 nos	373200
4	steel	800	47	Kg	37608
Total cost = 573730 Rs.					

8.1.3Social design (Civil) Biogas Plant

Objectives:

- Main objective of the project DE-HUMUS is the first commercial application of 4 treatment plants in 4 different European Countries for decentralised humus production out of different organic wastes with advantages of emission reduction and renewable energy generation. The installation of the project applications is conduced to show the possibility of technology with the following specific objectives and ambitions:
- humus production out of all kinds of organic waste material, to increase the topsoil/humus proportion and avoid land erosion decentralised humus allocation (65% of Europe shows a rural settlement

structure) out of small waste quantities including reduction of transportation costs and emissions; humus utilisation to substitute chemical fertiliser and close natural circuits (e.g. phosphorus, carbon) to increase resource efficiency; advance recycling management to guarantee an optimal use of resources reduction of environmental impacts, greenhouse gases (CO_2, CH_4, N_2O,..), odour and dust emissions renewable energy production to substitute fossil fuels as energy carriers and without competing with food industry (limitation of cultivated area and biomass leads to a competition food vs. energy); organic waste is still unused to comply with European directives and standards (e.g. Landfill Directive, Waste Framework Directive, Thematic Strategy on the Prevention and Recycling of waste, Directive on Renewable Energy Sources, Climate aims 20-20-20)

Bio gas plant

- Bio gas plant is one of the economical solutions for renewable energy sources for a rural area. It
- Transforms rural village in to clean village and also provide gas as energy source and gives fertilizer
- At end. The system consists of digester tank, Gas holder, Inlet and outlet, fixtures to burn gas.
- Data taken

Numbers of animals to one of the villagers = 37 (As per survey)
As per standard data, assume per day dung of animal =10 Kg.
So, total per day dung = 10 X 37 = 370 Kg/day
Design of Digester tank
Assume retention period (RT) = 60 days.
Assume mixing proportion of solid and water is 1:1
Now total amount of slurry per day (Sd) = Total per day dung + Water amount
= 370 + 370
= 740 Kg/day
= 740lit/day
= 0.74m3 / day
Volume of digester tank (Vd) = Sd X RT
= 0.74X 60 = 44.4m3
To increase resource efficiency; advance recycling management to guarantee an optimal use of resources reduction of environmental impacts, greenhouse gases (CO_2, CH_4, N_2O,..), odour and dust emissions renewable energy production to substitute fossil fuels as energy carriers and without competing with food industry (limitation of cultivated area and biomass leads to a competition food vs. energy); organic waste is still unused to comply with European directives and standards (e.g. Landfill Directive, Waste Framework Directive, Thematic Strategy on the Prevention and Recycling of waste, Directive on Renewable Energy Sources,

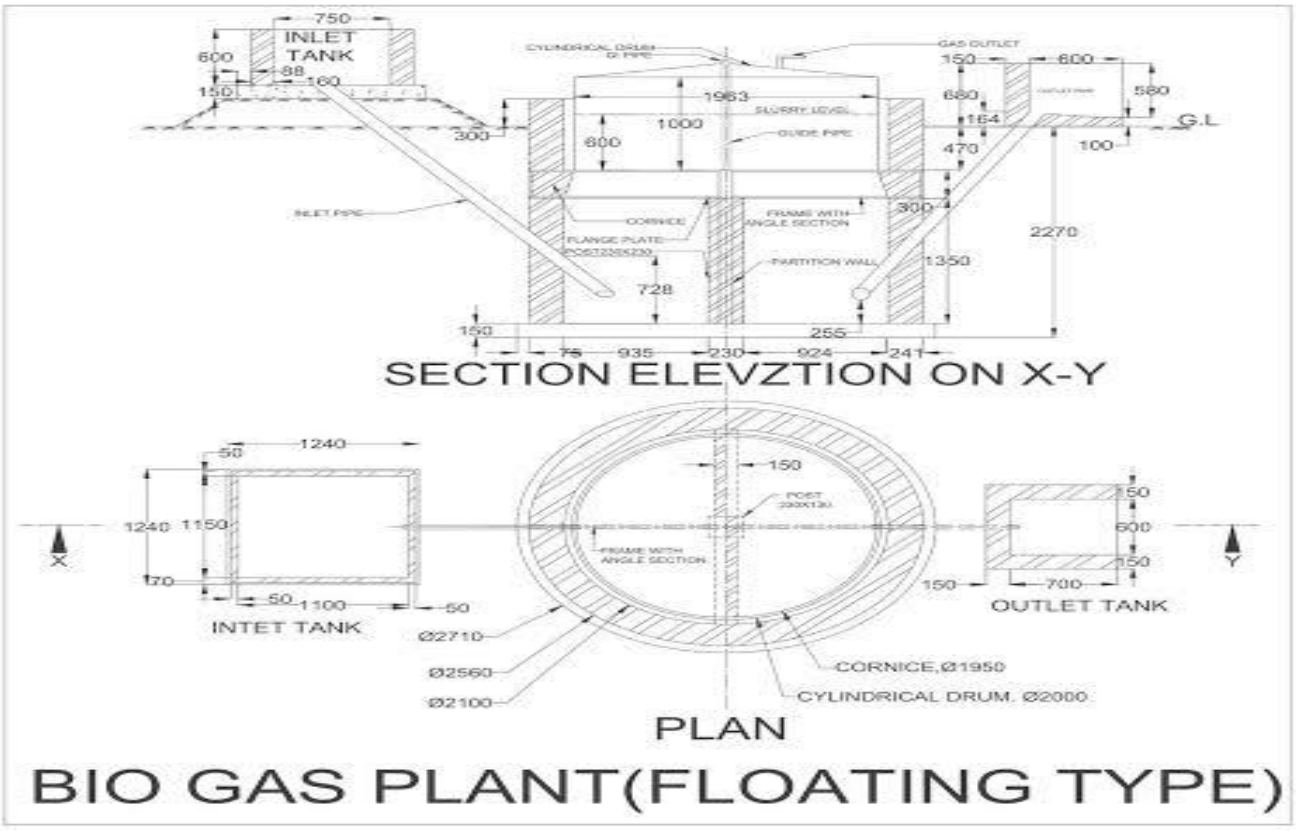


Fig 55 Biogas Plant

Assume shape of digester tank is cylinder. (Digester volume for one unit)
Total digester volume (Vd) = π R2 h
40.2= π R2 X2.1 (Assume h = 2.1m)
R = 2.46m
So, dimension of digester tank is R = 2.5m& h = 2.1 m
(Provided)

Design of Gas Holder

Assume digester temperature = 26-28 ˚C

From fig find Gd by taking RT = 60 days
Specific gas production Gd = 34 Lit /Kg/day
Daily gas production (G) = Gd X Feed volume
= 34 X 740
= 25160Lit.
= 25.160m3
Now assume gas holder capacity = 50%
Gas holder volume = Daily gas production X Capacity of holder
= 25.160× 0.50
= 12.58 m3
Gas holder volume = 13 m3 (Provided)
Assume shape of gas holder is cylinder.

Volume = π r2 h
13= π x r2 x 0.60 (Assume h = 0.60 m)
R = 2.63m

So, dimension of gas holder is r = 1.8m & h = 1 m (Provided)
Design of Inlet and Outlet
Total volume of slurry mixes per unit = 0.74 m3 / day
Total volume of slurry = 0.74m3 / day (Assume Single time filling operation)
Provide rectangular tank
Total volume for one time mixing of slurry = L × B × H
0.74 = L × B × H (Take H = 0.50 m)
0.74= 0.9× B X 0.9(Assume Rectangle chamber
With L=0.5)
B = 0.91m
Provide B = 1.1m
L = 0.90 m
Dimension of inlet are 0.9 m X 1.1m X 0.9m
Here, 0.74 m3 / day required < 0.89 m3/day provided.
Provide same size for outlet tank also.

➢ Measurement sheet

Item no.	Item description	No	Length	Breadth	Height	Quantity	Total quantity
1	**Excavation for foundation**						
	Inlet chamber	1	0.9	1.29	0.25	0.29	
		1	0.79	0.80	0.75	0.15	
	Digester chamber	1	0.79	0.80	0.75	8	**104.64**
	Outlet chamber	1	21.22	1.79	2.69	0.36	
		1	1.43	1	1.01	7	
	For inlet and outlet pipe					102.	
		2	0.90	0.30	0.80	17	
						1.44	
						0.21	
						6	
2	**P. C. C in foundation**						
	Inlet chamber	1	0.90	1.29	0.10	0.11	
		1	0.79	0.80	0.10	6	
		1	0.79	0.80	0.10	0.06	**0.385**
	Outlet chamber	1	1.43	1.00	0.10	3	
						0.06	
						3	
						0.14	
						3	
3	**Cement concrete for foundation**						
	Inlet chamber	1	0.90	1.29	0.23	0.26	
		1	0.79	0.70	0.23	7	
		1	0.79	0.70	0.23	0.12	**6.088**
	Digest chamber	1.1	Πr^2	-	0.23	7	
		0	=3.14×2.6			0.12	
			= 21.22			7	
						5.36	
	Outlet chamber		0.9	1.00	0.23		
		1					
						0.20	
						7	
4	**Masonry work**						
		1	4.5	0.12	0.5	0.27	
		1	1.4	0.12	0.7	0.11	
						7	

	Digester chamber length **= 2πr** **= 2× 3.14×2.6** **= 16.32** **Outlet chamber**	1 1 1	16.32 0.10 0.10	0.23 0.45 0.85	1.73 0.780 0.323	6.49 0.03 51 0.02 7	**6.93**
5	**Plastering double coat water proof inlet chamber** **Digester chamber** **Outlet chamber**	1 1 1 1	3.4 2.7 33.15 34.4 3.4	– – –	0.5 1.00 1.72 1.00 0.8	1.7 2.7 57.0 1 34.4 2.72	**98.53**
6	**200mm dia. Pipe required**	1	2.4	–	–	–	**2.4**
7	**Mechanical mixing unit**	1	90 number				**90**

- **Abstract sheet**

Sr no.	**Item description**	**Quantity**	**Unit rate**	**Unit**	**Total amount**
1	**Excavation for foundation for depth 1.5mt to 3.0mt including sorting out and stacking of useful material and disposing off the excavated stuff up to 50mt lead.**	104.64	94	Cumec	**9836 Rs**
2	**Providing and laying cement concrete 1:4:8 and curing complete in foundation**	0.385	1900	Cumec	**731Rs**
3	**Providing and laying cement**				

	concrete work 1:1:2 and complete curing excluding cost of for work and reinforcement.	6.088	3400	Cumec	**20700 Rs**
4	**Brick work using common burnt clay building brick in foundation in C: M (1:5).**	6.93	3300	Cumec	**22869 Rs**
5	**Providing 20mm thick plaster in single coat in single or half brick walls smooth in 1:3 (C:M).**	98.53	140	Cumec	**13794 Rs**
6	**R.C.C heavy duty pipe.**	2.4	250	Cumec	**600 Rs** **Total=68,530 Rs** **+1.5% water chages 1027 Rs** **+** **10%contractor profit 6853 Rs** **Grand total= 76,410 Rs**

8.1.7 Electrical Design 1

Background Of Design: When I was on visit in my allocated village kanera, I saw people telling me about the mishandling of the Street Light. Sometimes the street light were on till 11:00 Am in the morning. So I decided to propose this design as it will save electricity upto a great extent and hence helpful to people

8.1.7 Auto Intensity Control of Street Lights

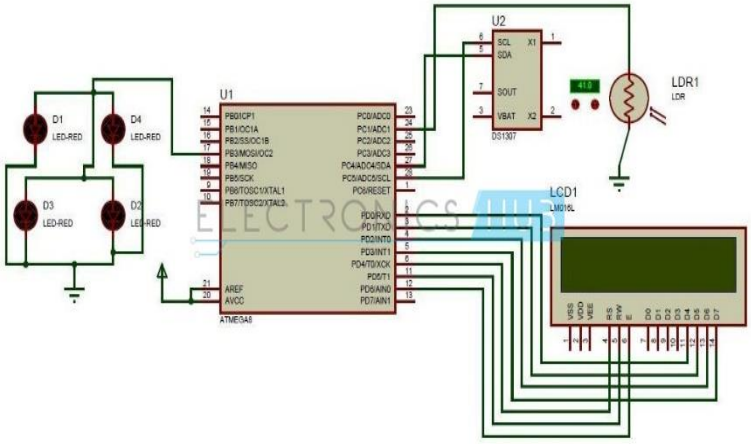
- Street lights are controlled manually in olden days. These days automation of street lights has emerged. But one can observe that there is no need of high intensity in peak hours i.e., when there is no traffic and even in early mornings. By reducing the intensity in these times, energy can be saved to some extent. Auto Intensity Control of Street Lights using ATmega8: Circuit Principle: The main principle of this project is to Control the intensity of street lights using PWM,.Peak hours of a particular area are calculated and accordingly PWM signal is adjusted by microcontroller to increase or decrease the intensity of street lights.

- These peak hours can be calculated by considering parameters like traffic density, time, light intensity of the environment. Auto Intensity Control of Street Lights Circuit Diagram
- The auto intensity control of street lights circuit is simple but it requires more coding part. This circuit consists of Atmega8 controller, DS1307, LDR, Relay and LEDs.
- Auto Intensity Control of Street Lights using ATmega8: Circuit Principle: The main principle of this project is to Contro

Circuit Components: 1) ATmega8 micro controlle 2) DS1307 IC 3) Light Dependent Resistor 4) LED array. 5) LCD display

- DS1307 Datasheet,,LCD Datasheet

Fig 56 Auto Intensity Control of Street



• The auto intensity control of street lights circuit is simple but it requires more coding part. This circuit consists of Atmega8 controller, DS1307, LDR, Relay and LEDs.

•LDR: LDR is used for calculating the light intensity of the environment. The light dependent resistor is connected to ADC1 (PC1) pin of the micro controller. The analogy light value is converted to digital value using ADC.

•RTC:Current time is calculated using RTC. Real time clock has 8 pins out of which SCL and SDA are connected to PC5 andPC4 pins respectively. SCL is serial clock while SDA is serial data RTC is I2C compatible, where I2C means inter integrated circuit. One bit of data is transmitted on data bus for each clock cycle.

•Data can be transferred between devices, using only two bi-directional buses. Each device can act as a slave or master. The slave devices will have one address and these devices can be accessed using this address.

•LCD: LCD is the display used for displaying time which is read from RTC IC. Interfacing of LCD in 4-bit mode is shown in circuit diagram. D4-D7 pins of LCD are connected to PD0-PD3 pins of microcontroller.

•RS pin of LCD is connected to PD4 pin of micro controller. RW and Enable pins are connected to PD5 and PD6 pins of controller.

•LED array is number of high-power LEDs connected in series. It is connected to PWM pin of the microcontroller.

I2C Protocol

- I2c is a communication protocol invented by Philips Company. This is well suited for communication between integrated circuits and peripherals. This uses two lines to transfer data.

- Serial Data – SDA
- Serial Clock – SCL.

1.This can connect up to 128 devices using two wires. Each device connected will have an address. The device which initiates the data transfer is called Master.

2.Every device will have 7 bit address.

3. Master initially sends the START bit on the data line.

4.Then it sends the address of the device with which wants to communicate and the mode of operation i.e. read or write.

5.The slave devices listen to the incoming data and checks if its address matches to the received data. The device whose address matches send an acknowledgement signal.

6.Then master starts transmitting or receiving the data from the slave.

7.After completion of the transmission, Master sends a STOP bit.

8.Data on SDA can be changed only if SCL pin is low.

➢ How Auto Intensity Control of Street Lights Circuit Works?

1.Initially power the circuit.

2.Time is displayed on the LCD display.

3.Place the LDR in darkness as the street lights switches on only when there is no light on LDR.

4.Now check the time if the time is between 9 pm to 2 am street light glows with full intensity.

5.From 2 pm intensity of the lights slowly starts decreasing and finally in early morning it glows with least intensity. When the light is sensed by the LDR lights are switched off automatically.

6) Code is written in such a way that up to 2 am lights will glow with full intensity. From then it slowly starts decreasing and finally it drops to zero in the morning.

➢ Limitations of this Circuit

•Even though energy is saved if there are any vehicles after fixed time, intensity of the light is low.

•Maximum energy cannot be saved.

➢ **Auto Intensity Control of Street Lights Circuit Advantages:** Power wastage can be reduced.

•Using LED array reduces the cost.

•Using of RTC and LDR produces accurate results

➢ Estimation of Auto Intensity Control of Street Lights

Sr No	Components	Price
1	AT mega8 microcontroller	40
2	DS 1307 IC	40
3	Light Dependent Resistor	6
4	LED Array	35
5	LCD display	450
6	IC1 PIC 16F877A	120
7	IC2 DS 1307	50
8	LCD Alphanumeric Display	70
9	Resistors of 1 Kilo Ohm	13.5

10	Resistors of 10 kilo Ohm	48
11	Resistors of 30 Kilo Ohm	60
12	Total	932.5

8.1.8 Water Level Controller using 8051 Microcontroller:

Background Of Design: The primary aim of this design is to control the wastage of water, Especially in Village area. On my visit to village the road was like river due to overflow of water from residential houses. This scene drags me to this design. Cheap but efficient.

- Water Level Controller using 8051 Microcontroller project will help in automatically controlling the water motor by sensing the water level in a tank. This article explains you how to detect and control the water level in an overhead tank or any other container.
- This system monitors the water level of the tank and automatically switches ON the The motor is switched OFF when the overhead tank or container is FULL. Here, the water level of the tank is indicated on LCD (Liquid crystal Display). Using this system, we can avoid the overflow of the water.
- We have already seen How water level indicator circuit works using AVR Microcontroller in the earlier post. But here we are designing the circuit which is used to detect and control the water level automatically in overhead tank using 8051 microcontrollers.
- In this system, water sensing can be done by using a set of 4 wires, which are placed at different levels in tank. DC supply probe is placed at the base of the tank. motor whenever tank is empty.
- Water Level Controller using 8051 Circuit Principle
- This system mainly works on a principle that “water conducts electricity”. The four wires which are dipped into the tank will indicate the different water levels. Based on the outputs of these wires, microcontroller displays water level on LCD as well as controls the motor.
- Initially when the tank is empty, LCD will display the message LOW and motor runs automatically. When water level reaches to half level, now LCD displays HALF and still motor runs.
- When the tank is full, LCD displays FULL and motor automatically stops. Again, the motors runs when water level in the tank becomes low.
- This system monitors the water level of the tank and automatically switches ON the The motor is switched OFF when the overhead tank or container is FULL. Here, the water level of the tank is indicated on LCD (Liquid crystal Display). Using this system, we can avoid the overflow of the water.
- When the tank is full, LCD displays FULL and motor automatically stops. Again, the motor runs when water level in the tank becomes LOW

➢ Components of Water Level Controller using Microcontroller 8051

- The heart of the Water Level Controller using 8051 Microcontroller project is the AT89C51 Microcontroller. The water level probes are connected to the P0.0, P0.1 and P0.2 through the transistors (they are connected to the base of the transistors through corresponding current limiting resistors). P0.0 for LOW level, P0.1 for HALF Level and P0.2 for HIGH Level.
- When the tank is full, LCD displays FULL and motor automatically stops. Again, the motors runs when water level in the tank becomes low.
- In this system, water sensing can be done by using a set of 4 wires, which are placed at different levels in tank. DC supply probe is placed at the base of the tank. motor whenever tank is empty.

- AT89C51 Microcontroller (or any 8051 based Microcontroller)
- 8051 Programmer (Programming Board)
- 11.0592 MHz Quartz Crystal
- 2 x 33pF Capacitor
- 2 x 10KΩ Resistor (1/4 Watt)
- 10µF Capacitor
- Push Button
- 1KΩ x 8 Resistor Pack (for Pull – up)
- 16 x 2 LCD Display
- 5V Relay
- 4 x 2N2222 (NPN) Transistors
- DC Motor (for demonstration)
- 10KΩ Potentiometer
- 1N4007 PN Junction Diode
- Programming cable
- Connecting wires
- Power Supply
- Keil µVision IDE
- Willar Software (for burning code)

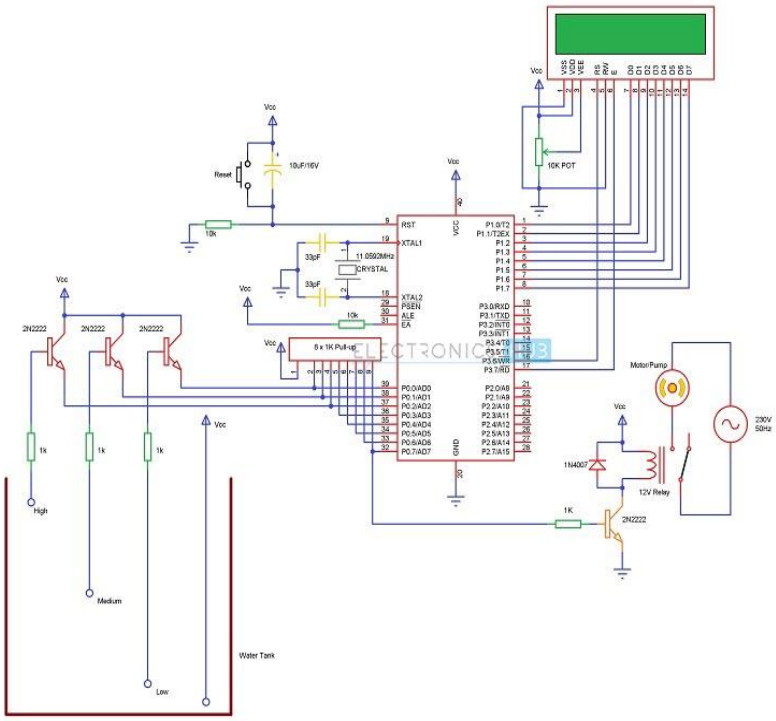


FIG 57 WATER LEVEL CONTROLLER

How to Design Circuit for Water Level Controller using 8051 Microcontroller?

- The heart of the Water Level Controller using 8051 Microcontroller project is the AT89C51 Microcontroller. The water level probes are connected to the P0.0, P0.1 and P0.2 through the transistors (they are connected to the base of the transistors through corresponding current limiting resistors). P0.0 for LOW level, P0.1 for HALF Level and P0.2 for HIGH Level.

- The Collector terminals of the Transistors are connected to VCC and the Emitter terminals are connected to PORT0 terminals (P0.0, P0.1 and P0.2).

- PORT1 of the microcontroller is connected to the data pins of LCD and the control pins RS, RW and EN of the LCD Display are connected to the P3.6, GND and P3.7 respectively.

- For demonstration purpose, we have used a simple DC Motor Pump. It is connected to the Relay and the input to the relay is fed from P0.7 through a transistor.

➢ Algorithm for Water Level Controller Circuit

•First configure the controller pins P0.0, P0.1 and P0.2 as inputs and P0.7 as output.

•Now, initialize the LCD.

•Continuously check the water level input pins P0.0, P0.1 and P0.2.

•If all the pins are low, then display tank as “EMPTY” on the LCD and make P0.7 pin HIGH to run the motor automatically.

•If the level is low i.e., if P0.0 is HIGH, display the water level as “LOW” and continue to run the motor.

•A HIGH pulse on the pin P0.1 indicates that water has reached half level. So, display the same thing on LCD and run the motor normally.

•If P0.2 is HIGH, then the water level in the tank is FULL.

•Now, make the P0.7 pin as LOW to turn off the motor automatically.

➢ How to Operate Water Level Controller Circuit using 8051 Microcontroller?

- Initially, write the program for Water Level Controller in Keil µVision IDE and generate the .hex file.
- Burn the program (.hex file) to the microcontroller using external programmer and Willar Software.
- Now give the connections as per the circuit diagram.
- While giving the connections, make sure that there is no common connection between AC and DC supplies (if you are using an AC Motor)
- Place the 4 water level indicating wires into the small tank (3 probes for three different levels and fourth one for common supply)
- Switch on the supply. Now, the motor will run automatically as there is no water in the tank. (It will turn on even if the water level is LOW).
- Now pour the water, when it reaches LOW level, then LCD displays LOW.
- For middle level, it will display as HALF on the LCD.
- Still if you pour the water, then the water level reaches full and the LCD displays FULL and also the motor is turned OFF automatically.

- Switch off the motor supply and board supply.

Water Level Controller Circuit Advantages

•Human effort is reduced as the system controls the motor automatically based on the water level.

•This system consumes less power.

•Simple and more reliable.

Applications of Water Level Controller Circuit using 8051

•Used in big buildings where the manual monitoring is difficult.

•Used in industries to control the liquid level automatically.

➢ Estimation of Water level Controller

Sr No	Components	Quantity	Price	Total Price
1	AT89C51 Microcontroller	1	200*1	200 Rs
2	8051 Programmer	1	700*1	700 Rs
3	11.0592 MHz Quartz Crystal	1	15*1	15 Rs
4	33pF Capacitor	2	17*2	34 Rs
5	Resistor of 10 kilo ohm	2	6*2	12Rs
6	10µF Capacitor	1	367*1	367 Rs
7	Push Button	1	64*1	64 Rs
8	Resistor of 1 kilo ohm	8	4.5*8	36 Rs
9	16 x 2 LCD Display	1	70*1	70 Rs

10	5V Relay	1	150*1	150 Rs
11	2N2222 (NPN) Transistors	4	40*4	160 Rs
12	10KΩ Potentiometer	1	25.8*1	25.8 Rs
13	1N4007 PN Junction Diode	1	99*1	99 Rs
14	Programming cable	1	590*1	590 Rs
15	Connecting wires	10 M	180*1	180 Rs
			Total Price	2702.8 Rs

8.1.9 Solar Battery Charger Circuit:

Background Of Design: This circuit will help villagers to have electricity even when there is no electricity. In a hot state like Gujarat we should use Solar related things as much as possible. Efficient to both pocket as well as Environment

- Here is a solar charger circuit that is used to charge Lead Acid or Ni-Cd batteries using the solar energy power. The circuit harvests solar energy to charge a 6-volt 4.5 Ah rechargeable battery for various applications. The charger has voltage and current regulation and over voltage cut-off facilities.
- The circuit uses a 12-volt solar panel and a variable voltage regulator IC LM 317.
- The solar panel consists of solar cells each rated at 1.2 volts.
- 12-volt DC is available from the panel to charge the battery. Charging current passes through D1 to the voltage regulator IC LM 317. By adjusting its Adjust pin, output voltage and current can be regulated.
- VR is placed between the adjust pin and ground to provide an output voltage of 9 volts to the battery. Resistor R3 Restrict the charging current and diode D2 prevents discharge of current from the battery.
- Transistor T1 and Zener diode ZD act as a cutoff switch when the battery is full. Normally T1 is off and battery gets charging current. When the terminal voltage of the battery rises above 6.8 volts, Zener conducts and provides base current to T1. It then turns on grounding the output of LM317 to stop charging.

- Solar concept is not new for us. As non-renewable energy sources are decreasing, usage of solar energy is increased. This solar energy is not only used on the Earth but also used in space stations where no electrical power is available. Here is the simple circuit to charge 12V, 1.3Ah rechargeable Lead-acid battery from the solar panel. This solar charger has current and voltage regulation and also has over voltage cut off facilities.
- This circuit may also be used to charge any battery at constant voltage because output voltage is adjustable.

➢ Specifications of the Charging Circuit:

- Solar panel rating – 5W /17V
- •Output Voltage –Variable (5V – 14V).
- •Maximum output current – 0.29 Amps.
- •Drop out voltage- 2- 2.75V.
- •Voltage regulation: +/- 100mV

➢ Solar Battery Charger Circuit Principle:

Solar battery charger operated on the principle that the charge control circuit will produce the constant voltage. The charging current passes to LM317 voltage regulator through the diode D1. The output voltage and current are regulated by adjusting the adjust pin of LM317 voltage regulator. Battery is charged using the same current

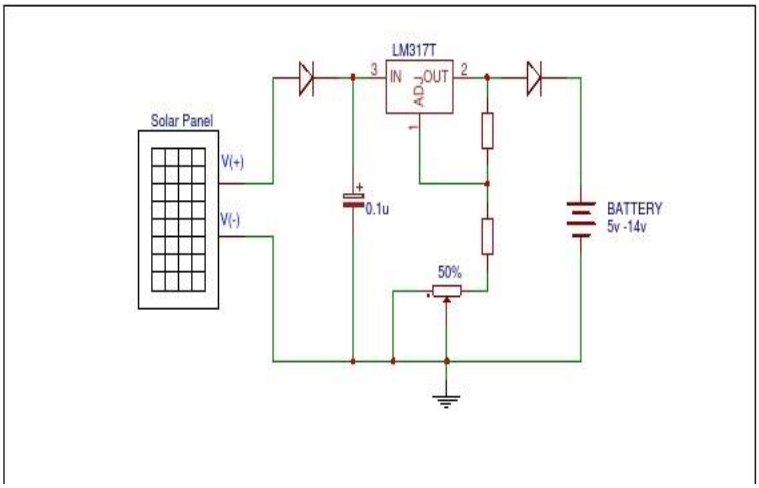


FIG 58 SOLAR BATTERY

➢ Circuit Components

- Solar panel – 17V
- LM317 voltage regulator
- DC battery
- Diode – 1n4007
- Capacitor – 0.1uF
- Schottky diode – 3A, 50V
- Resistors – 220, 680 ohms
- Pot – 2K Connecting wires

- **Solar Battery Charger Circuit Design:** Circuit must have adjustable voltage regulator, so Variable voltage regulator LM317 is selected. Here LM317 can produce a voltage from 1.25 to 37 volts maximum and maximum current of 1.5 Amps.

- Adjustable Voltage regulator has typical voltage drop of 2 V-2.5V .So Solar panel is selected such that it has more voltage than the load. Here I am selecting 17v/5w solar panel.

- Lead acid battery which is used here has specification of 12v/1.3Ah. In order to charge this battery following are required.

- Schottky diode is used to protect the LM317 and panel from reverse voltage generated by the battery when it is not charging. Any 3 A diode can be used here.

Estimation of Solar Charger Circuit

Sr No	Components	Quantity	Price	Total Price
1	Solar panel	1	17*50	850 RS
2	LM317 voltage regulator	1	1*9.25	9.25 Rs
3	DC battery	1	1*160	160 Rs
4	Diode – 1n4007	1	1*4.5	4.5 Rs
5	Capacitor – 0.1uF	1	1*17	17 Rs

6	Schottky diode – 3A, 50V	1	1*37	37 Rs
7	Resistors – 220, 680 ohms	1*30 + 1*90	30+90	120 Rs
8	Connecting Wires	-	180	180 Rs
9	-	-	Total Price	1377.75 Rs

8.2 Reason for Students Recommending this Design

Cement Concrete Road: There is no any "PUCCA ROAD" in the village so after asking from many villagers we thought that they need it. It would be helpful them in Transportation and save their time.

Primary Health Centre: There is no any Primary Health Centre in the Village so after asking from many villagers we thought to build a hospital. It would also help them in any emergency case.

Bio Gas Plant: The bio gas plant is very helpful in producing energy, Gas for cooking so we thought to recommend to villagers to build a bio gas plant in their village, it would also help for financially poor people in the village.

Auto Intensity Control of Street Lights Benefits:
Auto Intensity Control of Street Lights Circuit and Working. ... The lifetime of the lights used in this system is more and also consumes less power as compared to the HID lamps. The main purpose of this project is to control the light intensity as per the condition during non-peak hours, which is not possible in HID lamps .

Water Level Controller System Benefits:
A water level controller is a device that manages water levels on a variety of systems such as water tanks, pumps and swimming pools. The basic function of a water level controller is to regulate water flow and optimize system performance.

Solar Battery Charger Circuit Advantages:

The Solar Battery Charger can be used to charge our electronics while travelling. While camping the backup battery charged by the solar charger can be used for lightning purpose. It can be used as a backup power supply which you can keep in your backpack or in pocket.

8.3 About design suggestion / Benefits

Cement Concrete Road:

- Concrete roads are durable and safe.
- They are considerably less prone to wear and tear defects like rutting, cracking, stripping, loss of texture, and potholes that can occur with flexible pavement surfaces.
- This low maintenance requirement is one of the principal advantages of concrete pavements.

Primary Health Centre:

- Increased Access to Health Services
- Improved Quality of Car
- Focus on Prevention
- Early Management of Health Conditions
- Characteristics of Primary Care Delivery
- Reduced Need for Specialist Car

Bio Gas Plant:

- Biogas is a green energy source in form of electricity and heat for the local grid.
- Considerable environmental advantages - less emission of the greenhouse gasses methane, CO_2 and nitrous oxide. Environmentally friendly recirculation of organic waste from industry and hous

Auto Intensity Control of Street Lights Benefits:

- Smart street lights contribute to more livable cities by helping to improve safety and reduce congestion. Reduced energy cost. **Smart street lights** more efficiently manage electricity, leading to greater cost savings compared to simple LED luminaires. Increased revenue opportunities.

Water Level Controller System Benefits:

- Human effort is reduced as the system controls the motor automatically based on the water level.
- This system consumes less power.
- Simple and more reliable.

Solar Battery Charger Circuit Advantages:

- A solar charger is portable and you can easily carry it anywhere to charge the battery of your device. The main benefit of using this charger is that you do not require an external power source to charge your device. It is extremely handy for outdoor activities.

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

In this phase, we design
1) Secondary School
2) Bank
3) Reading Hall
4) Automatic Anchor Light
5) Programmable 3 Phase Controller For ON/OFF Motor
6) Automatic Water Pump Controller

1) Higher secondary school: In kanera village only one government primary school upto 1to 8 standard so, the students are going 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) Bank: In kanera village they not have any bank so, we plan to design bank in kanera village.

3) Reading hall: In kanera 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.

Chapter 10: Conclusion: -

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 KANERA 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 center
- windmill
- meditation hall
- primary health center
- 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: -

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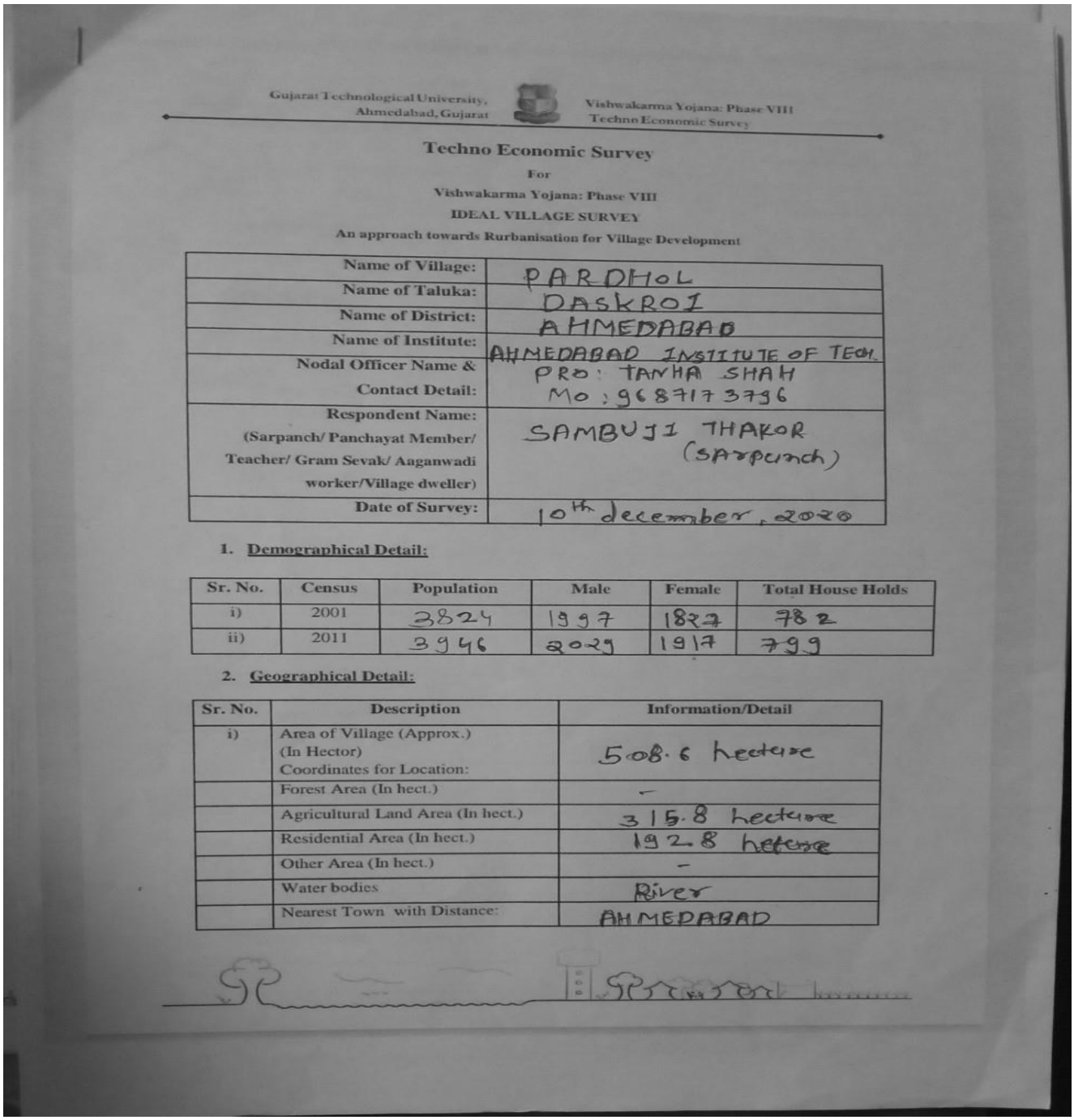
Chapter 12: Annexure: -

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

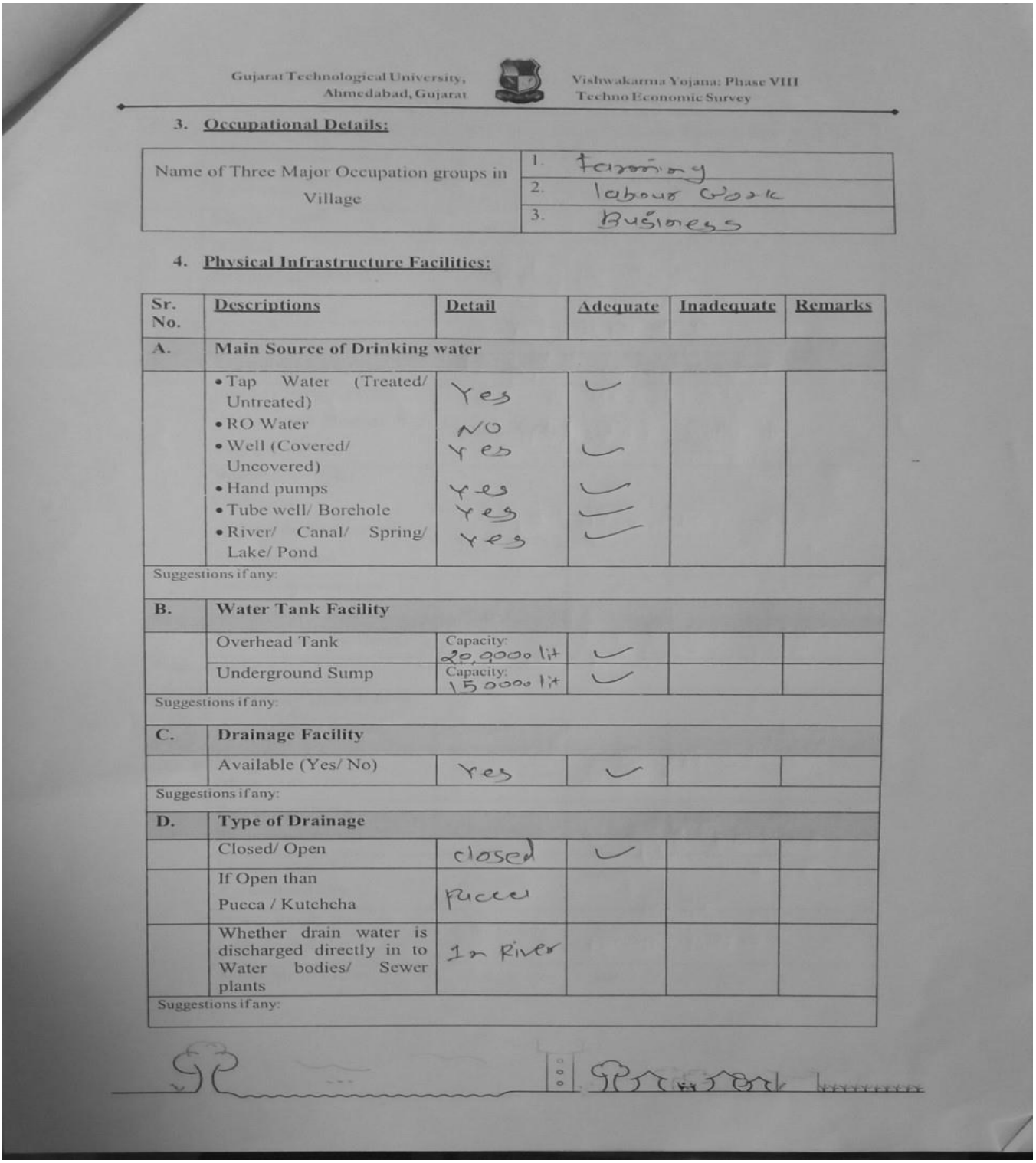
Name of Village:	PARDHOL
Name of Taluka:	DASKROI
Name of District:	AHMEDABAD
Name of Institute:	AHMEDABAD INSTITUTE OF TECH.
Nodal Officer Name & Contact Detail:	PRO: TANHA SHAH Mo: 9687173796
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SAMBUJI THAKOR (SARpanch)
Date of Survey:	10th december, 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 hectare
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	315.8 hectare
	Residential Area (In hect.)	192.8 hectare
	Other Area (In hect.)	-
	Water bodies	River
	Nearest Town with Distance:	AHMEDABAD



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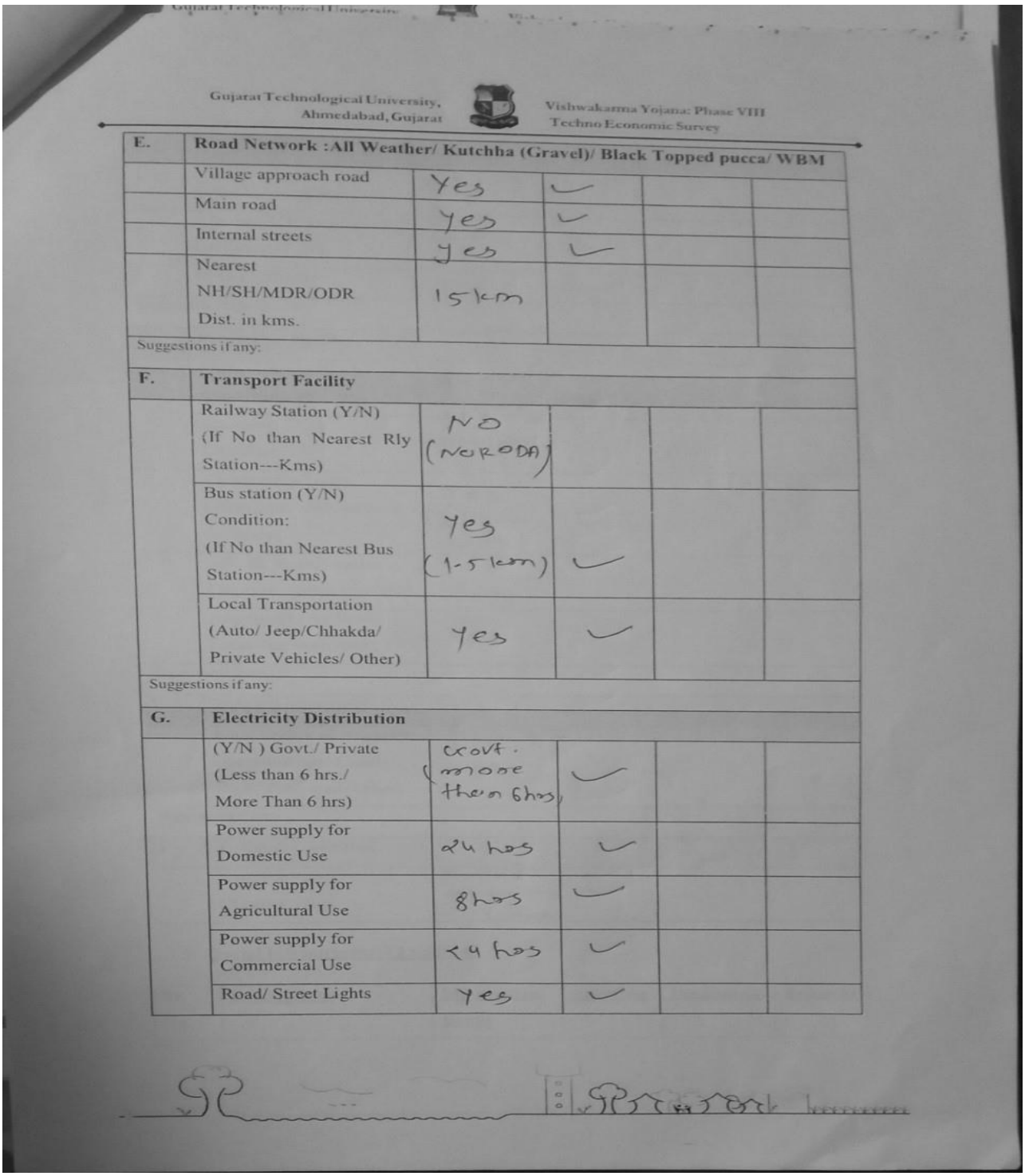
3. Occupational Details:

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: 20,9000 lit	✓		
	Underground Sump	Capacity: 150000 lit	✓		
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			
Suggestions if any:					



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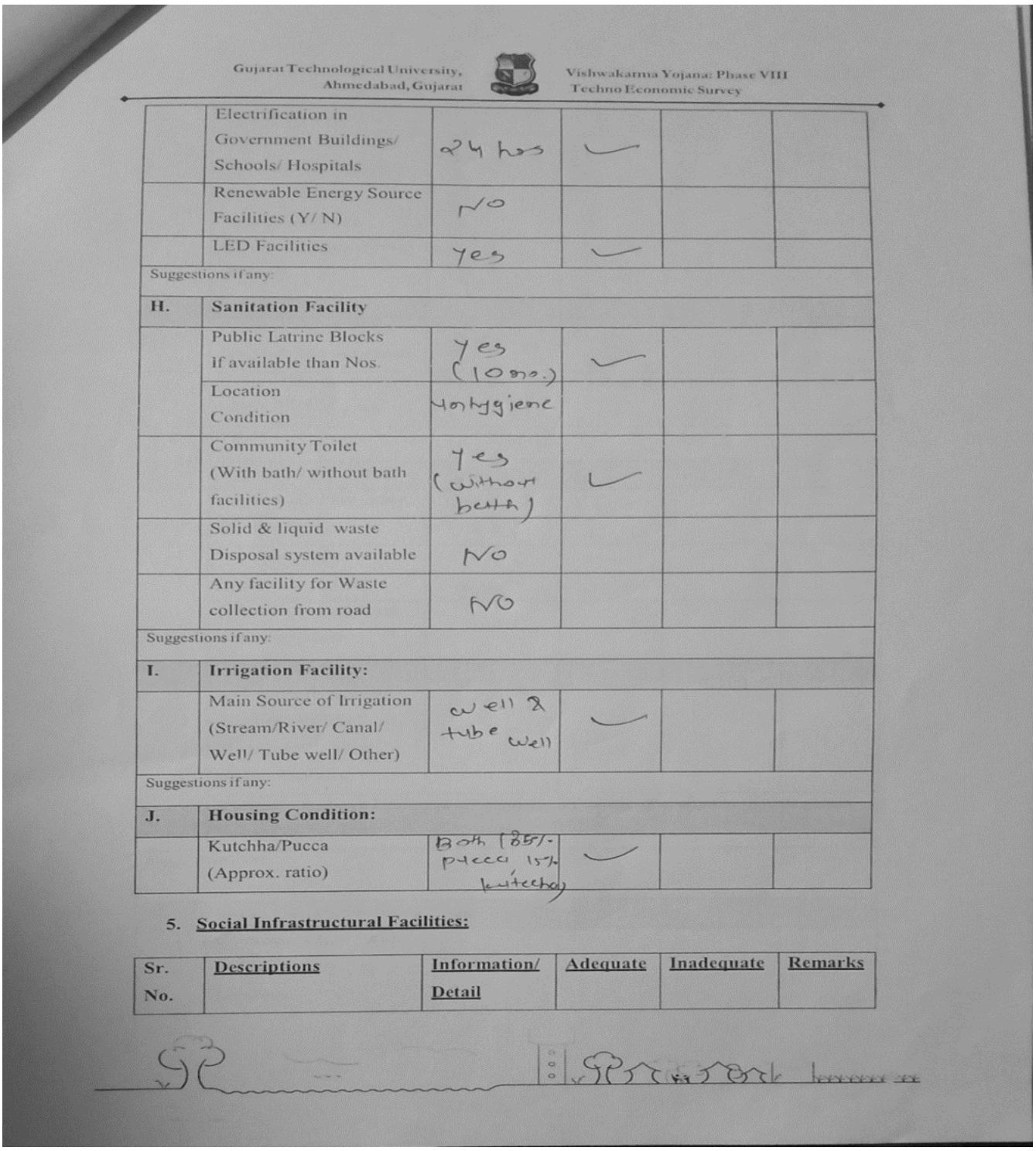
E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	✓		
	Main road	Yes	✓		
	Internal streets	Yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	15 km			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO (NORODA)			
	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 6hrs	✓		
	Power supply for Domestic Use	24 hrs	✓		
	Power supply for Agricultural Use	8hrs	✓		
	Power supply for Commercial Use	24 hrs	✓		
	Road/ Street Lights	Yes	✓		



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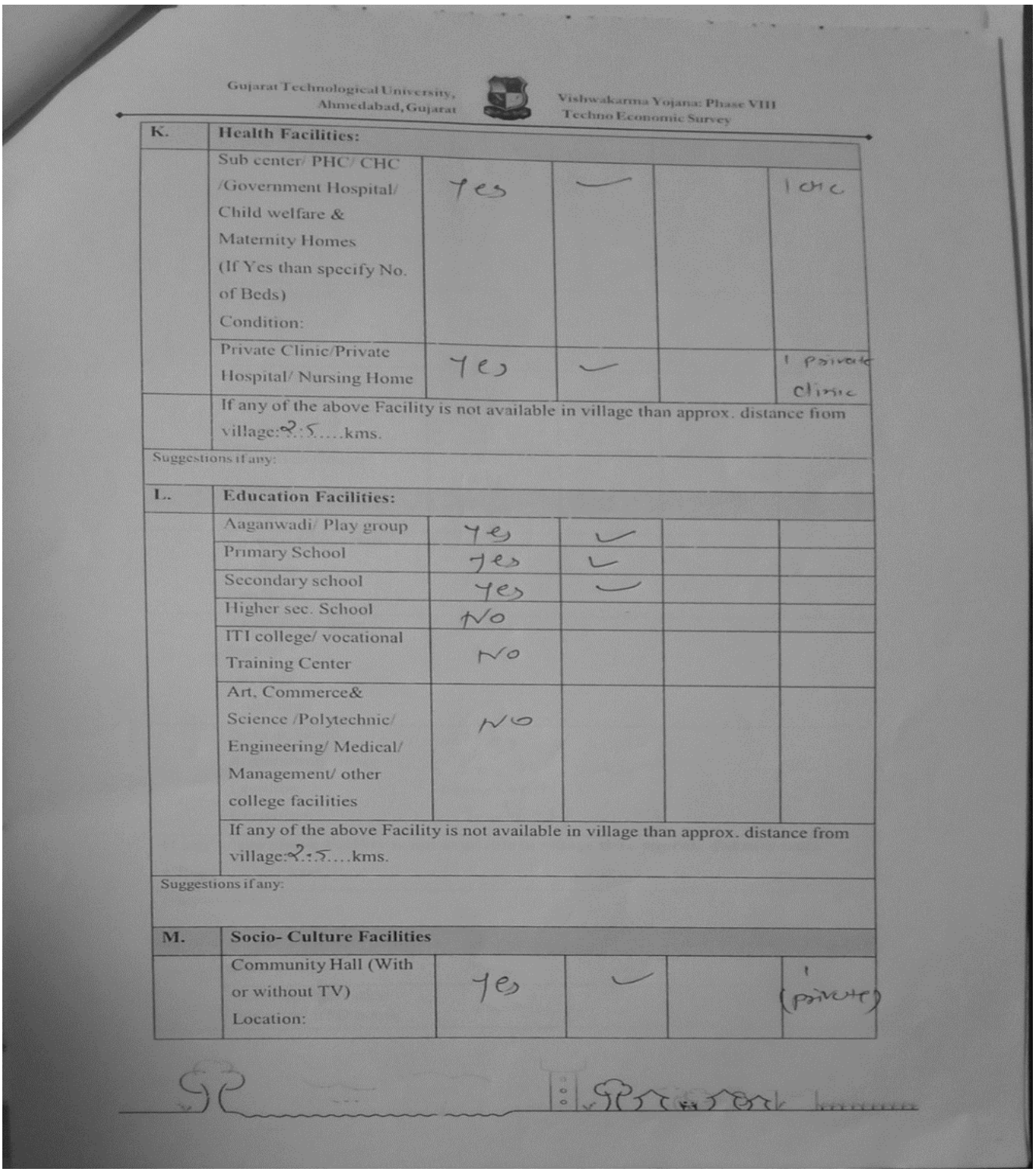
	Electrification in Government Buildings/ Schools/ Hospitals	24 hrs	✓		
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	Yes	✓		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes (10 nos.)	✓		
	Location Condition	Non hygiene			
	Community 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% kutchha)	✓		

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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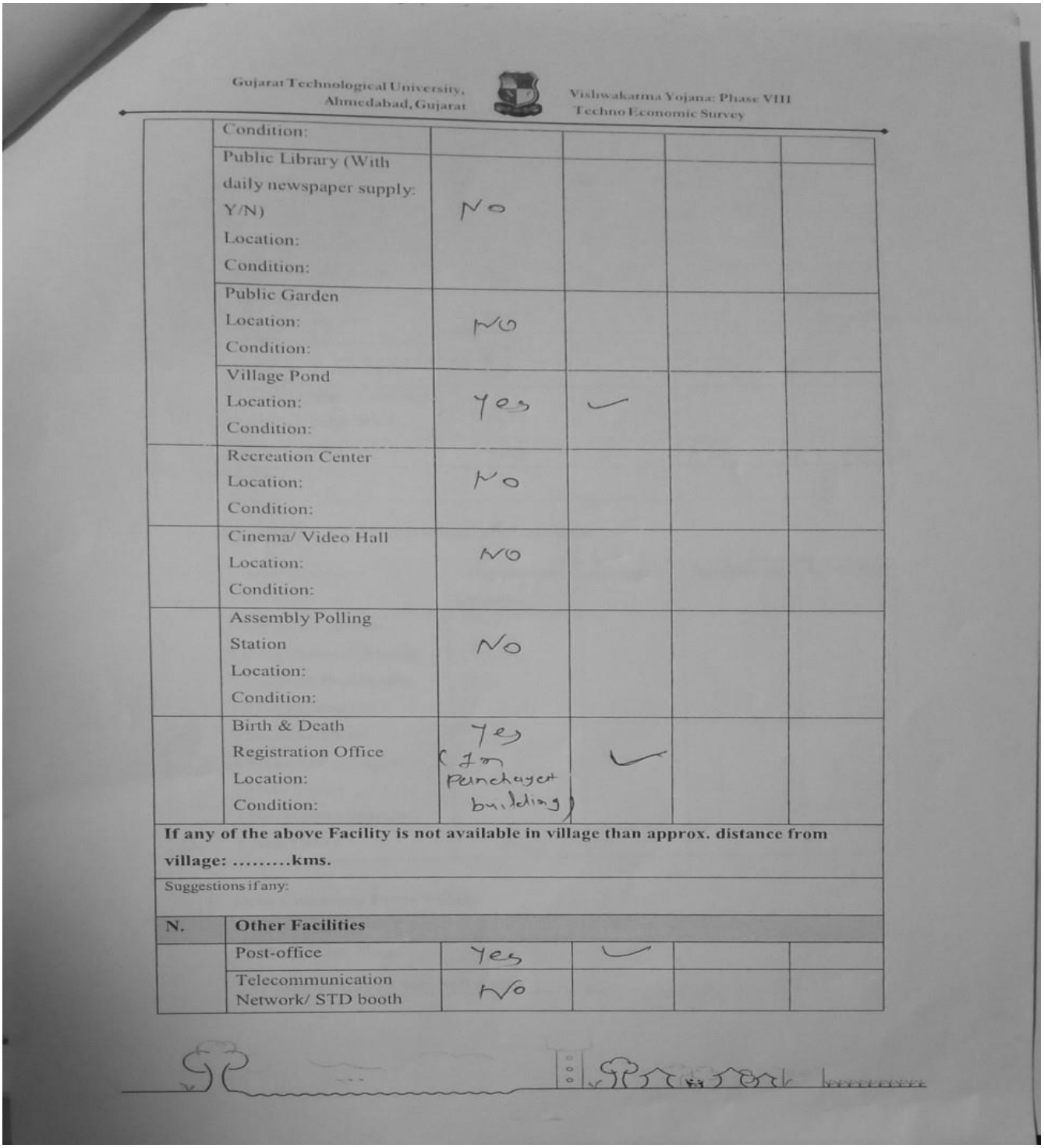
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes	✓		1 CHC
	Private Clinic/Private Hospital/ Nursing Home	Yes	✓		1 Private clinic
	If any of the above Facility is not available in village than approx.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



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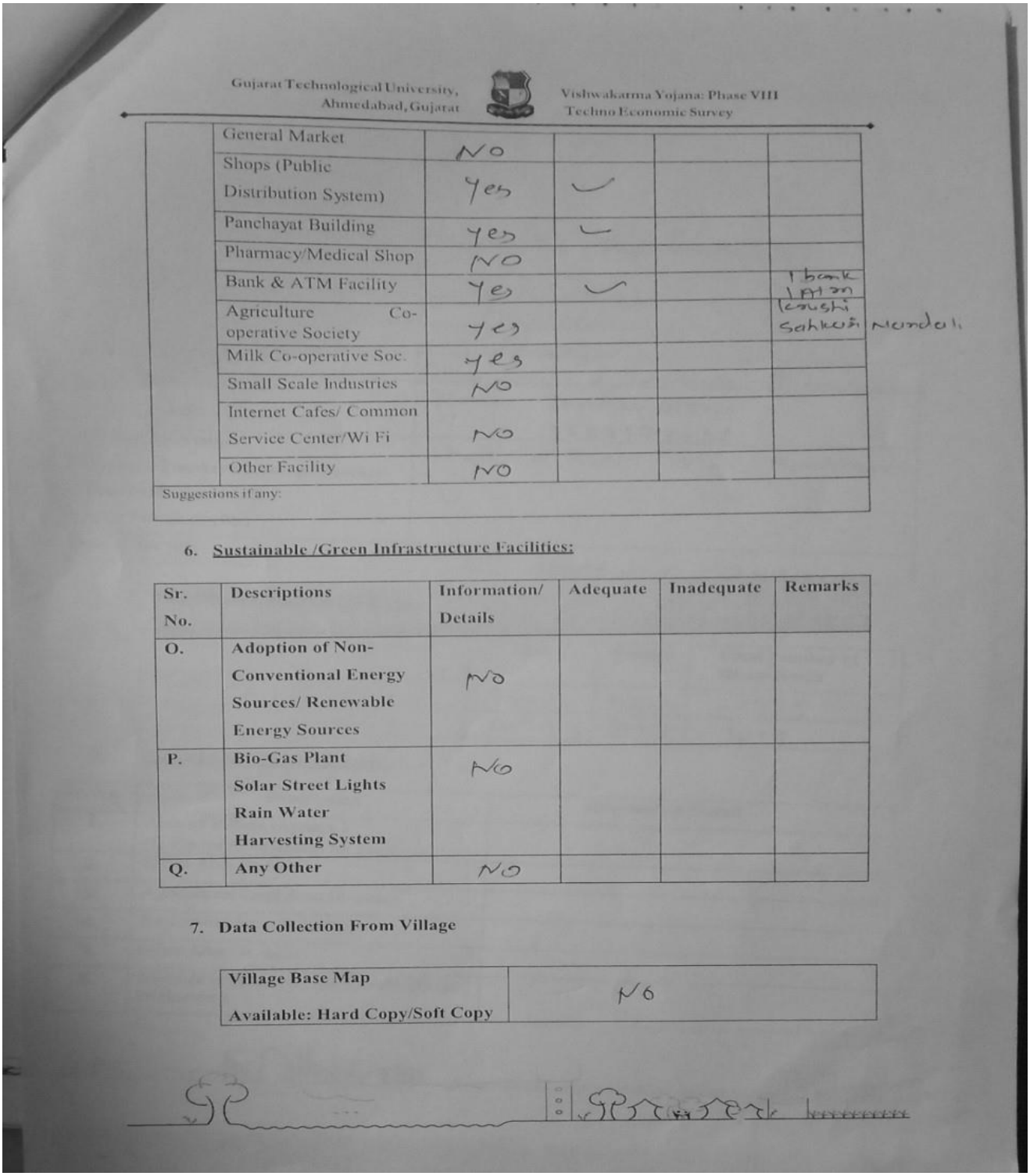
	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			
	Public Garden Location: Condition:	No			
	Village Pond Location: Condition:	Yes	✓		
	Recreation Center Location: Condition:	No			
	Cinema/ Video Hall Location: Condition:	No			
	Assembly Polling Station Location: 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: .....kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	Yes	✓		
	Telecommunication Network/ STD booth	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, Techno Economic Survey

Recent Projects going on for Development of Village	-Pradhan Mantri Yojna ; -Vikrang 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 bank - At primary health centure
2.	Additional Information/ Requirement	NO	

9. Smart Village Proposal Design

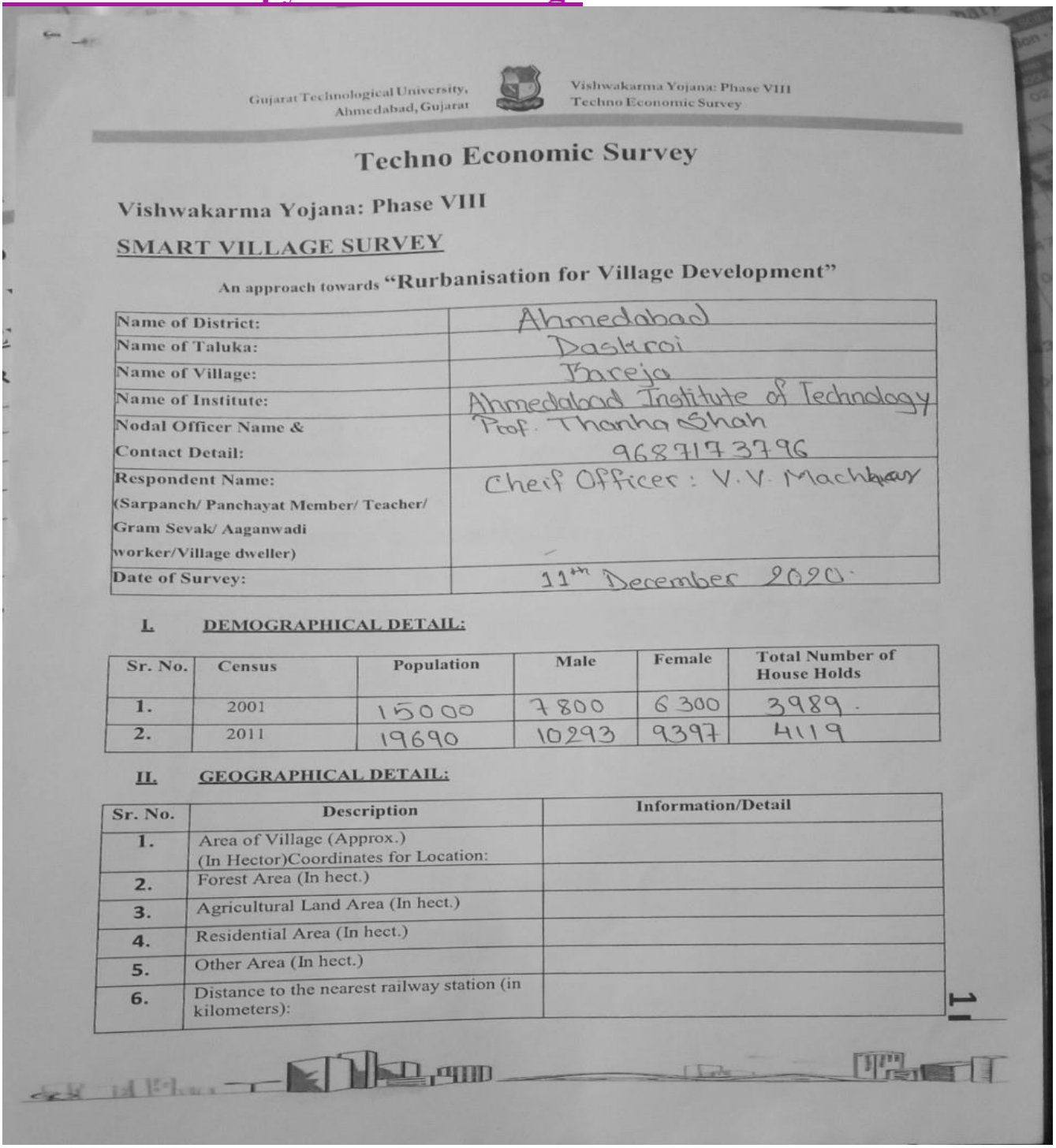
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Is their Any thing from the village enhancement possible?	Yes (Greenhouse building).	

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

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

સરપંચ
પરઢોલ ગ્રામ પંચાયત
દસ્ક્રોઈ, જિ. અમદાવાદ.

12.2 Scanned copy for Smart village



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

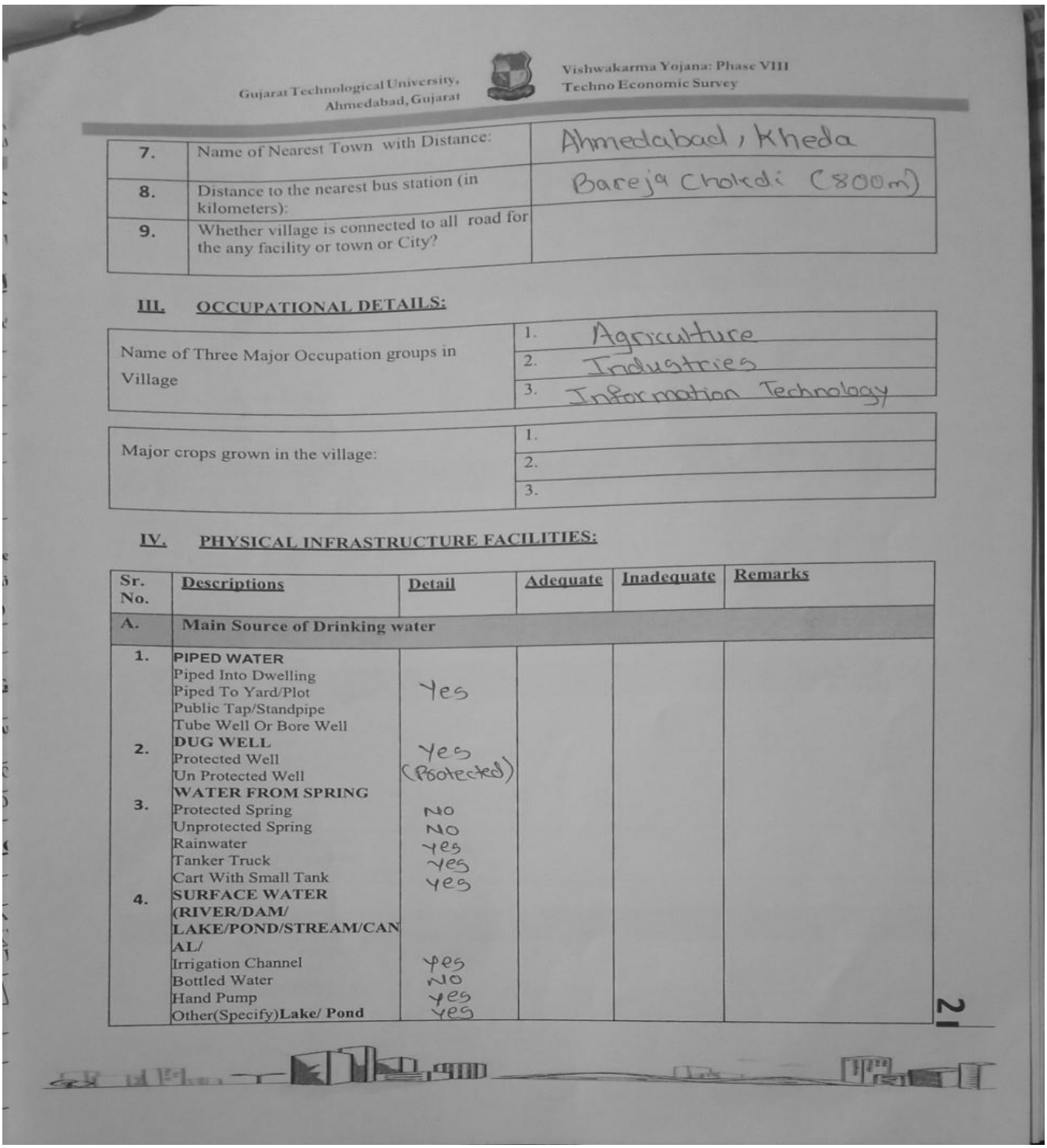
Name of District:	Ahmedabad
Name of Taluka:	Daskroi
Name of Village:	Bareja
Name of Institute:	Ahmedabad Institute of Technology
Nodal Officer Name & Contact Detail:	Prof. Thanha Shah 9687173796
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Cheif 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):	



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

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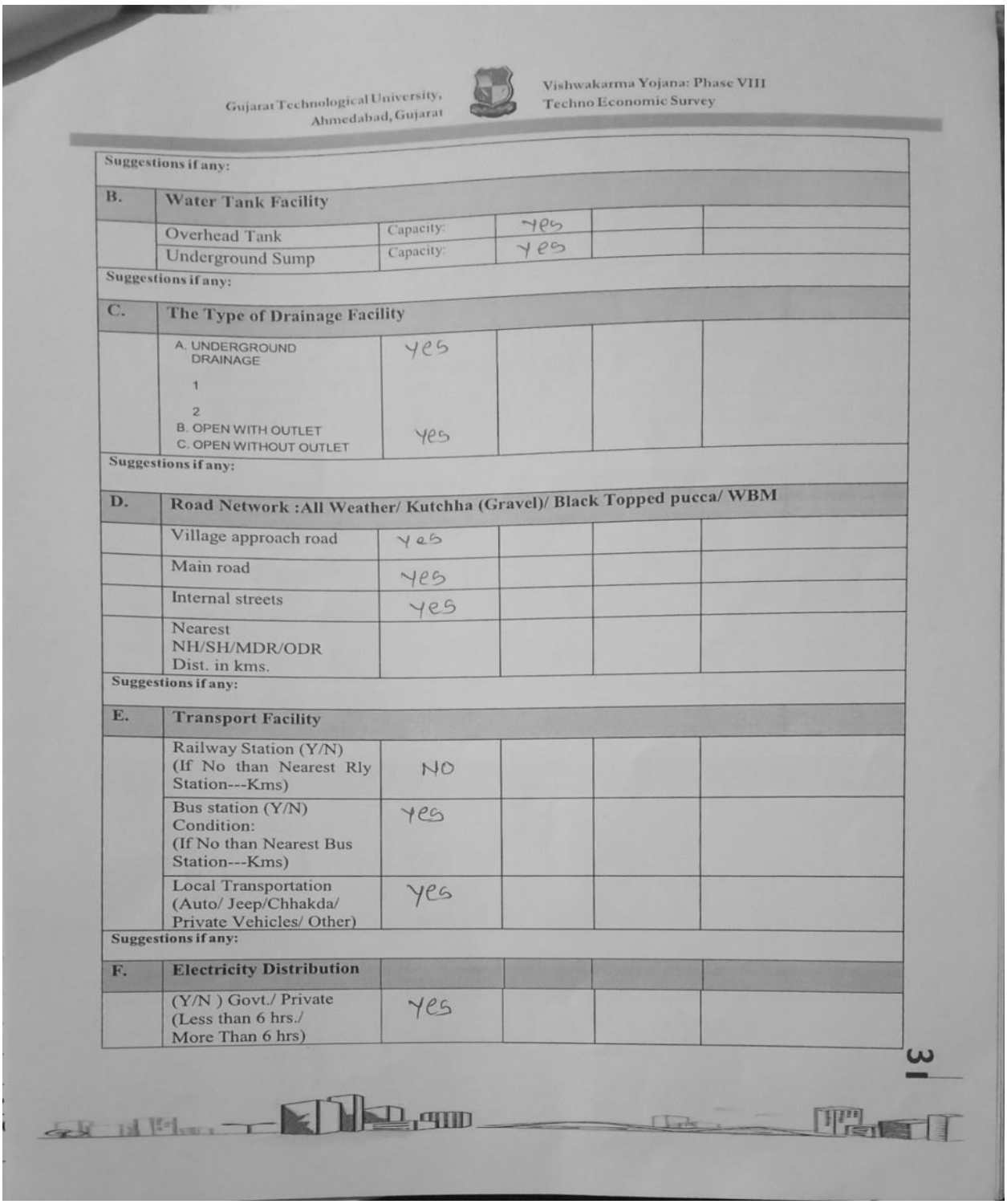

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Vishwakarma Yojana: Phase VIII
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Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	Yes		
	Underground Sump	Capacity:	Yes		
Suggestions if any:					
C.	**The Type of Drainage 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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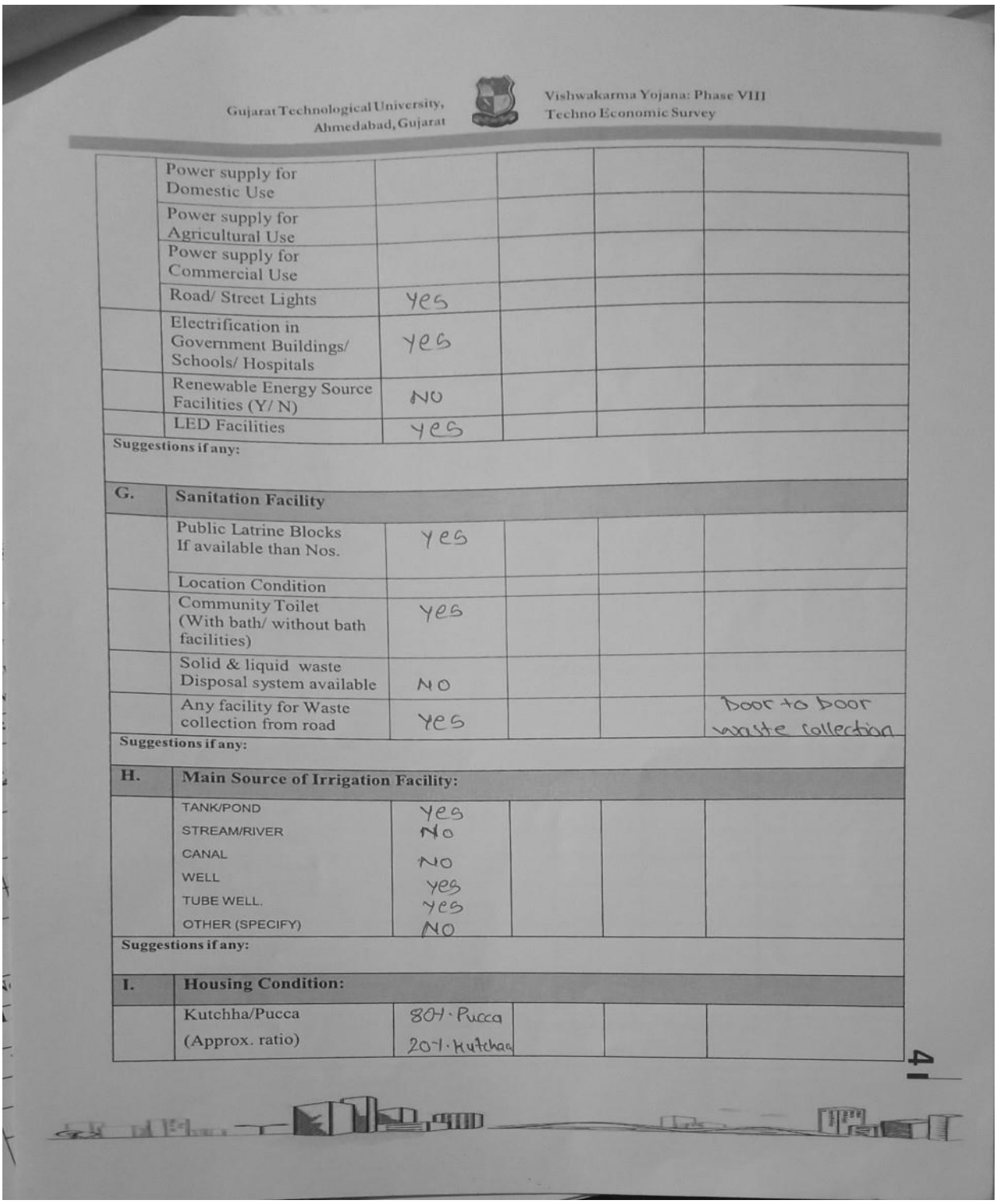

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	Power supply for Domestic Use				
	Power supply for Agricultural Use				
	Power supply for Commercial Use				
	Road/ Street Lights	Yes			
	Electrification in Government Buildings/ Schools/ Hospitals	Yes			
	Renewable Energy Source Facilities (Y/ N)	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% Pucca 20% Kutchaa			

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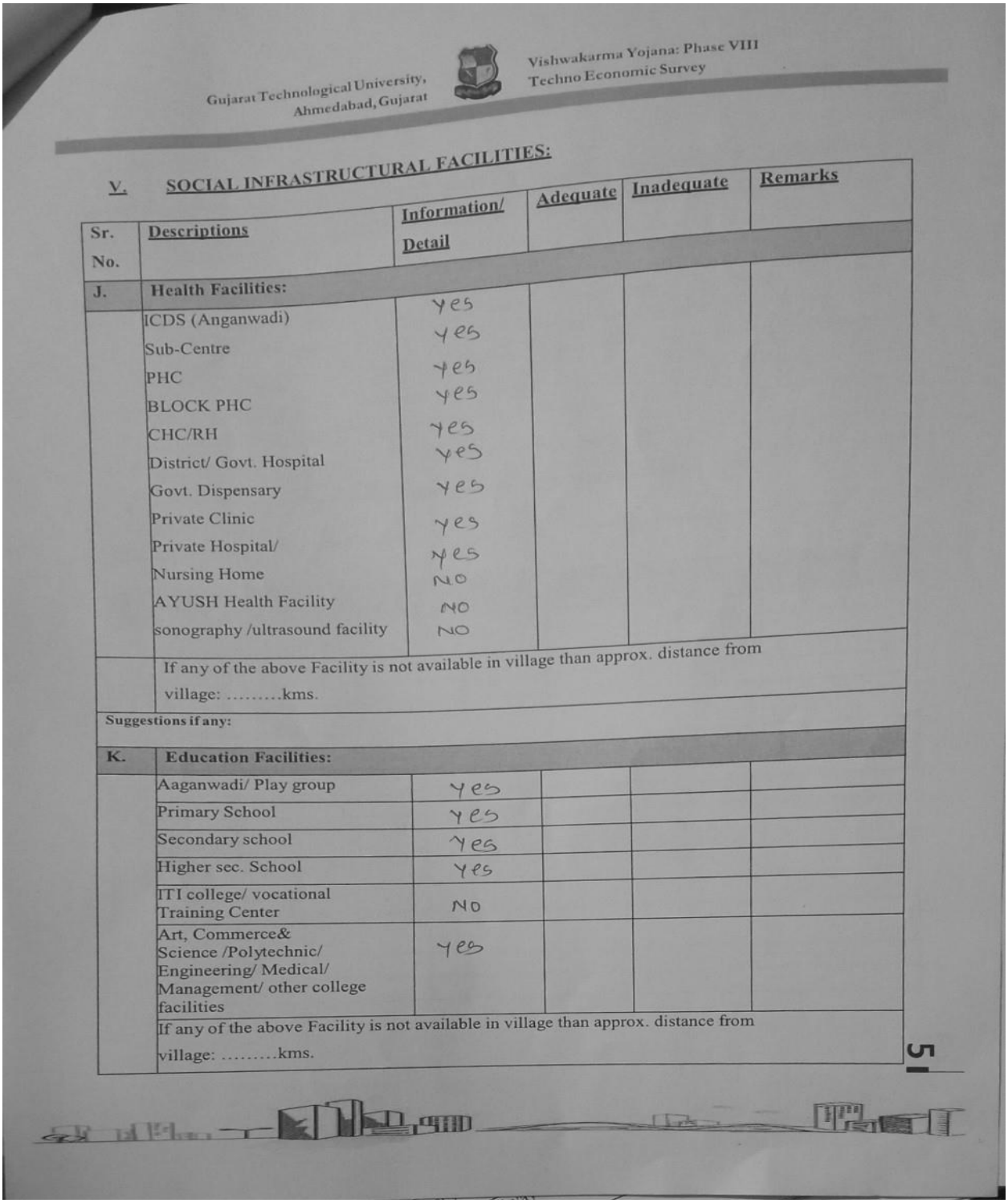

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

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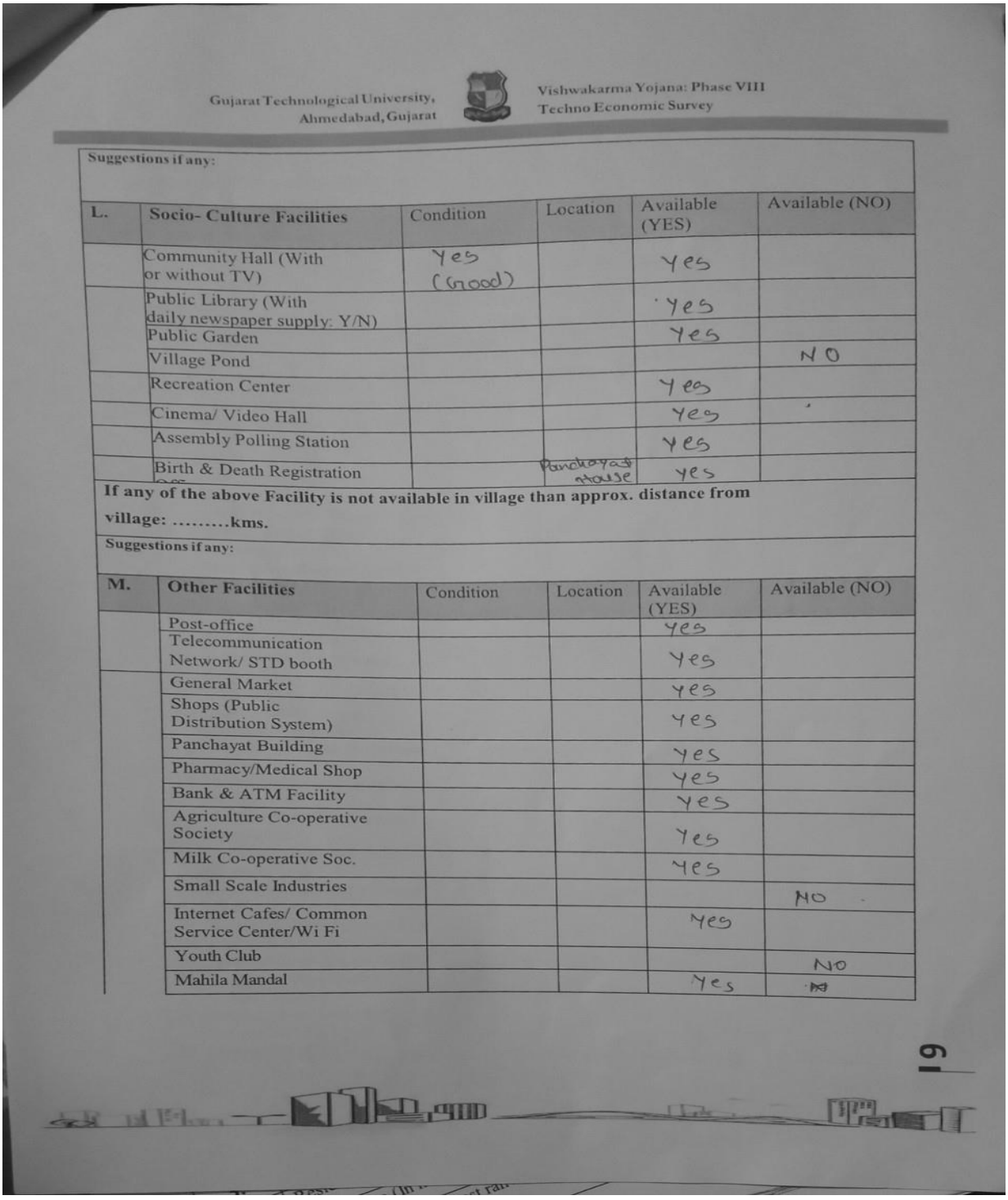

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Suggestions if any:

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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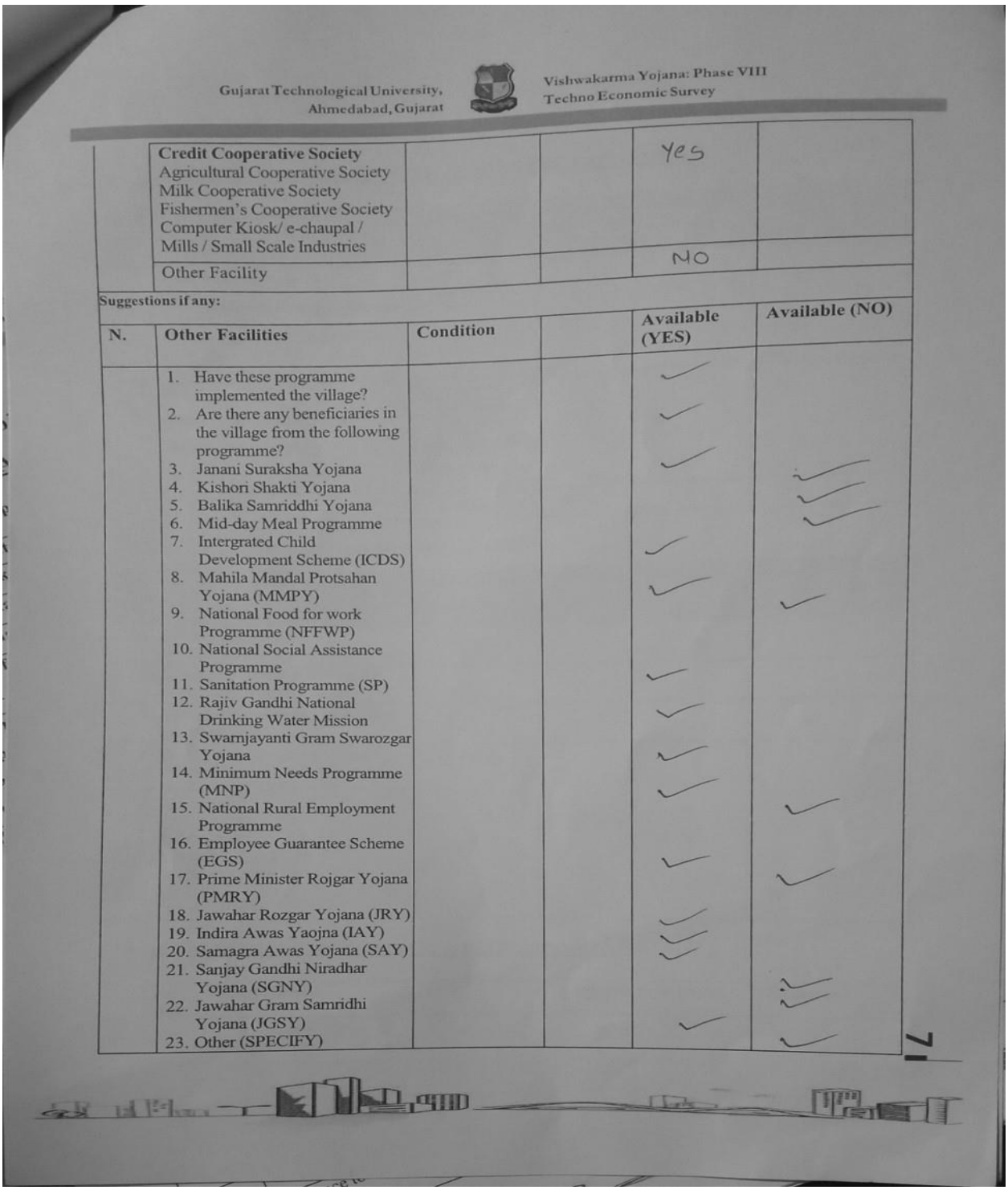

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries			Yes	
	Other Facility			NO	

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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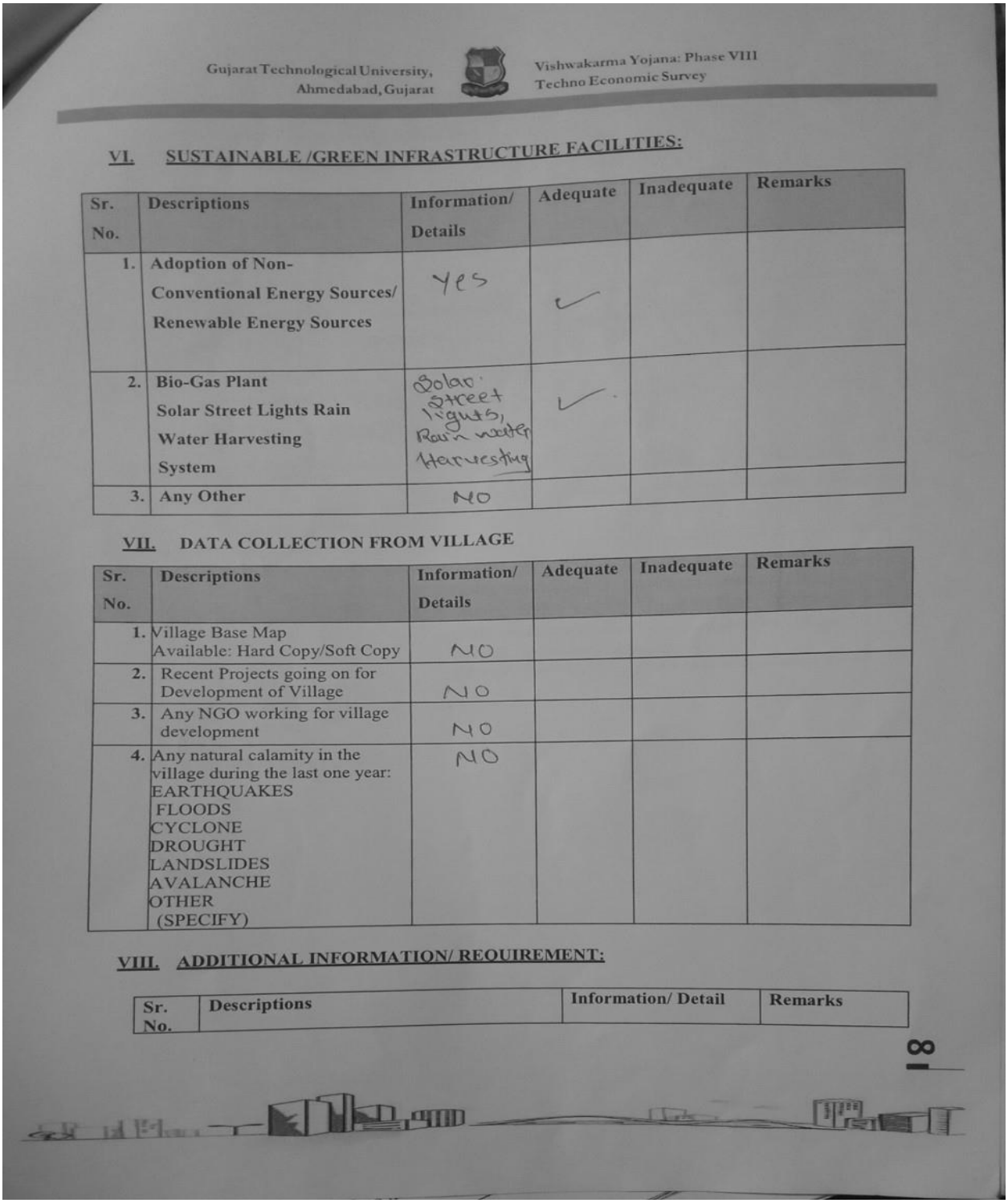

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Vishwakarma Yojana: Phase VIII
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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	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

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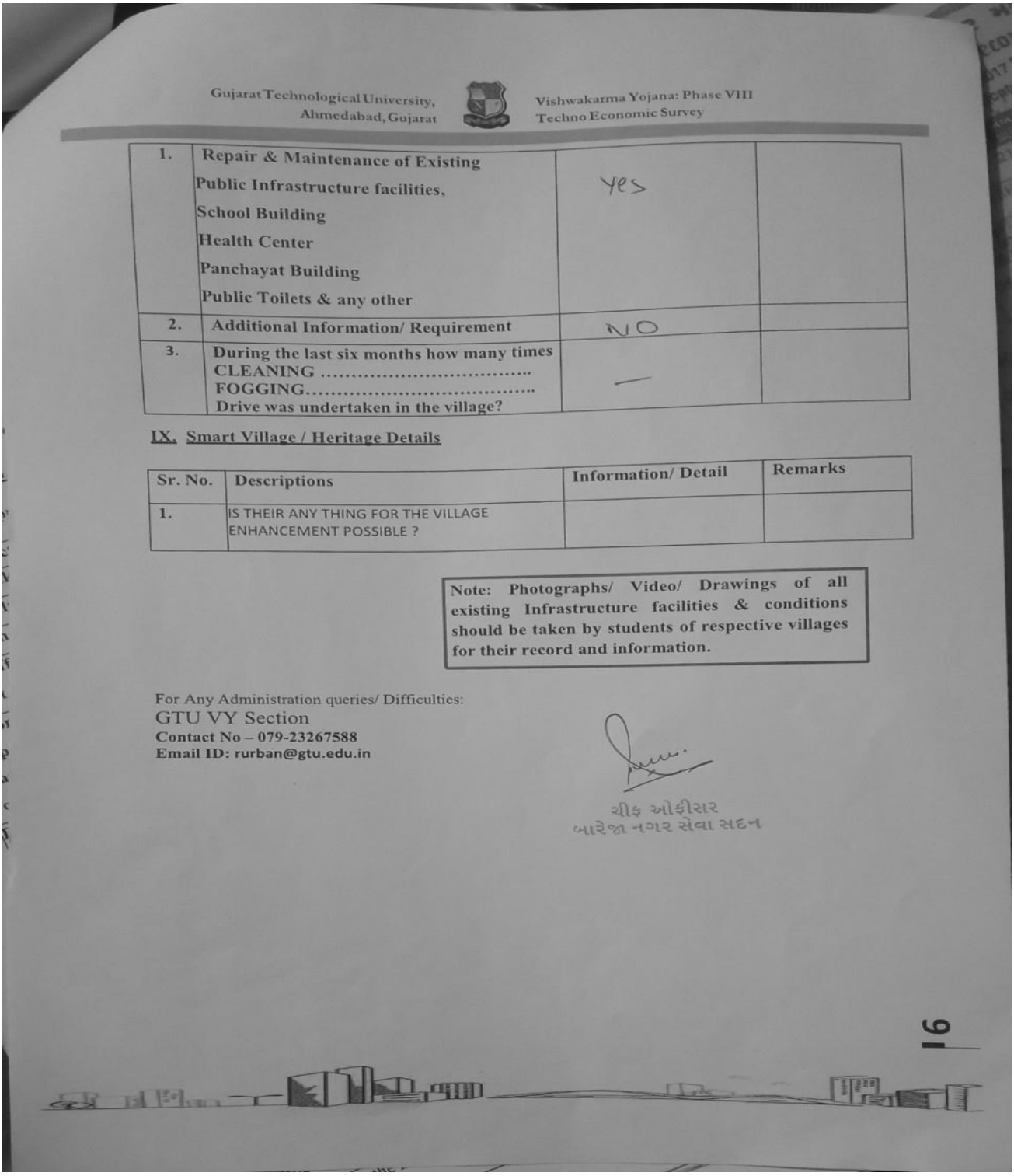

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Yes	
2.	Additional Information/ Requirement	NO	
3.	During the last six months how many times CLEANING ..... 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

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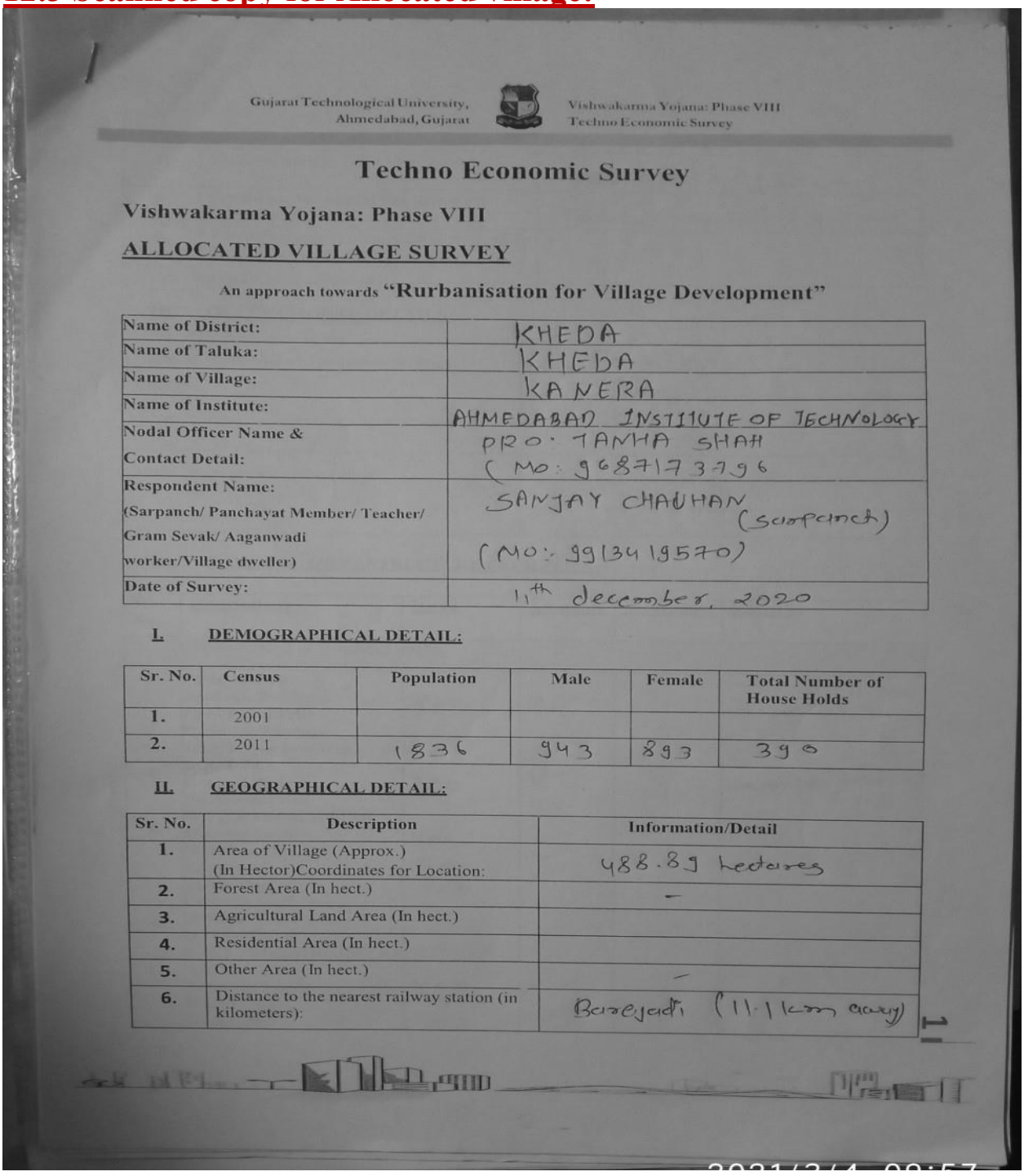
12.3 Scanned copy for Allocated village:



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Vishwakarma Yojana: Phase VIII
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ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

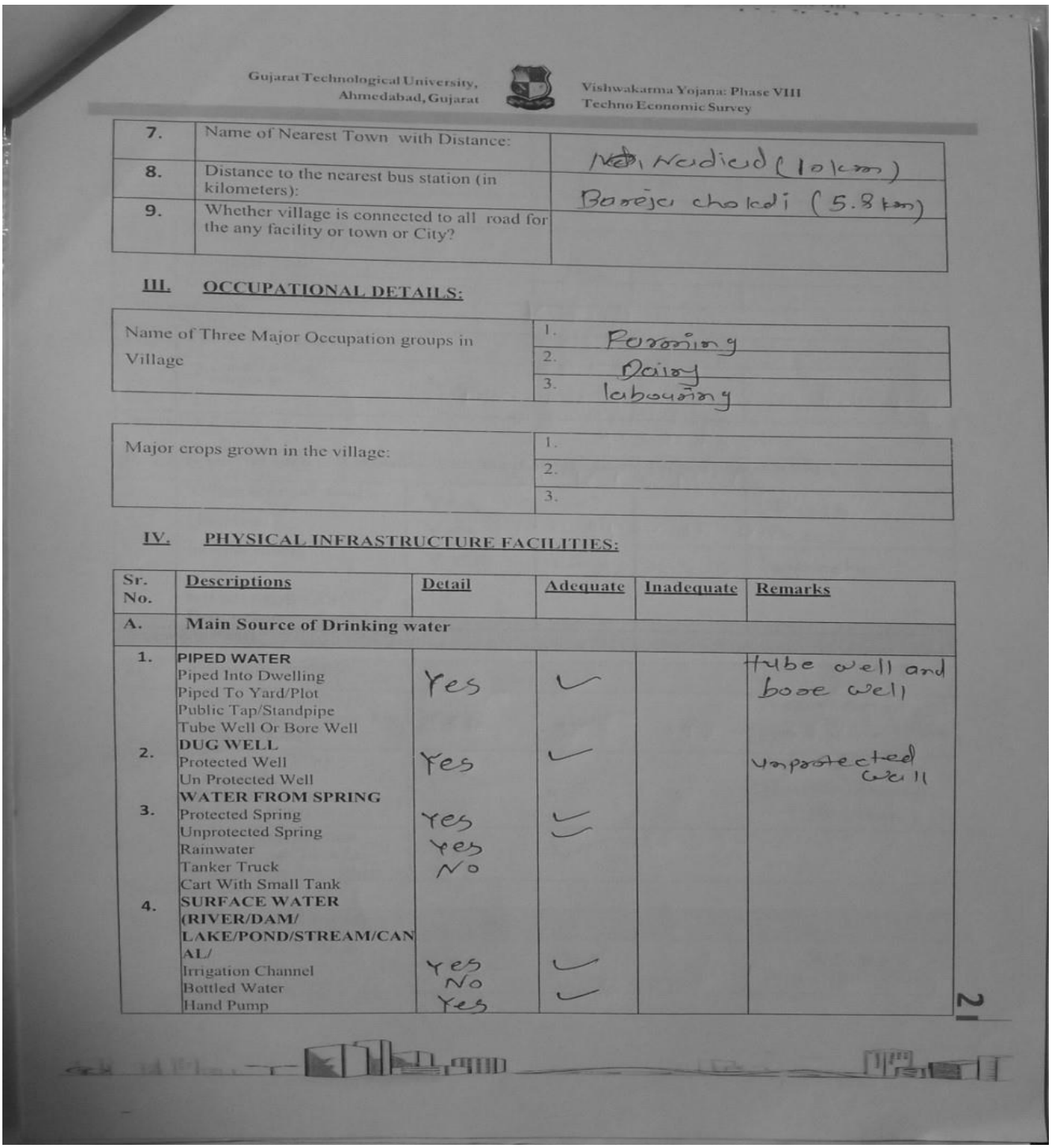
Name of District:	KHEDA
Name of Taluka:	KHEDA
Name of Village:	KANERA
Name of Institute:	AHMEDABAD INSTITUTE OF TECHNOLOGY
Nodal Officer Name & Contact Detail:	PRO: TANHA SHAH (Mo: 9687173796
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SANJAY CHAUHAN (Sarpanch) (MO: 9913419570)
Date of Survey:	11th December, 2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	1836	943	893	390

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	488.89 hectares
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):	Bareyadi (11.1 km away)



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7.	Name of Nearest Town with Distance:	Nadiad (10km)
8.	Distance to the nearest bus station (in kilometers):	Bareja chokdi (5.8km)
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.	Farming
	2.	Dairy
	3.	labouring

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 Public Tap/Standpipe Tube Well Or Bore Well	Yes	✓		tube well and bore well
2.	**DUG WELL** Protected Well Un Protected Well	Yes	✓		unprotected well
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	Yes Yes No	✓		
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	Yes No Yes	✓ ✓		

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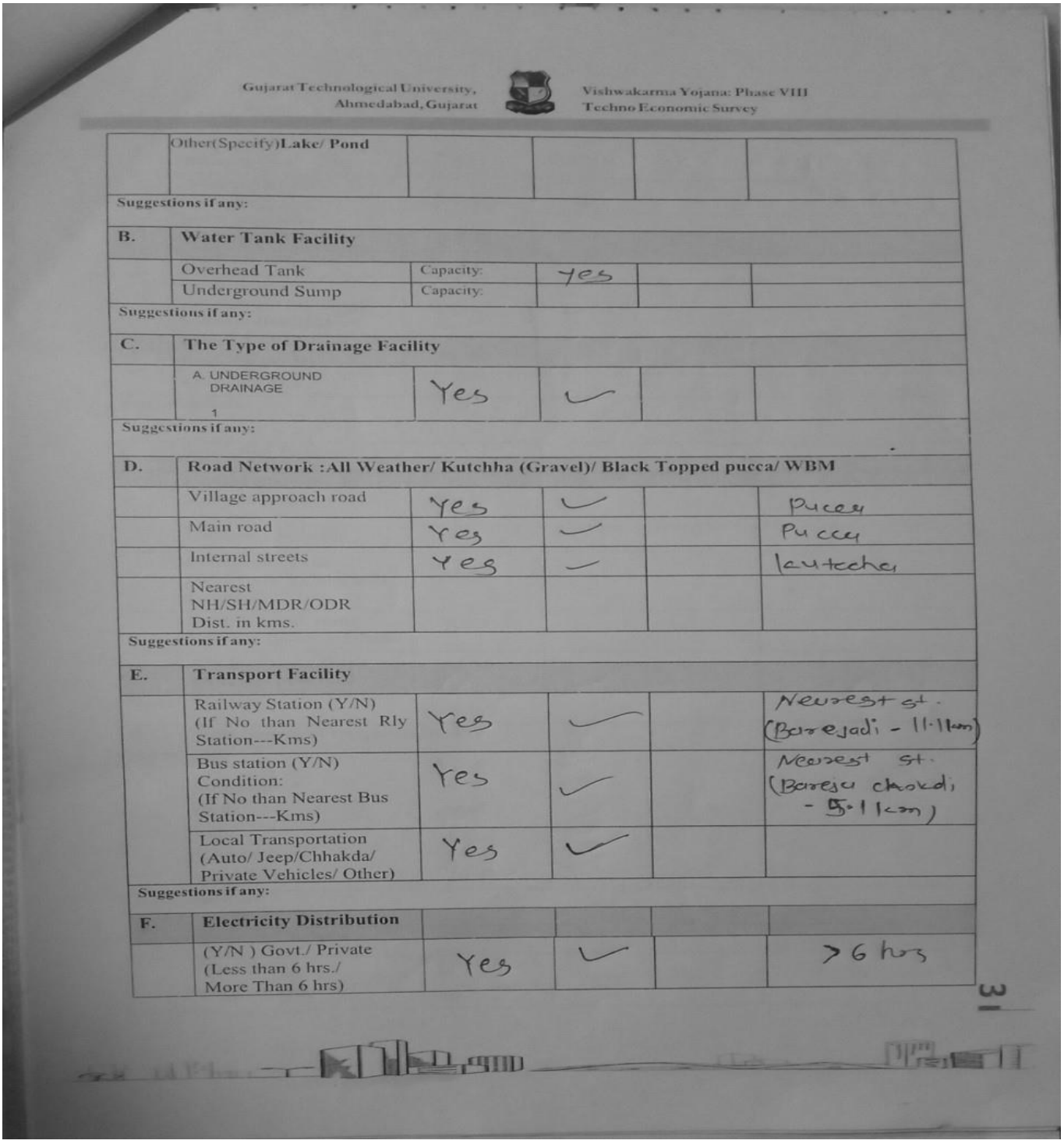

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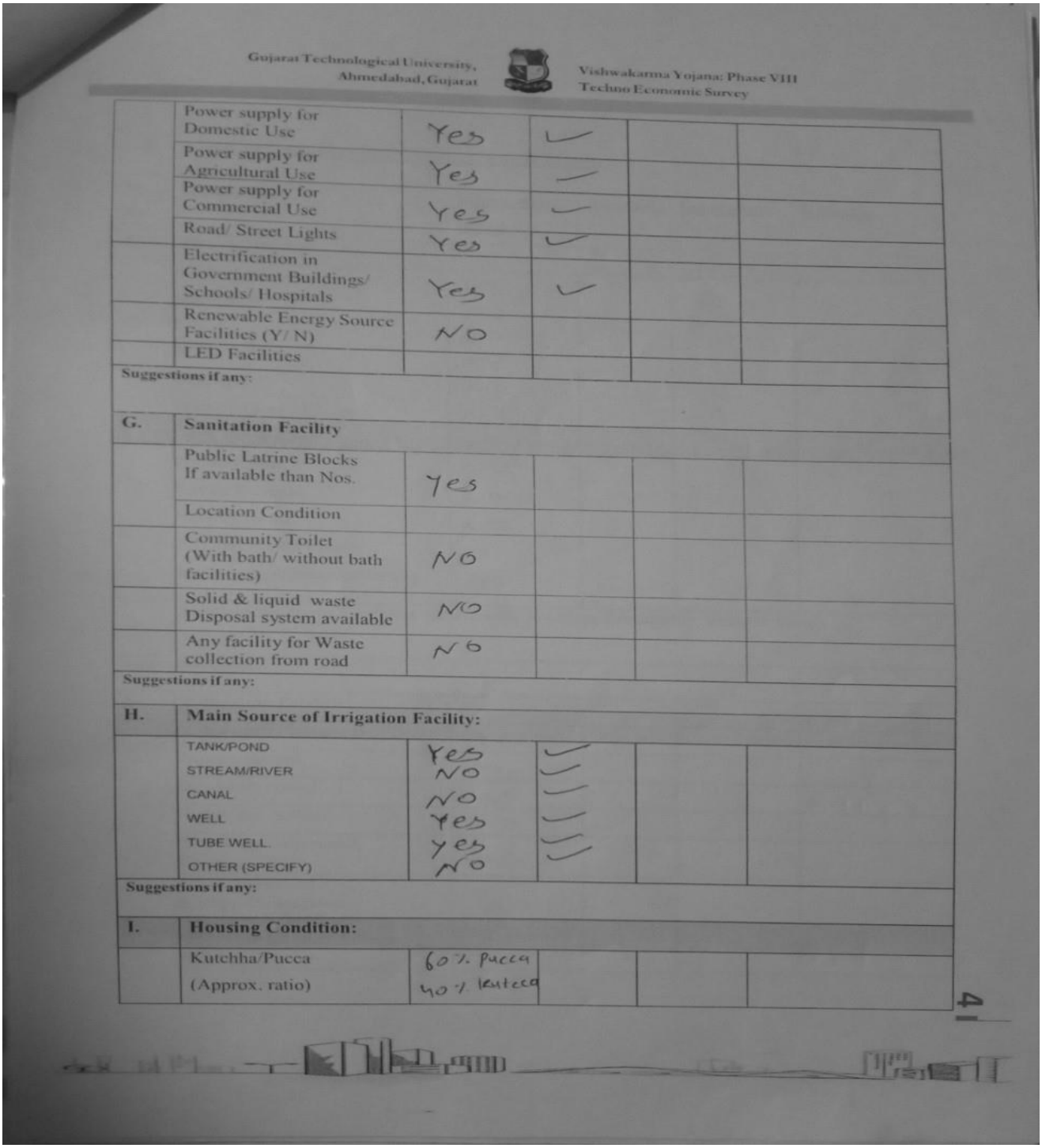
	Other(Specify)**Lake/ Pond**				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	Yes		
	Underground Sump	Capacity:			
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	Yes	✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	✓		Pucca
	Main road	Yes	✓		Pucca
	Internal streets	Yes	✓		kutcha
	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)	Yes	✓		Nearest st. (Bareja di - 11.1km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		Nearest st. (Bareja chokdi - 5.1km)
	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	✓		> 6 hrs



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

Suggestions if any:

G.	Sanitation Facility				
	Public Latrine Blocks If available than Nos.	Yes			
	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	NO	✓		
	WELL	Yes	✓		
	TUBE WELL	Yes	✓		
	OTHER (SPECIFY)	NO	✓		

Suggestions if any:

I.	Housing Condition:				
	Kutchha/Pucca (Approx. ratio)	60% Pucca 40% Kutcha			

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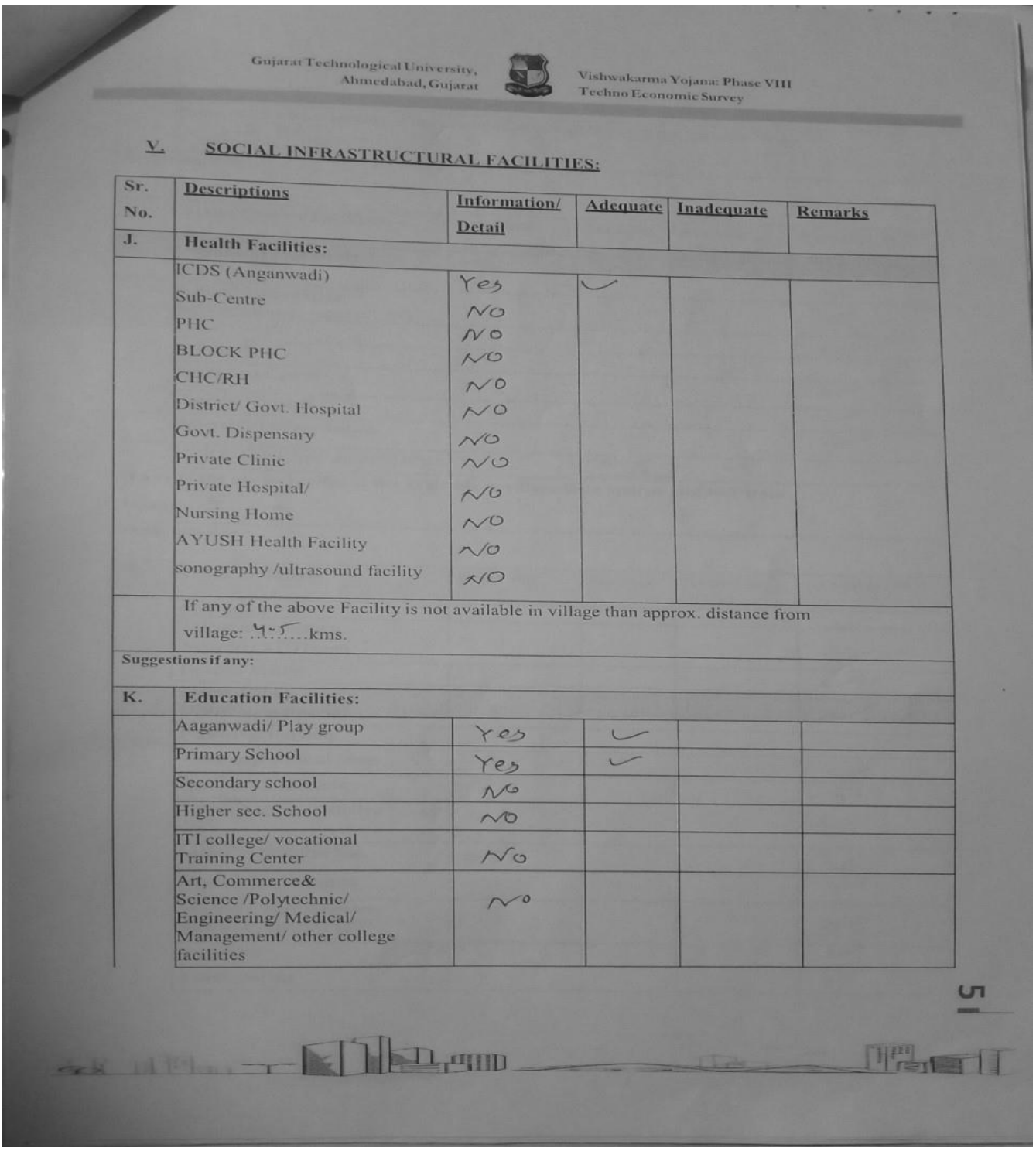

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Vishwakarma Yojana: Phase VIII
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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	✓		
	Sub-Centre	NO			
	PHC	NO			
	BLOCK PHC	NO			
	CHC/RH	NO			
	District/ Govt. Hospital	NO			
	Govt. Dispensary	NO			
	Private Clinic	NO			
	Private Hospital/ Nursing Home	NO			
	AYUSH Health Facility	NO			
	sonography /ultrasound facility	NO			
	If any of the above Facility is not available in village than approx. distance from village: 45 kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓		
	Primary School	Yes	✓		
	Secondary school	No			
	Higher sec. School	NO			
	ITI college/ vocational Training Center	No			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			

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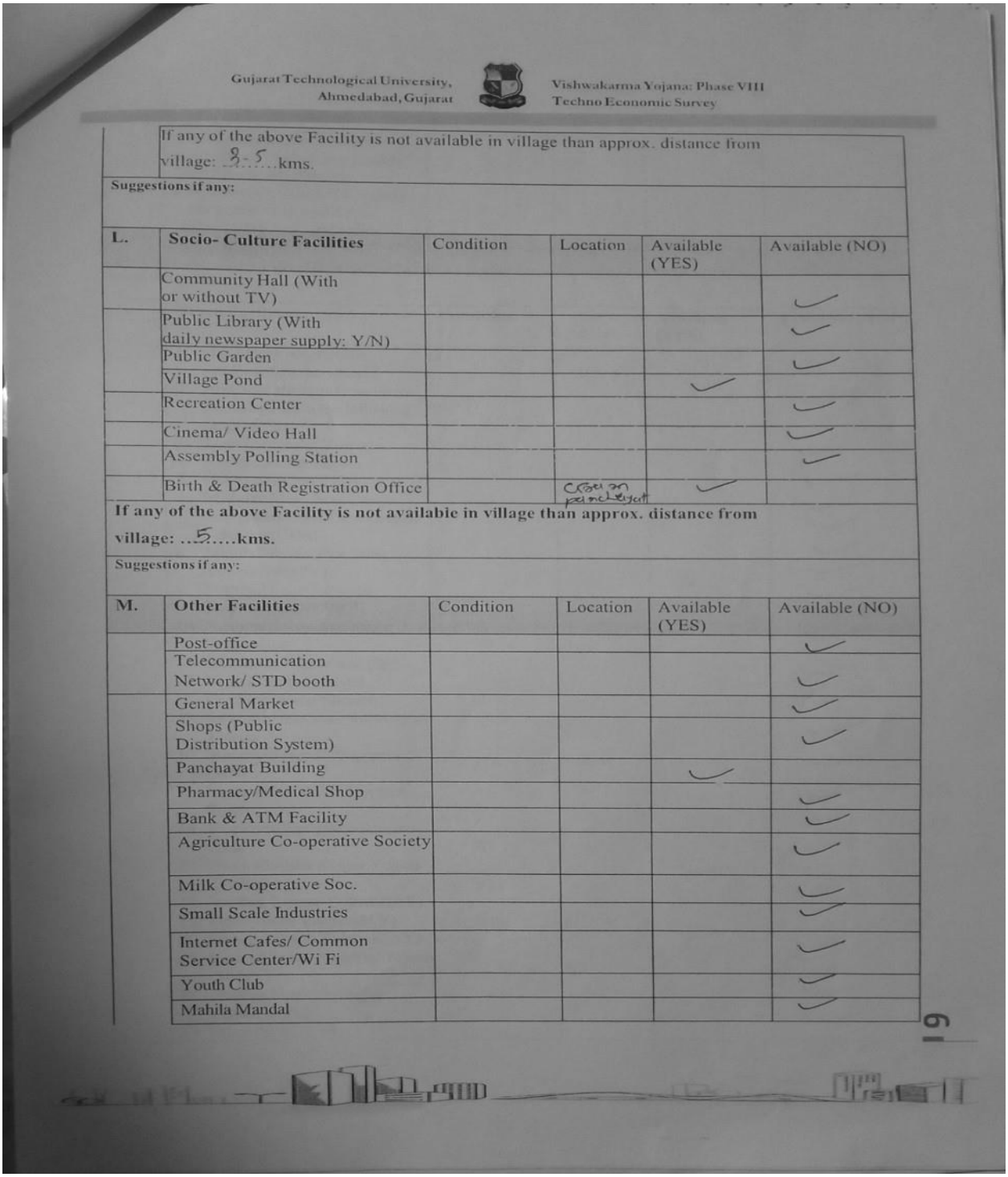

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If any of the above Facility is not available in village than approx. distance from village: 3-5 kms.

Suggestions if any:

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

If any of the above Facility is not available in village than approx. distance from village: ...5....kms.

Suggestions if any:

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

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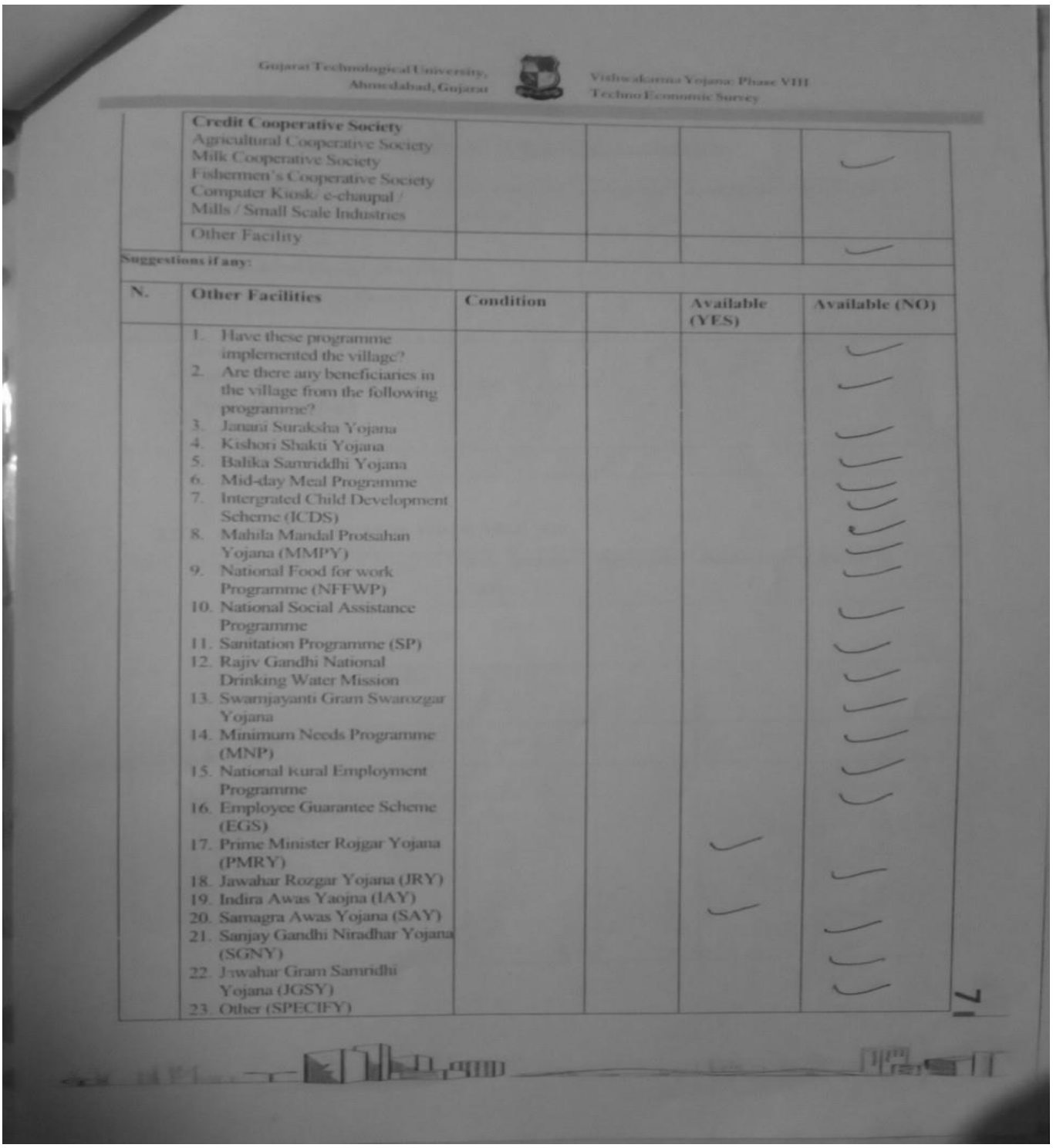

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries				✓
	Other Facility				✓

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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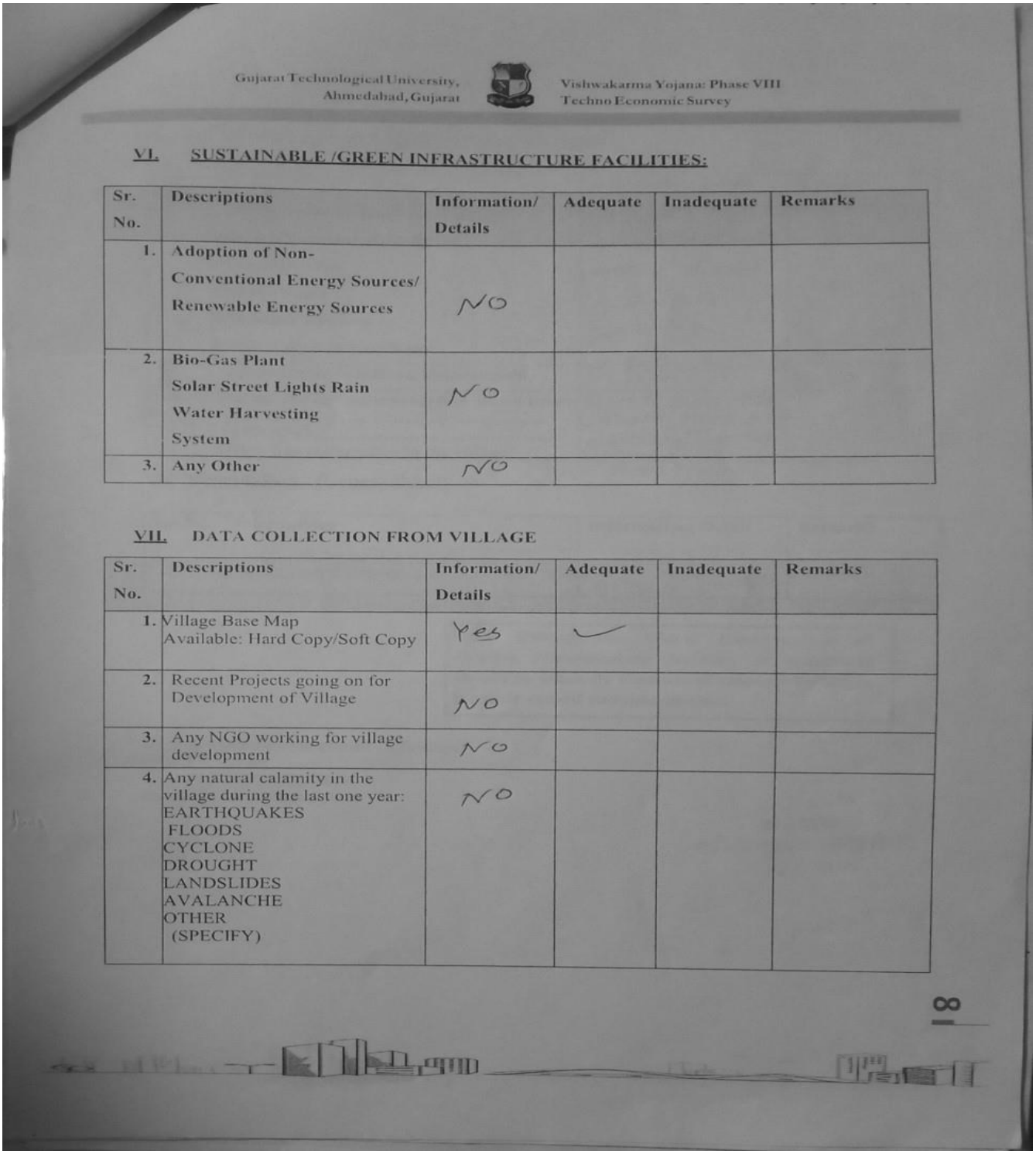

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	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
Techno Economic Survey

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	There are need to repair Road and PHC 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 times cleaning in the village in week.	

IX. Smart Village / Heritage Details

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

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

S. Mahadev
સરપંચ
કનેરા ગ્રામ પંચાયત
તા. જી. ખેડા.

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12.4 Gap Analysis:

Facilities	Planning commission /UDPFI Norms	Village	KANERA	
		Population		1836
		Existing	Required asmper 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.	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

2.	BAREJADI	Civil & ELECTRICAL	• Bank • Post ofiice • hospital	• atm • community hall
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 Kanera 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.

12.7 Summary of Good photographs:

Fig 59 Clinic

Fig 60 Water Tank

Fig 61 Dairy

Fig 62 School

Fig 63,64,65,66and 67 Photographs During Village Visit

12.8 Village interaction Report:

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

22th October, 2020

As per the circular GTU guideline dated 22th October 2020, GTU informed all the teams of VishwakarmaYojana to present their work in village for the effective implementation of VishwakarmaYojana. Under this guideline Student's team of KANERA village presented the village development plan of KANERA village at Panchayat office on 22th October 2020.

Sarpanch, Talati, All the Panchayat members and Village dwellers remained present to know how the development of kanera village is possible and to give their feedback. We presented our work under Vishwakarma Yojana. We explained core theme of Vishwakarma Yojana, 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 Repair & Maintenance of Internal road, Public toilet blocks and Bus stand repair & maintenance and Sustainable/ Renewable Energy source Planning.

Fig 68 Kanera Gram Panchayat

12.9 Sarpanch letter:

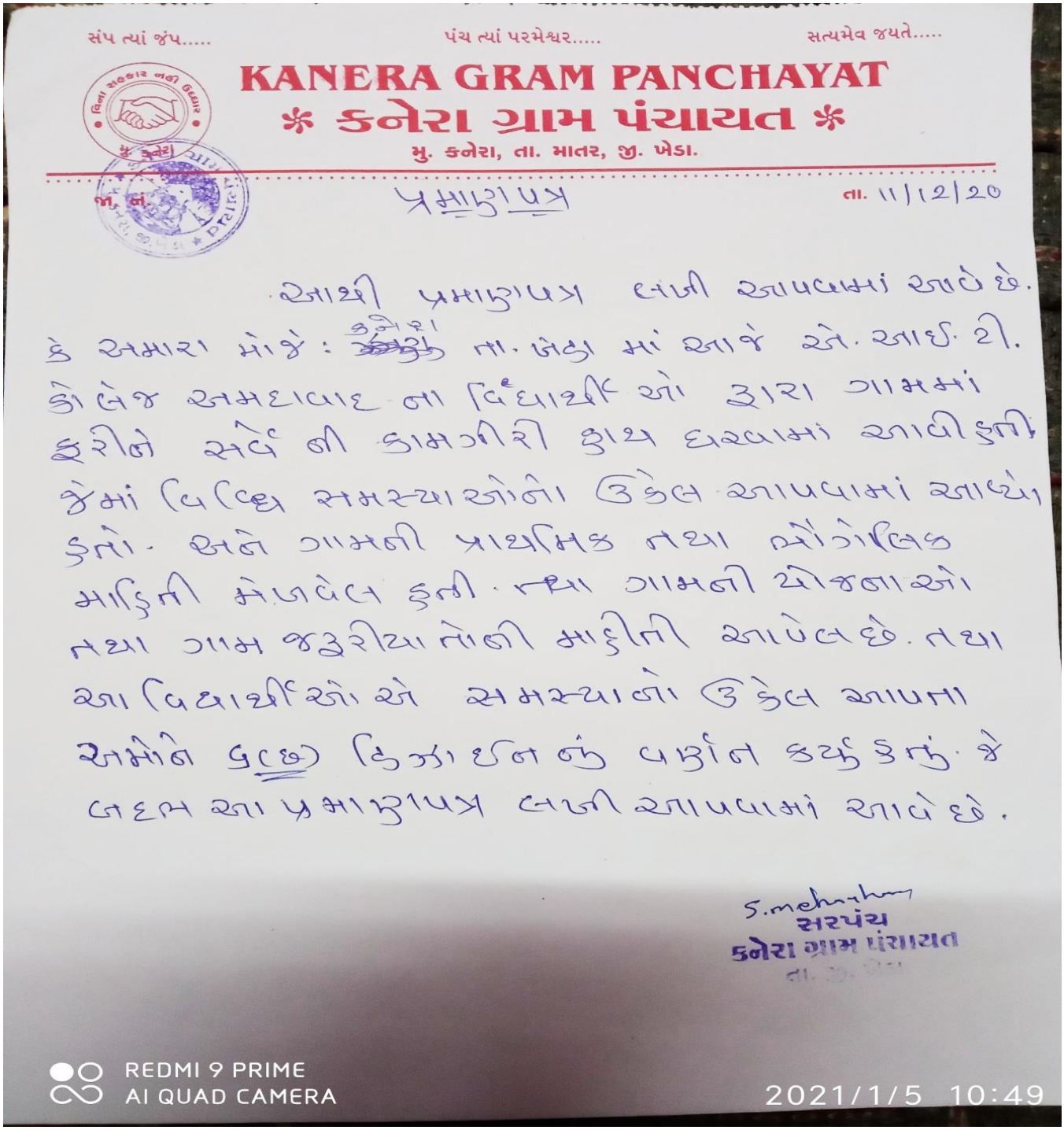


Fig 69 Letter from Panchayat

Chapter 13; From chapter 9 future designs of the aspects (Feasibility, Construction, Operation and maintenance of Various designs options in Rural Areas along with Cost Estimation with AutoCAD designs / planning with any Software

13.1 Design Proposal

1) Automatic soil nutrient detection and fertilizer dispensary system: Soil fertility is an important factor to measure the quality of the soil as it indicates the extent to which it can support plant life. The fertility of soil is measured by the amount of macro and micronutrients, water, pH etc. Soil nutrients are depleted after every harvest and hence must be replenished. To maintain nutrient levels in the soil in case of deficiency, fertilizers are added to soil. Most of the farmers choose to approximate the number of fertilizers and add them manually. However, addition of fertilizers in right amount is a matter of great importance as excess or insufficient addition can harm the plant life and reduce the yield. Use of modern trends and technology promises to provide a solution to the above problem. Though automated techniques for seeding, weeding, harvesting the crops etc. have been proposed and implemented, none of the techniques target at maintaining soil fertility. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by the measuring the amount of nutrients present. The presence of nutrients is determined by chemical processes and quantified using sensors. An automated system has been developed for the controlled addition of fertilizers in order to avoid excess/ deficient fertilizers in the soil.

2) Automatic Plant Irrigation System: Here is a simple project more useful in watering plants automatically without any human interference. We may call it as Automatic plant irrigation system. We know that people do not pour the water on to the plants in their gardens when they go to vacation or often forget to water plants. As a result, there is a chance to get the plants damaged. This project is an excellent solution for such kind of problems.

3) Smart Fence: Fencing is not a fledgling concept in agriculture. This is an age-old practice and has been carried out in different modes and methods with passage of generations. Yes, now the fencing is inline with contemporary technological methodologies. More and more sophisticated systems are flooding the market and enabling a wider choice for users. Fencing is a one-time investment and affords a long-term protection for agricultural fields and properties and helps curtail crop losses from diverse disruptive causes. An effective fencing set up have following advantages,

- Demark a possessed property (legal requirement),
- Keep out stray animals and intruders,
- Separate lands in case of mixed farming,
- Keep thieves away,
- Protect land and crop, and many more.

13.1.1 CIVIL DESIGN 1 (PUBLIC GARDEN)

13.1.1 PUBLIC GARDEN

TOTAL CENTER LINE LENGTH: =2*10.4+2* 10.4 =41.6m

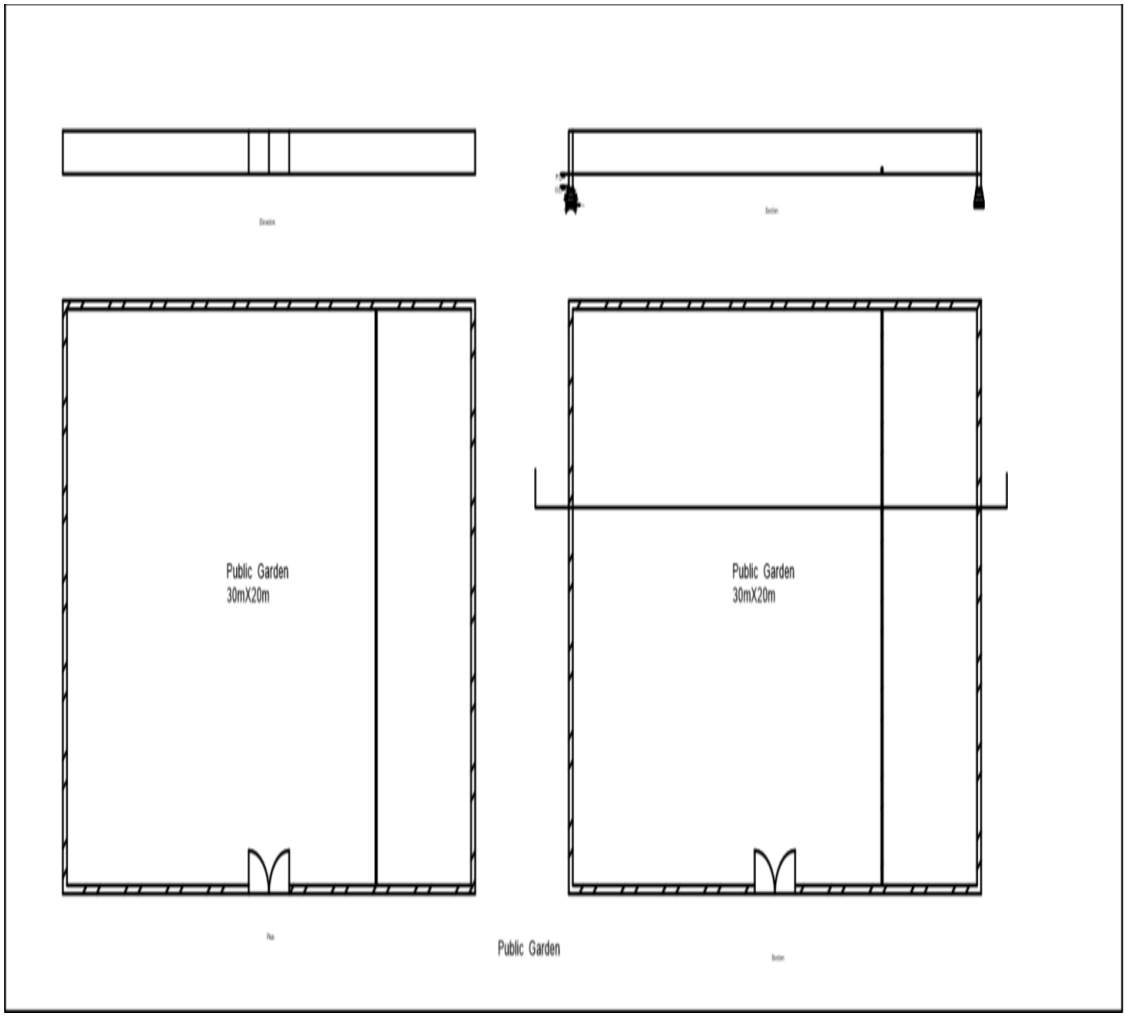


Figure70. plan of play ground

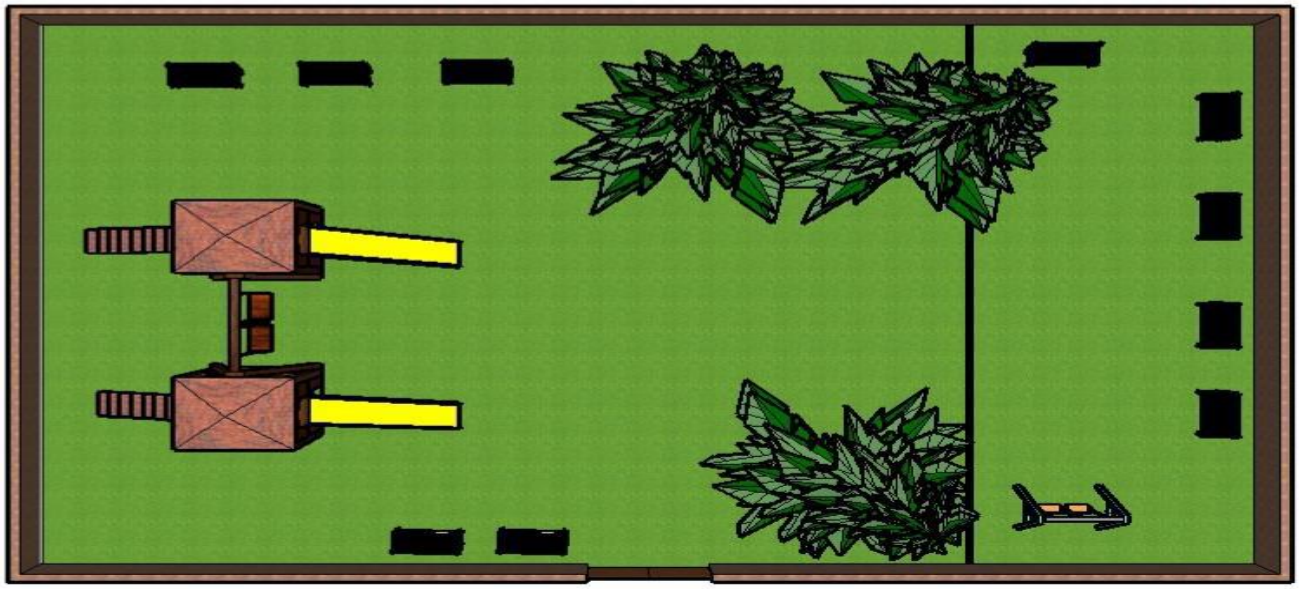


Figure71. Elevation of children's playground

Table13. CALCULATION (For Wall):

Item No.	Item description	No.	Length	Breadth	Height	Quantity
1	Excavation	1	41.6	0.7	0.3	8.736m^3
2	PCC	1	41.6	0.7	0.1	2.912 m^3
3	First step	1	41.6	0.5	0.2	4.16 m^3
4	Wall	1	41.6	0.4	0.9	14.976 m^3
Deduction:	Gate	1	1	0.4	0.9	(-)0.36 m^3
=18.77 m^3						

Table14. Abstract Sheet for Play ground

Item description	Qty	Rate	Per	Amount(Rs.)
Material:				
Brick:	9385	4	m^3	37540
Sand:	5.31	800	m3	4248
Cement:	25 bags	280	bag	7000

Labour:				
Male coolie:	2	350	Day	700
Female coolie:	2	300	Day	600
Bhistie:	1	350	Day	350
Cost: Rs.50438				

Water charges = 0.015 x 50438 =Rs. 756.57

Contractor profit = 0.1x50438=Rs. 5043.8

Total cost = Rs. **57238**

13.1.2 CIVIL DESIGN 2 (COMMUNITY HALL)

13.1.2 COMMUNITY HALL

- Community centres or community halls are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. Community centres can be religious in nature, such as Christian, Islamic, or Jewish community centres, or can be secular, such as youth clubs.
- Community centres generally perform many of the following functions in their communities:
- As the place for all-community celebrations at various occasions and traditions.
- As the place for public meetings of the citizens on various issues.
- As the place where politicians or other official leaders come to meet the citizens and ask for their opinions, support or votes ("election campaigning" in democracies, other kinds of requests in non-democracies).
- As a place where community members meet each other socially.
- As a place housing local clubs and volunteer activities.
- As a place that community members (and sometimes others), can rent cheaply when a private family function or party is too big for their own home. For instance the non-religious parts of weddings, funerals, etc.

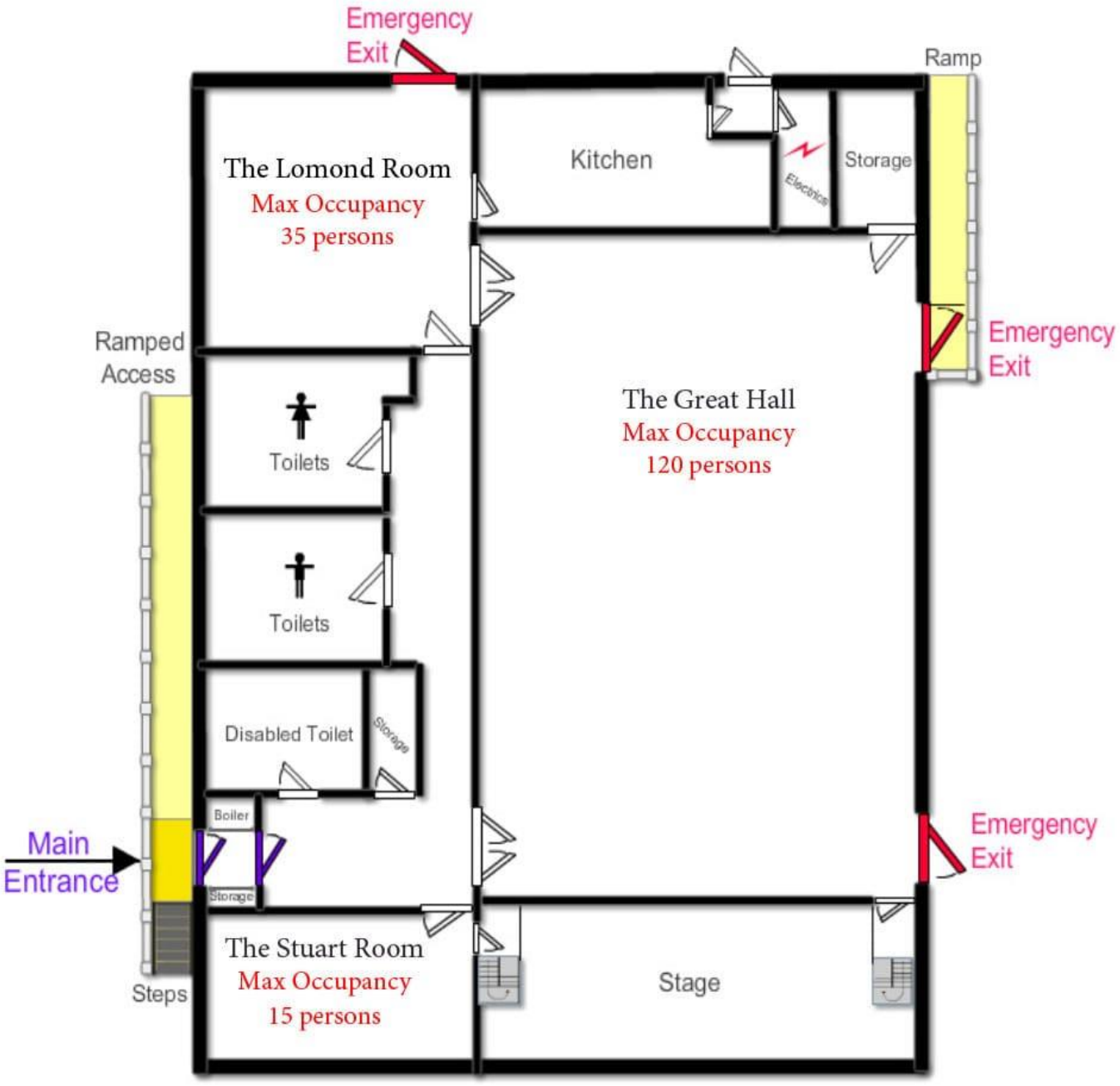
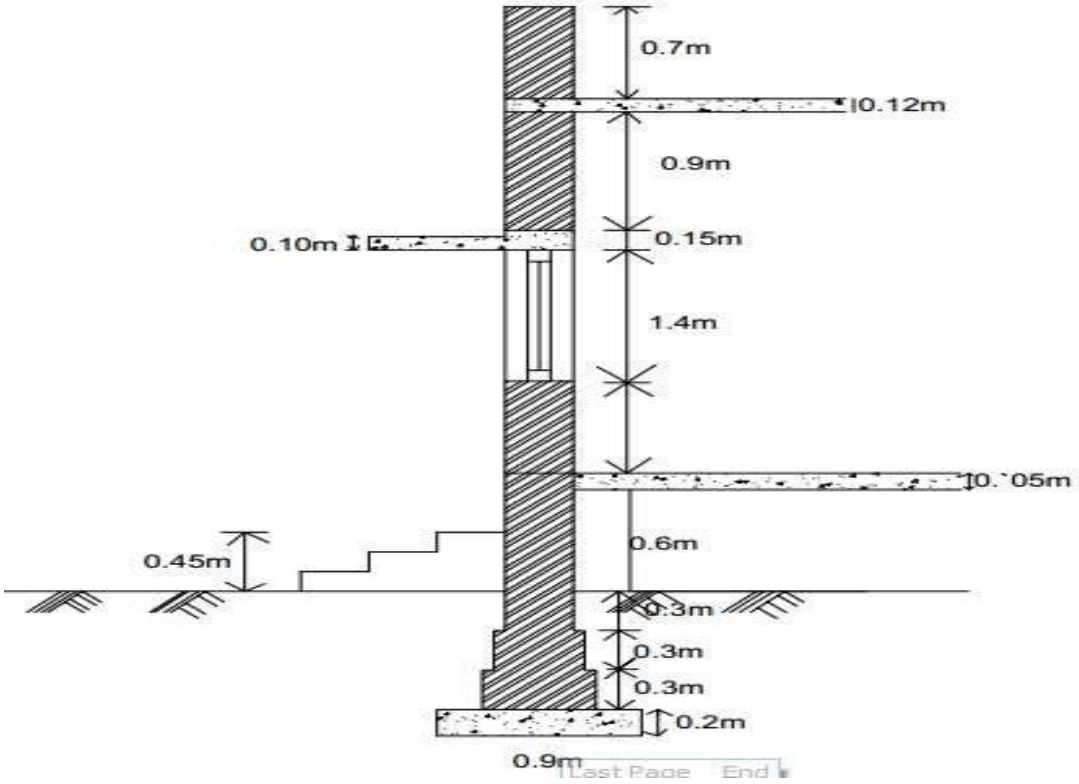


Fig.72Plan of community hall



MESUREMENT SHEET

Sr. No.	Item Name	Nos.	L (M)	B (M)	H (M)	Quantity (m^3)
1	Excavation for Community hall					
	(1) Long wall	2	13.2	0.9	1.1	26.136
	(2) Short wall	2	9.85	0.9	1.1	19.503
						———
						45.64 m^3
2	BBCC (1:4:8)					
	(1) Long wall	2	13.2	0.9	0.2	4.752

	(2) Short wall	2	9.85	0.9	0.2	3.546 ——— 8.298 m^3
3	Brick masonry up to plinth 3) Long wall • Step 1 • Step 2 • Step 3	 2 2 2	 12.8 12.7 12.6	 0.5 0.4 0.3	 0.3 0.3 0.85	 3.84 3.048 6.426
		2 2 2	10.25 10.35 10.45	0.5 0.4 0.3	0.3 0.3 0.85	3.075 2.484 5.329 ——— 24.202 m3
4		2 2	0.3 0.3	3 3	12.6 10.45 41.49- 9.176 = 32.314 m3	22.68 18.81 ——— 41.49m3
5		1 W1=7 W2=3 –	12.6 1.8 1.5 –	11.05 0.6 0.6 –	0.12 0.10 0.10 –	16.90 0.756 0.27 0.986 m3 ——— 18.912 m3
6		1	12.15	10.45	0.55	107.92 m2
7		2 2 1 -	12.15 10.45 12.15 -	- - 10.45 -	3 3 – –	72.9 62.7 126.96 - 13.63 ——— 248.93 m^3
8		2 2 -	12.75 11.05 -	- - -	3.1 3.1 -	79.05 68.51 -13.63 m2 ——— 133.93 m2

Abstract sheet

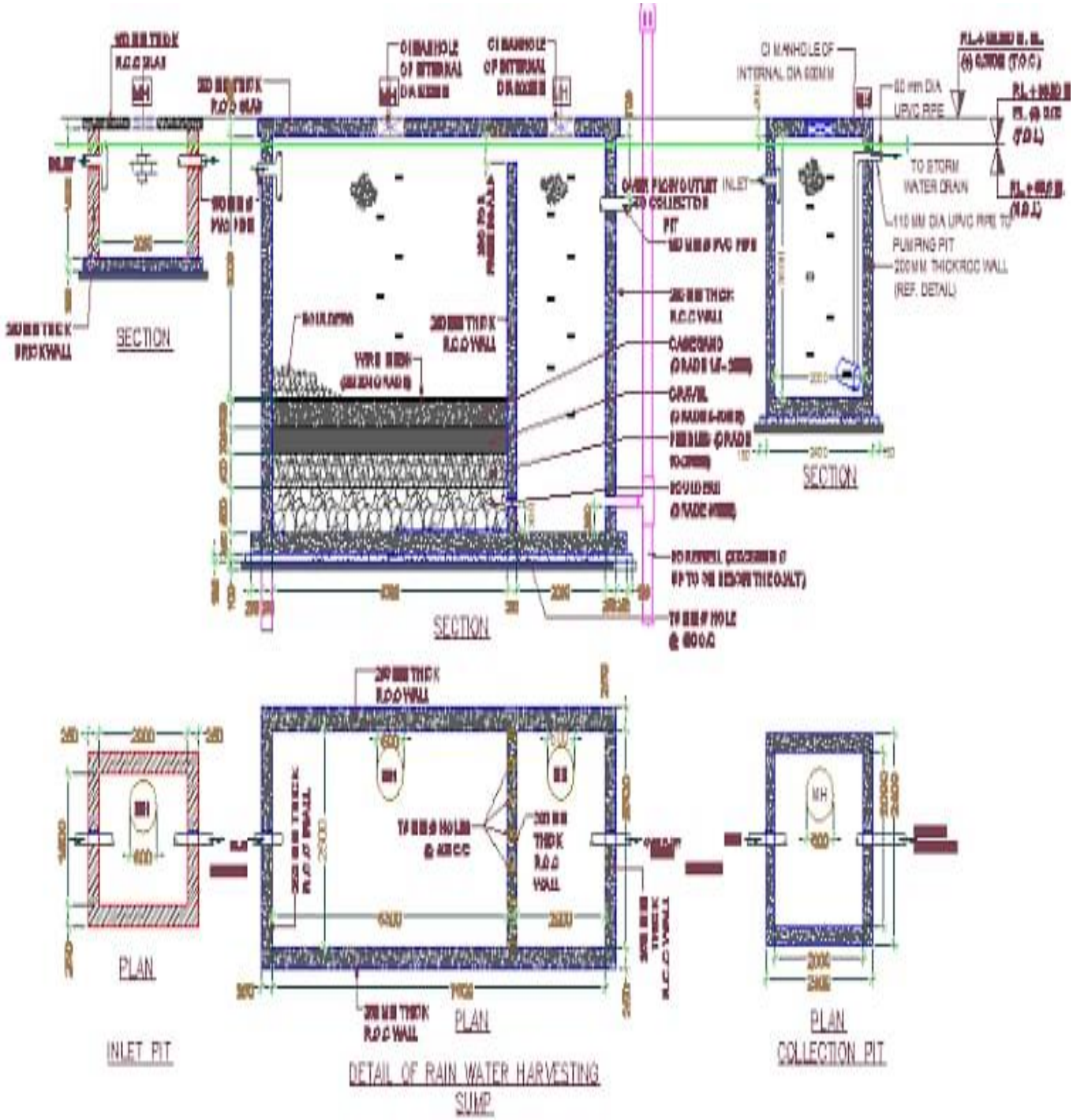
Item Name	Quantity	Rate	Per	Amount
Excavation for Community Hall	45.64	85	m^3	3879.4
BBCC (1:4:8)	8.298	2700	m^3	22404.6
Brick masonry up to plinth	24.202	3200	m^3	774464
Brick masonry above plinth	32.314	3500	m^3	113099
R.C.C Slab, lintle,chajja	18.912	8800	m^2	166425.6
Earth filling	107.92	50	m^3	5396
Internal smooth plaster	248.93	150	m^2	37339.5
Outer plaster	133.93	150	m^2	20089.5
Total cost of Community Hall = 446080 Rs				

13.1.3 CIVIL DESIGN 3 (RAIN WATER HARVESTING)

sr no.	particulars of items	quantity	rate	per	amount
1	excavation	97.965	85	m^3	8327 Rs
2	PCC	19.593	3200	m^3	62697 Rs
3	masonary upto GL	25.039	3200	m^3	80125 Rs
4	DPC	2.44	155	m^3	378 Rs
5	masonary for super structure	78.083	3500	m^3	2,73,290 Rs
6	RCC work	8.794	8800	m^3	77387 Rs
7	plaster(inside)	122.377	150	m^3	18355 Rs
8	RCC(plaster)	17.589	150	m^3	2638 Rs
9	plaster(outside)	69.853	150	m^3	10477 Rs
10	tiles flooring	17.589	500	m^3	8795 Rs
	total				5,42,469 Rs.
	Add 5 % constigencies				+ 27,123 Rs.
	Grand total				5,69,592 Rs.

13.1.3 RAIN WATER HARVESTING

1. Rainwater harvesting is the simple process or technology used to conserve Rainwater by collecting, storing, conveying and purifying of Rainwater that runs off from rooftops, parks, roads, open grounds, etc. for later use.
2. Rainwater harvesting systems consists of the following components:
3. Catchment- Used to collect and store the captured Rainwater.
4. Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.
5. Flush- It is used to flush out the first spell of rain.
6. Filter – Used for filtering the collected Rainwater and remove pollutants.
7. Tanks and the recharge structures: Used to store the filtered water which is ready to use.
8. The process of rainwater harvesting involves the collection and the storage of rainwater with the help of artificially designed systems that run off naturally or man-made catchment areas like- the rooftop, compounds, rock surface, hill slopes, artificially repaired impervious or semi-pervious land surface.
9. Several factors play a vital role in the amount of water harvested. Some of these factors are:
10. The quantum of runoff
11. Features of the catchments
12. Impact on the environment
13. Availability of the technology
14. The capacity of the storage tanks
15. Types of the roof, its slope and its materials
16. The frequency, quantity and the quality of the rainfall
17. The speed and ease with which the Rainwater penetrates through the subsoil to recharge the groundwater.


SECTION
SECTION
SECTION
PLAN
PLAN
PLAN
INLET PIT
COLLECTION PIT
DETAIL OF RAIN WATER HARVESTING SUMP

MEASUREMENT

A	***UNIT COST OF CONST. MATERIAL***				
SR NO	**DESCRIPTION**	**QTY**	**RATE**	**PER**	**AMOUN**
1	**EXCAVATION IN SOIL**	1	90	m^3	90
2	**P.C.C**	1	1500	m^3	1500
3	**R.C.C COLUMN**	1	4700	m^3	4700
5	**MASONARY**	1	1400	m^3	1400
8	**PVC PIPING**	1	165	m	165
15	**MAKING BOREHOLES**	1	180	m	180
		Total			**8035**
		Contractor profit =10			**803.5**
		contingencies = 5%			**40.175**
			TOTAL AMOUNT		**8878.675**
B	***CAPACITY OF HARVESTING WATER TANK AND RATES ACCORDING***				
	5000 L	**6000L**	**7000L**	**9000L**	**10000L**
TOTAL COST	12430	12975	13970	14380	15800

13.1.7 Electrical Design 1

13.1.7 Automatic soil nutrient detection and fertilizer dispensary system

- **Introduction:** Soil fertility is an important factor to measure the quality of the soil as it indicates the extent to which it can support plant life. The fertility of soil is measured by the amount of macro and micronutrients, water, pH etc. Soil nutrients are depleted after every harvest and hence must be replenished. To maintain nutrient levels in the soil in case of deficiency, fertilizers are added to soil. Most of the farmers choose to approximate the number of fertilizers and add them manually. However, addition of fertilizers in right amount is a matter of great importance as excess or insufficient addition can harm the plant life and reduce the yield. Use of modern trends and technology promises to provide a solution to the above problem. Though automated techniques for seeding, weeding, harvesting the crops etc. have been proposed and implemented, none of the techniques target at maintaining soil fertility. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by the measuring the amount of nutrients present. The presence of nutrients is determined by chemical processes and quantified using sensors. An automated system has been developed for the controlled addition of fertilizers in order
- to avoid excess/ deficient fertilizers in the soil.
- Hence there is need to implement modern science and technology in this field for increasing the yield. In this paper, an automated system is designed and built for implementation of soil testing for agricultural farm using this system; a farmer can program and accurately understand the soil health and fertility. The main aim of our work is to develop a testing system which can be used for soil testing, which in term helps the farmers to cultivate and produce the proper crop. Presently two-third of the Indian population depends directly on agriculture for its livelihood. Agriculture productivity mainly depends on quality of soil which is dependent mainly on factors like soil texture, soil water holding capacity, soil pH value, soil conductivity and soil mineral contents. Soil testing is also a requirement for farms that must complete a nutrient management plan. Major nutrients: Nitrogen (N), Phosphorus (P) and Potassium (K) Soil pH is the most commonly measured soil properties. It is also one of the most useful and informative soil parameters because of its relationship to many aspects of soil fertility and plant growth. The major components which are necessary for growth of plant are: nitrogen phosphorous and potassium. (Nitrogen) is most important element in soil which helps in growth of leaves and vegetation. In similar way P (Phosphorus) is key element for root and physical growth. K (Potassium) keeps regulation of water and nutrient in plant cell, flowering, fruiting. If we maintain the proper ratio of all these components then this will maintain the quality of soil and improve the growth of crop.
- Quantity of NPK is dependent on crop type and on plant growth status. How much quantity of fertilizer to be used is further dependent on present contents of NPK nutrients in the soil. Researchers in agriculture are looking for ways to optimize plant yield while minimizing the consumption of fertilizer. Since these macro-nutrients vary even on a small scale throughout a cultivated field, numerous

researchers have attempted to develop the sensors to map these nutrient contents. Integrated crop management systems have been designed to study spatial and temporal behavior of NPK. Continuous monitoring of these along with humidity and pH of soil is leading to automation in agricultural areas to improve crop productivity

- **Components of Automatic soil nutrient detection and fertilizer dispensary system:**

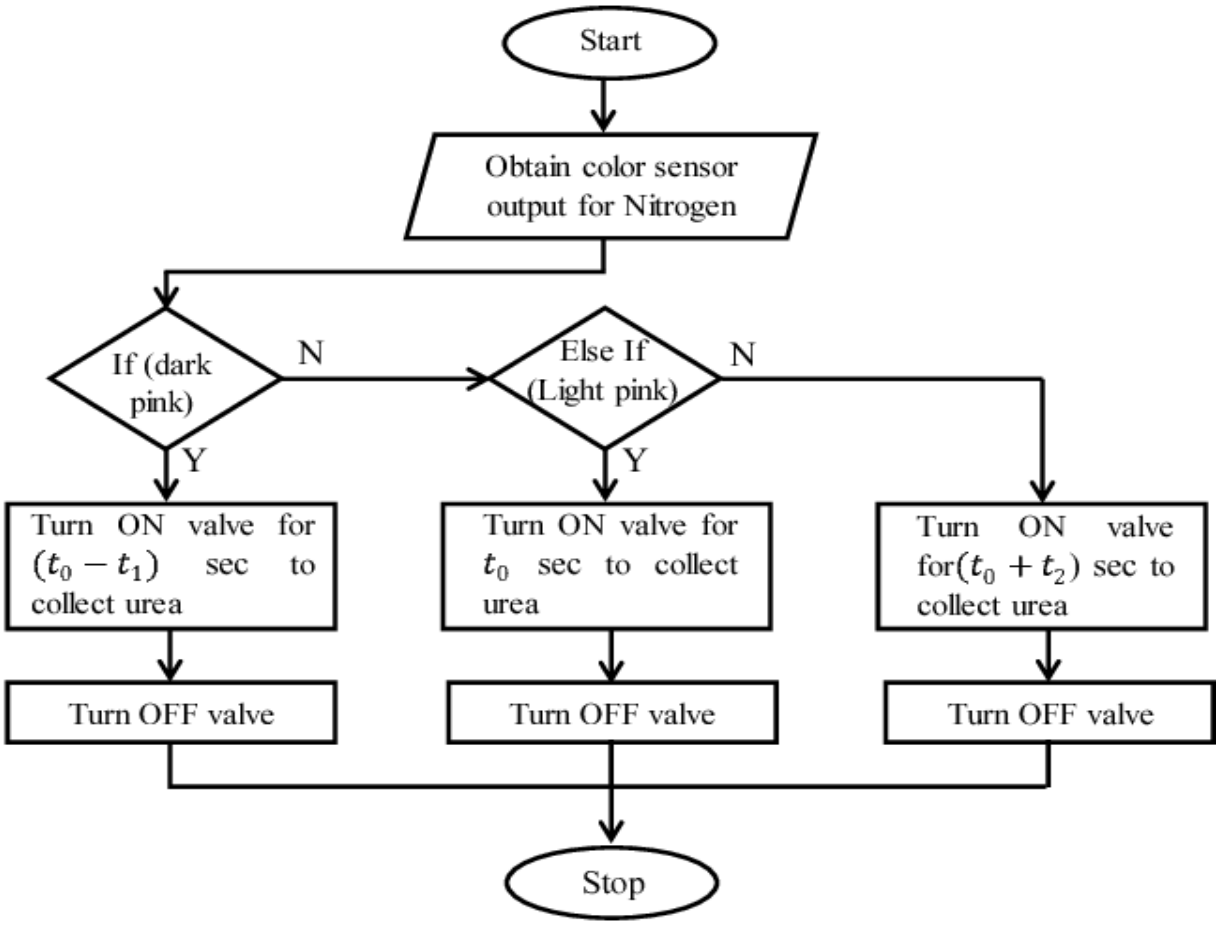
1. **Microcontroller;** The microcontroller used is P89V51RD2 operates at 11.0592 MHz at 5V D.C. The microcontroller plays a key role in processing data received from the sensor, where it compares the data already pre-stored with the sensor output signal. The microcontroller is the main control unit which is programmed to perform the various functions. First, the parameters of the soil are sensed and the gathered information is processed by the microcontroller. Based on the analysis, the type of crop and fertilizer can be determined precisely.
2. **Liquid Crystal Display**: A Liquid Crystal Display is a low cost, low power device capable of displaying text. The LCD controller receives control words from the microcontrollers; it decodes the control words and performs the corresponding actions on LCD. Once the initialization sequence is done, it displays the soil parameters.
3. **ADC (Analog to Digital Converter):** Microcontroller requires input in digital form for this purpose analog to digital converter is used to convert the output of signal conditioning, which is in analog, to digital signal.
4. **Signal Conditioning**: Signal conditioning converts output signal from the sensor, which is a weak signal, in to a strong signal.
5. **Software Required:** The KEIL 8051 Development Tools are designed to solve the complex problems facing embedded software developers. In this paper KEIL software of version 8.08 is selected, because it provides Device Database and the µVision IDE sets all compilers, assembler, linker, and memory options. Numerous example programs are included in this software and also the KEIL µVision Debugger accurately simulates on-chip peripherals (I^2C, CAN, UART, SPI, Interrupts, I/O Ports, A/D Converter, D/A Converter, and PWM Modules) of 8051 devices. Simulation helps to understand hardware configurations and avoids time wasted on setup problems. When testing the software application with target hardware, use the MON51, MON390, MONADI, or FlashMON51 Target Monitors, the ISD51 In-System Debugger, or the ULINK USB-JTAG Adapter to download and test program code on target system.
6. **NPK Sensor:** Detection of nitrogen, phosphorus, and potassium (NPK) nutrients of soil using optical transducer. The optical transducer is implemented as a detection sensor which consists of three LEDs as light source and a photodiode as a light detector. The wavelength of LEDs is chosen to fit the absorption band of each nutrient.

7. **DS18B20:** The DS18B20 is a 1-wire programmable Temperature sensor from maxim integrated. It is widely used to measure temperature in hard environments like in chemical solutions, mines or soil etc. It can measure a wide range of temperature from -55°C to +125° with a decent accuracy of ±5°C.
8. **Soil Moisture Sensor:** Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free-soil moisture requires removing, drying, and weighing of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content.

➢ Working of Automatic soil nutrient detection and fertilizer dispensary system

- Soil fertility is an important factor to measure the quality of the soil as it indicates the extent to which it can support plant life. The fertility of soil is measured by the amount of macro and micronutrients, water, pH etc. Soil nutrients are depleted after every harvest and hence must be replenished. To maintain nutrient levels in the soil in case of deficiency, fertilizers are added to soil. Most of the farmers choose to approximate the amount of fertilizers and add them manually. However, addition of fertilizers in right amount is a matter of great importance as excess or insufficient addition can harm the plant life and reduce the yield. Use of modern trends and technology promises to provide a solution to the above problem. Though automated techniques for seeding, weeding, harvesting the crops etc. have been proposed and implemented, none of the techniques target at maintaining soil fertility. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by the measuring the amount of nutrients present. The presence of nutrients is determined by chemical processes and quantified using sensors. An automated system has been developed for the controlled addition of fertilizers in order to avoid excess/ deficient fertilizers in the soil.
- A process of recommending crop varieties based on management categories. The management categories are determined by utilizing indices, which measure the economic implication of physical and chemical properties of a specific soil type in a region. The management categories may then be indicated graphically by indicia overlaying digitized soil maps, each of the indicia grouping soil types within a management category.
- Each crop variety is characterized by how the crop variety performs in each of the management categories. Each of the crop varieties may then be assigned an indicium of the management category for which it is adapted.
- Though automated techniques for seeding, weeding, harvesting the crops etc. have been proposed and implemented, none of the techniques target at maintaining soil fertility. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by the measuring the amount of nutrients present. The presence of nutrients is determined by chemical processes and quantified using sensors. An automated system has been developed for the controlled addition of fertilizers in order to avoid excess/ deficient fertilizers in the soil.

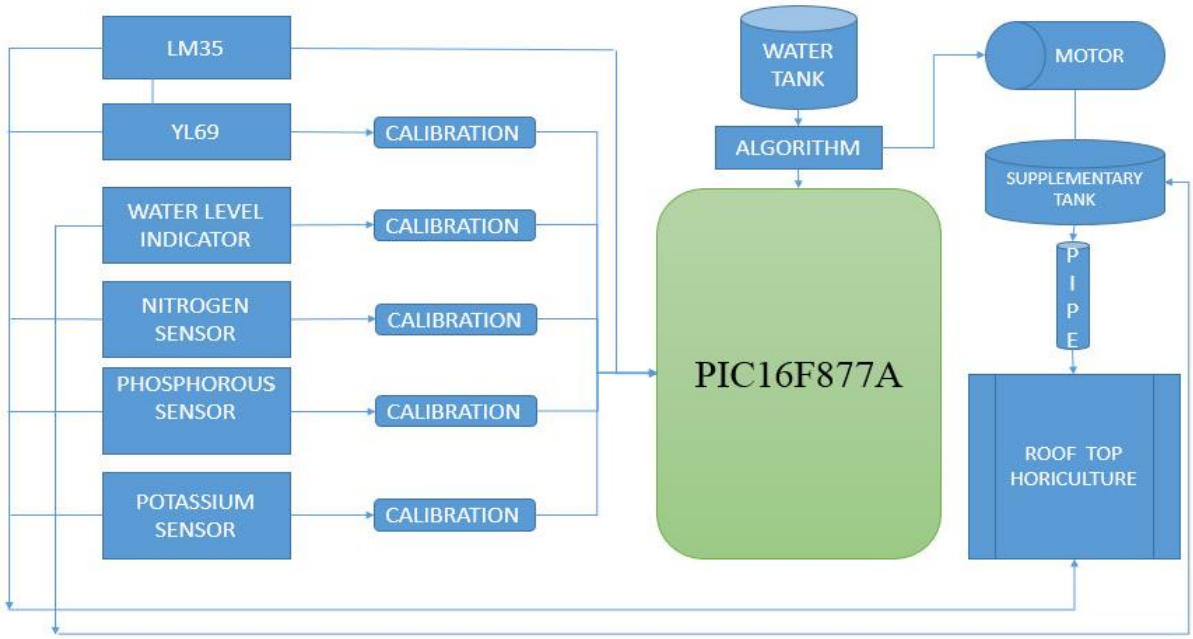
- Use of modern trends and technology promises to provide a solution to the above problem. Though automated techniques for seeding, weeding, harvesting the crops etc. have been proposed and implemented, none of the techniques target at maintaining soil fertility. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by the measuring the amount of nutrients present. The presence of nutrients is determined by chemical processes and quantified using sensors
- Fertigation is the injection of fertilizers, used for soil amendments, water amendments and other water-soluble products into an irrigation system.
- Fertigation is related to chemigation, the injection of chemicals into an irrigation system. The two terms are sometimes used interchangeably however chemigation is generally a more controlled and regulated process due to the nature of the chemicals used. Chemigation often involves insecticides herbicides, and fungicides, some of which pose health threat to humans, animals, and the environment.
- Uses
- Fertigation is practiced extensively in commercial agriculture and horticulture. Fertigation is also increasingly being used for landscaping as dispenser units become more reliable and easier to use. Fertigation is used to add additional nutrients or to correct nutrient deficiencies detected in plant tissue analysis. It is usually practiced on the high-value crops such as vegetables, turf, fruit trees, and ornamentals.
- Commonly used nutrients
- Most plant nutrients can be applied through irrigation systems. Nitrogen is the most commonly used plant nutrient. Naturally occurring nitrogen (N2) is a diatomic molecule which makes up approximately 80% of the earth's atmosphere. Most plants cannot directly consume diatomic nitrogen, therefore nitrogen must be contained as a component of other chemical substances which plants can consume. Commonly, anhydrous ammonia, ammonium nitrate, and urea are used as bioavailable sources of nitrogen. Other nutrients needed by plants include phosphorus and potassium. Like nitrogen, plants require these substances to live but they must be contained in other chemical substances such as monoammonium phosphate or diammonium phosphate to serve as bioavailable nutrients. A common source of potassium is muriate of potash which is chemically potassium chloride.[1] A soil fertility analysis is used to determine which of the more stable nutrients should be used.
- Each crop variety is characterized by how the crop variety performs in each of the management categories. Each of the crop varieties may then be assigned an indicium of the management category for which it is adapted.



Flowchart of Automatic soil nutrient detection and fertilizer dispensary system

- Our roof top cultivation is completely computerized with the assistance of PIC16F877A Microcontroller. As the info, we are utilizing are the profitable 6 sensors to be specific temperature, moisture, N, P, K . As the temperature sensor, which distinguishes the temperature of the soil and excessively climate conditions and moisture which recognizes the in soil and also in environment then the N, P,K sensor which identifies the Nitrogen, Potassium and Phosphorus supplement content in the soil. Subsequent to recognizing the entire vital datum, the sensors forward them to PIC controller then the controller which controls the water stream and manure supplement through the engine and supply to the plants as per the poor of the plants. This procedure, which lessens the human observing framework. The main obligation of the human is to check manure tank. All the 3 compost are put
- Away as fluid in the tank. The water tank is filled for that zone and which includes a moisture sensor arranged

- consequently through the underground bore water. If there should be an occurrence of force cut, when the water tank is void a quick message was sent to the particular proprietor of the house. State-of-the-art data are sending to the individual proprietor day by day. The clarification has been given in the Fig 1. PIC16F877A has 5 ports in which PORT An is appointed for sensor inputs, Port b for motor interfacing, port in the soil in each of the zones and, whenever cross examined, produces an electrical flag corresponding to the level of moisture in the soil proximate that sensor . The microcontroller is coupled in controlling and is viable to occasionally transmit the cross-examination signs to each of the moisture sensors d for lcd show, port e for control pins of LCD.
-



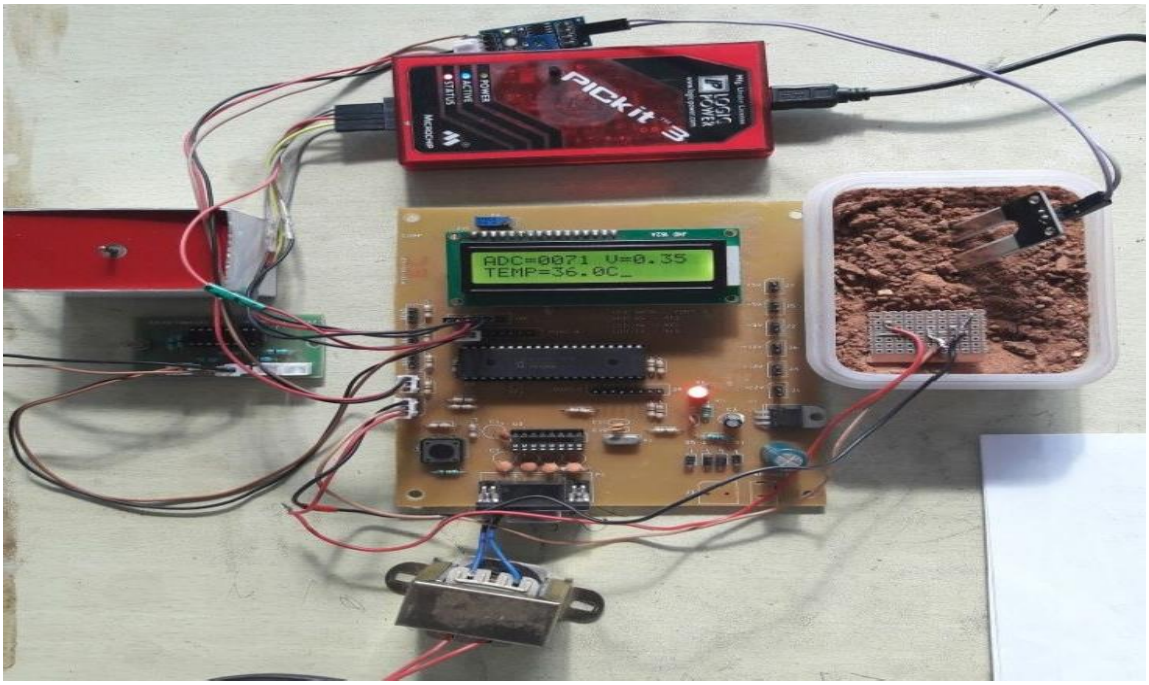
Block diagram of Automatic soil nutrient detection and fertilizer dispensary system

➢ STUDY OF CROPS

- The prerequisites for development of different products at the distinctive seasons were examined. The temperature and
- Moisture are two fundamental parameters which impacts the development of the harvest . Thus, the significance is given to both of this parameter. Each harvest requires diverse temperature and moisture levels at different stages. In any case, there is ideal scope of qualities in . The temperature and moisture are the between related parameter. At the point when the soil temperature expands, soil moisture diminishes. Consequently, the examination of these both parameter can be utilized for the better yield of products. The temperature and moisture level of the different tomato, chilies, beans, greens in examined. yields, for example, sugarcane were

➢ WORKING OF THE SYSTEM

➢ The zone which is to be flooded will be separated into majority of discrete zones of conceivable distinctive soil conditions, where each zone incorporates no less than one sprinkler head, soaker hose or, then again other water apportioning gadget and a valve having an "on" state and an "off" state for controlling the stream of water to such gadget away as fluid in the tank. The water tank is filled for that zone and which includes a moisture sensor arranged consequently through the underground bore water. If there should be an occurrence of force cut, when the water tank is void a quick message was sent to the particular proprietor of the house. State-of-the-art data are sending to the individual proprietor day by day. The clarification has been given in the Fig 1. PIC16F877A has 5 ports in which PORT An is appointed for sensor inputs, Port b for motor interfacing, port in the soil in each of the zones and, whenever cross examined, produces an electrical flag corresponding to the level of moisture in the soil proximate that sensor . The microcontroller is coupled in controlling and is viable to occasionally transmit the cross-examination signs to each of the moisture sensors .



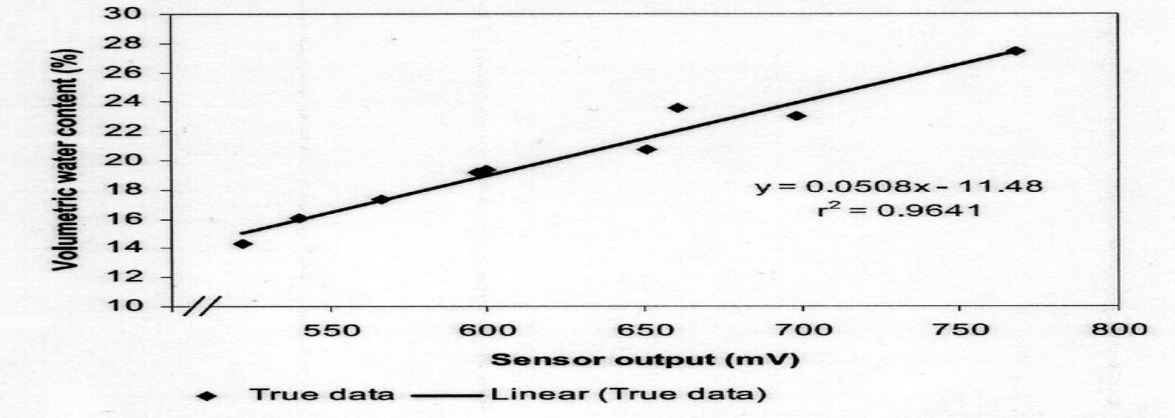
Prototype Model of the System

- The moisture sensors then react by transmitting the previously mentioned electrical flag tothe microcontroller. The microcontroller incorporates hardware and programming for specifically activating the valves in the majority of zones The prerequisites for development of differen products at the distinctive seasons were examined. The temperature and to an "on" state at foreordained circumstances amid a week after week time frame, unless the moisture sensor for that. given zone shows

a foreordained adequate level of moisture display. Subsequently, the microcontroller actuates each of the valves on a given watering day for a foreordained watering interim start with the pre-modified begin time and enduring for a pre-modified interim unless that interim is abbreviated in a specific zone where the moisture sensor for that zone demonstrates that the foreordained adequate level of moisture has been obtained in field.

➢ RESULTS

- The output of LM35 - Precision Centigrade Temperature Sensor is in the form of analog. The input supply voltage is 5 volts. The output will be in the form of voltage. The room temperature is 29



- **Fig soil temperature monitoring**
- degree Celsius. The output will be in millivolts, 290 millivolts. This analog is converted to digital data through ADC0808. It is directly connected to microcontroller. Its calibration is simple and easy. The output value of temperature sensor is displayed in the LCD. Figure.4. The soil moisture sensor is specifically associated with the microcontroller. The info supply voltage given to the sensor is 3-10 volts. The yield voltage is in computerized frame. The advanced information is straightforwardly sent to the controller. As per the dampness level of field, the water is provided to the field. In the event that the dampness level of the field is low, then the water is streamed to the field. When it achieves the level, consequently microcontroller shuts the valve in. The water source to plants and bushes at a painstakingly controlled rate by a method for adaptable tubing with modest drippers, sprayers, hoses, and bubblers connected to it. This framework is prudent, proficient and mechanized

➢ Advantages of the Proposed Circuit

- Smart irrigation systems offer a variety of advantages over traditional irrigation systems. Smart irrigation systems can optimize water levels based on things such as soil moisture and weather predictions. This is done with wireless moisture sensors that communicate with the smart irrigation controls and help inform the system whether or not the landscape is in need of water.

- Additionally, the smart irrigation controlled receives local weather data that can help it determine when a landscape should be watered. If you have ever returned home during a storm only to see your sprinklers spraying water you know how beneficial this is. Rather than wasting water resources and your valuable money on watering your landscape you can take advantage of the nature moisture from the storm and save that water for another day when it is more needed. The advantages of these smart irrigation systems are wide reaching.
- The smart irrigation system will help you have better control of your landscape and irrigation needs as well as peace of mind that the smart system can make decisions independently if you are away. You will save a significant amount of money on your water bills because through intelligent control and automation, your smart irrigation system will optimize resources so that everything gets what it needs without needless waste. Additionally, we have all seen many places in the country that have experienced droughts and we know that our water resources are precious.

➢ Disadvantages of the proposed Circuit

- The primary disadvantage associated with a smart irrigation is the expense. These systems can be quite costly depending on the size of the property. Furthermore, portions of the lawn will have to be dug up to install pipework and attach it to the plumbing system of the home. This can equate to days or weeks without use of the yard. Afterward, the landscaping will have to be repaired.
- It is best to install an irrigation system before installing sod or extensive landscaping because some of it will have to be torn up. Homeowners who already have pristine yards may be turned off by this reality.
- Even the most efficient smart systems can have their pitfalls. Wind can wreak havoc on sprinklers, directing water in the wrong direction. Underground pests may damage water-delivery systems, resulting in water pooling or broken parts. The repairs to fix an irrigation system can be much more costly than replacing a damaged garden hose.

➢ CONCLUSION

- Normal soil supplements fundamental for plants development and yield like NPK, moisture have been examined at different temperature and various atmosphere condition the framework which indicate positive outcome for the better development and yield of plants. This framework can be further enhanced by dissecting more soil supplement like Sulfur, calcium, press, zinc and so on. In this way, the change of different middle of the road and micronutrients may create the yield for different plants for enhancing diverse product assortments.
- The Microcontroller based dribble water system framework screens and controls every one of the exercises of trickle water system framework productively.
- The moisture of the soil and the temperature of the environment will be measured and water is provided to the product as needs be which avoids water stopping up. This framework spares water on the grounds that the water is specifically encouraged to the root and the nature of the product gets made strides. It likewise helps in efficient, evacuation of human error in changing accessible soil moisture levels and

to expand their net benefit. After nitrogen, phosphorus is presumably the component well on the way to be insufficient in soils.

- The soil mineral apatite is the most widely recognized mineral wellspring of phosphorus. While there is by and large 1000 lb. of phosphorus for every section of land in the dirt, it is for the most part inaccessible as phosphates of low dissolvability. Add up to phosphorus is around 0.1 percent by weight of the dirt, yet just a single percent of that is accessible. Of the part, accessible, the greater part originates from the mineralization of natural matter. Maybe horticultural fields ought to be treated to compensate for the phosphorus that has been expelled in yield.

➢ **Cost Estimation of the Circuit**

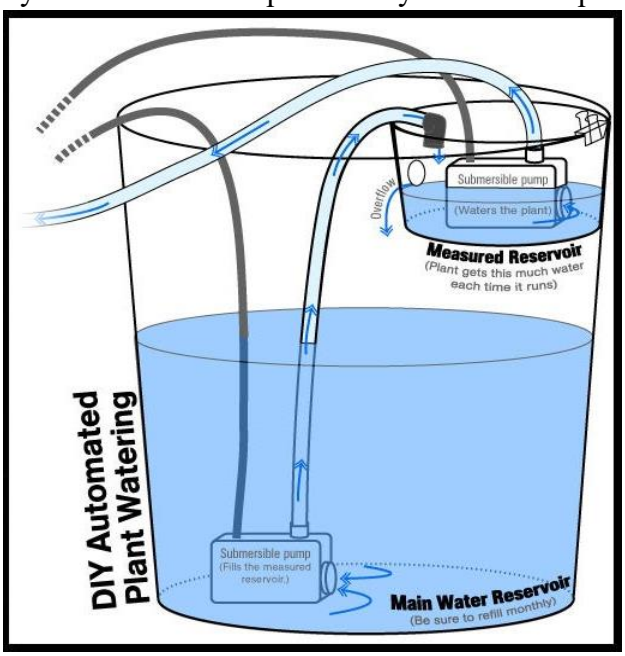
Sr No	Components	Price
1	Microcontroller P89V51RD2	750
2	Liquid Crystal Display	233
3	Analog to Digital Converter	250
4	Signal Conditioning	2500
5	NPK Sensor	2000
6	DS18B20	280
7	Soil Moisture Sensor	210
8	**Total**	**6223**

➢ 13.1.8 Automatic Plant Irrigation System

Introduction: A plant watering system is provided that includes a control module; at least one water valve in communication with the control module; and at least one weight sensor in communication with the control module. The control module is operable in at least one embodiment at least to: receive a signal from the at least one weight sensor corresponding to a weight of a plant measured by the at least one weight sensor; store a low weight and a high weight associated with each of the at least one weight sensors; and communicate a control signal to the at least one water valve that opens the at least one water valve at the low weight and closes the at least one water valve at the high weight.

- Here is a simple project more useful in watering plants automatically without any human interference. We may call it as Automatic plant irrigation system. We know that people do not pour the water on to the plants in their gardens when they go to vacation or often forget to water plants. As a result, there is a chance to get the plants damaged. This project is an excellent solution for such kind of problem

- A plant watering system is provided that includes a control module; at least one water valve in communication with the control module; and at least one weight sensor in communication with the control module. The control module is operable in at least one embodiment at least to: receive a signal from the at least one weight sensor corresponding to a weight of a plant measured by the at least one weight sensor; store a low weight and a high weight associated with each of the at least one weight sensors; and communicate a control signal to the at least one water valve that opens the at least one water valve at the low weight and closes the at least one water valve at the high weight.
- the main function of the inverter is to give the complemented output for its input i.e. it will give output which is opposite to input. For example, if the input is low to the inverter, then the output will be high. Just like the normal inverter which gives high output when the input is low and gives low output when the input is high. 7404 IC will be having six independent inverters; Operating supply voltage is around
- The present application relates to plant watering systems and more particularly automated plant watering systems.
- A number of plant automated systems have been proposed. Some, for example, water plants based on moisture content of the soil. The moisture content may be measured directly or may be estimated by weight. Weight actuated mechanical valves have also been proposed. These systems, however, have numerous drawbacks. For instance, these systems maintain constant moisture in the soil of the plants, which is not suitable for all plants and may cause the plants to rot at the roots. Accordingly, there is a need for an automated watering system that is not so limited.
- A plant watering system is provided that includes a control module; at least one water valve in communication with the control module; and at least one weight sensor in communication with the control module. The control module is operable in at least one embodiment at least to: receive a signal from the at least one weight sensor corresponding to a weight of a plant measured by the at least one weight sensor; store a low weight and a high weight associated with each of the at least one weight sensors; and communicate a control signal to the at least one water valve that opens the at least one water valve at the low weight and closes the at least one water valve at the high weight.

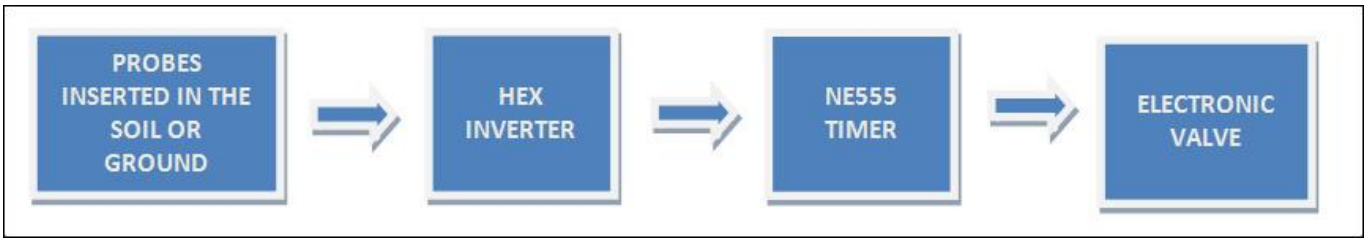


AUTOMATIC PLANT IRRIGATION DIAGRAM

➢ Components of Automatic Plant Irrigation System

1. **Hex Inverter 7404:** the main function of the inverter is to give the complemented output for its input i.e. it will give output which is opposite to input. For example, if the input is low to the inverter, then the output will be high. Just like the normal inverter which gives high output when the input is low and gives low output when the input is high. 7404 IC will be having six independent inverters; Operating supply voltage is around 4.75V minimum to 5.5V maximum, normal supply voltage is 5V. They are used in different applications like inverting buffers, drivers, hex inverters etc. 7404 IC will be available in different packages like DIP (dual inline package), QFP (Quad Flat Package) etc. The pin configuration of Hex Inverter 7404 is shown below.
2. **Arduino Nano R3**: The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3. It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.
3. **capacitive soil moisture sensor:** capacitive soil moisture sensors use the working principle of a capacitor to approximate the moisture content in soil. Capacitance is defined as the amount of charge a material can store under a given applied electrical potential_Capacitive sensors are most often used to measure the change in position of a conductive target. But capacitive sensors can be effective in measuring presence, density, thickness, and location of non-conductors as well. Non-conductive materials like plastic have a different dielectric constant than air.
4. **Relay Module (Generic):** A power relay module is an electrical switch that is operated by an electromagnet. When the relay is de-energized, the sets of contacts that were closed, open and breaks the connection and vice versa if the contacts were open. The relay is the device that open or closes the contacts to cause the operation of the other electric control. It detects the intolerable or undesirable condition with an assigned area and gives the commands to the circuit breaker to disconnect the affected area. Thus protects the system from damage.
5. **Resistors:** A resistor is a passive two-terminal electrical circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses. Resistor is an electrical component that reduces the component that implements electrical resistance as a circuit element. In electronic electric current. The resistor's ability to reduce the current is called resistance and is measured in units of ohms (symbol: Ω). If we make an analogy to water flow through pipes, the resistor is a thin pipe that reduces the water flow. High-power resistors that can dissipate many watts of electrical power as heat, may be used as part of motor controls, in power distribution systems, or as test loads for generators. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage. Variable resistors can be used to adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

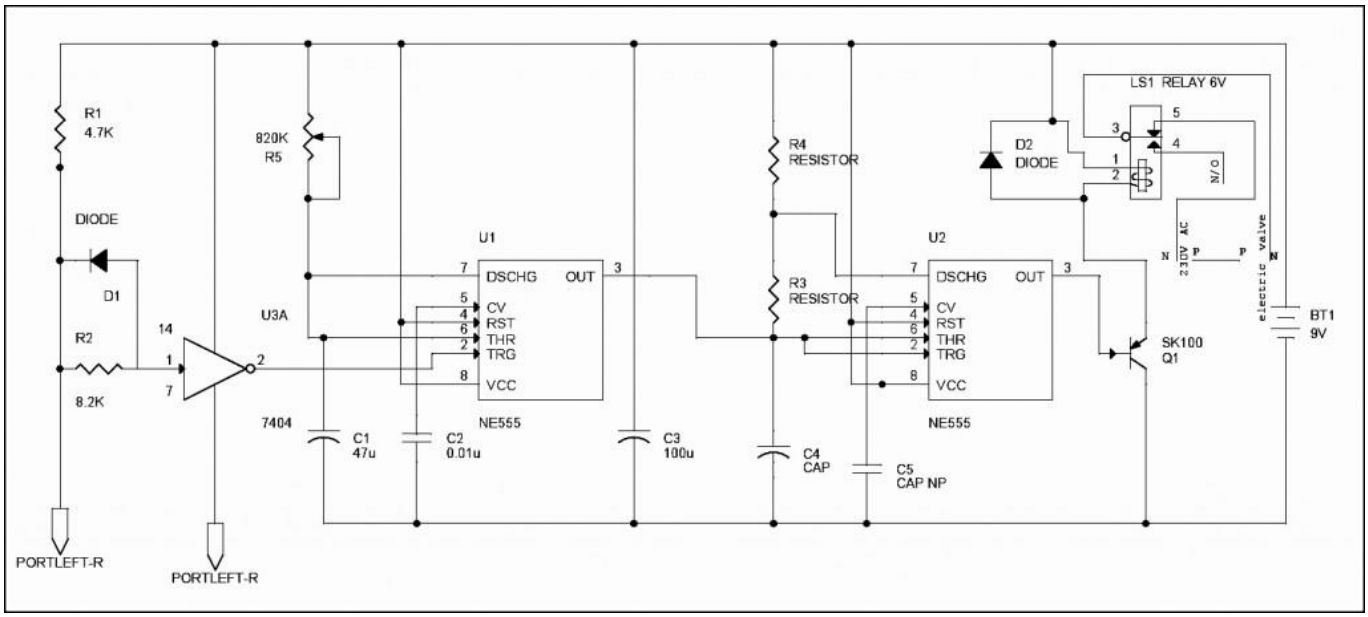
6. Block diagram of Automatic Plant Irrigation System



➢ Working of Automatic Plant Irrigation System

- Circuit is not that much complicated. We use the basic concept in this circuit i.e. soil have high resistance when it is dry and has very low resistance when it is wet.
- By using this concept we will make the system work. We insert two probes in the soil in such a way that that they will conduct when the soil is wet and they will not conduct when the soil is dry. So, when the probes do not conduct, system will automatically detect this condition with the help of HEX inverter which will become high when the input is low.
- HEX inverter will trigger the NE555 Timer and this NE555 timer will trigger another NE555 which is connected to the output of first NE555. Now the second NE555 which is configured as astable multivibrator will help to switch on the Electric valve and as result, it will allow the water to flow to the soil.
- When the soil is dry it will produce large voltage drop due to high resistance. This is sensed by 7404 hex inverter and makes the first NE555 timer trigger which is configured as monostable multivibrator with the help of a electrical signal.
- When the first NE555 is triggered at pin 2, it will generate the output at pin 3 which is given to the input of second NE555 timer. The second 555 timer is configured as astable multivibrator which got triggered by the first 555 timer and will generate the output and drive the relay which is connected to the electrically operated value through the transistor SK100. You can use a heat sink for SK100 transistor if it is dissipating more heat.
- The relay is the device that open or closes the contacts to cause the operation of the other electric control. It detects the intolerable or undesirable condition with an assigned area and gives the commands to the circuit breaker to disconnect the affected area. Thus protects the system from damage.

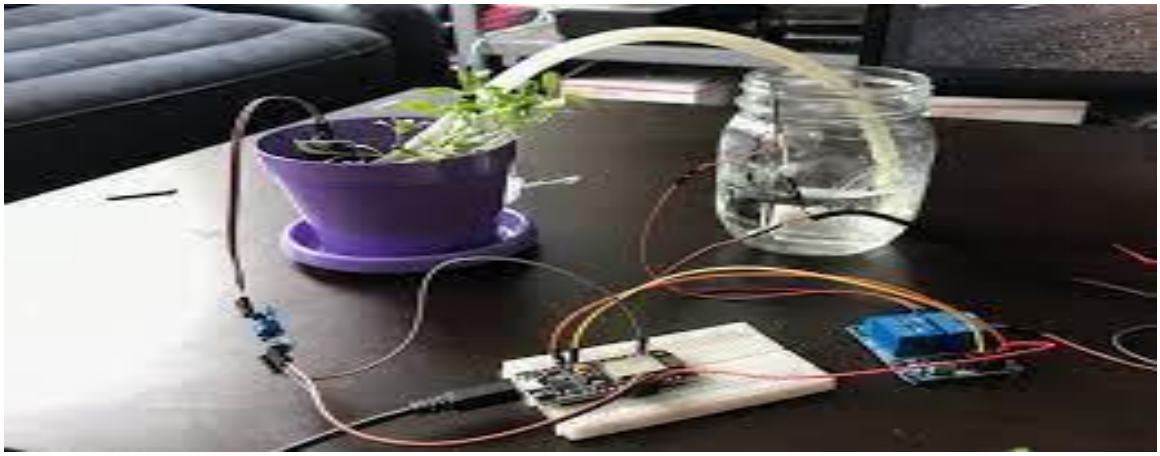
- When the water wet the soil, probes will again conduct and make the output of 7404 low which will make the first NE555 to low and also drive remaining circuit to low. So, automatically it will switch.



CIRCUIT DIAGRAM OF AUTOMATIC PLANT IRRIGATION

- We are all well aware that the plants will die due to lack of water in the soil. Soil will have high resistance when it is dry and it will have very low resistance when soil is wet. We use this simple logic to water the plants and make the circuit work.
- Two probes which are connected to the circuit are placed into the soil. The two probes will conduct only when soil is wet (resistance is low) and they cannot conduct when soil is dry due to high resistance. The voltage is given to the probes to conduct is given from the battery connected to the circuit.
- When the soil is dry it will produce large voltage drop due to high resistance. This is sensed by 7404 hex inverter and makes the first NE555 timer trigger which is configured as monostable multivibrator with the help of a electrical signal.
- When the first NE555 is triggered at pin 2, it will generate the output at pin 3 which is given to the input of second NE555 timer. The second 555 timer is configured as astable multivibrator which got triggered by the first 555 timer and will generate the output and drive the relay which is connected to the electrically operated value through the transistor SK100. You can use a heat sink for SK100 transistor if it is dissipating more heat.
- The output of second NE555 timer will switch on the transistor SK100 which will drive the relay. Relay which is connected to the input of electrical value and output of value is given to the plant plots through the pipe.

- When transistor has turned on relay, it will open the valve and water is poured on to the plants pot. When the water content in the soil is increased, the resistance in the soil will get decreased and conduction of the probes will get started which will make the 7404 Inverter to stop the triggering of first 555 timer. Ultimately it will stop the electrical valve which is connected to the relay. Variable resistor (R5) and capacitor (C1) are used to adjust the valve when to we want to conduct the probes.
- The capacitor C5 (0.01uf) is used to ground, the CV pin of second NE555 timer. C3 will remove the AC noise and allow only DC to the remaining circuit. C4 and R3 will constitute to configure the NE55 in astable multivibrator.



CIRCUIT CONNECTION OF DESIGN

➢ Advantages of Automatic Irrigation System

➢ Automation: Aside from meeting with the irrigation contractor, paying the bill, and flipping a switch – an automatic system requires no manual exertion. You don't even hav to be home when your lawn is watered.

- Cost effective: Automatic irrigation systems provide water to your lawn exactly where and when it is needed, which cuts down utility bills significantly, and offsets the initial cost of setup. In fact, automatic sprinklers ultimately end up paying for themselves within years, and can even boost your property value.
- Efficient: Perhaps the most appealing benefit of an automatic irrigation system is that it conserves water. Say goodbye to dry patches and thoroughly watered sidewalks or driveways. Automatic systems provide precise coverage, eliminating concerns of over or underwatering your lawn. Timers can be set for daily or weekly watering, and at times of low evaporation. Additionally, "smart" moisture sensors can be installed for many systems. These measure precipitation rates in real time, and activate only when your soil is dry.

- Professional installation and routine maintenance: Many irrigation contractors now use a vibratory plow for swift installation and minimal disruption to a lawn that leaves virtually no trace that the soil was even disturbed. A professional contractor will also provide crucial winterization services – blowing all water out of your pipes and sprinkler heads prior to winter each year, and will subsequently offer spring startup and other routine inspections.

➢ Disadvantages of Automatic Irrigation System

- The disadvantages of irrigation systems usually arise from poor design or inefficient installation. A sub-optimal irrigation system can lead to water waste, overwatering or underwatering of your garden.
- To get the most out of an irrigation system, it is important to choose the right one for your property, the climate you live in and the plants in your garden. If you need assistance with this, the team at Luke's Landscaping are experts in designing, installing and maintaining Reticulation Perth gardens thrive with.
- The primary disadvantage associated with a sprinkler system is the expense. These systems can be quite costly depending on the size of the property. Furthermore, portions of the lawn will have to be dug up to install pipework and attach it to the plumbing system of the home. This can equate to days or weeks without use of the yard. Afterward, the landscaping will have to be repaired.
- It is best to install an irrigation system before installing sod or extensive landscaping because some of it will have to be torn up. Homeowners who already have pristine yards may be turned off by this reality.
- Even the most efficient sprinkler systems can have their pitfalls. Wind can wreak havoc on sprinklers, directing water in the wrong direction. Underground pests may damage water-delivery systems, resulting in water pooling or broken parts. The repairs to fix an irrigation system can be much more costly than replacing a damaged garden hose.
- Irrigation systems have their advantages and disadvantages, and homeowners should weigh their options before installing a new system.

➢ Conclusion of the Proposed Designs

- Automatic system using a microcontroller, moisture sensorand other electronic tools were been developed. It was observed that the proposed methodology controls the moisture content of the soil of cultivated land. The motor automatically start pumping water if the soil is dry and need water and stops when the moisture content of the soil is maintained as require
- Thus, there is minimal waste of water. The system also allows the delivery to the plant when needed based on the type of plant, soil moisture, and observed temperature. The proposed work minimize the efforts of major agricultural regions. Many aspects of the system can be customized and used software to fine-tune the requirements of the plant. The result is a scalable, supporting technology. Using this sensor, we can see that the soil is wet or dry. If it is dry, the motor will automatically start pumping

➢ Cost Estimation of the Circuit

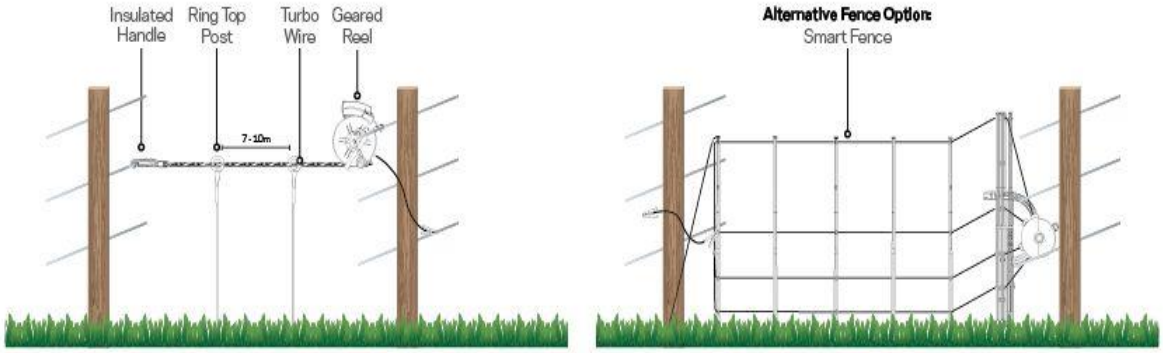
SR. NO.	COMPONENTS	PRICE
1	Hex Inverter 7404	350
2	Arduino Nano R3	350
3	Capacitive soil moisture sensor	210
4	Relay Module	275
5	Resistors	150
6	**Total**	**1335**

- Thus, there is minimal waste of water. The system also allows the delivery to the plant when needed based on the type of plant, soil moisture, and observed temperature. The proposed work minimizes the efforts of major agricultural regions. Many aspects of the system can be customized and used software to fine-tune the requirements of the plant. The result is a scalable, supporting technology. Using this sensor, we can see that the soil is wet or dry. If it is dry, the motor will automatically start pumping

13.1.9 Smart Fence

Introduction: A remotely controlled fence includes one or more sensors for sensing an unauthorized entry; an image capturing device to capture the image of the unauthorized object; a speaker; a microphone; a humidifier to create a chill out area; a display unit for showing the weather temperature of the surroundings; a radio FM device for a musical chanson and a medium for news to the listener; a lighting unit; solar panel hoods; and a communication interface to transmit the related information to the user, the fence is optimized to control all functions using a mobile app or a web technology with a user interacting device such as a computer, tablet, smartphone and the like.

A fenced area may also secure a public or commercial site from the possibility of theft and/or espionage. High value assets are frequently protected by wire fences or solid walls, but are susceptible to security loop holes and the fence can be surmounted or penetrated by a determined intruder. Thus, various high value assets owned by the military, government, utility companies, corporations or private entities may be at risk ; a display unit for showing the weather temperature of the surroundings; a radio FM device for a musical chanson and a medium for news to the listener; a lighting unit; solar panel hoods; and a communication interface to transmit the related information to the user, the fence is optimized to control all functions using a mobile



Rough Diagram of Smart Fence

- Generally, fences are made from common materials such as wood. Albeit, wooden fences typically have an attractive initial appearance, but maintaining that initial appearance may require significant investment and restoration because of weathering. Accordingly, the rotted or damaged portion of the fence may have to be repaired or replaced. Thus, conventional wooden fences frequently require periodic maintenance, which is time consuming and may be relatively expensive. In addition, the fence may be compromised in securing the protected area.
- A fenced area may also secure a public or commercial site from the possibility of theft and/or espionage. High value assets are frequently protected by wire fences or solid walls, but are susceptible to security loop holes and the fence can be surmounted or penetrated by a determined intruder. Thus, various high value assets owned by the military, government, utility companies, corporations or private entities may be at risk.
- The aforementioned prior art and other conventional fencing systems or methods aim to achieve a sufficient level of security. However, these solutions also include a number of limitations and shortcomings. The above mentioned prior art are limited in surveillance capability by limiting the monitoring of objects confined to a defined and targeted area, such as a limited perimeter of the fence. In some cases, the fencing system is outfitted with detection equipment such as a camera or other like imaging. The camera may be linked to a controller and/or computing system. However, these systems and methods have an inability to capture a plurality of images or panorama of an intruding object within a determined vicinity of the electric fence system. Furthermore, these electric fence systems lack a system of integrated sensors to monitor and determine a location of an object into the monitored area. In general, these systems provide an insufficient level of security and are unable to accommodate real time user control and most often include a stand-alone monitoring system that is not able to be remotely controlled by a user. Thus, such conventional methods lack real time human intervention from a device in a remote location such as by using a mobile application or another internet based technology.

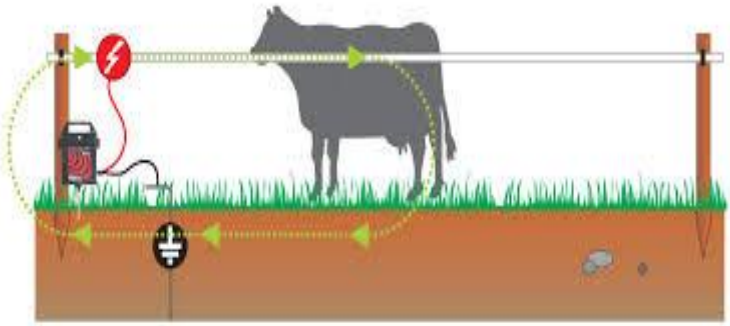
- Accordingly, there remains a need in the prior art to improve conventional fencing for an improved level of security by monitoring and controlling the fenced area remotely by a mobile app or internet based technology.

➢ Components of Smart Fence

Before we get on to how an electric fence works it is important to know what the main components of an electric fence are. An electric fence can be powered from mains, battery or battery & solar panel. So in very general terms the components below are what you would need for each system:

Battery System

- battery (preferably 12v leisure battery)
- energizer
- an earth stake or spike
- polywire, galvanized wire, rope, tape or netting
- posts and/or insulators



Representation of Smart Fence

Mains System

- energiser
- an earth stake or spike
- length of lead out cable (to run from energiser to fence)
- crocodile clips
- cut out switch (optional, useful if your energiser is a long way from your fence and you want to be able to turn your fence off at the fence)
- polywire, galvanised wire, rope, tape or netting
- posts and/or insulators

- Electric fences are designed to create an electrical circuit when touched by a person or animal. A component called a power energizer converts power into a brief high voltage pulse. One terminal of the power energizer releases an electrical pulse along a connected bare wire about once per second. Another terminal is connected to a metal rod implanted in the earth, called a ground or earth rod. A person or animal touching both the wire and the earth during a pulse will complete an electrical circuit and will conduct the pulse, causing an electric shock. The effects of the shock depend upon the voltage, the energy of the pulse, the degree of contact between the recipient and the fence and ground and the route of the current through the body; it can range from barely noticeable to uncomfortable, painful or even lethal.
- Smooth steel wire is the material most often used for electric fences, ranging from a fine thin wire used as a single line to thicker, high-tensile (HT) wire. Less often, woven wire or barbed wire fences can be electrified, though such practices create a more hazardous fence, particularly if a person or animal

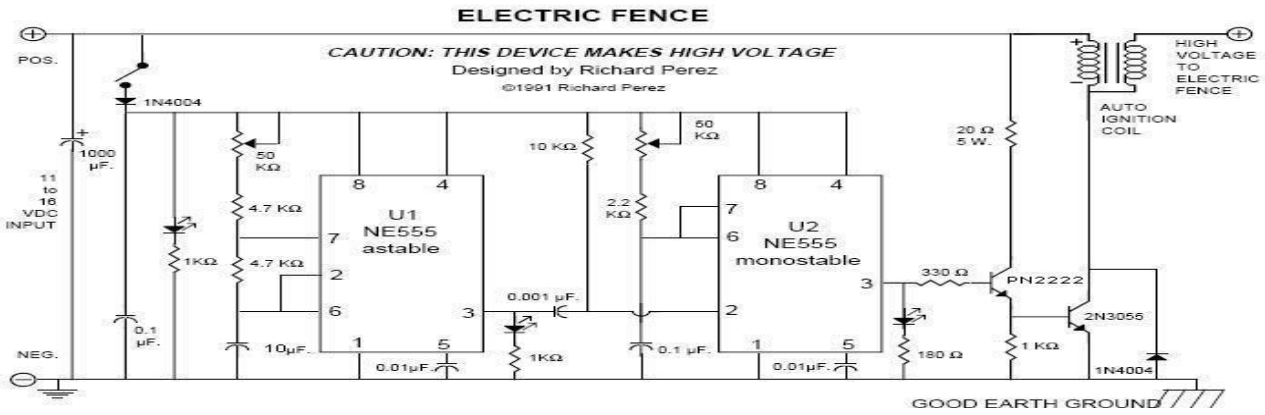
becomes caught by the fencing material (electrified barbed wire is unlawful in some areas). Synthetic webbing and rope-like fencing materials woven with fine conducting wires (usually of stainless steel) have become available over the last 15 to 20 years, and are particularly useful for areas requiring additional visibility or as temporary fencing.

- The electrified fence itself must be kept insulated from the earth and from any materials that will conduct electricity and ignite or short out the fence. Fencing must therefore avoid vegetation, and cannot be attached directly to wood or metal posts. Typically, wooden or metal posts are driven into the ground and plastic or porcelain insulators are attached to them, or plastic posts are used. The conducting material is then attached to the posts.

➢ Working of Smart Fence

- An electric fence energizer converts mains or battery power into a high voltage pulse. The energizer releases this pulse on to an insulated fence line about once every second. The pulse itself is only around 150 microseconds long.
- This pulse is commonly referred to as the "shock" and is felt by any animal which touches an electrified fence. When the animal makes contact with the fence the circuit is complete. It is at this point the animal receives a shock. The diagram below shows how the current flows from the energizer down the fenceline and through the animal. The current then flows through the earth back to the ground system and completes the circuit. It is the shock which deters the animal from putting pressure on the fence line.
- "Weed burner" fence chargers were popular for a time and featured a longer-duration output pulse that would destroy weeds touching the fence. These were responsible for many grass fires when used during dry weather. Although still available, they have declined in popularity.
- Most modern fences emit pulses of high voltage at a given interval of time, and don't take into account whether there is an animal or person touching the conductive wires, except for the voltage multiplier based electric fence charger that stores high voltage potential and dumps its charges as soon as a conductive load (grounded animal/person) touches the wires.

- An electric fence is a psychological barrier rather than a physical one so the animal must be educated to respect the fence. The pain that an animal feels is short lived and does not physically harm the animal, unlike barbed wire which can cause severe cuts and long lasting pain whilst also damaging the hide.



CIRCUIT DIAGRAM OF SMART FENCE

- Smart Fence consists of multiple horizontal twisted barbed wires, typically separated in 5 - 20 cm (2 - 8 in.) intervals and stretched along a typical segment of 50 meters (164 ft.). A solid state, self-balancing sensor and processor are located in the middle of each segment, collecting signals from all wires simultaneously. Power and communication are provided through a single cable
- connecting all segments into a single managed and controlled system - this combination serves as the backbone for the full length of a fence.
- In the view of the shortcomings described in the electric fence systems of the prior art, the present disclosure provides an improved remotely controlled electronic "smart" fence. As such, the general purpose of the present disclosure, which will be described subsequently in detail, is to provide a new and improved remotely controlled electronic fence further comprising one or more means for deterring an unwanted intruder, animal, and/or object. Further, the remotely controlled electronic smart fence may include system components for creating a pleasing environment including but not limited to musical audio and/or a lighting unit system.
- The further inventive aspects can be embodied in a remotely controlled electronic smart fence system using a mobile app or web connectivity. The at least one remotely controlled application may include multiple functionalities such as, by not limited to, a noise tailored to deter an intruder, animal, and/or object. A further functionality may include control of a lighting system, and/or a musical audio system. The electronic smart fence is intended to be interactive and operable using varied and updatable applications as a need arises.
- The other inventive aspects can be embodied in an electronic fence apparatus that comprises at least one of a means for sensing, an image capturing device, a speaker, a microphone, a humidifier, a display

unit, a display interface, a radio FM device, a lighting system and/or unit, at least one solar panel unit such as one or more solar panel hoods used in conjunction with an electrical power system, and a communication system and/or a communication system interface. Further, the multiple functionalities of the fencing system may be optimized for remote control that uses a mobile app or internet-based communication technology with a user interfacing device such as computer, tablet, smartphone, and other like devices.

- Smooth steel wire is the material most often used for electric fences, ranging from a fine thin wire used as a single line to thicker, high-tensile (HT) wire. Less often, woven wire or barbed wire fences can be electrified, though such practices create a more hazardous fence, particularly if a person or animal becomes caught by the fencing material (electrified barbed wire is unlawful in some areas). Synthetic webbing and rope-like fencing materials woven with fine conducting wires (usually of stainless steel) have become available over the last 15 to 20 years, and are particularly useful for areas requiring additional visibility or as temporary fencing.
- Early alternating current (AC) fence chargers used a transformer and a mechanically driven switch to generate the electrical pulses. The pulses were wide and the voltage unpredictable, with no-load peaks in excess of 10,000 volts and a rapid drop in voltage as the fence leakage increased. The switch mechanism was prone to failure. Later systems replaced the switch with a solid-state circuit, with an improvement in longevity but no change in pulse width or voltage control.
- "Weed burner" fence chargers were popular for a time and featured a longer-duration output pulse that would destroy weeds touching the fence. These were responsible for many grass fires when used during dry weather. Although still available, they have declined in popularity.
- Most modern fences emit pulses of high voltage at a given interval of time, and don't take into account whether there is an animal or person touching the conductive wires, except for the voltage multiplier based electric fence charger that stores high voltage potential and dumps its charges as soon as a conductive load (grounded animal/person) touches the wires.
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- connecting all segments into a single managed and controlled system - this combination serves as the backbone for the full length of a fence
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- Depending on the area to be fenced and remoteness of its location, fence energizers may be hooked into a permanent electrical circuit, they may be run by lead-acid or dry cell batteries, or a smaller battery

kept charged by a solar panel. The power consumption of a fence in good condition is low, and so a lead-acid battery powering several hundred metres of fence may last for several weeks on a single charge. For shorter periods dry cell batteries may be used. Some energizers can be powered by more than one source

➢ Advantages of Smart Fence

• Combines high-performance sensor with a physical barrier
• Low maintenance costs
• Unaffected by Electromagnetic Interference / Radio Frequency Interference (EMI / RFI)
• Operates in wide variety of environments including desert conditions, severe storms, humid climates and snow-covered areas
• The system has less than 1 false alarm per kilometer per 3 months
• Constant sensitivity
• Simple integration with control unit - power and data on one cable

- Some of the advantages to installing an electric fence are, to start with, it's an excellent security deterrent to burglary, vandalism and trespassing. Also, they are very easy to build due to their lighter material construction, and the maintenance involved is very minimal. Another big advantage is that it is a very durable style of fencing, one that you can trust in to last for many years. There are also many specialised selections that you can opt for to make sure that the fence suits your needs exactly.
- Electric fences are cheap compared to other fences. They can be made with inexpensive wire, a low-cost fencer (the unit that sends pulsed voltage through the wire), steel rods and affordable plastic insulators. A fence can be put up in a few hours or less, and it will suffice for basic livestock and animal control.
- They are easy to build or add to an existing structure. It doesn't take an electrician to install a fence, and if you can set fence posts, you can electrify a field or garden. No special tools are required, and you don't have to worry about how perfectly straight the fence is, or even the tension on the wire. If you already have a fence installed, then simply fasten some insulators to the existing structure and run your wire, and you are good to go.

➢ Disadvantages of Smart Fence

- One of the major disadvantages of having an electric fence installed is that it requires regular maintenance. There are many rules and regulations involved, one that you need to check with local council to ensure even installing one is approved. Another is that you must constantly maintain the surrounding plant life. If trees and grass are not properly trimmed back they could be considered a fire hazard. You also need to ensure that the fence has been properly grounded otherwise it may become hazardous or ineffective.

- They require a working power source. If you have access to the grid, that's great, and your fence is ready to go. If you make your own power, then you will need to integrate them to solar power or another source. The power consumption is still low, but it is a constant low-level drain you must keep in mind.
- An electric fence must be maintained. Broken or damaged insulators can leak current, poorly grounded fencers can fail to perform, weeds and vegetation on wires can drain the voltage and negate the entire purpose of the fence, and a scared animal can run right through the fragile wire if they are spooked enough.
- **Cost Estimation of the Circuit**

• SR. NO.	COMPONENTS	PRICE
1	Battery (preferably 12v leisure battery)	895
2	Energizer.	2500
3	Earth stake or spike.	600
4	Polywire, galvanized wire, rope, tape or netting.	300
5	Posts and/or insulators.	500
6	**Total**	4795

13.2 Reason for Student Recommending this Design

- **Public garden**: in village there are no children playground and also dirty lake passes through near village so, they didn't get fresh air and children plays the near that dirty lake so, they are children so many times ill. A public garden is an institution that maintains collections of plants for the purposes of public education and enjoyment, in addition to research, conservation, and higher learning. That's why we plan to design public garden lake opposite direction in village
- **Community hall**: in village there are no community hall for deciding village social activity or public Information. Community centres or community halls are public locations where members of

a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. So, we plan to design one community hall near the kanera village.

- **Rain water harvesting**: When combined with other sustainable technologies, rainwater harvesting systems can help secure planning permission and in some areas of the UK – where the mains water simply cannot support increased demand - it could be a necessity. Harvesting rainwater has become a serious consideration for all new build or refurbishment projects.
- **Automatic soil nutrient detection and fertilizer dispensary system:** Additionally, the smart irrigation controlled receives local weather data that can help it determine when a landscape should be watered. If you have ever returned home during a storm only to see your sprinklers spraying water you know how beneficial this is. Rather than wasting water resources and your valuable money on watering your landscape you can take advantage of the nature moisture from the storm and save that water for another day when it is more needed. The advantages of these smart irrigation systems are wide reaching.
- **Automatic Plant Irrigation System:** Efficient: Perhaps the most appealing benefit of an automatic irrigation system is that it conserves water. Say goodbye to dry patches and thoroughly watered sidewalks or driveways. Automatic systems provide precise coverage, eliminating concerns of over or underwatering your lawn. Timers can be set for daily or weekly watering, and at times of low evaporation. Additionally, “smart” moisture sensors can be installed for many systems. These measure precipitation rates in real time, and activate only when your soil is dry.
- **Smart Fence:** Electric fences are cheap compared to other fences. They can be made with inexpensive wire, a low-cost fencer (the unit that sends pulsed voltage through the wire), steel rods and affordable plastic insulators. A fence can be put up in a few hours or less, and it will suffice for basic livestock and animal control.
- They are easy to build or add to an existing structure. It doesn’t take an electrician to install a fence, and if you can set fence posts, you can electrify a field or garden. No special tools are required, and you don’t have to worry about how perfectly straight the fence is, or even the tension on the wire. If you already have a fence installed, then simply fasten some insulators to the existing structure and run /your wire, and you are good to go.
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13.3 About design Suggestion/ Benefit of the Villagers

- **Public garden** : The positive benefits available to the urban community as a result of a garden visit should be emphasized to funding sources as proof of public gardens' significance to the community. Garden administrators can further use the research results in promoting gardens to the public, thus encouraging increased attendance and membership**.**
- **Community hall** : .Community centres or community halls are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. So, we plan to design one community hall near the kanera village.
- **Rain water harvesting:** Advantages of Rainwater Harvesting. The benefits of rainwater harvesting system are listed below. It reduces soil erosion, stormwater runoff, flooding, and pollution of surface water with fertilizers, pesticides, metals and other sediments.
- **Automatic soil nutrient detection and fertilizer dispensary system:** Additionally, the smart irrigation controlled receives local weather data that can help it determine when a landscape should be watered. If you have ever returned home during a storm only to see your sprinklers spraying water you know how beneficial this is. Rather than wasting water resources and your valuable money on watering your landscape you can take advantage of the nature moisture from the storm and save that water for another day when it is more needed. The advantages of these smart irrigation systems are wide reaching.
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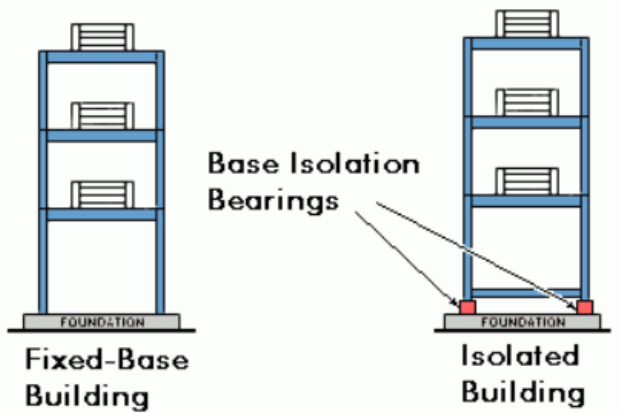
14. Technical Options with Case Studies

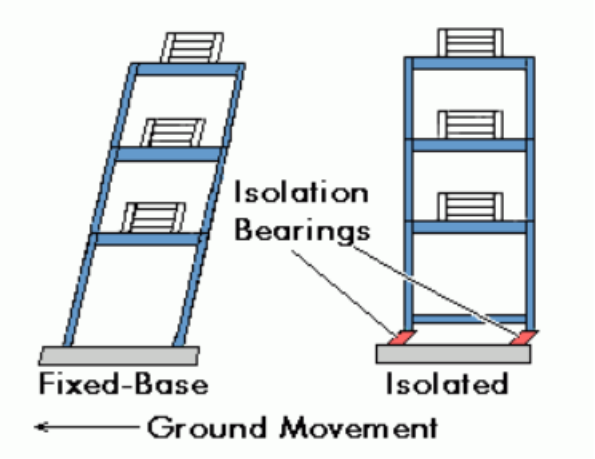
14.1 Civil Engineering

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.
- **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.

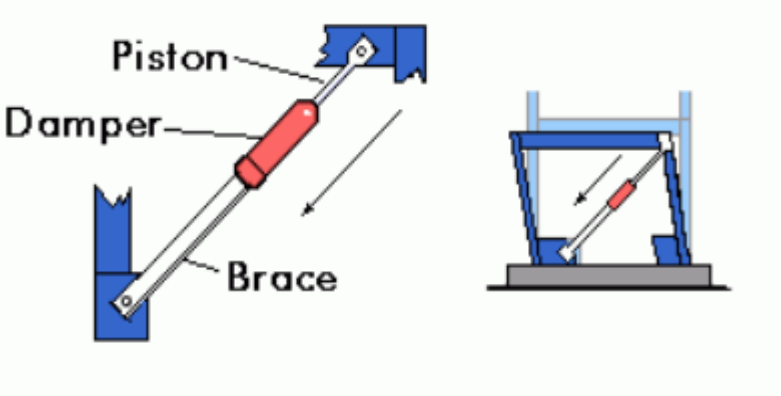


- **Energy Dissipation Devices:** As a result of an earthquake, the ground beneath each building begins to move. In Figure 2, it is shown moving to the left. Each building responds with movement which tends toward the right. The building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia
- 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.



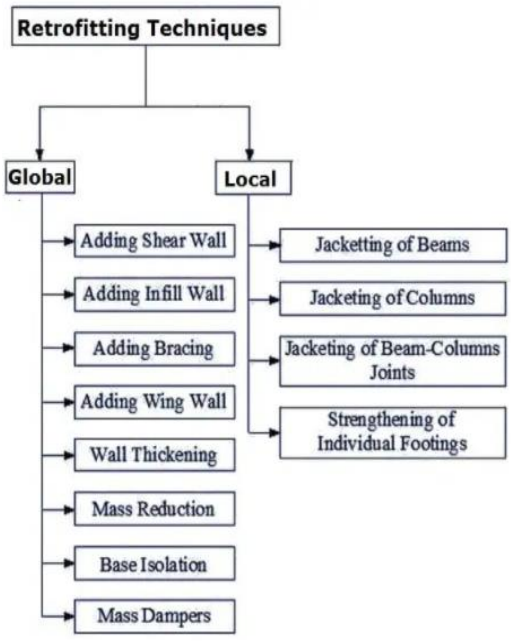
- The second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead-rubber bearings. As we've said, a certain amount of vibration energy is transferred to the building by earthquake ground motion. Buildings themselves do possess an inherent ability to dissipate, or damp, this energy. However, the capacity of buildings to dissipate energy before they begin to suffer deformation and damage is quite limited. The building will dissipate energy either by undergoing large scale movement or sustaining increased internal strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage. Accordingly, a wide range of energy dissipation devices have been developed and are now being installed in real buildings. Energy dissipation devices are also often called damping devices. The large number of damping devices that have been developed can be grouped into three broad categories:
- Friction Dampers: these utilize frictional forces to dissipate energy
- Metallic Dampers : utilize the deformation of metal elements within the damper
- Viscoelastic Dampers : utilize the controlled shearing of solids
- Viscous Dampers: utilized the forced movement (orificing) of fluids within the damper

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. Most earthquake ground motion is in a horizontal direction; so, it is a building's columns which normally undergo the most **displacement** relative to the motion of the ground. Figure 3 also shows the damping device installed as part of the bracing system and gives some idea of its action.

14.1.2 Seismic Retrofitting of Buildings



1. Introduction to Seismic Retrofitting Techniques:

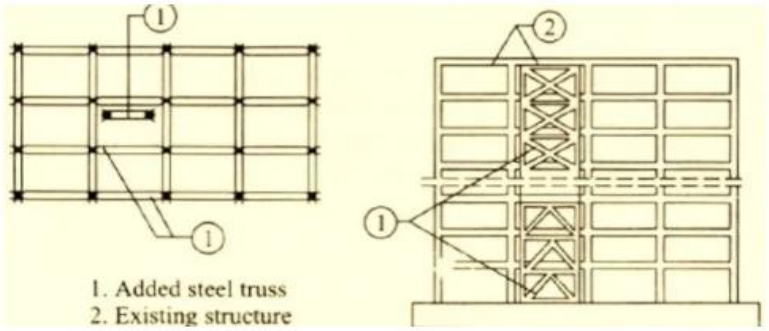
- Earthquake creates great devastation in terms of life, money and failures of structures.
- Upgrading of certain building systems (existing structures) to make them more resistant to seismic activity (earthquake resistance) is really of more importance.
- Structures can be (a) Earthquake damaged, (b) Earthquake vulnerable
- Frequently used for retrofitting of non ductile reinforced concrete frame buildings.
- The added elements can be either cast?in?place or precast concrete elements
- Retrofitting proves to be a better economic consideration and immediate shelter to problems rather than replacement of building.

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.

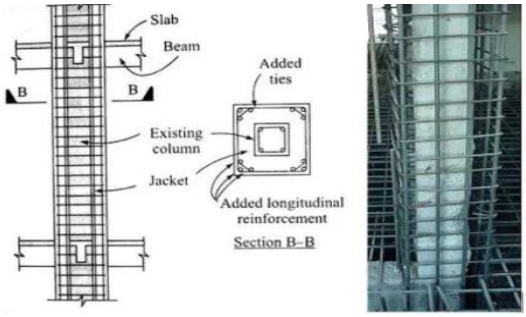
1.2 Adding Steel Bracings

- 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:

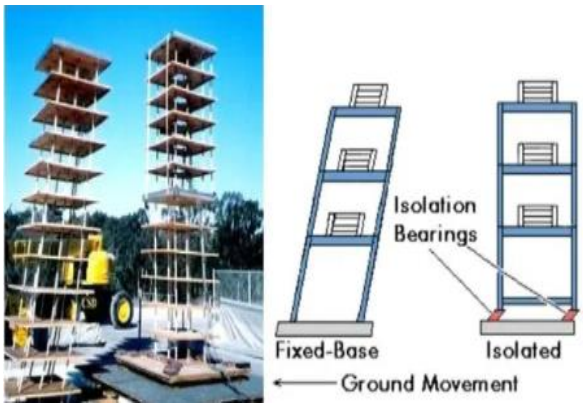
1. 1.Steel jacket,
2. Reinforced Concrete jacket,
3. Fibre Reinforced Polymer Composite (FRPC) jacket

Purpose for jacketing:

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

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.

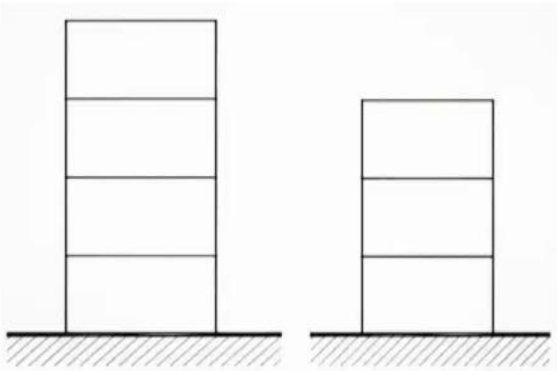


1.5 Mass Reduction Technique of Retrofitting:

- 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.



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

3D VOLUMETRIC CONSTRUCTION

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.

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

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- 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 installed 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.

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.

- 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 enables 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 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 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 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:
  1. The wall units are placed in the site.
  2. The twin units are propped temporarily.
  3. The wall units are later joined by means of reinforcing.
  4. The gap between the wall units are filled by means of concrete.

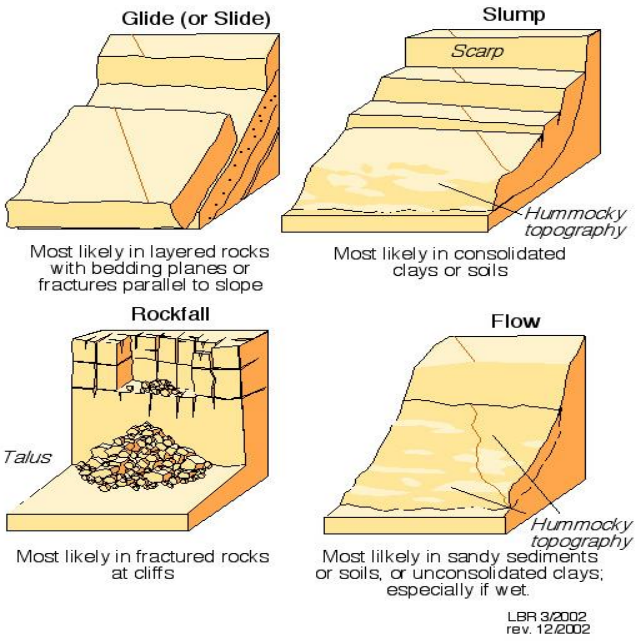
This system of construction is faster than normal construction methods and economical. The twin wall system is mainly employed in association with the construction of precast floors.

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Introduction to Soil Mechanics

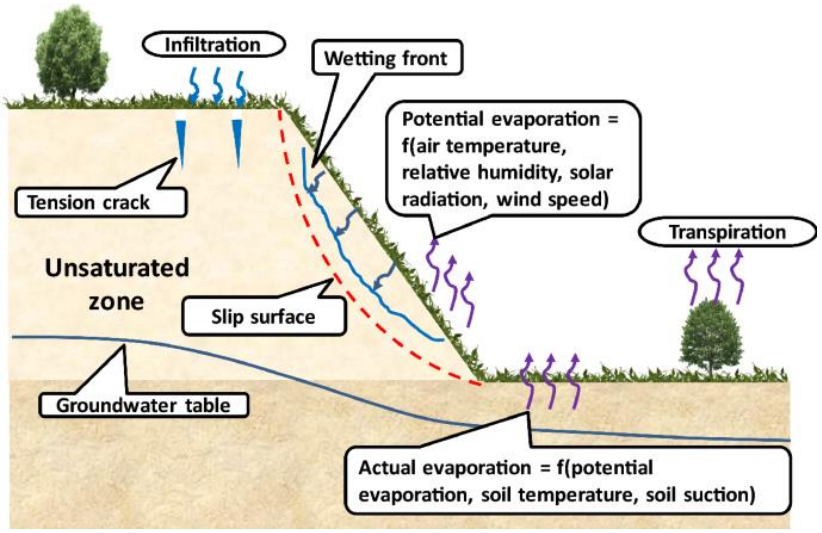
- The term "soil" can have different meanings, depending upon the field in which it is considered.
- To a geologist, it is the material in the relative thin zone of the Earth's surface within which roots occur, and which are formed as the products of past surface processes. The rest of the crust is grouped 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.

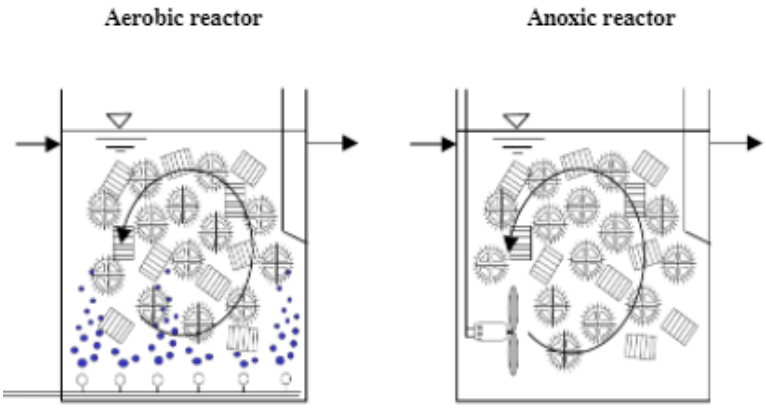


Formation of Soils

- 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 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.

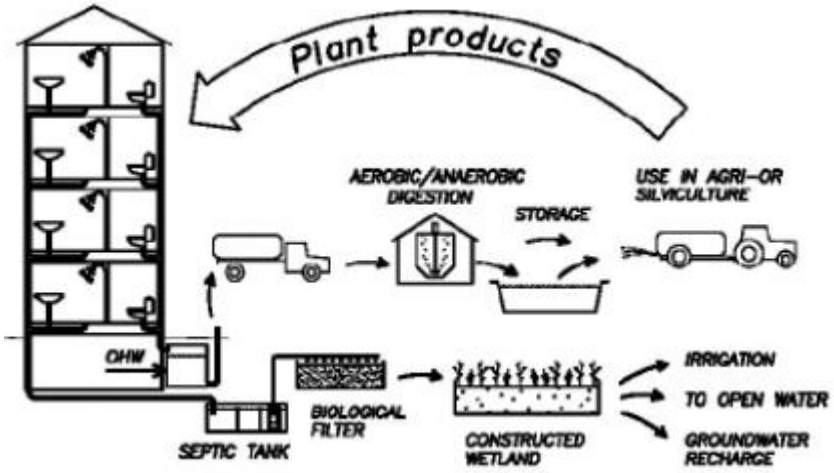
New nitrogen removal processes

- 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

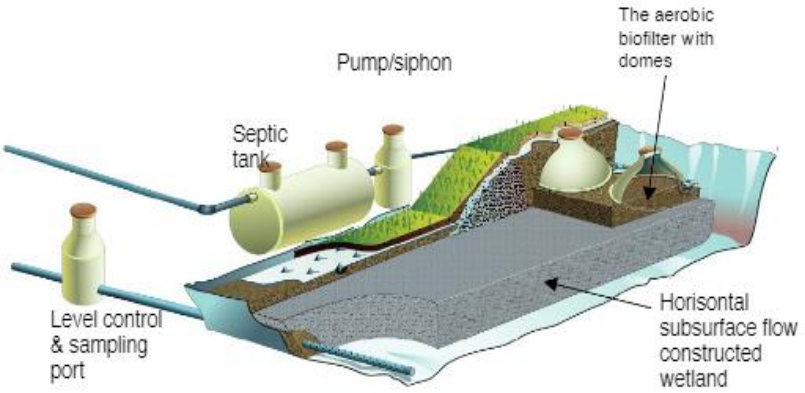
- Concentrated toilet and organic household waste can also produce energy via aerobic or anaerobic processes (Jenssen et al. 2003). In Norway the main focus has been on the use of extreme water saving (e.g. vacuum) and composting toilets. Substantial efforts are also devoted to the development of simple greywater treatment systems as wetlands, biofilters or soil infiltration systems or a combination of such.
- 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
- 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 (Höglund 2001, Johansson et al. 2001).



- 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.
- 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**: 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.

- 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).

14.1.6 civil engineering prototype

CIVIL Design and Prototype Model of Pervious Concrete: -

Abstract: Pervious concrete is a special high porosity concrete used for roads carrying light traffic, allows the water from precipitation and thereby reducing the runoff from a road surface and hence recharging ground water levels. Objective of this research is to find mechanical properties i.e., compressive strength, split tensile strength and flexural strength of the pervious concrete. The main problem of pervious concrete pavement is the strength itself. The conventional and pervious concrete is tested for 28 days of curing period with fresh water & salt water. For conventional concrete the mix proportion is considered as 1:1.5:3 and that of for pervious concrete 1:4. Water cement ratio of 0.3 for both conventional and pervious concrete is adopted. Fresh water (FW) is a tap water and salt water

(SW) is prepared by adding of common salt (2.5%), detergent (2.5%) by volume. From experimental results, it is observed that use of salt

- water for curing of concrete, improved the mechanical properties of both the conventional and pervious concrete for the period of 28 days.
- Keywords: - Pervious concrete, Salt water, Compressive strength, Split tensile strength, Flexural strength
- Introduction: - Pervious concrete which is also known as the no-fines, porous, gap-graded, and permeable concrete. It has been found to be a reliable storm water management tool. By definition, pervious concrete is a mixture of gravel or granite stone, cement, water, little to no sand (fine aggregate) with or without admixtures. When pervious concrete is used for paving, the open cell structures allow storm water to filter through the pavement and into the underlying soils. Pervious concrete can be used in a wide range of applications, although its primary use is in pavements which are in: residential roads, alleys and driveways, low volume pavements, low water crossings, sidewalks and pathways, parking areas, tennis courts, slope stabilization, sub- base for conventional concrete pavements etc. [1] The performance of slag concrete exposed to artificially made sea water. They concluded that the development of compressive strength for slag concrete is not significant at the early age of curing. The gain in strength occurs at relatively rapid ate at later ages of curing. Mix proportion of slag with cement has a significant effect on strength development of slag concrete. Among the mix proportions studied, the 70:30 mix slag concrete shows higher compressive strength. [2] studied the effect of different concentrations of ammonia in the popular image on the physical, chemical and mechanical properties of different types of cement such as SRC; OPC and HSC. The electrochemical measurement (linear polarization systems) as well as infrared spectroscopy (IR) were used in this study. The behavior of reinforced steel embedded in SRC; OPC and HSC with (5 wt. %) ammonium sulphate solution were determined. The results showed that ammonia gets a harmful effect on OPC and SRC mortars but HSC shows high resistivity. Also, the reinforced steel is greatly affected in the aggressive medium containing ammonium solution. The effects of percentage of fine aggregates and cement to coarse aggregate ratio on the important engineering properties of pervious concrete were investigated [3]. As per the test results, maximum compressive strength of pervious concrete was achieved by using the 20mm graded aggregate and 1:4 cement: total aggregate ratio. [4] studied the properties of pervious concrete used for bridge superstructure. They concluded that use of this concrete is suitable bridge superstructure. [5] employed testing processes for pervious concrete that are more representative of field conditions to determine the effects of the inclusion of sand as a fine aggregate; fly ash, slag and silica fume as cementitious alternatives, and construction practices on freeze-thaw durability and deicing salts exposure of pervious concrete. The pervious concrete helps in attenuate storm water problems, reduce the absorption of solar radiation but requires regular maintenance to prevent any clogging of the pores by sediments and vegetation

a) Compressive strength:- The blocks made of conventional concrete with 1:1.5:3 cement sand and aggregate ratio with 0.30 of water cement ratio were cured with fresh water (FW) for 28 days, the average compressive strength was 22.55 MPa and when the same sample mix was cured with salt water (SW) for 28 days the average compressive strength was 23.51 MPa which is a 4.2% higher. As shown in Table

Table 1. Compressive Strength of Conventional Concrete cured with FW and SW

S. No.	Mix Proportion	28 days Compressive Strength (FW) (MPa)	28 days Compressive Strength (SW) (MPa)
1	1:1.5:3	22.52	24.64
2	1:1.5:3	22.52	22.49
3	1:1.5:3	22.63	23.40
Average Compressive Strength (MPa)		22.55	23.51

b). Split Tensile Test: -

Concrete is strong in compression and weak in tension. Tensile forces are taken mainly by reinforcement. Due to tension, cracks are formed. This test is based on the fact that circular disc is subjected to compression load diametrically. As per IS 5816-1970 [8] the split tensile strength of the concrete is given by:

(1.1)
$$F = \frac{2P}{\pi DL}$$

Table 3. Split Tensile Strength of Conventional Concrete cured with FW and SW

S. No.	Mix Proportion	Tensile Strength (FW) (MPa)	Tensile Strength (SW) (MPa)
1	1:1.5:3	2.90	3.34
2	1:1.5:3	3.49	3.49
3	1:1.5:3	3.34	3.49
Average Tensile strength (MPa)		3.24	3.44

c). Flexural Strength: -

As per IS 456:2000 [9], the flexural strength of concrete is calculated as: $f_{cr} = 0.7 \sqrt{f_{ck}}$ (1.2)

Where, f_{ck} is is the characteristic cube compressive strength of concrete in N/mm^2. The flexural strength of conventional concrete when cured with FW and SW is shown in Table 5. For conventional concrete, the average flexural strength was 3.68 MPa at 28 days of curing with fresh water and when the same sample mix, cured with salt water for 28 days the average flexural strength was 3.82 MPa, which is 3.80% higher.

Table 5. Flexural Strength of Conventional Concrete cured with FW and SW

S. No.	Mix Proportion	Flexural Strength (FW) (MPa)	Flexural Strength (SW) (MPa)
1	1:1.5:3	3.23	3.33
2		3.97	4.12
3		3.85	4.02

Average Flexural Strength (MPa)	3.68	3.82

Conclusion: -

- From the experimental work and the results obtained it can be concluded that:
- The fine aggregate plays a vital role in imparting the strength to the concrete. Also, salt water enhancing the strength in the early stage.
- The compressive strength of conventional concrete and pervious concrete increased in all cases when curing is done with salt water, to that of the compressive strength of both the concrete cured with fresh water.
- The split tensile strength as well as flexural strength improves considerably when cured with salt-detergent solution.

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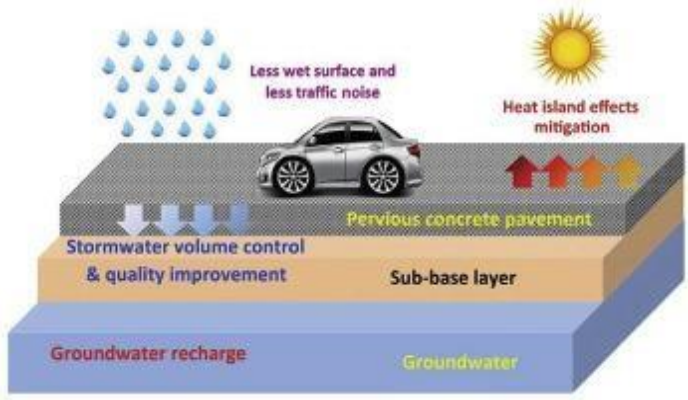


14. Technical Options with Case Studies

14.1.1 Design of Power Electronics converter

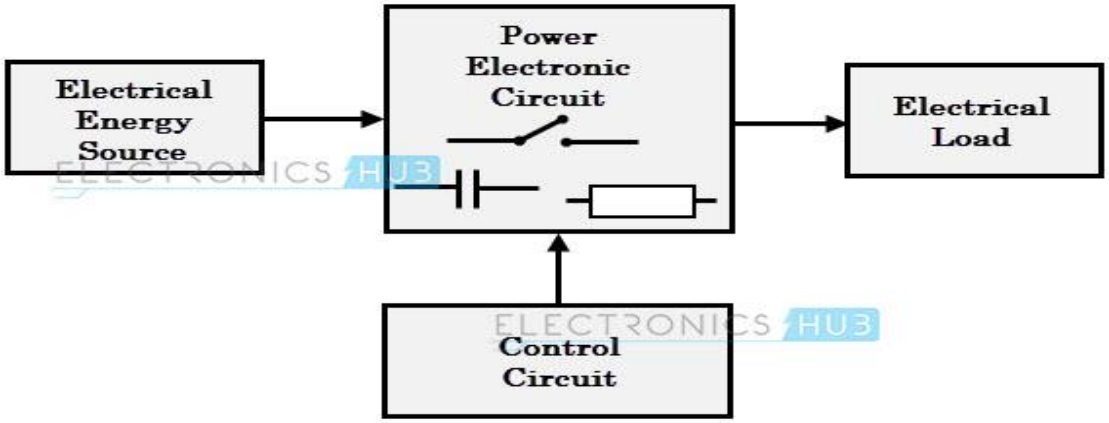
Introduction: Power electronic converters are used everywhere in normal daily routines at home, commercial workplaces or in an industrial environment.

- Due to the high power handling with higher efficiencies, these converters become an integral part of industrial electric drives, high electric power supplies, electric traction systems and automobile control equipments.
- There are different types of power electronic converters used for performing different functions (such as inversion, rectification, etc.) which are rated from a few milliwatts to a few thousand watts. Let us look at these converters in detail.
- The power electronic circuit consists of both power part and control part. Power part transfers the energy from source to load and it consists of power electronic switches (SCR or TRIAC), transformers, electric choke, capacitors, fuses and sometimes resistors.
- A power electronic converter uses power electronic components such as SCRs, TRIACs, IGBTs, etc. to control and convert the electric power
- Power electronic technology deals with processing and controlling the flow of electrical energy in order to supply voltages and currents in a form that optimally suited for end user's requirements.
- A power electronic converter uses power electronic components such as SCRs, TRIACs, IGBTs, etc. to control and convert the electric power. The main aim of the converter is to produce conditioning power with respect to a certain application.

Power Electronics Converter

- The block diagram of a power electronic converter is shown in figure above. It consist of an electrical energy source, power electronic circuit, a control circuit and an electric load. This converter changes one form of electrical energy to other form of electrical energy.
- The power electronic circuit consists of both power part and control part. Power part transfers the energy from source to load and it consists of power electronic switches (SCR or TRIAC), transformers, electric choke, capacitors, fuses and sometimes resistors.
- The control circuit or block regulates the elements in the power part of the converter. This block is built with a complex low power electronic circuit that consists of either analog or digital circuit assembly.

- Power electronic converters perform various basic power conversion functions. This converter is a single power conversion stage that can perform any of the functions in AC and DC power conversion systems.



Block Diagram of PEC

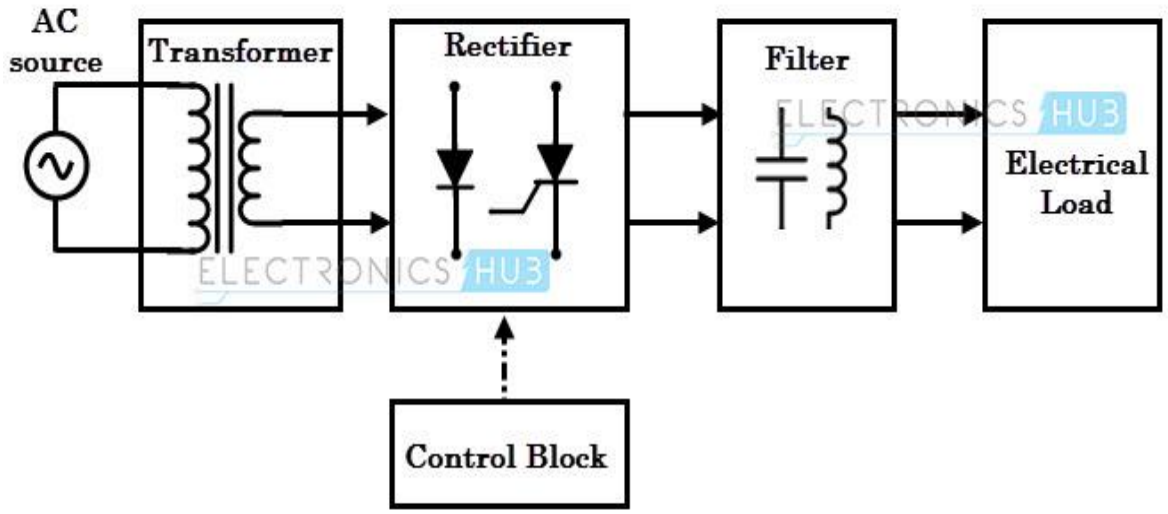
- Here, the transformer adjusts the primary AC source supply to the input of rectifier stage. Usually it is a step-down transformer that reduces the supply voltage to a circuit operating range.
- The rectifier converts the low voltage AC supply into DC supply.
- These types of power electronic converters may be found in a wide variety of applications such as switch mode power supplies (SMPS), electrical machine control, energy storage systems, lighting drives, active power filters, power generation and distribution, renewable energy conversion, flexible AC transmission and embedded technology.

Depending on the type of function performed, power electronic converters are categorized into following types.

- AC to DC = Rectifier: It converts AC to unipolar (DC) current
- DC to AC = Inverter: It converts DC to AC of desired frequency and voltage
- DC to DC = Chopper: It converts constant to variable DC or variable DC to constant DC
- AC to AC = Cycloconverter, Matrix converter: It converts AC of desired frequency and/or desired voltage magnitude from a line AC supply.
- These types of power electronic converters may be found in a wide variety of applications such as switch mode power supplies (SMPS), electrical machine control, energy storage systems, lighting drives, active power filters, power generation and distribution, renewable energy conversion, flexible AC transmission and embedded technology.

➢ AC to DC Converters or Rectifiers

- An AC to DC converter is also called a rectifier, which converts AC supply from main lines to DC supply for the load. The block diagram of an AC to DC converter is shown in figure below.
- The essential components in this rectifier include transformer, switching unit, filter and a control block.



AC to DC Converter

- Here, the transformer adjusts the primary AC source supply to the input of rectifier stage. Usually it is a step-down transformer that reduces the supply voltage to a circuit operating range.
- The rectifier converts the low voltage AC supply into DC supply.
- It comprises diode and/or thyristors based on type of rectifier. The output of the rectifier is of pulsed DC and hence it is filtered using filter circuit, which is usually made with a capacitor or a choke.
- The control block controls the firing angle of thyristors in case of phase-controlled rectifiers. Since the diode is not a controllable device, control block is not needed in case of diode rectifiers.

➢ Advantages of Power Electronics Converter

1. Long life
2. Small size
3. High efficiency because of loss is low in power semiconductor devices
4. High reliability of power-electronic converter system
5. Can handle large output current
6. Less maintenance due to the absence of any moving part
7. Fast dynamic response of the power electronic system as compared to the electro-mechanical converter systems
8. Fewer weight results in less floor space and therefore lower installation cost

9. Low thermal dissipation
10. Mass production of power semiconductor devices have resulted in a lower cost of the converter equipment
11. Reduce the fluctuation in power fed to grid
12. Reduce acoustical noise from the wide turbine
13. High-quality power to the grid
14. Flexibility in operation

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

Introduction: The ac motor starters are increasingly becoming popular due to its controlled soft-starting capability. The ac motor starter provides limited starting current and hence conventional electromagnetic line starters and reducedvoltage starters are replaced with ac motor starters. Thyristor-based soft starters have many desirable properties and provide a viable solution to starting problems in three phase induction motors. These power semiconductor based starters are cheap, simple, and reliable and occupies less volume. The power density of these soft starters is also very high. A three phase induction motor produces electromagnetic torque on its shaft but initial switching instants of all three phases to the supply produces pulsations on the electromechanical torque when it is controlled by a direct- online starter. These severe pulsations in electromagnetic torque might cause shocks to the shaft and hence to the driven equipment. These pulsations might damage mechanical system components, such as shafts, couplings and gears etc. The electromagnetic torque pulsations also causes long term effects on various mechanical system components if the strength of materials is exceeded which might lead to fatigue also. The reduced voltage starting by soft starters eliminates stress from the electrical supply and it also reduces the possibility of voltage dip and brown out conditions. Soft and smooth starters provide smooth acceleration of rotor of three phase induction motor. Reduced voltage starting reduces high amount of starting torque applied on the shaft and therefore eliminates the shock on the driven load. An instantaneous high amount of starting torque can cause a jolt on the conveyor which can damage products, pump cavitations and water hammer in pipes. Therefore, a soft starter ramps up the voltage applied to the motor from the initial voltage to the full voltage. The voltage is initially kept low to avoid sudden jerks during the start. The voltage and torque increases gradually so that the induction motor starts to accelerate. This ramp up voltage provides sufficient torque for the load to accelerate gradually and hence mechanical and electrical shocks are minimised from the system, The voltage supplied to stator windings are adjustable and it has ramp characteristics.

➢ OPERATING PRINCIPLE OF SOFT STARTER

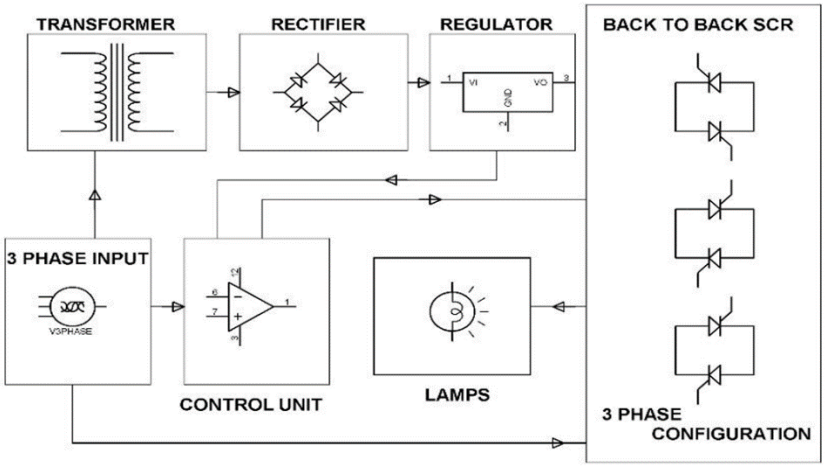
- In a closed loop control, any characteristic of the motor is monitored for the desired response. The starting voltage is modified depending on required motor current or motor speed. The current in each phase is monitored properly and time voltage ramp is stopped when current in each phase exceeds a certain set point. The supply voltage applied to stator windings of three phase induction motor is controlled by controlling the conduction angle of SCRs.
- A soft starter basically comprises of two anti-parallel SCRs in each phase of three phase induction motor. There are total six SCRs required for all three phases for smooth acceleration of electric motor.

These SCRs are power semiconductor devices which normally are in OFF state but these SCRs starts to conduct when firing signals are given to them and hence allows voltage and current to pass through them.

- Initially to perform soft starting, a firing pulse are given to the SCRs so that only the remaining part of each half period of sinusoidal voltage curve passes through them. Then the instants of firing pulses are reduced which allows larger part of the voltage to pass through SCRs. Finally, the firing pulses are applied exactly at the zero crossing of the voltage which allows 100% of the voltage to pass through. This is also seen as the ramping up of voltage from reduced voltage at starting by allowing more voltage to pass through SCRs. In this way, a full voltage is applied from reduced voltage at the starting. The opposite procedure is followed for soft stop.
- An Induction motor can self start owing to the interaction between the rotating magnetic field flux and the rotor winding flux, causing a high rotor current as torque is increased. As a result, the stator draws high current and by the time the motor reaches to full speed, a large amount of current (greater than the rated current) is drawn and this can cause heating up of the motor, eventually damaging it. To prevent this, motor starters are needed.
- These SCRs are power semiconductor devices which normally are in OFF state but these SCRs starts to conduct when firing signals are given to them and hence allows voltage and current to pass through them.
- The full voltage is allowed to pass through the thyristors and when the stop time is about to reach, the firing pulses are delayed which allows less voltage to pass through. The instants of firing pulses are increased till the end of voltage is arrived. Then, no more voltage is applied to the motor and in this way, the motor is stopped.
- An Induction motor can self start owing to the interaction between the rotating magnetic field flux and the rotor winding flux, causing a high rotor current as torque is increased. As a result, the stator draws high current and by the time the motor reaches to full speed, a large amount of current (greater than the rated current) is drawn and this can cause heating up of the motor, eventually damaging it. To prevent this, motor starters are needed.
- Motor starting can be in 3 ways

PHASE SOFT STARTER

- Applying full load voltage at intervals of time: Direct On Line Starting
- Applying reduced voltage gradually: Star Delta Starter and Soft starter
- Applying part winding starting: Autotransformer starter
- **Working:** A power supply circuitry to provide the required dc supply voltage.The level voltage is generated using the comparator LM324 whose inverting terminal is fed using a fixed voltage source and the noninverting terminal is fed through a capacitor connected to the collector of an NPN transistor. The charging and discharging of the capacitor cause the output of the comparator to change accordingly and the voltage level to change from high to low. This output level voltage is applied to the noninverting terminal of another comparator LM339 whose inverting terminal is fed using a ramp voltage. This ramp voltage is produced using another comparator LM339 which compares the pulsating DC voltage applied at its inverting terminal to the pure DC voltage at its noninverting terminal and generates a zero voltage reference signal which is converted to a ramp signal by the charging and discharging of an electrolyte capacitor.
- The 3rd comparator LM339 produces a High pulse width signal for every high-level voltage, which decreases gradually as the level voltage reduces. This signal is inverted and applied to the Optoisolator, which provides gate pulses to the SCRs. As voltage level falls, the pulse width of the Optoisolator increases and more the pulse width, lesser is the delay and gradually the SCR is triggered without any delay. Thus by controlling the duration between the pulses or delay between applications of pulses, the firing angle of SCR is controlled and the application of supply current is controlled, thus controlling the motor output torque.



- **Advantages:** Improved Efficiency: The efficiency of the soft starter system using solid-state switches is more owing to the low on-state voltage.
- Controlled startup: The starting current can be controlled smoothly by easily altering the starting voltage and this ensures smooth starting of the motor witho ut any jerks.
- Controlled acceleration: Motor acceleration is controlled smoothly.
- Low Cost and size: This is ensured with the use of solid-state switches.

14.2.3 Advanced Wireless Power Transfer System

Introduction: The project is a device to transfer power wirelessly instead of using conventional copper cables and current carrying wires. The concept of wireless power transfer was introduced by Nikolas Tesla. This power is made to be transferred within a small range only for example charging rechargeable batteries etc. For demonstration purposes we have used a fan instead of battery that operates by using wireless power. This requires an electronic circuit for conversion of AC 230V 50Hz to AC 12V, high frequency and this is then fed to a primary coil of an air core transformer. The secondary coil of the transformer develops 12V high frequency. Therefore by this way the power gets transferred through primary coil to secondary coil that are separated by certain distance around 3cm. Here the primary coil acts as transmitter and secondary coil receives the power to run a load. This project can be used to charge batteries of a pace maker and similar applications.

Wireless Power Transfer System

- Wireless power transfer (WPT), wireless power transmission, wireless energy transmission (WET), or electromagnetic power transfer is the transmission of electrical energy without wires as a physical link. In a wireless power transmission system, a transmitter device, driven by electric power from a power source, generates a time-varying electromagnetic field, which transmits power across space to a receiver device, which extracts power from the field and supplies it to an electrical load. The technology of wireless power transmission can eliminate the use of the wires and batteries, thus increasing the mobility, convenience, and safety of an electronic device for all users.[2] Wireless power transfer is useful to power electrical devices where interconnecting wires are inconvenient, hazardous, or are not possible.
- Wireless power techniques mainly fall into two categories, near field and far-field. In near field or non-radiative techniques, power is transferred over short distances by magnetic fields using inductive coupling between coils of wire, or by electric fields using capacitive coupling between metal electrodes. Inductive coupling is the most widely used wireless technology; its applications include charging handheld devices like phones and electric toothbrushes, RFID tags, induction cooking, and wirelessly charging or continuous wireless power transfer in implantable medical devices like artificial cardiac pacemakers, or electric vehicles.

➢ Working of Advanced Wireless Power Transfer System

- The wireless power transmission can be defined as the energy that can be transmitted from the transmitter to a receiver through an oscillating magnetic field.
- To accomplish this, power source (DC current) is changed into high-frequency AC (Alternating Current) by particularly designed electronics erected into the transmitter. The AC boosts a copper wire

coil in the transmitter, which produces a magnetic field. When the receiver coil is placed in proximity of the magnetic field, the magnetic field can make an AC (alternating current) in the receiving coil. Electronics in the receiving coil then alter the AC back into DC which becomes operating power

- This power is made to be transferred within a small range only for example charging rechargeable batteries etc. For demonstration purposes we have used a fan instead of battery that operates by using wireless power. This requires an electronic circuit for conversion of AC 230V 50Hz to AC 12V, high frequency and this is then fed to a primary coil of an air core transformer. The secondary coil of the transformer develops 12V high frequency. Therefore by this way the power gets transferred through primary coil to secondary coil that are separated by certain distance around 3cm. Here the primary coil acts as transmitter and secondary coil receives the power to run a load. This project can be used to charge batteries of a pace maker and similar applications.
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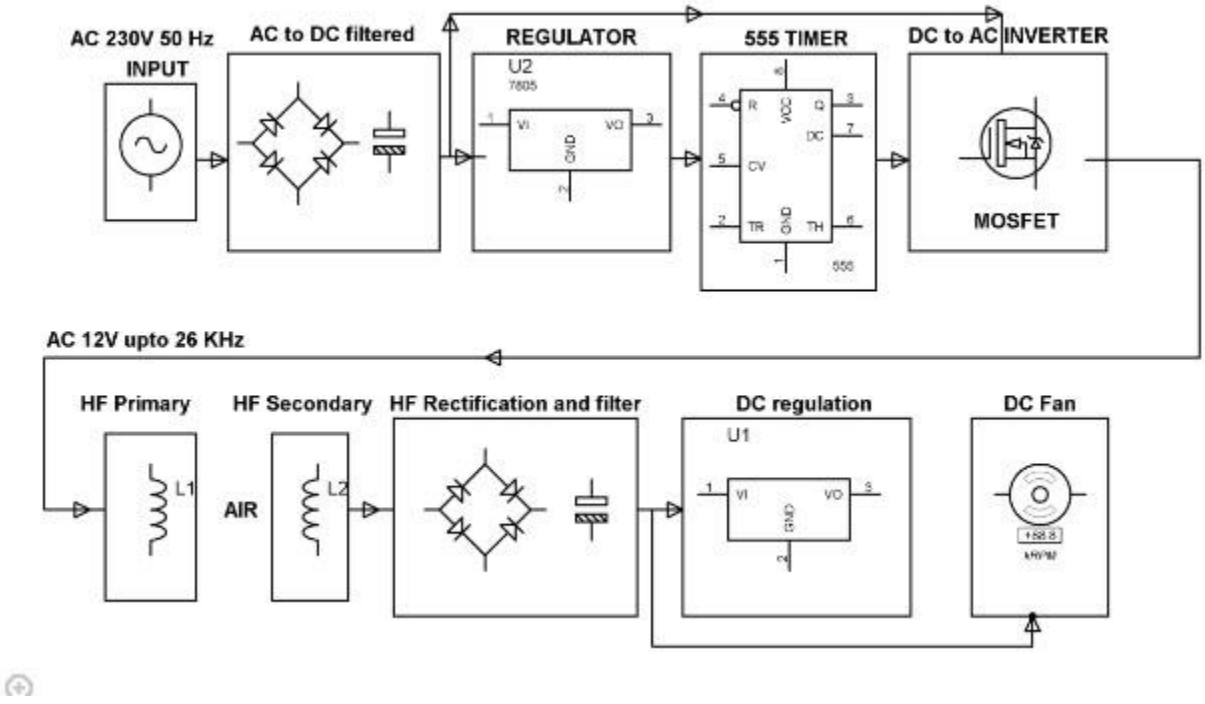

Circuit Diagram of Wireless power Transfer

- Thus the power transfer can be done with the transmitter (primary) to the receiver (secondary) that is separated by a considerable distance (say 3cm). Therefore the power transfer could be seen as the TX transmits and the RX receives the power to run a load.
- Moreover, the WPT technique can be used to charge gadgets like mobile phones, laptop batteries, iPods, propeller clock, etc. And also this sort of charging offers a far lower risk of electrical shock. Furthermore, this project can be enhanced by increasing the distance of power transfer as the research across the world is still going on
- Thus, this is all about wireless power transmission, wireless power transfer circuit working and its applications which include simple electronic devices like mobile phones, mobile chargers, etc.. Wireless power transfer not only reduces the risk of shock and stops to plug frequently into the sockets. We hope that you have got some basic insights into this concept. Moreover, for any technical help on this topic as well on other electrical and electronic engineering projects you can contact us by commenting below.

➢ Advantages of Wireless Power Transfer System

- Allows for charging of multiple devices. This is achieved by changing the coil geometry, as well as allocating large charging surface areas such as table tops and charging benches.
- High charging speeds: though at the moment wireless charging offers a slower charging rate than the wired option, advances in resonance and induction technology promises an increased charging rate and improved efficiency in the future
- Wireless power transfer allows for greater spatial freedom between the power source and the device. This means that the two do not have to be precisely aligned for power transfer.
- Eliminating charging cords enables engineers to make compact and watertight devices, thus maximising on safety, and varied use such as in deep-sea applications.
- Prevents corrosion and sparking by eliminating mechanical connectors and wired contacts
- Reduces costs associated with maintaining and replacing mechanical connectors

➢ 14.2.4 Industrial Temperature Controller

- **Introduction:** After Blinking LEDs and controlling Relays using Arduino, every hobbyist, who is actively making DIY projects, plans on building a Weather Station. It doesn't have to predict rainfall or storms but simply measure the basic stuff like Temperature and Humidity.
- Temperature Sensor and Humidity Sensor (often they come in a single package, but discreet components are also available) are the main ingredients of an Arduino Weather Station. Since this article is all about Arduino Compatible Temperature Sensors, let us focus on them.
- Measuring Temperature of an object or a room using Arduino is a very useful project. You can continuously monitor the changes in temperature and log the data for further analysis.

- There are a bunch of Arduino compatible Temperature Sensors available in the market. Some are relatively cheap and easy to use while some are expensive with great accuracy.
- I made a list of some commonly found Temperature Sensors for Arduino, with some basic specifications listed out for each sensor. These sensors can be used with other developments boards like STM32F103C8T6 Blue Pill Board, Raspberry Pi, ESP8266 or ESP32.
- So, if you are looking for the perfect Arduino Temperature Sensor for your DIY project, then go through the list and make the decision
- Many factors change the amount of time that the heater needs to on, to maintain the process temperature. For example the size of the heater, the size of the oven, the amount of insulation surrounding the oven and the ambient temperature will all change the rate at which the oven will heat up or cool down. Other factors such as the circulation of air within the oven, the humidity of the air. The mass of product being place inside the oven and many more that are described in minute detail
- Today, there are a variety of Temperature Sensors that are marketed towards DIY and hobbyist community. But a few years ago, if we speak about temperature sensor, then LM35 is the only choice

- It is one of the most popular temperature sensors available out there, which is being used even today. LM35 is an Analog Temperature Sensor which is calibrated directly in Celsius. The output analog voltage is linearly proportional to temperature in Centigrade.
- The transfer function of LM35 is
- VOUT = 10mV/0C x T, where VOUT is the output voltage, T is the temperature in 0C.
- What the transfer function means is that for every degree Celsius rise in temperature, the output voltage increases by 10mV.
- There are two other Temperature Sensors similar to LM35. They are LM34, which is calibrated for temperature in Fahrenheit and LM335, which is calibrated for temperature in Kelvin.

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- **Important Specifications of LM35:**

Range	-55^{0}C to 150^{0}C
Accuracy	±0.5^{0}C at 25^{0}C
Operating Voltage Range	4V to 30V
Communication Protocol	Analog Output
Applications	Power Supplies
	HVAC Systems
	Consumer Appliances
	Battery Management Systems

- One of frequently used Temperature Sensors in Arduino projects is the DHT11 Sensor. It is a Relative Humidity Sensor and hence it can measure both the Temperature as well as Humidity.
- Many factors change the amount of time that the heater needs to on, to maintain the process temperature. For example the size of the heater, the size of the oven, the amount of insulation surrounding the oven and the ambient temperature will all change the rate at which the oven will heat up or cool down. Other factors such as the circulation of air within the oven, the humidity of the air. The mass of product being place inside the oven and many more that are described in minute detail at
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Working

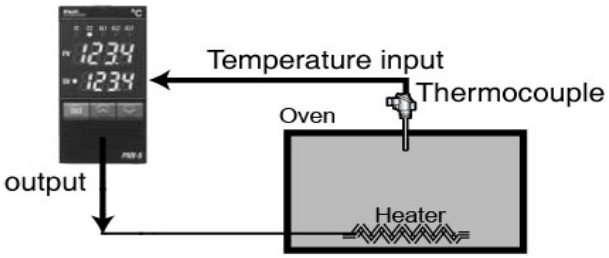
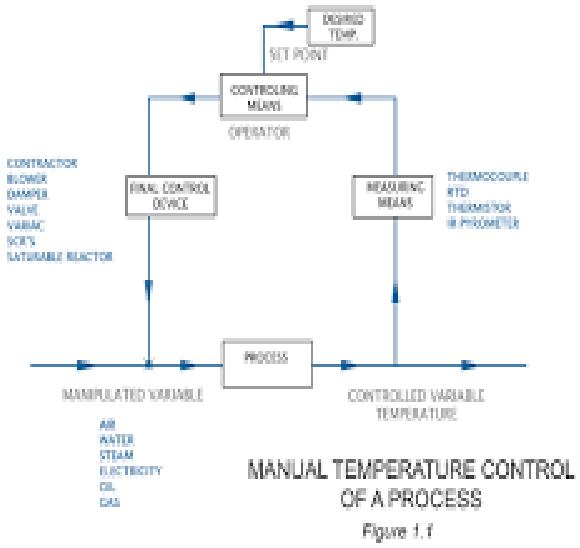


Diagram Temperature Controller

- A temperature controller is an device that is used to control temperature. It does this by first measuring the temperature (process variable), it then compares it to the desired value (set value). The difference between these values is known as the error (Deviation). Temperature controllers use this error to decide how much heating or cooling is required to bring the process temperature back to the desired value. Once this calculation is complete the controller will produce an output signal that effects the change required. This output signal is known as the (manipulated value) and is normally connected to a heater, control valve, fan or some othe "final control element" which actually injects or removes heat from the process.
- Temperature controllers form one of the four parts of a temperature-controlled system. To help visualize this we will consider an oven. The four parts would be :
- 1 The oven
- 2. The heater
- 3. The thermometer (or thermocouple)
- 4. The controller
- The role of the temperature controller is to measure the temperature on the thermocouple, compare it to the set point and to calculate the amount of time the heater should remain switched on to maintain a constant temperature.
- Many factors change the amount of time that the heater needs to on, to maintain the process temperature. For example the size of the heater, the size of the oven, the amount of insulation surrounding the oven and the ambient temperature will all change the rate at which the oven will heat up or cool down. Other factors such as the circulation of air within the oven, the humidity of the air. The mass of product being place inside the oven and many more that are described in minute detail at
- At the end of the day a temperature controller replaces the function of a person who's job description would read something like
- Watch that thermometer
- Keep the temperature stable at 80Deg C
- If you need more heat, switch on the heater.
- The important point, is that the temperature controller has one input, one output and one set point.

- An object's or space's temperature increases when heat energy moves into it, increasing the average kinetic energy of its atoms, e.g., of things and air in a room. Heat energy leaving an object or space lowers its temperature. Heat flows from one place to another (always from a higher temperature to a lower one) by one or more of three processes: conduction, convection and radiation. In conduction, energy is passed from one atom to another by direct contact. In convection, heat energy moves by conduction into some movable fluid (such as air or water) and the fluid moves from one place to another, carrying the heat with it. At some point the heat energy in the fluid is usually transferred to some other object by means conduction again. The movement of the fluid can be driven by negative-buoyancy, as when cooler (and therefore denser) air drops and thus upwardly displaces warmer (less-dense) air (natural convection), or by fans or pumps (forced convection). In radiation, the heated atoms make electromagnetic emissions absorbed by remote other atoms, whether nearby or at astronomical distance. For example, the Sun radiates heat as both invisible and visible electromagnetic energy. What we know as "light" is but a narrow region of the electromagnetic spectrum.

  If, in a place or thing, more energy is received than is lost, its temperature increases. If the amount of energy coming in and going out are exactly the same, the temperature stays constant—there is thermal balance, or thermal equilibrium.



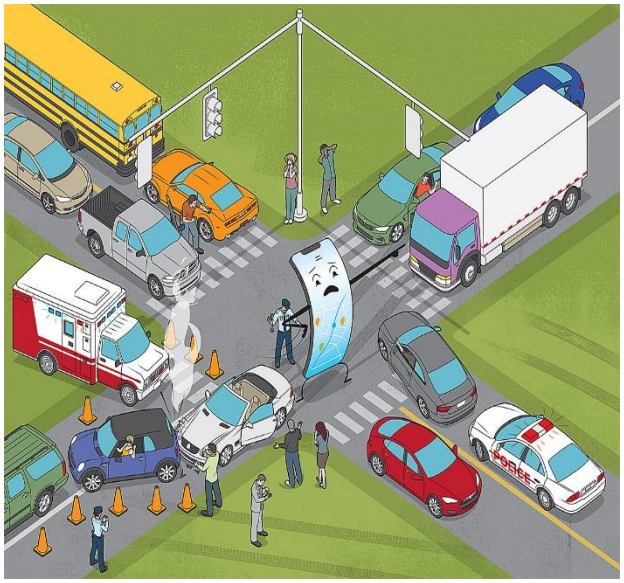
FLOW CHART OF TEMPERATURE CONTROLLER

➢ **Advantages of a Temperature Controller**

- Eliminate human error that can occur with attempting to control temperatures manually.
- Save time.
- Minimize costs.
- Automate your process from start to finish.

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

Introduction: Road accidents and traffic congestion are the major problems in urban areas. Currently there is no technology for accident detection. Also due to the delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of the death of victim. There is a need of introducing a system to reduce the loss of life due to



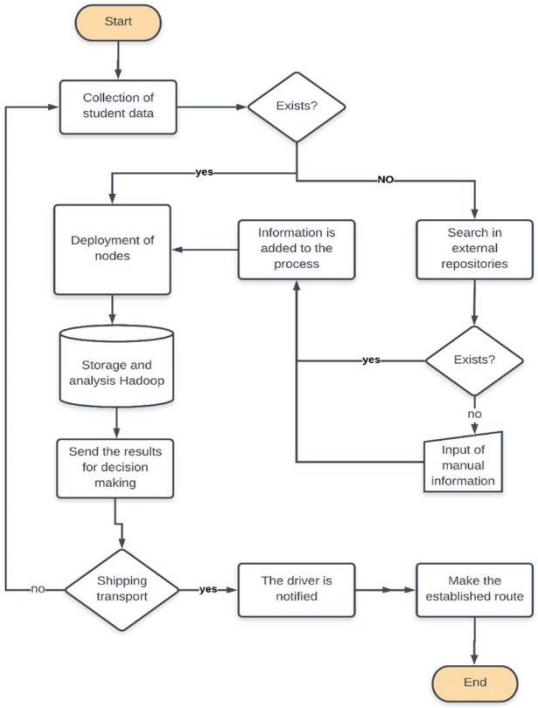
accidents and the time taken by the ambulance to reach the hospital. To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident through sensors provided in the vehicle. A main server unit houses the database of all hospitals in the city. A GPS and GSM module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot. Along with this there would be control of traffic light signals in the path of the ambulance using RF communication. This will minimize the time of ambulance to reach the hospital. A patient monitoring system in the ambulance will send the vital parameters of the patient to the concerned hospital. This system is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time

- Existing System
- Currently there is no technology for accident detection. As it is done manually there is loss of life in golden hours. The accident victim is dependent on the mercy of others to rush him to hospital. Many a times an accident goes unnoticed for hours before help comes in. Due to all these factors there is a high rate of mortality of the accident victims. In addition to this there is delay in the ambulance reaching the hospital due to the traffic congestion between accident location and hospital which increases the chances of the death of victim.
- Proposed system
- To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident. A sensor, GPS, GSM unit fitted in the vehicle detects the accident and sends the accident location to a main server unit which houses the database of all the nearby hospitals. An ambulance is rushed to the accident spot which carries the patient to the hospital and simultaneously monitors the vital parameters like temperature and pulse rate and conveys them to the concerned hospital. Along with this there would be control of traffic light signals in the path of the ambulance via RF communication to provide a clear path for the ambulance. This will minimize the time required by the ambulance to reach the hospital.

➢ **Working:** The system consists of three main units, which coordinate with each other and make sure that the ambulance reaches the hospital without any time lag. Thus our system is divided into following four units:

- 1. The vehicle unit.
- 2. The ambulance unit.
- 3. The traffic junction unit.

- 4. The control unit.
- 1) Vehicle unit
- For implementation of this project, vehicle unit should be installed in every vehicle .It consists of microcontroller along with the accelerometer, GPS and GSM module and sensors to sense the accident. On impact on the vehicle, information about accident is send to the main server. This information
- consists of the location of accident detected by GPS module installed in vehicle. The GPS system finds out
- current position of vehicle (latitude and longitude) which is the location of accident spot and gives that data to GSM module. This information to the main server is conveyed by GSM module. There is also provision of avoidance.



- 2) Ambulance unit: Control unit sends the ambulance to the accident location. Ambulance collects the victim from the accident location. While in the ambulance the vital parameters of the patient temperature and pulse rate are continuously monitored and conveyed to the concerned hospital. We are using LM35 temperature sensor whose output voltage is linearly proportional to the Celsius (centigrade). For measuring pulse rate we are using IR based obstacle sensor. Normally there is delay in ambulance reaching the hospital due to traffic congestion. To overcome this delay, the traffic signals in the path of ambulance are controlled via RF communication. The ambulance section consists of an RF transmitter and the traffic unit will consist of the RF receiver. The RF transmitter on the ambulance will communicate with the RF receiver of the signal section and make the signal green whenever it is within a 100m radius. As a result of which the ambulance will have a clear path all along its way to the hospital without any traffic congestion.

➢ Advantages

- Thus we have developed the above mentioned units and successfully coordinated the system. For the main server unit we have created a database using visual basic 6.0 on PC. For the prototype the communication between the ambulance and traffic unit takes place via RF transmitter and RF receiver
- 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. Accident detection and alert systems are highly relevant in these days and this project aims at developing a low cost solution for the same for the benefit of the society.

➢ Cost Estimation

Sr No	Components	Quantity	Price
1	ESP32	1	Rs 900
2	Traffic Light Sensor	1	Rs 650
3	OLED Display	1	Rs 700
4	Connecting Wires	1 Pack	Rs 400
5	**Total Cost**	_	Rs 2650

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

Cement concrete road: There is no any pucca road inside the village so after asking from many villagers we think that they need it. It also helps them if they want to invest or save their money cement concrete road is also work as a better transport purpose.

Hospital: Hospital that is present in village is very small and mostly it remains 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.

Biogas plant: We ask lots of villagers as well as staff of panchayat office and all of them want biogas plant in their village for make biogas with the help of animal dungs. so, we decide to design small and low biogas plant for village

Community Hall: 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.

Rain water harvesting: rain water harvesting system will help the people to store rain water and use that water in serval things.

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 affects their health and various public placed have RO but some time it's 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 designed 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 panchayat

Sr. No	Design Name	Period	Amount Expenditure	Benefit
8.1.1	Cement concrete road	Immediately	Rs. 5,28,365/-	There is no pucca road 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 cement concrete road is also work as a better transportation.
8.1.2	Hospital	Long term (1-3 years)	Rs. 4,93,452/-	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	Biogas plant	Immediately	Rs. 76,410/-	We ask lots of villagers as well as staff of panchayat office and all of them want to biogas plant in their village for producing natural biogas with help of animal dungs.
8.1.4	Auto intensity	Immediately	Rs. 932/-	Auto Intensity Control of Street Lights Circuit and Working. ... The lifetime of the lights used in this system is

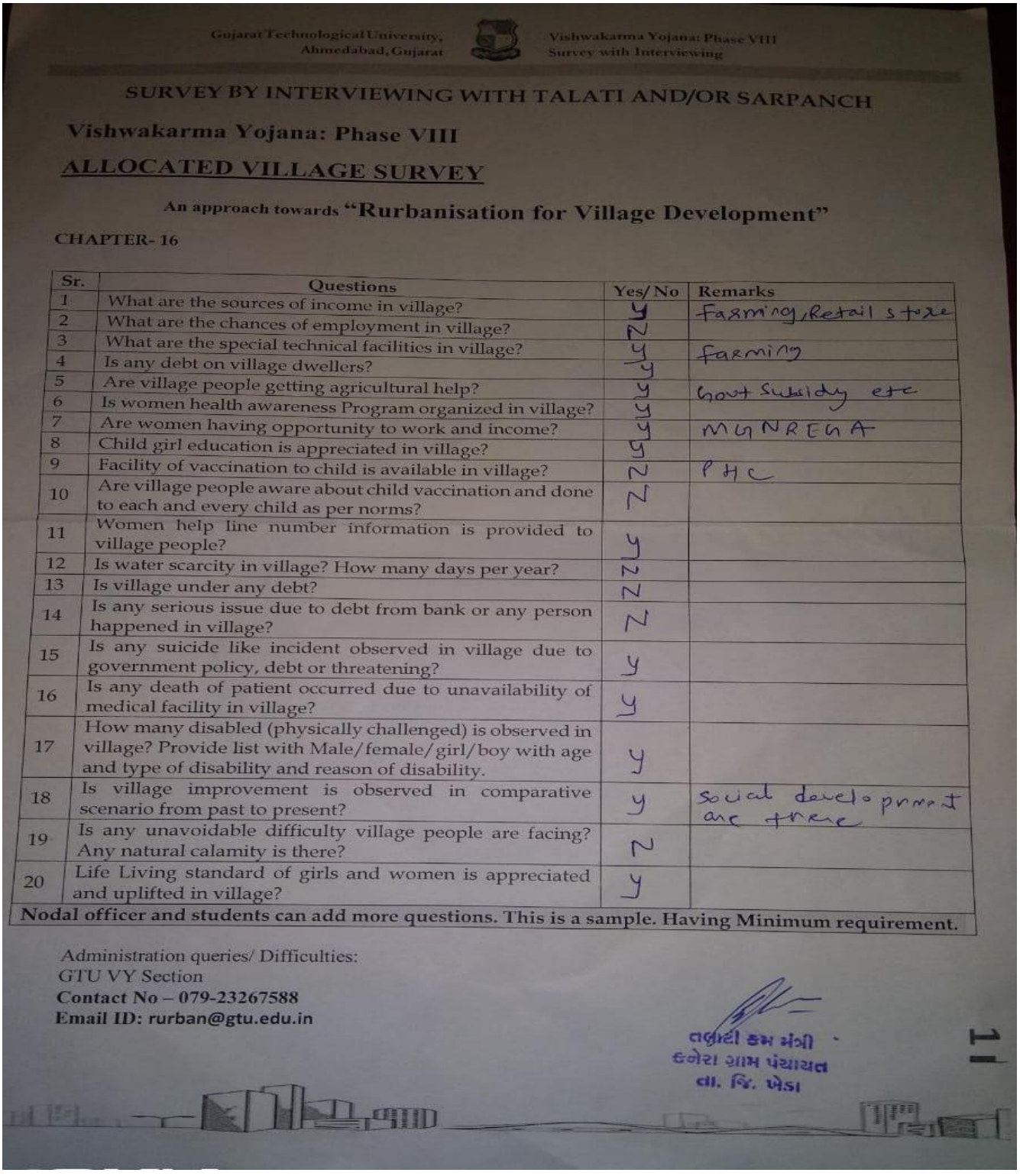
	control of street light			more and also consumes less power as compared to the HID lamps. The main purpose of this project is to control the light intensity as per the condition during non-peak hours, which is not possible in HID lamps.
8.1.5	Water level controller	Immediately	Rs. 2702.8/-	A water level controller is a device that manages water levels on a variety of systems such as water tanks, pumps and swimming pools. The basic function of a water level controller is to regulate water flow and optimize system performance.
8.1.6	Solar battery charger circuit	Immediately	Rs. 1377.5/-	The Solar Battery Charger can be used to charge our electronics while travelling. While camping the backup battery charged by the solar charger can be used for lightning purpose. It can be used as a backup power supply which you can keep in your backpack or in pocket.
13.1.1	Public garden	Long term (3-5 years)	Rs. 2,29,086/-	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.
13.1.2	Community hall	Long term (1-3 years)	Rs. 5,69,592/-	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**.**
13.1.3	Rain water harvesting	Immediately	Rs.15,800/-	rain water harvesting system will help the people to store rain water and use that water in serval things.
13.1.4	Automatic soil nutrient detection	Immediately	Rs. 6223/-	Additionally, the smart irrigation controlled receives local weather data that can help it determine when a

	and fertilizer dispensary system			landscape should be watered. If you have ever returned home during a storm only to see your sprinklers spraying water you know how beneficial this is. Rather than wasting water resources and your valuable money on watering your landscape you can take advantage of the nature moisture from the storm and save that water for another day when it is more needed. The advantages of these smart irrigation systems are wide reaching.
13.1.5	Automatic pant irrigation system	Immediately	Rs. 1335/-	Efficient: Perhaps the most appealing benefit of an automatic irrigation system is that it conserves water. Say goodbye to dry patches and thoroughly watered sidewalks or driveways. Automatic systems provide precise coverage, eliminating concerns of over or underwatering your lawn. Timers can be set for daily or weekly watering, and at times of low evaporation. Additionally, "smart" moisture sensors can be installed for many systems. These measure precipitation rates in real time, and activate only when your soil is dry.
13.1.6	Smart fence	Immediately	Rs. 4795/-	Electric fences are cheap compared to other fences. They can be made with inexpensive wire, a low-cost fencer (the unit that sends pulsed voltage through the wire), steel rods and affordable plastic insulators. A fence can be put up in a few hours or less, and it will suffice for basic livestock and animal control. .

16. Survey by Interviewing With Talati And/Or Sarpanch

Interactive Presentation (Vishwakarma Yojana: Phase: VII) At Kanera 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 Kanera village presented the village development plan of Kaneraa village at Kanera Panchayat office on 11th December, 2020. Sarpanch, Talati, All the Panchayat members and Village dwellers remained present to know how the development of Kanera 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.
- Kanera 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 Kanera 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.
- 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 .



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 etc
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?	N	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?	N	
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 development 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 requirement.

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

તલાટી કમ મંત્રી
કનેરા ગ્રામ પંચાયત
તા. જિ. ખેડા

11

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.
- GSM BASED IRRIGATION CONTROL AND MONITORING SYSTEM Irrigated agriculture is one of the primary water consumers in most parts of the world. With developments in technology, efforts are being channelled into automation of irrigation systems to facilitate remote control of the irrigation system and optimize crop production and cost effectiveness. This paper describes an on-going work on GSM based irrigation monitoring and control systems. The objective of the work is to provide an approach that helps farmers to easily access, manage and regulate. Modernisation Strategy for National Irrigation Systems in the Philippines:
- It proposes a system diagnosis approach for the development of a more appropriate and climate-smart irrigation
- Condensation irrigation a system for desalination and irrigation condensation irrigation is a system for both desalination and irrigation. The principles are that humidified air is let into an underground horizontal pipe system, where the air is cooled by the ground and humidity falls out as fresh water. The humidification could e.g., be achieved by evaporation of seawater in solar stills or any other heat source. By using drainage pipes for underground air transportation, the water percolates into the soil, thereby irrigating the land. This study focuses on drinking water production, which means that humid air is led into plan pipes where the condensed water is collected at the pipe endings. Numerical simulations gave

a study-state diurnal mean water production of 1.8 kg per meter of pipe over a 50 m pipe. Shorter pipes result in a greater mean production rate. Since the heat transfer of drainage pipes would be greater, current study indicates that condensation irrigation is a promising method for desalination and irrigation.

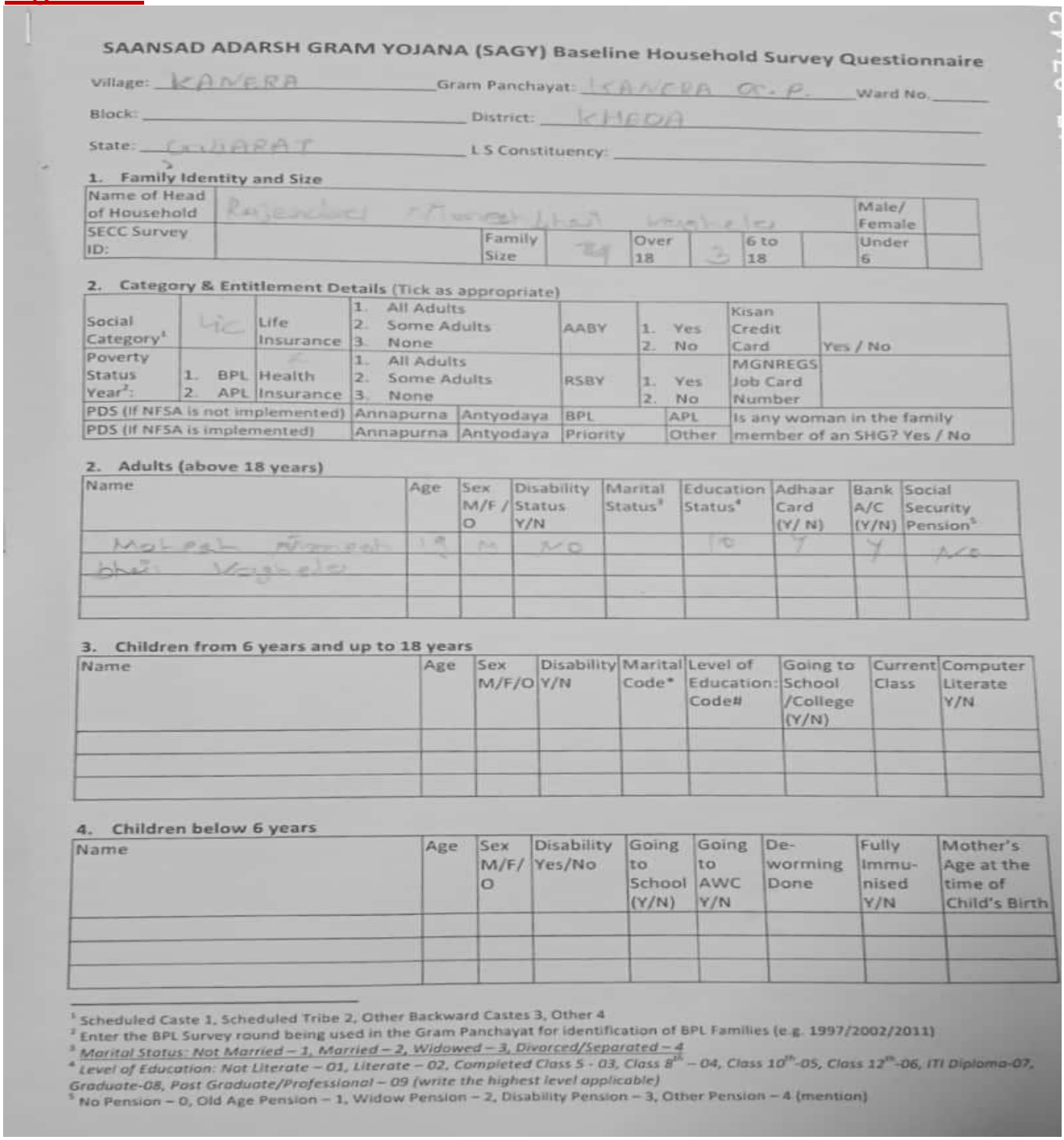
- Occasionally, urologists may see patients requiring temporary bladder irrigation at hospitals without stocks of specialist irrigation apparatus. One option is to transfer the patient to a urology ward, but often there are outstanding medical issues that require continued specialist input. Here, we describe an improved system for delivering temporary bladder irrigation by utilizing readily available components and the novel modification of a sphygmomanometer blub. This option is good for bladder irrigation in patients with moderate or severe gross hematuria due to various causes. In this prospective study from March 2007 to April 2009, we used our new system in eligible cases. In this system, an irrigant bag with 1 L of normal saline was suspended 80 cm above the indwelled 3-way Foley catheter, and its drainage tube was inserted into the irrigant port of the catheter. To increase the flow rate of the irrigant system, we inserted a traditional sphygmomanometer bulb at the top of the irrigant bag. This closed system was used for continuous bladder irrigation (CBI) in patients who underwent open prostatectomy, transurethral resection of the prostate (TURP), or transurethral resection of the bladder (TURB). This high-pressure system is also used for irrigation during cystourethroscopy, internal urethrotomy, and transurethral lithotripsy. Our 831 eligible cases were divided into two groups: group 1 were endourologic cases and group 2 were open prostatectomy, TURP, and TURB cases. The maximum and average flow rates were evaluated. The efficacy of our new system was compared prospectively with the previous traditional system used in 545 cases. In group 1, we had clear vision at the time of endourologic procedures. The success rate of this system was 99.5%. In group 2, the incidence of clot retention decreased two fold in comparison to traditional gravity-dependent bladder flow system. These changes were statistically significant (P = 0.001). We did not observe any adverse
- The continuous requirement for the food needs the rapid improvement in food production technology. The economy of food production is mainly dependent on agriculture and the weather conditions, which are isotropic and thus we are not able to utilize the whole agricultural resources. The main reason is the deficiency of rainfall and paucity in land reservoir water. The continuous withdrawal water from the ground reduces the water level resulting in most of the land to come under the arid. In the field of cultivation, use of appropriate method of irrigation plays a vital role. Drip irrigation is a renowned methodology which is very economical and proficient. When the conventional drip irrigation system is followed, the farmer has to tag along the irrigation timetable, which is different for diverse crops. The current work makes the drip irrigation system an automated one, thereby the farmer doesn't want to follow any timetable since the sensor senses the soil moisture content and based on it supplies the water. Moreover the practice of economical sensors and the simple circuitry makes this project as an inexpensive product, which can be bought even by an underprivileged farmer. The current project is best suited for places where water is limited and has to be used in limited quantity.
- . 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.

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

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. KANERA SAGY Questionnaire Survey form with the Sarpanch Signature



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: KANERA Gram Panchayat: KANERA G. P. Ward No. _____

Block: _____ District: KHEDA

State: GUJARAT L S Constituency: _____

1. Family Identity and Size

Name of Head of Household								Male/ Female	
SECC Survey ID:		Family Size	4	Over 18	3	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	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 Rajendra	19	M	NO		10	Y	Y	A/C
bhai Vaghela								

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 Hectar	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
[illegible]	[illegible]	50
[illegible]	[illegible]	150

17. Livestock Numbers

Cows: 1	Bullocks: 0	Calves: _____
Female Buffalo: 5	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): 15 14		

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: KANERA

b. Block: _____

c. District: KHEDA

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 290 Total Population 1836 Male 943 Female 893

SC HHs 38 ST HHs 101 OBC HHs 140 Other HHs 397

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

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 0 Public _____ Private _____

b. Mini Stadium : N/A 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 0

Names of such villages: _____

c. Schools (Number)

Primary Private: - Primary Govt.: 5

Middle Private: - Middle Govt.: 1

Secondary Private: - Secondary Govt.: 1

Higher Secondary Private: 0 Higher Secondary Govt: 0

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (Rice/ Wheat/ Millets)							
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	KANERA	
b.	Hand Pump Coverage in Villages:	Covered / Not Covered ✓	KANERA	
c.	Coverage under Covered Drains:	Covered ✓ / Not Covered	KANERA	
d.	Coverage under Open Drains:	Covered / Not Covered ✓	KANERA	
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ 1000 / Not Connected	KANERA	

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 Bigha	e.	Forests/ Plantations	1200	h.	Wells/Bore Wells	
c.	Un-irrigated Land	200 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)	142
b)	Number of Households receiving pension (old age, widow, disability)	130
c)	Number of eligible Households who are not receiving pension	0
d)	Number of Households eligible for Ration Card	650
e)	Number of eligible HHs having ration cards	650
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	250
j)	Number of shops selling alcohol	—
k)	Number of BPL families	—
l)	Number of landless households	381
m)	Number of IAY beneficiaries	170
n)	Number of FRA[2] beneficiaries	70
o)	Number of Community Sanitary Complexes	—
p)	Number of Households headed by single women	3
q)	Number of Households headed by physically handicapped persons	14
r)	Total number of Persons with Disability in the village	—
s)	Number of SHGs	10
t)	Number of active SHGs	9
u)	Number of SHG Federations	2
v)	Number of Youth Clubs	—
w)	Number of Bharat Nirman Volunteers	—

Name and Signature of Surveyor and Respondent'

Arvind Singh Mohammad Sahil Surveyor	સરપંચ PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	01/06/21 Date of Survey

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

4

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

I. Basic Information

a. Village: KANERA
b. Ward Number: _____
c. Gram Panchayat: KANERA
d. Block: _____
e. District: KHEDA
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 290 Total Population 1836 Male 943 Female 893

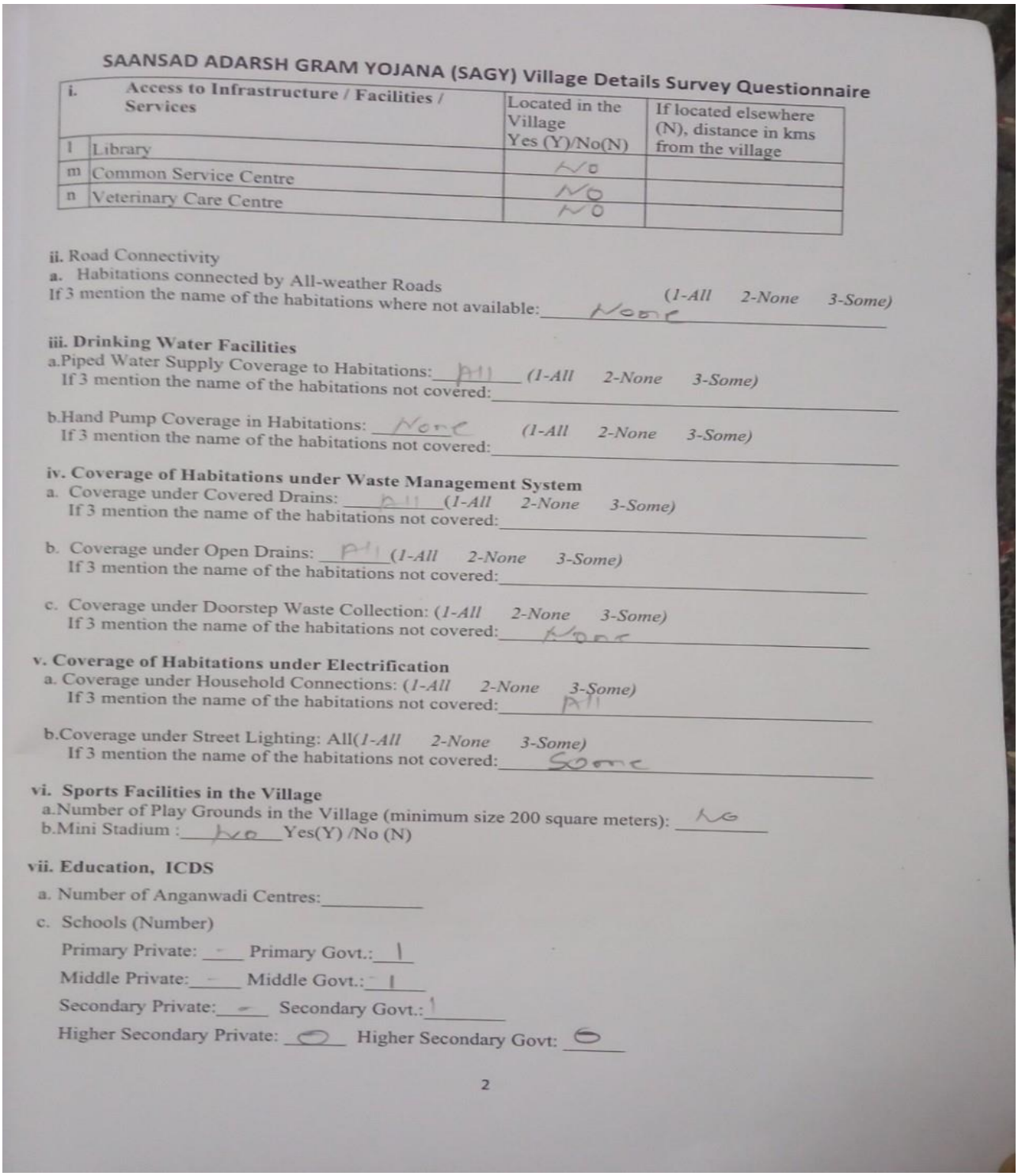
SC HHs 98 ST HHs 101 OBC HHs 640 Other HHs 997

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	NO	
m	Common Service Centre	NO	
n	Veterinary Care Centre	NO	

ii. Road Connectivity

a. Habitations connected by All-weather Roads

If 3 mention the name of the habitations where not available: None *(1-All 2-None 3-Some)*

iii. Drinking Water Facilities

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

If 3 mention the name of the habitations not covered:

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

If 3 mention the name of the habitations not covered:

b. Coverage under Open Drains: All *(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: None

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: All

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

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

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): No

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

vii. Education, ICDS

a. Number of Anganwadi Centres:

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: 1

Secondary Private: - Secondary Govt.: 1

Higher Secondary Private: 0 Higher Secondary Govt: 0

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	910	d.	Pasture / Grazing Land	—	g.	Check Dam	—
b.	Irrigated Land	910	e.	Forests/ Plnatations	—	h.	Wells/Bore Wells	—
c.	Un-irrigated Land	142	f.	Other Common Land	—	I	Tanks /Ponds	—

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	221
2	Number of active Job Card holders who have completed 100 days of work	—
3	Number of shops selling alcohol	No
4	Number of BPL families	—
5	Number of landless households	301
6	Number of IAY beneficiaries	—
7	Number of FRA beneficiaries	—
8	Number of common sanitation complexes	1
9	Number of SHGs	8
10	Number of active SHGs	2
11	Existence of SHG Federation in the Village (Yes / No)	yes
12	Number of Youth Clubs	—
13	Number of Bharat Nirman Volunteers	—

Name and Signature of Surveyor and Respondent'

Arvind Singh Mohammad Sahil Surveyor	સરપંચ 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)	01/06/21 Date of Survey

3

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

Gmail shah Tanha <shahtanha19@gmail.com>

Introduction of Vishwakarma Yojana for Kanera village
1 message

shah Tanha <shahtanha19@gmail.com> Thu, Jun 24, 2021 at 10:15 PM
To: ddo-khe@gujarat.gov.in, collector-khe@gujarat.gov.in, sdmkheda@gmail.com, tdo-khe@gujarat.gov.in, do-dish-khe@gujarat.gov.in

Respected Sir/Madam,
I Tanha Shah, HOD in Ahmedabad Institute of Technology under my guidance Malek Muhammad Sahil & Arvind Singh 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 Yojana (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 Kanera village of Kheda district, profile of issues for development and our design work for them which are as below:

Village:Kanera		**Population: 1836(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.	● PrathmicAarogya 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 all available in the village.	● Reading Hall ● Samajsevamandal

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	Cement Concrete Road	7 to 9 months	5,28,365	Makes transportation easy
2	PHC	9 to 10 months	4,93,452	No problems would be faced by villagers regarding their health.
3	Biogas Plant	8 to 9 months	76,410	People would get help easily cooking gas.
4	Public Garden	3 to 5 months	Annual 2,29,068	People can take care of their health
5	Community Hall	1 to 1.5 months	5,69,592	Villagers can held their functions and gathering
6	Rain water Harvesting	7 to 9 months	8878	People can save the precious rain water and can use it through out year
7	Auto intensity control of street light	6 to 12 months	932	Saves energy upto a great extent
8	Water level controller using 8051 microcontrollers	30 days	2702	Saves water upto a great extent
9	Solar Battery Charger Circuit	15 days	1377.75	Converts and generates electricity from sun rays. It is portable
10	Automatic Soil nutrient detection and fertilizer dispensary system	6 to 8 months	6223	It would become easy for the farmers for taking care of their crops
11	Automatic plant irrigation system	1 to 2 months	1335	Saves water and gives water to plants accordingly
12	Smart Fence	15 to 30 days	4795	Keeps away cow and another herbivore animal who damages the crop by over-grazing.

Please find herewith attached,

Detailed Project Report of **Kanera Village**

Thanking you,

Tanha shah

HOD
Civil engineering Department Ahmedabad Institute of Technology, Ahmedabad.

Chapter 21: Comprehensive report for the entire village

Village: Kanera		**Population: 1836(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 all available in the village.	● Reading Hall ● 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	Cement Concrete Road	7 to 9 months	5,28,365	Makes transportation easy
2	PHC	9 to 10 months	4,93,452	No problems would be faced by villagers regarding their health.
3	Biogas Plant	8 to 9 months	76,410	People would get help easily cooking gas.
4	Public Garden	3 to 5 months	Annual 2,29,068	People can take care of their health
5	Community Hall	1 to 1.5 months	5,69,592	Villagers can hold their functions and gathering
6	Rain water Harvesting	7 to 9 months	8878	People can save the precious rain water and can use it throughout year
7	Auto intensity control of street light	6 to 12 months	932	Saves energy upto a great extent
8	Water level controller using 8051 microcontrollers	30 days	2702	Saves water upto a great extent
9	Solar Battery Charger Circuit	15 days	1377.75	Converts and generates electricity from sun rays. It is portable
10	Automatic Soil nutrient detection and fertilizer dispensary system	6 to 8 months	6223	It would become easy for the farmers for taking care of their crops
11	Automatic plant irrigation system	1 to 2 months	1335	Saves water and gives water to plants accordingly
12	Smart Fence	15 to 30 days	4795	Keeps away cow and another herbivore animal who damages the crop by over-grazing.