DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
AGHAR Village

PATAN District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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COLLEGE NAME: GOVERNMENT ENGINEERING COLLEGE KATPUR, PATAN

NODAL OFFICERS NAME:
Dr. M.I. BALYA

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 AGHAR

DISTRICT PATAN

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.
This project work has been carried out by them under our supervision and guidance.

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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College Name:	**GOVERNMENT ENGINEERING COLLEGE, PATAN**
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ABSTRACT

Vishwakarma Yojana is providing a special scheme for the development of the village by GTU and the Government of Gujarat in which students work together and collect data and information regards village development with the help of gram panchayat and stakeholders. The village has some basic facilities like drinking water, drainage system, pakka road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give a proposal regarding sustainable energy sources and solutions related to infrastructure problems.

As a part of the PMMS subject, we have given the project under the scheme of Vishwakarma Yojana phase VIII. Under this project, we have allotted the 'AGHAR' village of the 'PATAN' district. Under this project, we have visited the village and collected data regarding the existing infrastructure and required new proposed amenities.

During our village visit, we met to the Sarpanch, Talati and Villagers for the collection of information related to the village as existing and future development. The survey carried out for the collection of data from government offices like gram panchayat. We collected the data related total population of the 'AGHAR' village, male female ratio, literacy rate of village, growth rate, number of schools, various government schemes running for village development, area of village, agricultural area of village, major occupations, major crops taken, water supply source for drinking as well as irrigation water, transportation facilities, etc.

This Yojana is one of the approaches to reduce urban city Pressure and lower the migration rate by developing village with a 'rural soul' but with all urban amenities that a city may have given to the villagers. The developmental work in villages that could undertake as per the need of the village includes Physical, Social and Renewable infrastructure Facilities.

To provide sustainable road condition, smart villages technologies like rainwater harvesting, solar panels for electricity generation etc. in future….

Key words: Data collection, list of existing facilities, need of amenities, sustainable planning, economical design proposal, etc.

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 **Dr. Navin Sheth**, **Hon'ble Vice Chancellor, Gujarat Technological University-Ahmedabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N. Kher**, **Registrar, Gujarat Technological University-Ahmedabad** for giving us complete support.
We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

We express our sincere thanks to **DDO, TDO, Sarpanch, Talati and staff members of Ahmadabad** District for providing us with requisite data whenever we approached them. Especially our thanks are to all villagers and stake holders for their support during Survey.
We are also thankful to our **Dr. H.S. Patel Principal**, faculties of our colleges for their encouragement and support to complete this project work.

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,
Dr. M.I. Balya from college form their invaluable guidance, constant inspiration and active involvement in our project work.

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

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We, therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.
Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma Yojna
SAGY	Sansad Adarsh Gram Yojana
SC	Smart City
ICT	Information and communication technology
RWH	Rainwater harvesting
SV	Smart Village

1. Ideal village visit from District of Gujarat State (Civil Concept)
(Ideal village: -Jafaripura, sidhpur, patan, 384151)

1.1 Background

Sometimes just a vision for change can bring ocean for difference. This village create its own image as an ideal village in Patan district.

Jafaripura is in Siddhpur tehsil of Patan district in Gujarat. The total geographical area of Jafaripura village is 374.21 hectares. Jafaripura village has a total population of 575 peoples. There are about 122 houses in Jafaripura. Sidhpur is nearest town to Jafaripura village which is approximately 11km away.

Jafaripura village literacy rate is 79.3% The name of sarpanch of Jafaripura is Maherali Kojar.

Jafaripura has primary school, bus stop, Gov. health centre, Tamples, Mosques etc. Nearest village is Kakosi.

- **Study Area Location**

Fig-1 Map (jafaripura)

1.2 Concept: ideal village and normal village

Ideal Village

An ideal Indian village will be so constructed as to lend itself to perfect sanitation. It will have cottages with sufficient light and ventilation built of a material obtainable within a radius of five miles of it. The cottages will have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all avoidable dust. It will have wells according to its needs and accessible to all. It will have houses of worship for all, also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have Panchayats for settling disputes. It will produce its own grains, vegetables and fruit, and its own Khadi. This is roughly my idea of a model village. In the present circumstances its cottages will remain what they are with slight improvements. Given a good zamindar, where there is one, or co-operation among the people, almost the whole of the programme other than model cottages can be worked out at expenditure within means of the villagers including the zamindar or zamindars, without Government assistance. With that assistance there is no limit to the possibility of village reconstruction. But my task just now is to discover what the villagers can do to help themselves if they have mutual co-operation and contribute voluntary labour for the common good.

I am convinced that they can, under intelligent guidance, double the village income as distinguished from individual income. There are in our village's inexhaustible resources not for commercial purposes in every case but certainly for local purposes in almost every case. The greatest tragedy is the hopeless unwillingness

Fig -2 Ideal village concept

- **Normal Village**

Fig -3 concept of rural village

A village is a clustered human settlement or community, larger than a hamlet but smaller than a town (although the word is often used to describe both hamlets and smaller towns), with a population typically ranging from a few hundred to a few thousand. Though villages are often located in rural areas, the term urban village is also applied to certain urban neighbourhoods. Villages are normally permanent, with fixed dwellings; however, transient villages can occur. Further, the dwellings of a village are fairly close to one another, not scattered broadly over the landscape, as a dispersed settlement.

In the past, villages were a usual form of community for societies that practice subsistence agriculture, and also for some non-agricultural societies. In Great Britain, a hamlet earned the right to be called a village when it built a church. In many cultures, towns and cities were few, with only a small proportion of the population living in them. The Industrial Revolution attracted people in larger numbers to work in mills and factories; the concentration of people caused many villages to grow into towns and cities. This also enabled specialization of labour and crafts, and development of many trades. The trend of urbanization continues, though not always in connection with industrialization. Historically homes were situated together for sociability and defence, and land surrounding the living quarters was farmed. Traditional fishing villages were based on artisan fishing and located adjacent to fishing grounds.

1.2.1 Objectives

- ✓ Create a healthy and environmentally sustainable community.
- ✓ Encourage the provision of local business services within the village.
- ✓ Encourage slow and sustainable development that maintains the village's rural and historic character and identity.
- ✓ Improve pedestrian and traffic safety within the village.
- ✓ Cooperate on planning and future development activities with Beckwith Township.

1.2.2 Live case studies of ideal village of Gujrat

- **STREET ROAD**

Fig-4 Street Road

Street road facilities at jafripura village in patan district is clean and in good condition as compared to aghar village. And this facility is laying in whole village so, we can say ideal village. So, that can feel much comfort in drive and walk. All most road are rigid pavement constructed in whole village.

- **STREETLIGHT**

Fig-5 streetlight

Now a present-day streetlight is provided in whole village. So, at a night good appearance of village because of streetlight and one main thigh is reduction of crime during the night.

Street lighting can provide safety benefits at intersection locations and can also improve safety for pedestrians, particularly at crossing points and at night. Lighting intersections can also aid navigation and helps drivers to see the intersecting road, turning vehicles, traffic queues and any other road users and other benefits also…

- **A PLACE TO SPIT**

There is best facility for to the spit for villagers and other people. It is placed on the solders of the road so; village would be clean. Main benefit of this kind of bucket creates healthy environment. So, no need for pay to hospital for heath. Collection of waste from the bucket is taken by municipal worker at equal interval.

Fig -6 place of spit

- **HOUSES**

In whole village almost all hoses are made by cement and concrete we can say pakka houses as compared to aghar village. So that is protect during sunlight and monsoon. And the placing of houses in whole village is uniform and linear to each other.

Fig-7 Houses in jafaripura

- **CLEANING WORK OF ROAD & VILLAGE**

In jafaripura for cleaning work of road the worker to do this work every day. So, village become clean and with healthy atmosphere. Main benefit of cleaning work creates healthy environment. So, no need for pay to hospital for heath. Collection of waste from the street is taken by municipal worker every day.

Fig-8 Cleaning Work

- **CCTV camera**

For the security of villager's governments provided CCTV camera in whole village this become very useful for security mostly during the night and day also.

Fig -9 CCTV camera

- **Wi-Fi connection**

In an internet era we need must connectivity of internet for ease to life. wi-fi is available in jafaripura for villagers With Wi-Fi Router you can connect to the multiple modern-day devices at once. You can access internet anywhere (where the signals are available).

Fig -10 WI-FI

1.2.3 Idea of smart village

Fig -11 Smart Village

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

1.2.4 Ancient History Civil / Electrical concept about Indian Village/Foreign Countries Perspective and its Development

Chhotkei village in Angul district of Odisha has emerged as the first smart micro grid implementing village in India. The village gets a supply of 30 kWp (kilo watt, peak) Solarpower. The village has installed a Smart Nanogrid to meet the energy demands of 140 households, 20 streetlights, a temple, and three community centres. After usage, the village saves around 10 kWp which they set aside for daytime use in irrigation pumps and microenterprises to improve agricultural output, to enable value-addition to agriculture, and generate employment.

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

- ✓ Resources available in Ideal Village
- ✓ Agriculture
- ✓ Schools
- ✓ College
- ✓ Hospital
- ✓ Substation
- ✓ Bank & ATMs
- ✓ Existing road
- ✓ Existing infrastructure

1.4 SWOT Analysis of ideal village

Strengths	• Street road facilities • Streetlight facilities • CCTV camera • Good economic growth
Weaknesses of ideal village	• Very low agriculture growth • No renewable energy sources.
Opportunities of ideal village	• Use bio-gas plant, solar streetlight, etc.……
Threat	• Not required

1.5 Future Prospects.

In future they think to do installation of solar, biogas or any other renewable energy sources as per availability of sources in village and more suitable source for the area. If any other problems were occurring in future, then try to solve that problem also.

- ✓ Solar streetlight
- ✓ Biogas Plant
- ✓ Wastewater treatment plant
- ✓ Blood Bank
- ✓ Water Meter

1.6 Benefit of the visit of ideal village

- Locally produced and locally consumed energy: In villages if the mountains, hilly area are present then use of solar energy & wind energy then energy is producing in that village itself & use for development of village.
- Creation of job: Generally, village people migrate from village to city for purpose of job. If village becomes smart so all the job requirements are fulfills & people not migrate from one place to another.
- Contribution to global environment: The system can reduce reliance on fossil fuels &contribute to reduction of greenhouse gases such as carbon dioxide. Energy consumption optimization 25-30% average energy saving.
- For farmer e-learning etc. facility that will be able to ask there quarries online.
- New technologies in education, e-learning, desktop publishing, horoscope generation of interested person of the village. Transportation of village into comfortable & safe space that enhance quality.

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

Provision of clean and sustainable energy is central to almost all other dimensions of rural development.

- Energy security is the secret mantra, which enables development in agriculture, healthcare, education, and skilling of rural communities.

- With a wide variety of solar, wind, biomass, and biogas technologies now available at competitive costs, we are at the cusp of witnessing energy disruption and creating an abundant energy economy.
- For rural energy supply and management, the element of 'smart' refers to creation and management of mini, micro, and Nano grids within the energy eco-system of a village or a group of villages. It is particularly relevant to rural areas with no or unreliable grid connectivity. These micro / Nano grids bring in the element of self-reliance in energy for rural community and create a possibility of giving back the surplus to the grid. Developing a village with this approach can usher in a new developmental model.
- The vision for a smart village revolves around energy security. Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the planet to thrive. One such case has been shared in the below for reference.
- Chhotkei village in Angul district of Odisha has emerged as the first smart micro grid implementing village in India. The village gets a supply of 30 kWp (kilo watt, peak) Solarpower. The village has installed a Smart Nanogrid to meet the energy demands of 140 households, 20 streetlights, a temple, and three community centres. After usage, the village saves around 10 kWp which they set aside for daytime use in irrigation pumps and microenterprises to improve agricultural output, to enable value-addition to agriculture, and generate employment.

2.Literature Review

2.1 Introduction: Urban & Rural village concept

It is an innovation of sustainable planning approach at the village level that promotes knowledge-based development through the continuous learning of human resources as an integrative part of village resource development, especially in encouraging rural areas development as a part of regional system in the context of national development planning system. This leads to the effective and efficient development of economic sectors, especially primary and secondary sectors supported by appropriate technology to high technology because of continuous learning which could facilitate sustainable rural urban linkages

Fig -12 Urban VS Rural

- Community's integrity. The willingness of the people as human resources at rural level to develop their capacities and promote changes to achieve better quality of life
- History and culture. Characteristic of rural history and culture as consideration to develop knowledge-based development.
- Spatial context in urban and regional planning perspective. Rural areas as an integrative component of regional and national spatial system
- Economic sectors. Primary and secondary sectors that could facilitate harmonious relationships with tertiary and quarter sectors of growth area (urban area)

- Technology readiness. It depends on the rural spatial function in regional context, including specific rural resources to be encouraged in ensuring rural urban linkages. In addition, the smartness concept promotes a sustainable and resilient rural area.
- Technological impacts, Physical and development synergies. There are synergies among rural physical infrastructure and rural telecommunication system.

Substitution effects. The limited rural physical flows can be substituted and facilitated by rural virtual flows.

- Generational effects. A rural area will be more sustainable and competitive by the synergy between physical and telecommunication infrastructures along with the growth of rural economic activities.
- Enhancement effects. A rural area will be more attractive, efficient, and rural physical network (road, rail, water, energy, and irrigation) will be more adequate to ensure rural-urban connectivity.

URBAN AREA: An urban area is characterized by higher population density and in comparison, to areas surrounding it. Urban areas may be cities or towns, but the term is not commonly extended to rural settlements such as villages.

For the Census of India 2011, the definition of urban area is as follows:

1. All places with a municipality, corporation, cantonment board or notified town area committee, etc.
2. All other places which satisfy the following criteria:
    1. A minimum population of 5,000,
    2. At least 75% of the male main working population engaged in non-agricultural.
    3. A density of population of at least 400 persons per sq. km

RURAL AREA: Rural areas are also known as 'Countryside' or a 'village' in India. It has a very low density of population. In rural area people practice agriculture for their livelihood. Town with a maximum population of 15,000 is considered rural in nature.

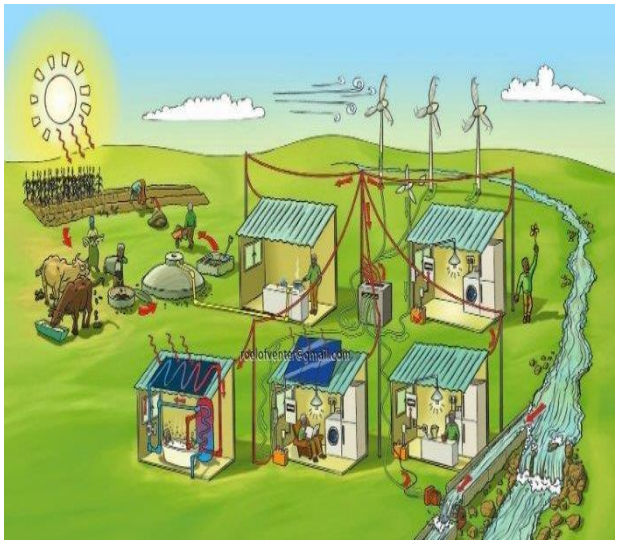
2.2 Importance of the Rural development

Rural development relates to the method of enhancing the quality of life and financial wellbeing of an individual living in populated and remote areas.

Traditionally rural development is cantered on the misuse of land natural resources such as forestry and agriculture. But today, increasing urbanization and change in global production, networks have transformed the nature of rural areas.

Fig- 13 Rural Development

Today, rural development 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 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.

2.3 Various Definition

- **RURAL**

Rural areas are areas which are not towns or cities. They are often farming or agricultural areas. These areas are sometimes called "the country" or "countryside". People who live "in the country" often live-in small villages, but they might also live somewhere where there are no other houses nearby.

Fig -14 Rural Area

Rural is the opposite of urban, which means places such as cities where buildings and places where people work and live are all close together. A rural area is an open swath of land that has few homes or other buildings, and not very many people. A rural areas population density is very low. Many people livein a city, or urban area. Their homes and businesses are located very close to one another.

- **URBAN**

An urban area is an area where many people live and work close together. The population density is higher than in the surrounding area. It is where buildings are close together. Urban is the opposite of rural, where farmlands and nature are. Urban areas are usually cities and towns. Most of the work available in urban areas is factory and office work. agricultural work is rare because buildings are close together and there is no space for farmlands.

Fig -15 Urban Area

An urban area is the region surrounding a city. Most inhabitants of urban areas have nonagricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. "Urban area" can refer to towns, cities, and suburbs.

Urbanization in Republic of India was primarily caused when independence, thanks to adoption of mixed system of economy by the country that given rise to the event of personal sector. Urbanization is going down at a quicker rate. Population residing in urban areas in Republic of India, in keeping with 1901 census, was 11.4%.

This count increased to twenty-eight. 53% in keeping with 2001 census, and crossing half-hour as per 2011 census, standing at thirty-one.16%. in keeping with a survey by world organization State of the globe Population report in 2007, by 2030, 40.76% of country's population is anticipated to reside in urban areas.

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

Population growth of India as per Census 2011:

- Rural/Urban distribution: 68.84% & 31.16%
- Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census.

As per the Provisional Population Totals of Census 2011, the total population of India was 1210.2 million. Of this, the rural population stands at 833.1 million and the urban population 377.1 million.

The total urban population in the country as per Census 2011 is more than 377 million constituting 31.16% of the total population.

As per the Provisional Population Totals of Census 2011, the total population of India was 1210.2 million. Of this, the rural population stands at 833.1 million and the urban population 377.1 million.

The statistic displays the main states and union territories with the highest number of people living in rural areas in India in 2011.

In that year, the state of Uttar Pradesh had the highest population with over 155 million people living in rural areas.

The government has started many programs aimed at improving the standard of living in villages or rural areas. To build rural infrastructure, the government launched a time-bound business plan for action Bharat Nirmanin2005. Under Bharat Nir man, action is proposed in the areas of Water Supply, Housing, Telecommunication, and Information Technology, Reads, Electrification and Irrigation.

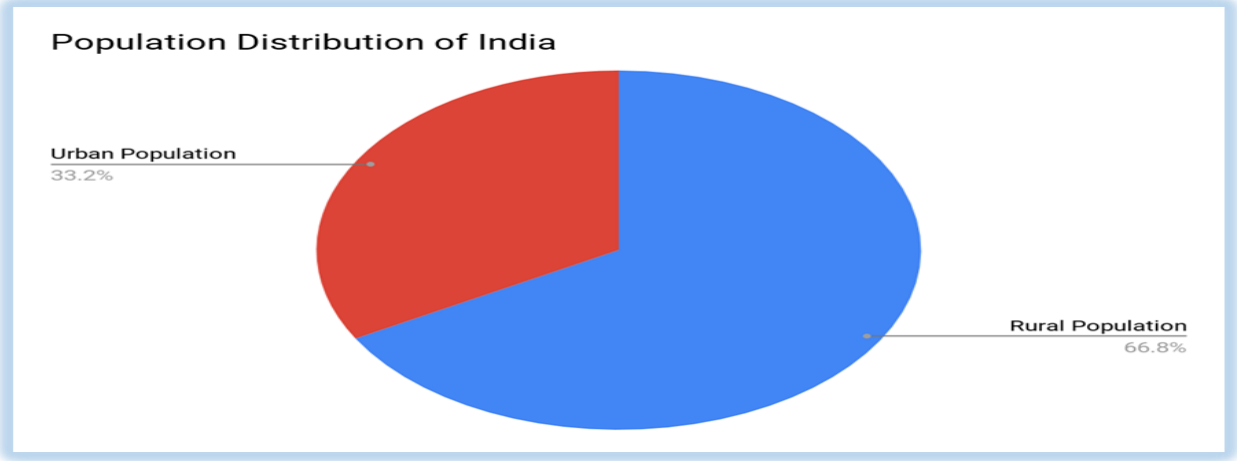


Fig-16 Population Distribution India (2011

Table-1 Population according 2011 Census

	1991-2001	2001-2011	Difference
India	21.5	17.6	-3.9
Rural	18.1	12.2	-5.9
Urban	31.5	31.8	0.3

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

- The total population growth in this decade was 19.28 percent while in previous decade it was 22.48 percent. The population of Gujarat forms 4.99 percent of India in 2011. In 2001, the figure was 4.93 percent.

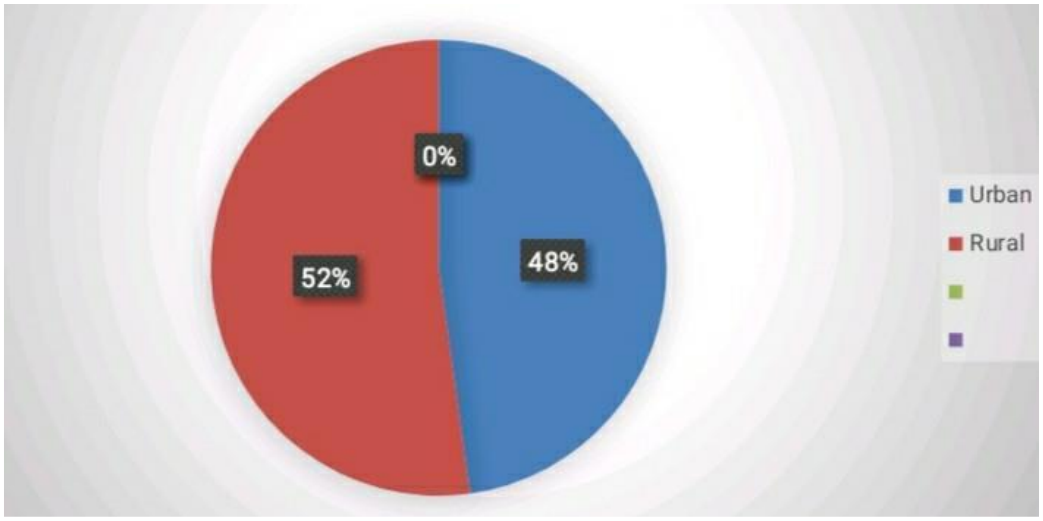


Fig-17 Population Distribution Gujrat (2011)

Table-2 Population according 2011 Census

Description	Rural.	Urban
Male.	81.61 %	90.98 %
Female	57.78 %	70.26 %

2.6 Rural Development Issues - Concerns - Measures

- **Poverty**

Poverty in India is still a major issue even currently. The population of people living below the poverty line in India is the highest in the world and the problem is not going away. If you have ever been to India then you will understand - from the moment the place hits the ground the

poverty is evident, indeed it is the idea of such extreme poverty which puts people of the idea of travelling to India in the first place.

Several factors are responsible for poverty in the rural areas of India. Rural populations primarily depend on agriculture as their livelihoods, which in turn, is highly dependent on rain patterns and monsoons. Inadequate rain and improper irrigation facilities can obviously cause low, or in some cases, zero production of crops followed by the obvious but sometimes catastrophic repercussions that often follows.

An Indian family unit can be often very large, which can exacerbate the effects of poverty. Also, the caste system which is still found a lot in India (although it is getting less) is a major reason for rural poverty for it keeps people locked in the endless cycle with less facilities and opportunities for the lower castes. The government has planned and implemented poverty eradication programs, but the benefits of all these programs have yet to reach the core of the country.


Fig-18 Poverty

- **Poverty in India - the statistics**

✓ 50% of Indians do not have proper shelter.

✓ 70% do not have access to decent toilets (which inspires a multitude of bacteria to host their own disease party).

✓ 35% of households do not have a nearby water source.

✓ 85% of villages do not have a secondary school (how can this be the same government claiming 9% annual growth?)

✓ Over 40% of these same villages do not have proper roads connecting them.

- **Electricity**

It is a matter of shame for all of us that even 56 years after Independence, 63 percent of all rural households in India do not have electricity and use kerosene for lighting. Even forthose rural areas, which are electrified, there is a tremendous shortage of power supply. Thusit is not uncommon for these areas to have 10-15 hours of blackouts and brownouts everyday. There is a shortfall of about 15,000-20,000 mw of electricity in the country and we require about 140,000 mw of additional capacity by 2010 with an estimated outlay of Rs5,50,000 crore. Because of tremendous shortage of electricity, industrial growth and general life in the country is seriously affected.

Fig-19 Rural Area Electricity

"The key issue that remains ambiguous is what defines "power for all" — Is it just electrification of villages or to provide quality and adequate electricity to all households?

The definition of electrified village has changed over the years. Before October 1997, a village was classified as "electrified" if electricity was used within its revenue area for any purpose. After October 1997, a village was declared "electrified" if the electricity was used in the inhabited locality, within the revenue boundary of the village for any purpose.

- **Water**

Earlier this year, Safe Water Network released a detailed and comprehensive report that takes stock of the progress of community safe water solutions in the country. This report on the

drinking water situation in India addresses some of the key questions we are seeking to answer as investors finding profitable companies that can deliver affordable water for the masses. here are some facts on the drinking water situation in India that will make you sit up and take note of the problem.

- ✓ It is estimated that only 18% of a total rural population of 833 million Indians have access to treated water. In comparison, 41% of the rural population, or 346 million people, own mobile phones.
- ✓ Only about one-third of rural households in India are reached by piped water supplies. The balance two-third of rural households is still living 'beyond the pipe'. The 2011 census estimates that 138 million rural households, or about 685–690 million people, lack access to safe drinking water.

Fig-20 water facility (rural)

- ✓ More than half of the pipes in rural areas in India deliver untreated water.
- ✓ Access to safe water varies greatly from state to state. 36% of the rural population in Andhra Pradesh has access to treated water while, in Bihar, less than 2% of the rural population receives treated water.

- **Transport**

A major constraint with developing and maintaining rural roads is the fact that they are, unfortunately, rural. The areas where they are needed are often difficult to access, logistics become complicated, local contracting capability is limited, engineers are few and far between, and younger engineers especially, are not keen to leave the urban environment.

We need somehow to keep our design and construction techniques to consider capability and the limited knowledge on quality procedures. How do we do it?

- ✓ Design simple, high error margin techniques with low maintenance regimes
- ✓ Use local materials as much as possible
- ✓ Remember the cheapest option is probably the worst option no matter what the economic analysis or traffic volume figures indicate.

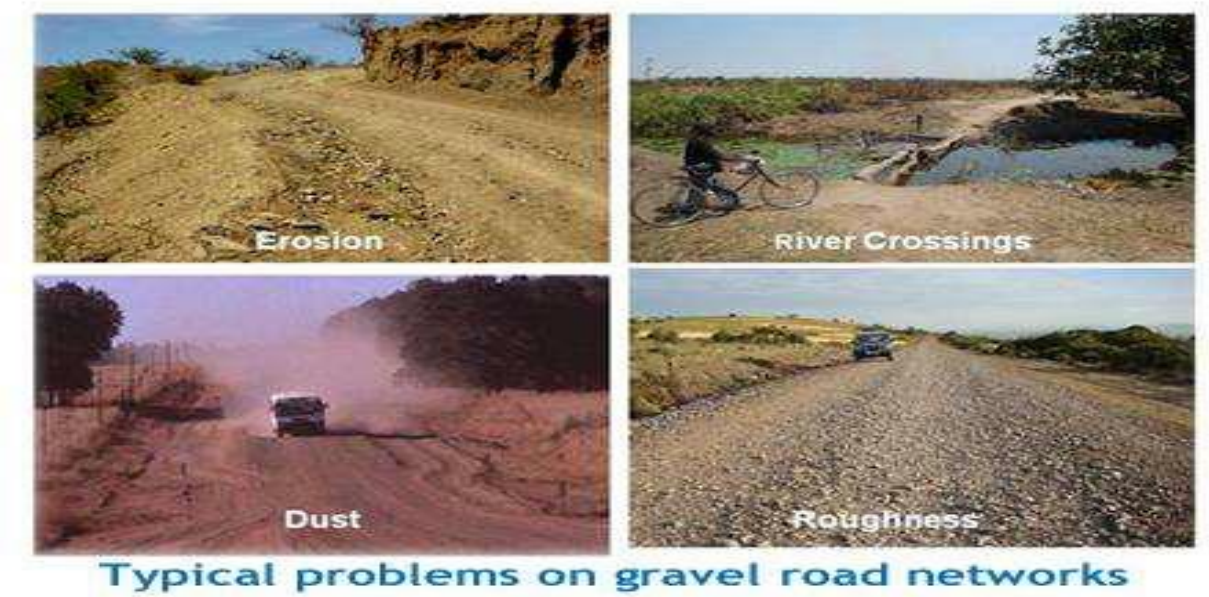


Fig-21 Transportation in Rural

There are many issues surrounding the low initial-cost provision of gravel roads. These include:

- ✓ Short road-life expectation due to erosion and wear
- ✓ Lack of drainage and watercourse crossings
- ✓ Damage to health and detriment to farming productivity from dust.
- ✓ Damage to road users and equipment from rough roads

There is increased expectation amongst the rural poor that governments will provide and maintain roads in a condition that facilitate all-weather access and regular transport services.

2.7 Various Infrastructure and Guidelines /Norms for Villages for the Provisions of Different Infrastructure Facilities.

- DRDAs must themselves be more professional and should be able to interact effectively with various other agencies. They are expected to coordinate with the line departments, the

Panchayati Raj Institutions, the banks and other financial institutions, the NGOs as well as the technical institutions, with a view to gathering the support and resources required for poverty reduction effort in the district. It shall be their endeavor and objective to secure inter-sectoral and inter-departmental coordination and cooperation for reducing poverty in the district. It is their ability to coordinate and bring about a convergence of approach among different agencies for poverty alleviation that would set them apart.

- The DRDAs are expected to oversee the implementation of different anti-poverty programs of the Ministry of Rural Development in the district. This is not to be confused with actual implementation, which will be by the Panchayati Raj and other Institutions. The DRDAs will monitor closely the implementation through obtaining of periodic reports as well as frequent field visits. The purpose of the visit should be to facilitate the implementing agencies in improving implementation process, besides ensuring that the quality of Implementation of programs is high. This would include over-seeing whether the intended beneficiaries are receiving the benefits under the different programs.
- The DRDAs shall keep the Zilla Parishad, the State and the Central Government duly informed of the progress of the implementation of the programs through periodic reports in the prescribed formats. Special report, as and when called for, shall be provided.
- The DRDAs shall take necessary step to improve the awareness regarding rural development and poverty alleviation particularly among the rural poor. This would involve issues of poverty, the opportunities available to the rural poor and generally infusing a sense of confidence in their ability to overcome poverty.

2.8 Ancient/Existing Electrical Concept Literature review for village

- Rural electrification is the process of bringing electrical power to rural and remote areas. Rural communities are suffering from colossal market failures as the national grids fall short of their demand for electricity.
- GRID is an Indian start-up aimed at facilitating sustainable economic and social development through low-cost energy solutions in rural areas. Outside of microgrid systems, GRID has utilized solar energy to solve a myriad of issues that plague rural communities. For example, Grid has setup solar powered reverse osmosis filtration plants in rural India to help eliminate water insecurity.

- GRID's filtration plant is able to provide 20,000 to 30,000 liters of clean water per day which helps to alleviate this issue and reduce the spread of water-borne illness. Additionally, the ease of distribution has reduced the amount of time spent collecting water, allowing for more time on productive tasks and a reduction in time poverty. Finally, GRID employs locals in the community to run the plants day to day operations. From the ground up, GRID's business model fosters the development of rural communities, and they plan to scale their operations across India.

2.9 Other Schemes/Projects.

1. Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY):

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

2. Bharat Nirman Yojana:

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

- ✓ rural housing,
- ✓ irrigation,
- ✓ drinking water,
- ✓ rural roads,
- ✓ electricity
- ✓ rural telephone.

3. Indira Awasa Yojna:

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

3. Smart (Cities / Village) Concept Idea and its Visit (Civil):

3.1 Concepts

- ✓ The concept of smartness is popular in respect and honor of human development regardless of rural or urban area, literate, or illiterate in all the countries and India is not omission to it. Like many developing countries, India too is a rural dominated country.
- ✓ The idea of "Smart Village" will also attention to multiple challenges such as unplanned urbanization, under-development of villages, migration for economic pursuance, improved standard of living etc.
- ✓ The basic concept of smart village is to collect community efforts and strength of people from various streams and integrate it with information technology to provide benefits to the rural community.
- ✓ According to Mahatma Gandhi's philosophy and thoughts smart village project provides, "Global means to the local needs."
- ✓ The concept of smart village is defined as below

Fig -22 Concept Village

Table-3 Smart Village Concept

S	Social, skilled and simple.	Zero tolerance for caste and creed and no discrimination on gender and religion. Skilled simple living and high thinking.
M	Moral, methodical and modern.	Moral values of Mahatma Gandhi and Swami Vivekananda using modern (latest) methods .
A	Aware, adaptive and adjusting.	Awareness about global, social and economic issues adaptive and adjusting the fast changing environment.
R	Responsive and ready	Ready to generate all resources for self - sufficiency and self-governance. Responsive for co-operative movements and collective wisdom.
T	Techno savvy and transparent	Tecnosavy for IT and transparent mobile usage harmonic relations.

3.2 Vision-Goals:

- ✓ Homes with access to toilet, safe drinking water and regular power.
- ✓ A Smart Village knows all information about its citizens, available resources, applicable services, and schemes.
- ✓ Every household has diversified livelihood opportunities and/or micro enterprise. Microenterprise a business operating on a very small scale, esp. one with a sole proprietor and fewer than six employees.
- ✓ Maintain its Identity, culture, and Heritage.
- ✓ Plans for development based on People, Assets and
- ✓ Service Centric information and tracks its progress.
- ✓ It works towards Revenue generation.
- ✓ Has functional solid/liquid waste management system.
- ✓ End all preventable maternal deaths and infant deaths.
- ✓ Which means proving good basic health facilities in Health care cantered.

Fig-23 Goal of Smart Village

3.3Technological Options:

- **Smart Sewage Management System and Sanitation**

No village or group of villages can be termed truly ‘smart’ without an effective sewage management system and there is a need for framing a proper sanitation plan for towns intended to become smart. Management of large quantity of household waste and garbage had become major headache for local managing bodies. Also dumping such garbage in locality is affecting common people’s health. To solve the problem related with sewage management, an urgent and effective action plan is required. The knowledge enhancement and capacity building on sanitation diagnostics, town sanitation planning and decision making and analysis of cost effective and sustainable wastewater treatment technologies for mainstreaming faucal sludge should be focus for developing smart villages. Preparing our mind set for sewage management at personal level will be more fruitful. Every individual can have dust bin fixed outside their home where they can put their household garbage instead of throwing in open space. Different colored dust bins can be chosen for different categories of wastes like dry and wet, decomposable, and non-decomposable waste, etc. Ample number of wastes collecting vehicles so called ‘Ghantagadi’ can be availed for each village to collect it. Waste material dumping yards shall be far away from civilization and shall have provision for categorizing and recycling of collected waste.

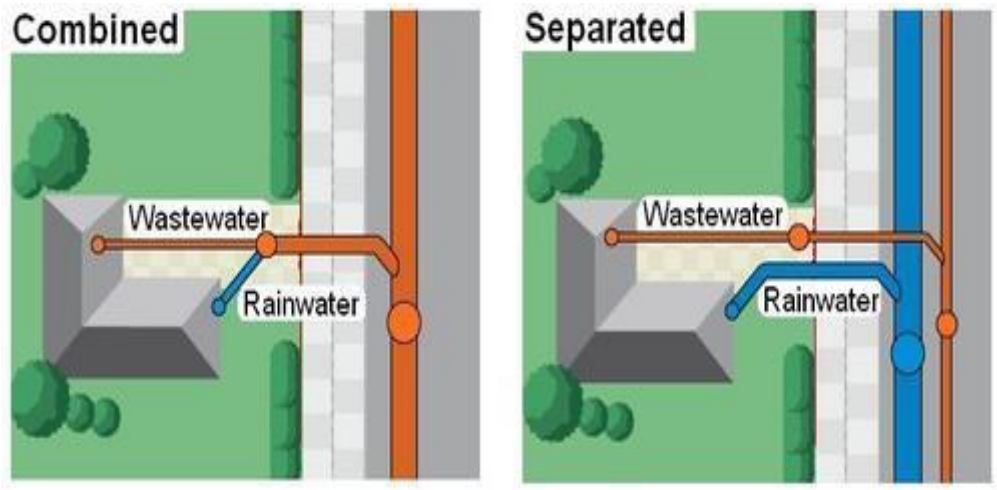


Fig-24 Sewage Management

This technology appears like constructed wetland systems. The constructed wetlands are combination of settling, filtration, and biological action. These systems utilize wetland plants, soils, and associated microorganisms to remove contaminants from wastewater. They can remove contaminants such as BOD, suspended solids, metals including cadmium, chromium, iron, lead, manganese, selenium, zinc and toxic organics from wastewater. This project was run by contractor designated by State government till 2 years and then shall be operated by the local authority like gram panchayat which again raise the question mark that whether it will be continued or dumped. But our government of Maharashtra should be appreciated for initiating the direction of treatment of domestic waste generated in rural areas.

- **Renewable Energy Sources and Solar Energy**

Fig-25 Renewable Energy Sources

Traditional sources of energy like wood, coal, diesel, petrol, oil, natural gas, etc are now on the verge of ending. Also, excessive use of these sources is polluting earth's environment and is responsible for remarkable adverse effects, like abrupt climate change, drought and flood situation, green house effects, melting of ice caps on poles, de-thickening of ozone layer in atmosphere collectively known as global warming. Due to fast growing development of urban civilization, forests are reducing with greater rate. By the 1990s, the excess use of traditional sources in developing countries was marked as a leading environmental threat, with negative impacts linked with deforestation, desertification, and widespread soil erosion. Thus, to save our earth from the threat of global warming, alternative energy sources which burns less carbon are required to be invented and solar energy source can play vital role to overcome these global environmental effects.

- **Smart and Efficient Public Transport System**

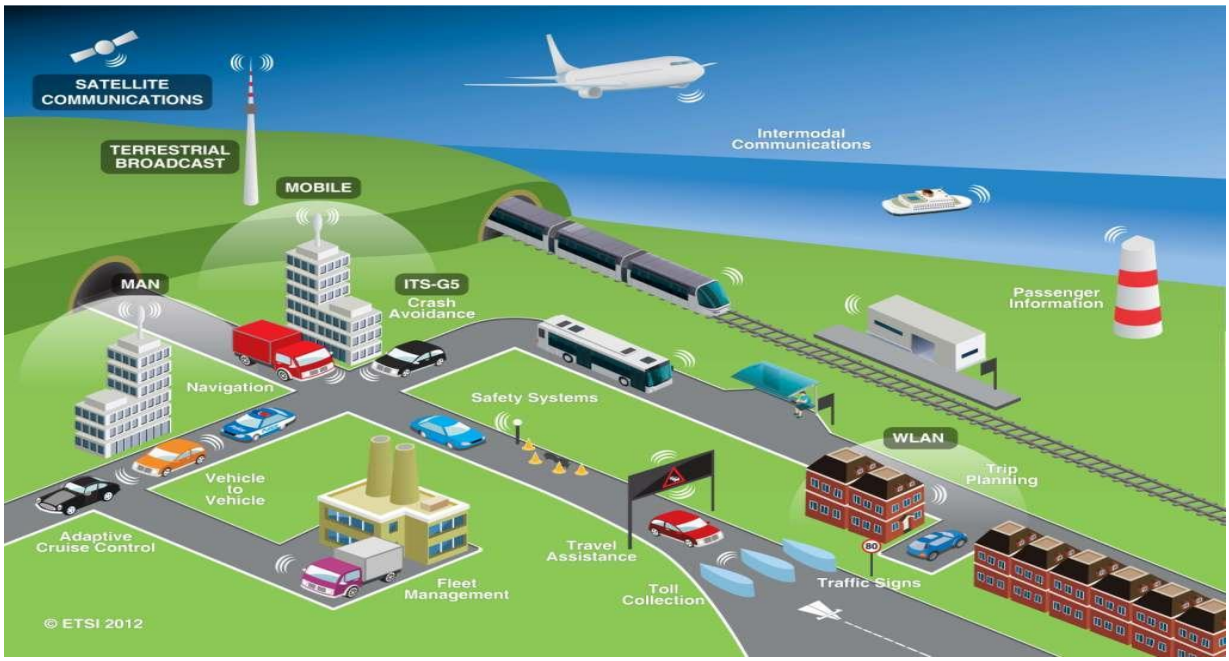


Fig-26 Public Transport System

Lack of transportation facility is the major reason behind isolating villages from rest of the world. Since last 70 years of freedom, roads, and train network in rural part of India could not be spread to our expectations. There are thousands of villages in our country to which as such no transportation is available. The direct impact of this is on accessibility of villagers to urban areas, market and lack of any other facilities which is only available in big cities. To overcome this problem, smart transportation can be main melody for development of smart villages.

3.4 Road Map and Safeguards

✓ A smart city is defined as a city that engages its citizens and connects its infrastructure electronically. A smart city has the ability to integrate multiple technological solutions, in a secure fashion, to manage the city ‘s assets-the city‘s assets include, but not limited to, local departments‘information systems, schools, libraries, transportation systems, hospitals, power plants, law enforcement, and other community services.

✓ The goal of building a smart city is to improve the quality of life by using technology to improve the efficiency of services and meet residents‘needs.Business drives technology and large-scale urbanization drives innovation and new technologies. Technology is driving the way city officials interact with the community and the city‘s infrastructure.

✓ Using real-time control systems and sensors, data are collected from citizens and sensors and then processed in real-time.

✓ The information and knowledge gathered are keys to tackling inefficiency, which leads to optimizing systems. A smart city offers technological solutions to tell what is happening in the city, how the city is evolving, and how to enable a better quality of life.

✓ The Smart City mission has two components: area-based development for smaller areas within the city and pan-city development where one idea is implemented all throughout.

✓ According to officials from the Ministry of Urban Development (MoUD), among other things, area-based plans allow for the purchase of buses and other means to augment public transportation.

3.5 Issues & Challenges:

- **Agriculture and Agro-based Services**

The Indian economy is still highly dependent on the agriculture sector. A huge population essentially translates into a need to address the growing food demands each year. The Indian villagers and the villages where they are residing are dependent on agricultural activities. Hence, aiming for a smart village in India requires us to see the agricultural activities happening in the villages. Strengthening village economy should be the priority for a smart village. It is important to turn farming economically viable not only because a large proportion of the population is engaged in agriculture, directly as well as indirectly, but also to provide financial support for setting up rural infrastructure. To provide urban amenities in the rural areas is very important. Facilities like educational institutions, colleges, hospitals along with ago-based industries in the

villages as well as at the block level will create opportunities within rural areas, thereby drastically reducing the migration to urban centres. Making the villages self-reliant as far as their food security needs are concerned, this would require synergy of the provisions under food security law with farming systems. Every cluster of villages at the block or tehsil level should be encouraged to follow the principles of ensuring local production, local procurement, and local distribution.

- **Pure Drinking Water Supply and Sanitation**

Fig-27 Pure Drinking Water Supply and Sanitation

Pure drinking water and good sanitation are essential prerequisites for good health and hygiene. Most of the epidemics and ill health in India are mainly due to communicable diseases caused by oral focal routes. Open defecation along with contaminated water is still the major challenge in our villages today. A smart village must have this aim to eliminate the above-mentioned problems. Innovative approaches to improve water supply and sanitation must be tested well and introduced in the villages. Community led total sanitation and public-private partnerships to supply of pure drinking water and sanitation should be practiced.

- **Skill Development Training for Economic Activities**

Considerable evidence is there for marginalization of rural populations and the incidence of poverty within rural areas. In terms to access to services, including education and training, rural people in general, are the inaugurator. Skills and knowledge are essential driving forces of economic growth and social development of any country. They have become even more important in the increasing pace of globalization and technological change that is taking place in the world. Countries with higher and better levels of skills adjust more effectively to the

challenges and opportunities of globalization. Smart villages should take best opportunities to showcase the area and region-specific skills and wisdom to the world.

- **Streetlights**

Solar powered streetlights have all the required means today to lighten up the villagers in terms of the sense of security. Solar LED Street lighting will provide a high quality, sustainable lighting solution for people in remote areas who do not have access to the conventional electricity grid. It will help in increasing the level of safety on roads and streets and allowing for more economic and social activity.

- **Waste Management**

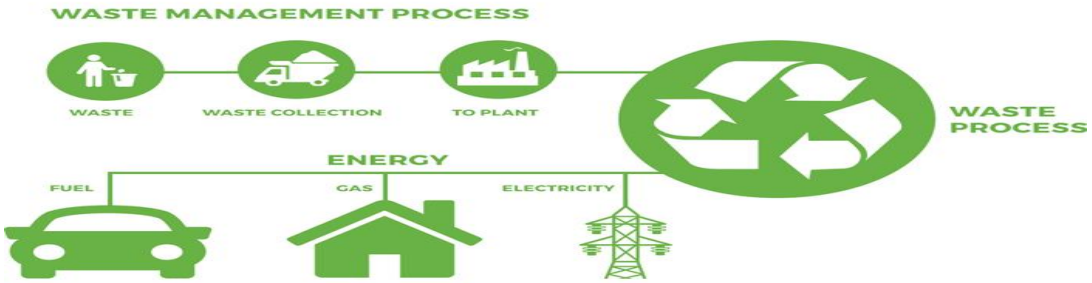


Fig-28 Waste Management

Everywhere there is a rise of a consumer culture and the villages are being introduced to the invading culture. Unorganized growth model has seen in the forms of mammoth heaps of waste in many cities. This form of growth that generates more waste than efficient consumption of resources must not be replicated in our villages. Sustainable waste management, conversion of rural waste into rural wealth will help our villages to become free from unwanted waste that is left uncollected. This will make the working conditions much better and help in improving the life expectancy of the locals.

3.6 Smart Infrastructure:

- **Smart Buildings**

✓ The homes and buildings can be made smart using sensors and cameras.

✓ These will produce real-time data which can be analyzed to take necessary actions. For example, sensors installed in a home can detect smoke and hence start the water sprinklers automatically to combat the fire. Similarly, the sensors can monitor the usage of electricity in the home or building and switch the lights off when not in use.

- ✓ Efficient energy management is the key need in villages where the electricity is not available all the time.
- ✓ The security of the building can be monitored using cameras and appropriate alerts can be generated in case of any anomalies. The water levels and pressure can be measured in the water tanks and pipes and used to refill the tanks when necessary as well as detect any faults in the pipes.


Fig -29 smart building

- **Smart Dairy**

- ✓ The secondary occupation of many farmers is rearing cattle for dairy products.
- ✓ The use of sensors and cameras in the barn or shelter can help the farmers in better management of their work. Any changes can be reported instantly through alert messages and required measures can be taken. Favorable temperature for the cattle can be maintained using smart devices.
- ✓ The food, water and health necessities of the cattle can also be monitored in a similar fashion. Grazing the cattle in the open fields is a risky thing if there is no one to supervise it. The use of sensors in the fields can eliminate the job of supervision by a human and it can be done remotely by the farmers.


Fig -30 Smart Dairy

- **Smart Surveillance**

✓ System Security is a major concern in villages as there is lesser number of lights, police stations are far off and the villages are located away from the main cities. Due to these factors, the smart surveillance systems are needed in villages.

✓ These will work based on the data generated by sensors and cameras along with emergency buttons located in different parts of the village.

✓ In case of a theft or robbery, the nearest emergency button can be pressed, and it will send an alert to the nearest police station. The data generated by the cameras can be used to locate the thief thereafter. The data can also be analyzed to avoid such incidents in the future.

Fig-31 Smart Surveillance

3.7 Cyber Security:

Computer security, cybersecurity or information technology security (IT security) is the protection of computer systems and networks from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.

The field is becoming more significant due to the increased reliance on computer systems, the Internet and wireless network standards such as Bluetooth and Wi-Fi, and due to the growth of "smart" devices, including smartphones, televisions, and the various devices that constitute the "Internet of things". Owing to its complexity, both in terms of politics and technology, cybersecurity is also one of the major challenges in the contemporary world.

3.8: Retrofitting- Redevelopment- Greenfield Development District Cooling:

Retrofitting will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and livable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens.

Redevelopment will affect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs)

in consultation with citizens.

Greenfield development will introduce most of the Smart Solutions in a previously vacant area (More than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g., land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities to address the needs of the expanding population.

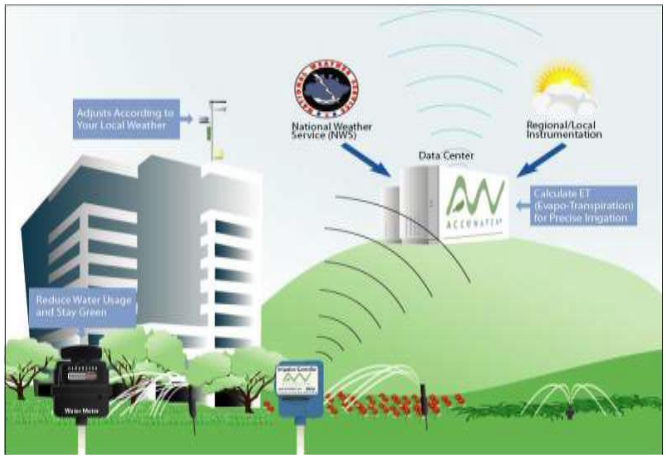
As far as Smart Solutions are concerned, an illustrative list is given below. This is not, however, an exhaustive list, and cities are free to add more applications.

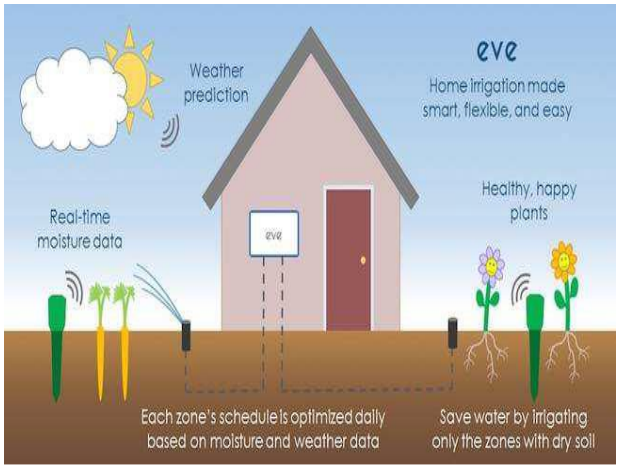
3.9 Strategic Options for Fast Development:

Not surprisingly, this will require improving the low - speed mode infrastructure. Smart growth & transit villages Smart growth is an urban planning and transportation strategy that emphasizes growth. While these options show potential, their impact is dependent upon demand for such options throughout regions. t has convenient access to public transportation near the village including a light rail line. which is located one - and - a - half miles from the village. Smart growth and smart development are higher density and transit oriented. ... It provides transportation and housing options. lease up a lot faster than a more traditional type of development, like Austin and Atlanta use to develop smart growth strategies and then it will have about eighteen smart growth development projects.

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

Contemporary India faces a pressing developmental challenge, namely providing financial crises, development assistance, indigenous people, extremism. India must grapple with many challenges it its quest to provide safe. The access in urban areas is better than in rural areas. Hygiene poses another challenge, safe drinking water and sanitation in the children, refugees, indigenous people, disabled people, and others.





3.11 Initiatives in village development by local self-government

✓ Under the scheme, during 2019-24, MPs will be able select one village every year for integrated development aimed at improving the overall quality of rural life. The project also envisages turning villages into model villages not just through infrastructure development but gender equality, peace and harmony.

✓ It also aims to instill the spirit of community service, mutual cooperation, self-reliance, local self-government and drive transparency and accountability in public life.

✓ The programme also aims to inspire a sense of pride among people by giving them ownership of the development schemes and through initiatives like honouring village elders, celebrating village day and folk-art festivals and by driving them to develop their own village song.

✓ The blueprint of the project, which is likely to be unveiled by prime minister Narendra Modi on Saturday, will have the gram panchayat as the basic unit for development. While a population size of 3,000-5,000 per development unit has been fixed for plain areas, for hilly, tribal and difficult areas the population base for each of these selected villages will be between 1,000 and 3,000. According to the document, while Lok Sabha MPs will have to choose a gram panchayat from within their constituencies, Rajya Sabha MPs will be able to select a gram panchayat from a district of their choice in the state from which they have been elected.

3.12 Smart Initiatives by District Municipal Corporation

- ✓ Stabilization pond system for wastewater treatment
- ✓ Duckweed based wastewater treatment with pisciculture.
- ✓ Root zone treatment system
- ✓ Anaerobic Decentralized Wastewater Treatment System
- ✓ Aerobic DEWATS
- ✓ Study Technological Options at Household Level Management like
- ✓ Kitchen Garden with Piped Root Zone System, Kitchen Garden without Piped Root
- ✓ Zone System and Leach Pit
- ✓ Pile Method, NADEP Method, Bangalore Method, Indor Method and Coimbatore Method
- ✓ Vermi composting

- ✓ Windrow Composting
- ✓ Thermophilic Composting
- ✓ MARC Method
- ✓ Biogas Technology
- ✓ Toilet Linked Biogas Plant

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

- Government of India has launched the scheme "Deendayal Upadhyaya Gram Jyoti Yojana" for rural electrification. The erstwhile Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) scheme for village electrification and providing electricity distribution infrastructure in the rural areas has been subsumed in the DDUGJY scheme. Rural Electrification Corporation is the Nodal Agency for implementation of DDUGJY.
- Under DDUGJY-RE, Ministry of Power has sanctioned 921 projects to electrify 1,21,225 un-electrified villages, intensive electrification of 5,92,979 partially electrified villages and provide free electricity connections to 397.45 lakh BPL rural households. As on 30th June 2015, works in 1,10,146 un-electrified villages and intensive electrification of 3,20,185 partially electrified villages have been completed and 220.63 lakh free electricity connections have been released to BPL households.

3.14 How to Implement Other Countries Smart Villages Projects in Indian Village Context

1. Promoting mixed land use in area-based developments

Planning for 'unplanned areas' containing a range of compatible activities and land uses close to one another to make land use more efficient. The states will enable some flexibility. in land use and building byelaws to adapt to change.

2. Housing and inclusiveness

Expand housing opportunities for all.

3. Creating walkable localities

Reduce congestion, air pollution and resource depletion, boost local economy, promote interactions, and ensure security. The road network is created or refurbished not only for vehicles and public transport, but also for pedestrians and cyclists, and necessary administrative services are offered within walking or cycling distance.

4. Preserving and developing open spaces

Parks, playgrounds, and recreational spaces to enhance the quality of life of citizens, reduce the urban heat effects in areas and generally promote eco-balance.

5. Promoting a variety of transport options

Transit oriented development (TOD), public transport and last mile para-transport connectivity.

6. Making governance citizen

Friendly and cost effective-increasingly rely on online services to bring about accountability and transparency, especially using mobiles to reduce cost of services and providing services without having to go to municipal offices. For minge-groups to listen to people and obtain feedback and use online monitoring of programs and activities with the aid of cyber tour of worksites.

4. About AGHAR village

4.1 Introduction

4.1.1 Introduction About AGHAR Village

- **About Aghar village:**

Aghar is a village placed in Patan Block of Patan district in Gujarat. Situated in rural area of Patan district of Gujarat, it is one among the 139 villages of Patan Block of Patan district. According to the government records, the village number of Aghar is 508853. The village has 1316 houses.

- **Population of Aghar village:**

According to Census 2011, Aghar's population is 6695. Out of this, 3419 are males while the females count 3276 here. This village has 998 kids in the age group of 0-6 years. Out of this 521 are boys and 477 are girls.

- **Literacy rate of Aghar village**

Literacy rate in Aghar village is 51%. 3456 out of total 6695 population is educated here. Among males the literacy rate is 64% as 2194 males out of total 3419 are literate whereas female literacy rate is 38% as 1262 out of total 3276 females are educated in this Village. The Negative part is that illiteracy rate of Aghar village is 48%. Here 3239 out of total 6695 persons are illiterate. Male illiteracy rate here is 35% as 1225 males out of total 3419 are uneducated. Among the females the illiteracy rate is 61% and 2014 out of total 3276 females are illiterate in this village.

- **Agricultural status of Aghar village**

The number of employed people of Aghar village is 3659 whereas 3036 are un- employed. And out of 3659 working people 459 individuals are entirely reliant on farming

4.1.2 Need of the study

- ✓ Because several schemes of the Government which are being operated and run for rural development in the rural areas of the country.
- ✓ Evaluation taken up so far for these schemes has been in a piecemeal form, i.e., generally for each scheme separately.

- ✓ So, we can use that kind of government schemes use for required development in rural area using with engineering concept in economical way.

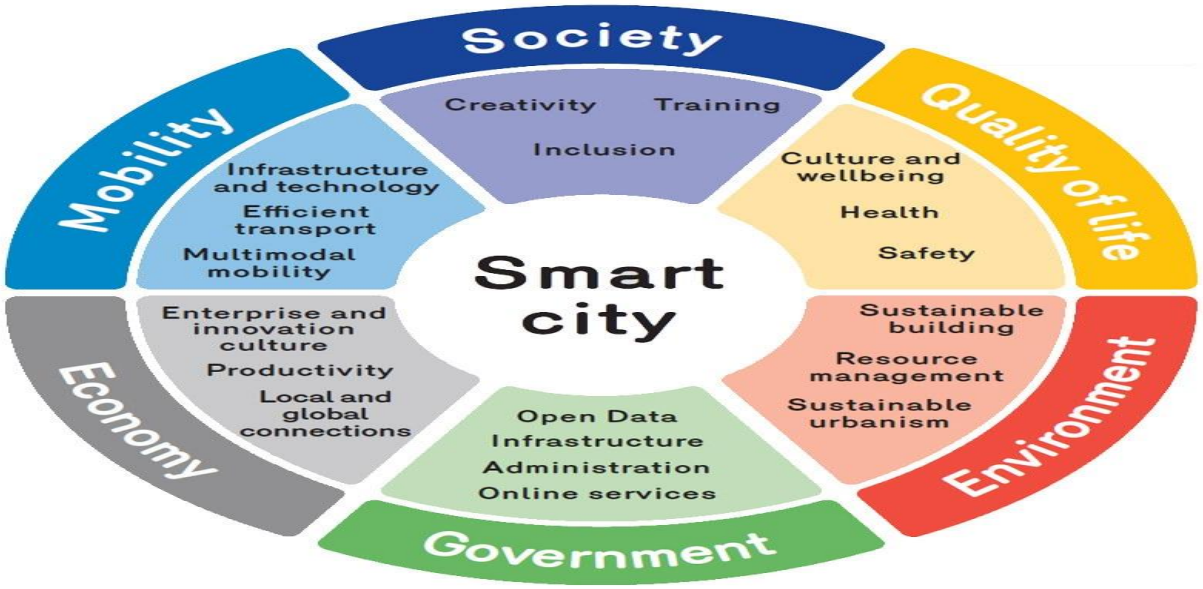


Fig-32 Smart City

4.1.3 Study Area

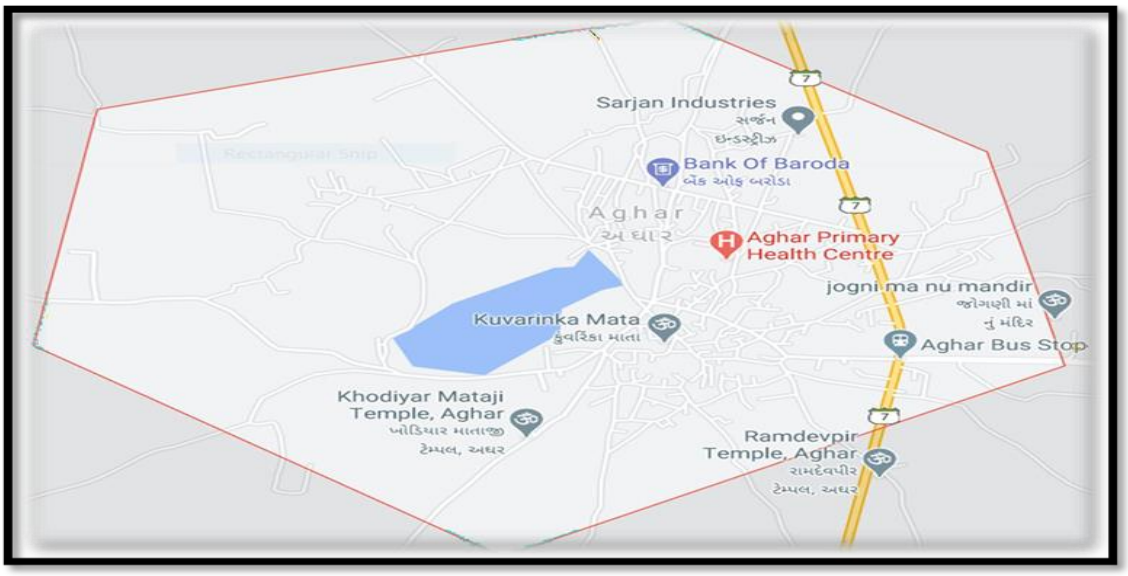


Fig -33 Map (Aghar)

Aghar is a village placed in Patan Block of Patan district in Gujarat. Situated in rural area of Patan district of Gujarat, it is one among the 139 villages of Patan Block of Patan district. According to the government records, the village number of Aghar is 508853.

4.1.4 Objectives of the study

- ✓ To collect data regarding existing road condition, electricity vailability, housing condition, government institutions, boundary of exiting pond etc.
- ✓ To design biogas plant for whole village.
- ✓ To develop lake boundary for sustainable water supply for irrigation purpose.
- ✓ To develop solid waste management as eco-friendly for Environment.
- ✓ To design solar based electricity generation system.
- ✓ To provide sustainable road condition, smart villages technologies like rainwater harvesting, solar panels for electricity generation, building design etc. in future.,
- ✓ "Developing village with a 'rural soul' but with all urban amenities that a city may have".
- ✓ To provide sustainability to the villages.
- ✓ To manage the reduction of migration from villages and prevent the cities from the urban Pressure.

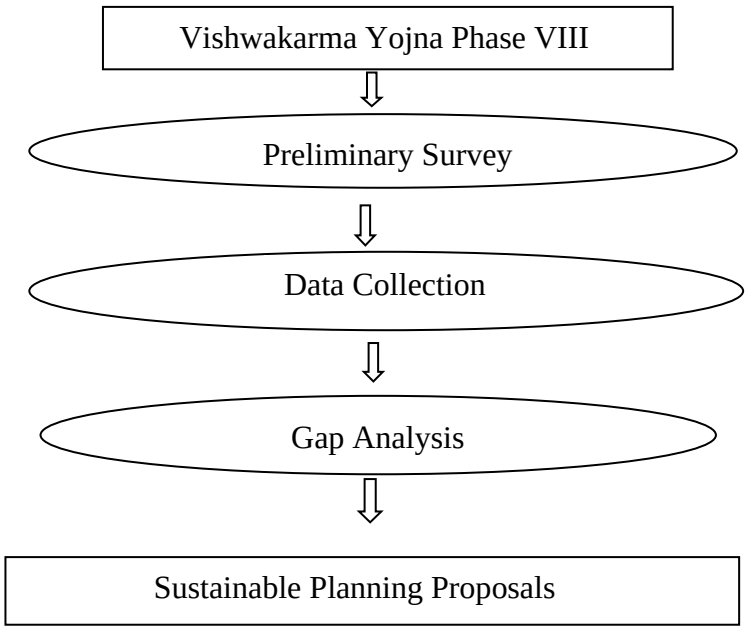
4.1.5 Scope of the Study

- ✓ It is very essential to develop village because India's development depends upon the progress of the villages.
- ✓ India is agriculture country and poverty can be removed through improvement in agriculture.
- ✓ Solutions of rural problems can bring the change in the rural society.
- ✓ The country and its society can be reconstructed only through rural developments.
- ✓ For successful implementation of democratic decentralization, the village community is tobe studied in detail.
- ✓ Rural sociology can help to organize the disorganized Indian in detail.
- ✓ The extension worker must know the rural culture, rural institutions, problems, resources etc. for successful transfer of technology for improvement of agriculture.
- ✓ It can be achieved through the study of rural sociology.
- ✓ The study of rural sociology helps the extension worker to transfer the technology.

Fig-34 *R-Urban Town*

Rural Soul + Urban Amenities=R-Urban Town

4.1.6 Methodology Framework for development of your village



4.1.7 Available Methodology for development of related to Civil

Following objects are available related civil:

- Data of ideal village (Techno form of AGHAR Village)
- Data of smart village (Techno form of AGHAR village)
- SWOT Analysis of ideal village
- Outline MAP of AGHAR village
- GOV. guideline regarding village development
- SWACH BHARAT ABHIYAN Guidelines by gov.
- GAP Analysis of village

4.2 Study Area Profile of Aghar Village

4.2.1 Study Area Location with brief History land use details

4.2.2 Base Location map, Land Map, Gram Tal Map

Fig-35 Map (Aghar)

According to Census 2011, Aghar's population is 6695. Out of this, 3419 are males while the females count 3276 here. This village has 998 kids in the age group of 0-6 years. Out of this 521 are boys and 477 are girls.

Area of Village (Approx.) (In Hector) Coordinates for Location: **2186.81** Hector

4.2.3 physical and demographical growth

In Aghar village population of children with age 0-6 is 998 which makes up 14.91 % of total population of village. Average Sex Ratio of Aghar village is 958 which is higher than Gujarat state average of 919.

Aghar village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Aghar village was 60.66 % compared to 78.03 % of Gujarat. In Aghar Male literacy stands at 75.71 % while female literacy rate was 45.09 %

Table-4 demographical growth

Particulars	Total	Male	Female
Total No. of Houses	**1,316**	-	-
Population	**6,695**	3,419	3,276
Child (0-6)	**998**	521	477
Schedule Caste	**651**	358	293
Schedule Tribe	**0**	0	0
Literacy	**60.66 %**	75.71 %	45.09 %
Total Workers	**3,659**	1,965	1,694
Main Worker	**2,082**	-	-
Marginal Worker	**1,577**	247	1,330

4.2.4 Economic generation profile / Banks

In aghar village mainly economic growth is depends on agriculture side. As per discussion with sarpanch of aghar total 80% of village connect with agriculture. To financial aspect there is branch of BOB bank and ATM is available for village people.

4.2.5 Actual Problem faced by Villagers

- **Solid waste:**

In aghar village no propre place for the collection of solid waste. So, in village villagers through the waste Anywhere in village. So, we should provide propre Scientific method for solid waste management in village for cleanness.

Fig-36 solid waste

- **Poor road condition:**

A good approach road to reach Aghar village is available in good condition. Streets are in acceptable condition in village. Internal streets are in fair weather condition and not suitable in all weathers like monsoon. Quality of internal streets is needed to be improving.

Fig-37 Street Road

- **Public toilet:**

Public Toilets must not only be constructed but also well maintained to assure their continued use. It is one of the crucial factors in making clean India a success that the public toilets are clean otherwise people will continue to relieve themselves in open place, which unfortunately they consider a cleaner option.

- **Low voltage electricity**

In aghar village as per population electricity is low in whole village. So, we should think about that proper economical solution of electricity power like solar energy, hydroelectric power etc…

4.2.6 Social scenario

In Aghar village population of children with age 0-6 is 998 which makes up 14.91 % of total population of village. Average Sex Ratio of Aghar village is 958 which is higher than Gujarat state average of 919. Child Sex Ratio for the Aghar as per census is 916, higher than Gujarat average of 890.

Aghar village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Aghar village was 60.66 % compared to 78.03 % of Gujarat. In Aghar Male literacy stands at 75.71 % while female literacy rate was 45.09 %.

Schedule Caste (SC) constitutes 9.72 % of total population in Aghar village. The village Aghar currently does not have any Schedule Tribe (ST) population.

4.3. Data Collection of Aghar village

4.3.1 Methodology

- ✓ First one we studied that what are the various goals and different objectives and aspect of Vishwakarma Yojana and studied various basic definitions related to the project like rural area, urban area, rurbanization etc.
- ✓ Then after we make one interview sheet for **aghar** which is helpful in to understand to the scenario of whole village.
- ✓ Then after we frequently visited the **aghar** village for the purpose of collecting various data related to various facilities and amenities and survey of different aspects related to physical, infrastructural, social facilities.
- ✓ Gap analysis is done based on data collected through survey of village. And various suggestions are made by us on development of village. And based on this suggestion we will design proposed facilities in the village according to the need and population of that village.

4.3.2 primary detail of survey

Survey includes data collection from government offices like gram panchayat. We collect the data related total population of the **'AGHAR'** village, male female ratio, literacy rate of village, growth rate, number of schools, various government schemes running for village development, area of village, agricultural area of village, major occupations, major crops taken, water supply source for drinking as well as irrigation water, transportation facilities, etc.…

We had done this survey with the help of sarpanch, talati mantri, grampanchyat members and villagers.

4.3.3 Average size of house & geographical detail

The total geographical area of village is 2186.81 hectares.

Aghar is a large village located in Patan Taluka of Patan district, Gujarat with total 1316 families residing. The Aghar village has population of 6695 of which 3419 are males while 3276 are females as per Population Census 2011.

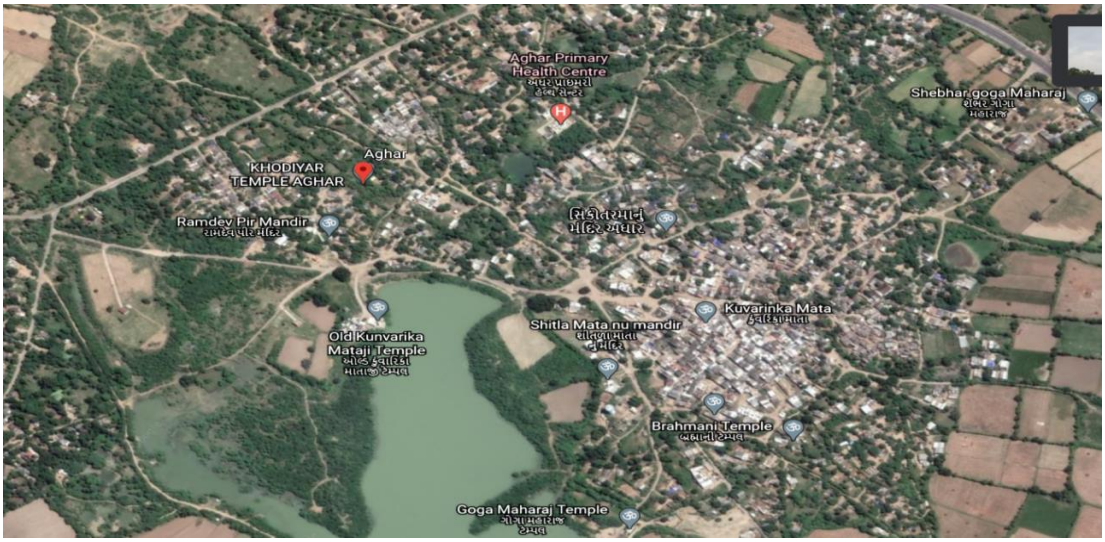


Fig-38 Geographical Map

4.3.4 No of Human being in One House

Aghar village total 1316 families residing with average 5 people in one house.

4.3.5 Material available locally in the village and Material Outsourced by the villagers.

Basically, houses are made with clay or brick. Concrete and RCC is also used.

All the materials are outsourced and supplied by outside contractors.

4.3.6 Geographical Detail

According to Census 2011 information the location code or village code of Aghar village is 508853. Aghar village is in Patan Tehsil of Patan district in Gujarat, India. It is situated 7km away from Patan, which is both district & sub-district headquarter of Aghar village. As per 2009 stats, Aghar village is also a gram panchayat.

The total geographical area of village is 2186.81 hectares. Aghar has a total population of 6,695 peoples. There are about 1,316 houses in Aghar village. As per 2019 stats, Aghar villages comes under Patan assembly & parliamentary constituency. Patan is nearest town to Aghar which is approximately 7km away.

4.3.7 Demographical Detail - Cast Wise Population Details

The Aghar village has population of 6695 of which 3419 are males while 3276 are females as per Population Census 2011.

Aghar village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Aghar village was 60.66 % compared to 78.03 % of Gujarat. In Aghar Male literacy stands at 75.71 % while female literacy rate was 45.09 %.

Schedule Caste (SC) constitutes 9.72 % of total population in Aghar village. The village Aghar currently does not have any Schedule Tribe (ST) population.

4.3.8Occupational Detail

Main occupation of village is Agricultural, animal husbandry. Small household activities are also carried out in village.

4.3.9 agriculture detail

In Aghar village out of total population, 3659 were engaged in work activities. 56.90 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 43.10 % were involved in Marginal activity providing livelihood for less than 6 months. Of 3659 workers engaged in Main Work, 459 were cultivators (owner or co-owner) while 1242 were Agricultural laborer.

4.3.10Physical Infrastructure Facilities - Manufacturing HUB / Warehouses

There is not any such infrastructure in the village.

4.3.11Tourism development available in the village for attracting the tourist

There one lake to make recreation centre as tourism place in form of garden and something.

4.4 Infrastructure Detail (With Existing Village Photograph)

4.4.1 Drinking Water:

There is 3-4 hours water supply in the village. From the government supply water is come and then distributed in the village. There are three water tanks in village.

For drinking water is supplied through underground pipes in easy way from the elevated storage tanks and ground level water tank.

Fig-39 Drinking Water Facilities

As per standard data of NBC code, 135 liters of water is required for per person per day in village area. This is enough for the whole village.

4.4.2 Drainage Network:

There is open type drainage facility in aghar. The drain water is discharged directly into its nearby water body or on the free land. Also, it creates bad smell & polluted atmosphere. It is not good for the people those are living near it.

4.4.3 Transportation & Road network:

A good approach road to reach Aghar village is available in good condition. Streets are in acceptable condition in village. Internal streets are in fair weather condition and not suitable in all weathers like monsoon. Quality of internal streets is needed to be improving.

Fig-40 Street Road

4.4.4 Housing Condition:

There are 70% puchha house and 30% kachha house.


Fig-41: - Housing Condition

4.4.5 Social infrastructure

Health Facilities:

There is government health center is available such as clinic, PHC center etc.

Fig-42 Health Center

Education system:

There is 7 Aanganwadi in the and 2 primary school. For the higher study like collage, medical college, engineering collage are not available near the village, it is 10 to 15 km away from this village.

Fig-43 Education system:

Community Hall:

There is one community Hall in the village.

4.4.6 Technology Mobile / Wi-Fi / Internet Usage Details in %:

There is not any personal Wi-Fi in the village because of most people are agriculture side. From the total population 70% people are used mobile phone. There is not any other Wi-Fi facility available for public usage.

4.4.7 Sports Activity as Gram Panchayat:

There is no sports activity in the village. Sometimes cricket match is organized by villagers.

4.4.8 Socio Cultural Facilities:

Public Library: There is no Public Library in village.

Public Garden: There is no Public Garden in the village.

Village Pond: There is one pond or lake in the village.

4.4.9 Other Facilities:

- ✓ There is one Panchayat Building in the village.
- ✓ There is one Bank & ATM in the village.
- ✓ There is one Milk Co-operative Society in the village.
- ✓ There is one medical shop & government health Centre in the village.

4.4.10 Sustainable Infrastructure Facilities & Repair & Maintenance

- ✓ Water supply system
- ✓ Wastewater management system
- ✓ Solid waste management system
- ✓ Underground tank
- ✓ Rainwater harvesting system.
- ✓ Lake development s
- ✓ Vegetable market
- ✓ Post office
- ✓ Public toilet

4.5 Existing Institution like - Village Administration – Detail Profile

4.5.1 Bachat Mandali

No bacchat mandali in village

4.5.2 Dudh Mandali

One dudh mandali is available.

Fig -44 Dudh Mandali

4.5.3 Mahila forum

No Mahila forum in village

4.5.4 Plantation for the Air Pollution

For reducing pollution panchayat has stated planting trees over the areas on which plantation is possible.

4.5.5 Rainwater Harvesting - Waste Water Recycling

Rainwater harvesting required in village. Because there is most family are connected to agriculture side so we can use that water for agriculture purpose and public use also.

4.5.6 Agricultural Development

- ✓ Provide advanced technology for agriculture.
- ✓ Awareness program by panchayat.
- ✓ Agro centre create in village for farmer.

5. Technical Options with Case Studies

5.1.1 Advance Sustainable construction techniques

Construction Waste Management

Reducing waste is becoming more achievable for contractors as haulers have grown more sophisticated in recent years. Where jobsites once had trash bins for different types of waste, they now need just one, in many cases, because haulers use pickers to separate materials.

"Through haulers, we can achieve 75% landfill avoidance through their process, and we don't need to separate materials to do it," says Dale Forsberg, president of St. Louis Park-based Watson-Forsberg. "On a couple of sites, we've hit 95%."

For inner city projects with small footprints, having haulers handle materials in a single container makes all the difference because space is at a premium, Forsberg says. Some materials are recyclable on site in particular, concrete that can be crushed and used for foundations or as aggregate beneath parking lots.

The three largest construction projects underway in the Twin Cities all have a recycling rate of more than 90%, according to Zachary Hansen, environmental health director, St. Paul-Ramsey County Public Health department, speaking at a recent conference sponsored by the Minneapolis based Environmental Initiative.

5.1.2 Different types of Roads:

- ✓ **Earth Road:** This is least expensive kind of street and it is produced using the characteristic soil. Earth, Silt, Sand and so forth utilized in development of earth street.
- ✓ **Kankar Road:** Kankar street is an unclean limestone, and it is accessible as a characteristic store in specific regions. It is accessible in two structures in particular knobs and square.
- ✓ **Rock Road:** A rock street is comprising of a carriageway made of a layer of compacted rock. This street is better than Earth streets.

- ✓ **Moorum Road:** In this sort of streets, the carriageway has the surfacing of Moorum which is combined in single layer or more than one layer to get the necessary completed thickness of surface. Moorum streets are basically minimal effort streets and are generally utilized as town streets.

- ✓ **Water Bound Macadam Road:** This street named after the incomparable Scottish interstate specialist John L. Macadam (1756-1836). It implies a thick and conservative street surface made of squashed or broken totals which are precisely interlocked by rolling and the voids being topped off with screening and restricting material with the help of water.

- ✓ **Bituminous Road:** It is characterized as a street where bitumen is utilized in one structure or the different as a cover to keep together the coarse total or street metal. They award water confirmation surface. It is non tricky.

- ✓ **Concrete Road:** The concrete solid streets are turning out to be well known on account of the way that solid of wanted quality can be set up by them present day methods of concrete solid development. It has two capacities all the while as the heap conveying base and as the wearing surface.

5.1.3 Biogas plant

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas is a renewable energy source.

Biogas is produced by anaerobic digestion with methanogen or anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials. This closed system is called an anaerobic digester, biodigester or a bioreactor.

Fig- 46 Biogas plant

Biogas is primarily methane (CH_4) and carbon dioxide (CO2) and may have small amounts of hydrogen sulfide (H_2S), moisture and siloxanes. The gases methane, hydrogen, and carbon monoxide (CO) can be combusted or oxidized with oxygen. This energy release allows biogas to be used as a fuel; it can be used for any heating purpose, such as cooking. It can also be used in a gas engine to convert the energy in the gas into electricity and heat.

Biogas can be compressed after removal of Carbon dioxide, the same way as natural gas is compressed to CNG, and used to power motor vehicles. In the United Kingdom, for example, biogas is estimated to have the potential to replace around 17% of vehicle fuel. It qualifies for renewable energy subsidies in some parts of the world. Biogas can be cleaned and upgraded to natural gas standards when it becomes bio-methane. Biogas is a renewable resource because its production-and-use cycle is continuous, and it generates no net carbon dioxide. As the organic material grows, it is converted and used. It then regrows in a continually repeating cycle. From a carbon perspective, as much carbon dioxide is absorbed from the atmosphere in the growth of the primary bio-resource as is released, when the material is ultimately converted to energy.

5.1.4 Sustainable Sanitation

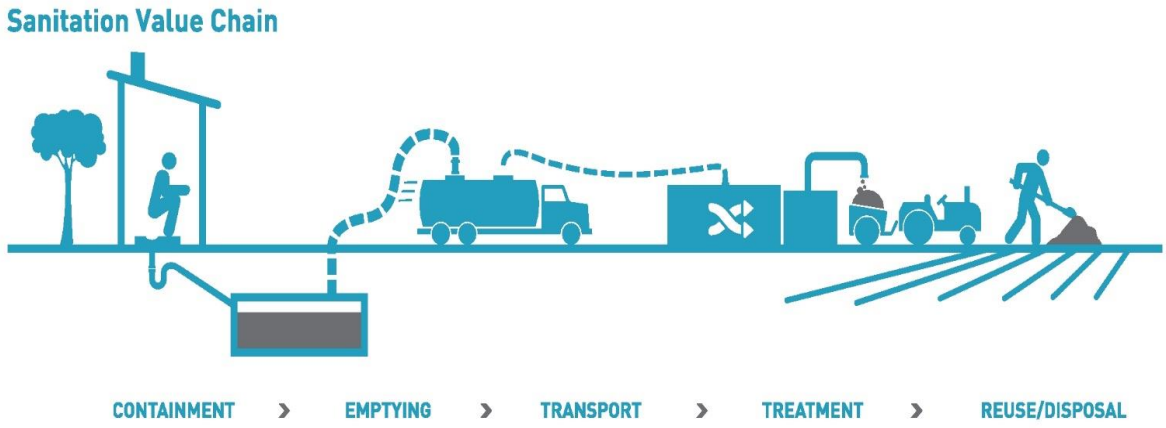


Fig-47 Sustainable Sanitation

Conventional approaches to wastewater management that regard wastewater as a waste, and often are dysfunctional, have serious drawbacks (Source: CONRADIN 2010).

Sustainable sanitation aims at overcoming these drawbacks. It is not a certain technology, but an approach with certain underlying principles. There are a number of technologies (see for instance sanitation systems) that can be used to make sanitation and wastewater management more sustainable. The term “sustainable sanitation” in principle denominates the same as ecological sanitation, though the latter has a stronger focus on source separation.

The first and foremost principle is probably the one to recognise that excreta and wastewater are not a waste, but a valuable resource that can be reused and recycled. This is actually — to speak in a simplified way — the very basis of sustainability: to use resources wisely and without impairing the possibilities of future generations to meet their own needs.

5.1.5 Soil Liquefaction

Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid. In soil mechanics, the term "liquefied" was first used by Allen Hazen in reference to the 1918 failure of the Calaveras Dam in California. He described the mechanism of flow liquefaction of the embankment dam as:

If the pressure of the water in the pores is great enough to carry all the load, it will have the effect of holding the particles apart and of producing a condition that is practically equivalent to that of quicksand… the initial movement of some part of the material might result in accumulating pressure, first on one point, and then on another, successively, as the early points of concentration were liquefied.

Fig-48 Soil Liquefaction

Soil liquefaction occurs when the effective stress (shear strength) of soil is reduced to essentially zero. This may be initiated by either monotonic loading (i.e. a single, sudden occurrence of a change in stress – examples include an increase in load on an embankment or sudden loss of toe support) or cyclic loading (i.e. repeated changes in stress condition – examples include wave loading or earthquake shaking). In both cases a soil in a saturated loose state, and one which may generate significant pore water pressure on a change in load are the most likely to liquefy. This is because loose soil has the tendency to compress when sheared, generating large excess porewater pressure as load is transferred from the soil skeleton to adjacent pore water during undrained loading. As pore water pressure rises, a progressive loss of strength of the soil occurs as effective stress is reduced. Liquefaction is more likely to occur in sandy or non-plastic silty soils but may in rare cases occur in gravels and clays (see quick clay).

A 'flow failure' may initiate if the strength of the soil is reduced below the stresses required to maintain the equilibrium of a slope or footing of a structure. This can occur due to monotonic loading or cyclic loading and can be sudden and catastrophic. A historical example is the Aberfan disaster. Casagrande referred to this type of phenomena as 'flow liquefaction' although a state of zero effective stress is not required for this to occur.

'Cyclic liquefaction' is the state of soil when large shear strains have accumulated in response to cyclic loading. A typical reference strain for the approximate occurrence of zero effective stress is 5% double amplitude shear strain. This is a soil test-based definition, usually performed via cyclic triaxial, cyclic direct simple shear, or cyclic torsional shear type apparatus. These tests are performed to determine a soil's resistance to liquefaction by observing the number of cycles of loading at a particular shear stress amplitude required to induce 'fails'. Failure here is defined by the shear strain criteria.

The term 'cyclic mobility' refers to the mechanism of progressive reduction of effective stress due to cyclic loading. This may occur in all soil types including dense soils. However, on reaching a state of zero effective stress such soils immediately dilate and regain strength. Thus, shear strains are significantly less than a true state of soil liquefaction.

5.1.6 Transport Infrastructure

Transport infrastructure is one of the most important factors for a country's progress. Although India has a large and diverse transport sector with its own share of challenges, they can be overcome by energy-efficient technologies and customer-focused approach.

Fig-49 Transport Infrastructure

One cannot overemphasize the importance of transportation than call it the 'lifeline' of a nation. It has been proven by so many instances how transport infrastructure has added speed and efficiency to a country's progress. Good physical connectivity in the urban and rural areas is essential for economic growth. India, the seventh largest nation with over a billion population, has one of the largest transport sectors. But not one without its own set of challenges.

5.1.7 Vertical Farming

vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics.[1] Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned mine shafts. As of 2020, there is the equivalent of about 30 ha (74 acres) of operational vertical farmland in the world. The modern concept of vertical farming was proposed in 1999 by Dickson Despommier, professor of Public and Environmental Health at

Columbia University. Despommier and his students came up with a design of a skyscraper farm that could feed 50,000 people. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical farming coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through traditional farming methods.

The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. The increased ability to cultivate a larger variety of crops at once because crops do not share the same plots of land while growing is another sought-after advantage. Additionally, crops are resistant to weather disruptions because of their placement indoors, meaning less crops lost to extreme or unexpected weather occurrences. Because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna.

Fig-50 Vertical Farming

Vertical farming technologies face economic challenges with large start-up costs compared to traditional farms. In Victoria, Australia, a "hypothetical 10 level vertical farm" would cost over 850 times more per square meter of arable land than a traditional farm in rural Victoria. Vertical farms also face large energy demands due to the use of supplementary light like LEDs. Moreover, if non-renewable energy is used to meet these energy demands, vertical farms could produce more pollution than traditional farms or greenhouses.

5.1.8 sewage treatment plant

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

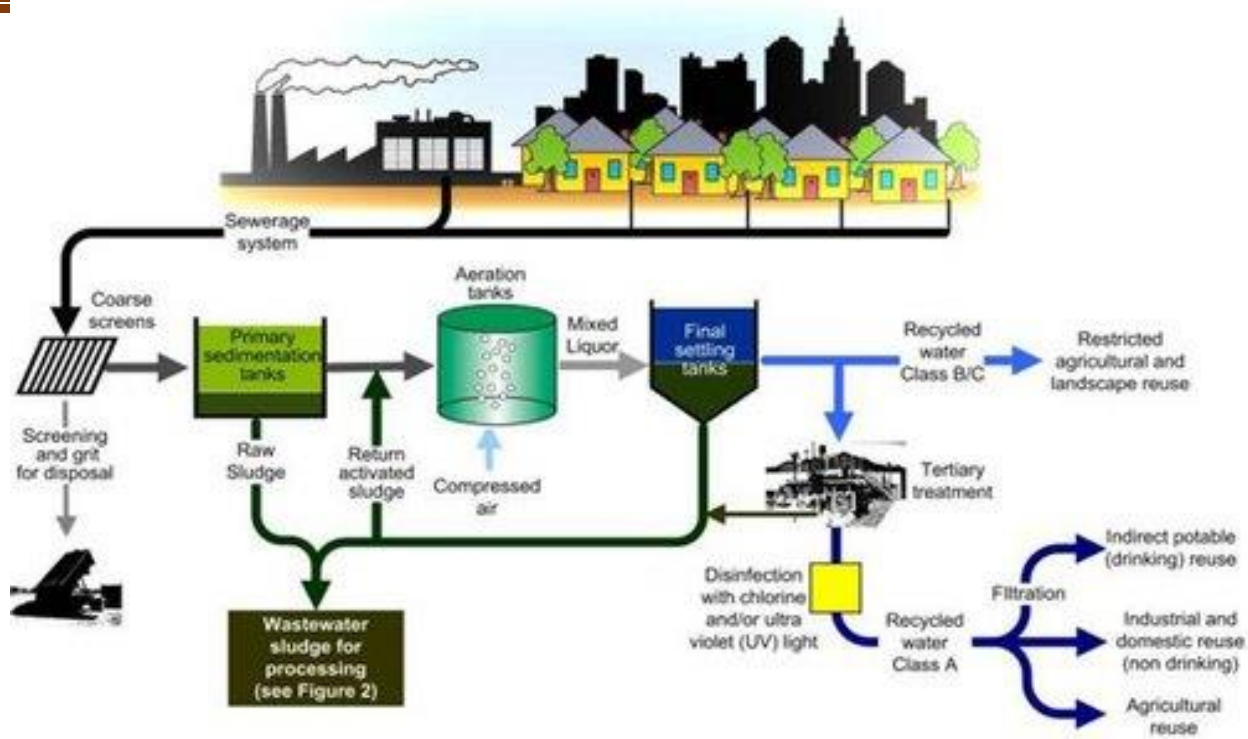


Fig-51 sewage treatment plant

Sewage treatment may also be referred to as wastewater treatment. However, the latter is a broader term that can also refer to industrial wastewater. For most cities, the sewer system will also carry a proportion of industrial effluent to the sewage treatment plant that has usually received pre-treatment at the factories to reduce the pollutant load. If the sewer system is a combined sewer, then it will also carry urban runoff (stormwater) to the sewage treatment plant. Sewage water can travel towards treatment plants via piping and in a flow aided by gravity and pumps. The first part of the filtration of sewage typically includes a bar screen to filter solids and large objects that are then collected in dumpsters and disposed of in landfills. Fat and grease are also removed before the primary treatment of sewage.

5.1.9 Smart parking

Smart Parking is a parking strategy that combines technology and human innovation to use as few resources as possible such as fuel, time, and space to achieve faster, easier, and denser parking of vehicles for most of the time they remain idle.

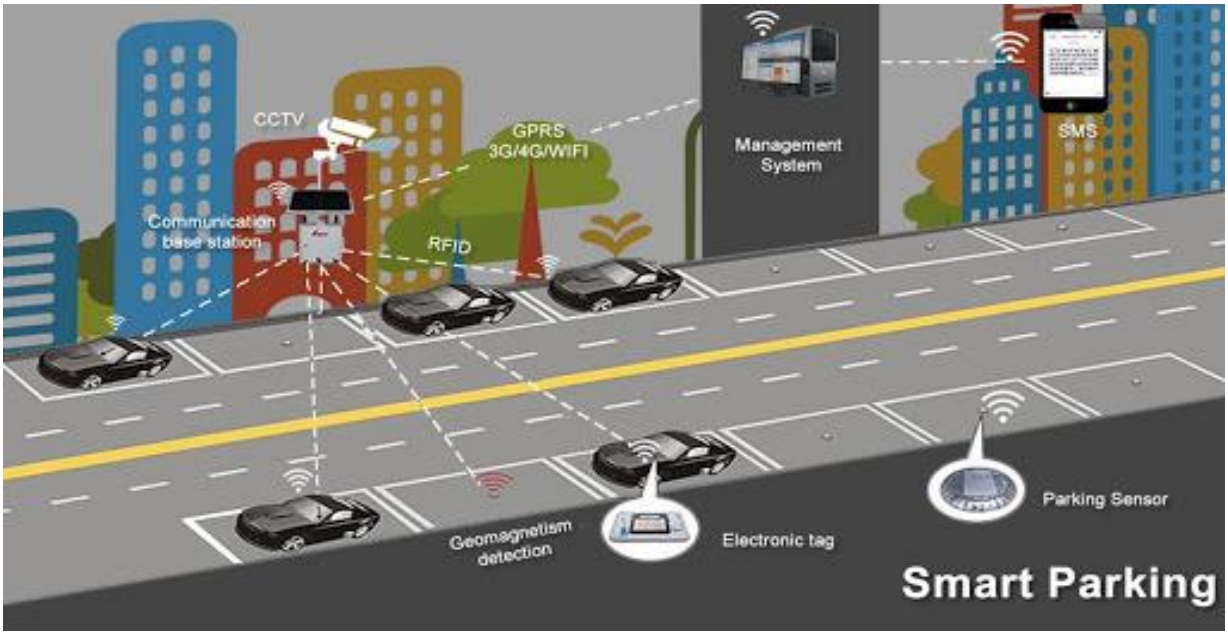


Fig- 52 Smart Parking

Smart Parking and its sister approach, Intelligent Transportation, are based on the fundamental ecological principle that we are all connected. Parking and transportation are both essential in the movement of people and goods. The Smart Parking and Intelligent Transportation vision and overlapping technologies are steadily melding into one integrated stream.

5.1.10 Development of lake

Most lakes have at least one natural outflow in the form of a river or stream or in form of irrigation which maintain a lake's average level and get more benefit by allowing the drainage of excess water. Some lakes do not have a natural outflow and lose water solely by evaporation or underground seepage or both. They are termed endorheic lakes.

Fig -53 Lake (Aghar)

Many lakes are artificial and are constructed for hydro-electric power generation, aesthetic purposes, recreational purposes, industrial use, agricultural use or domestic water supply.

So as per above benefits we take some planning for aghar lake which is in useless condition at present time. As per the large area covered by that village, we takeout maximum benefit at low cost. Most of the villagers are depends on agriculture side so we can develop the lake in form of agriculture use, domestic use, recreational purpose, etc……

- **Agriculture purpose: -**

Irrigation is the artificial application of water to the soil through lake using pump or machine. Irrigation is usually used in areas where rainfall is irregular or dry times or drought is expected. There are many types of irrigation systems, in which water is supplied to the entire field uniformly. Irrigation water can come from groundwater, through springs or wells, surface water, through rivers, lakes, or reservoirs, or even other sources, such as treated wastewater or desalinated water. As a result, it is critical that farmers protect their agricultural water source to minimize the potential for contamination. So, here we get maximum benefit from lake for agriculture uses.

Fig -54 Irrigation System

- **Hydroelectric power generation: -**

In nature, energy cannot be created or destroyed, but its form can change. In generating electricity, no new energy is created. One form of energy is converted to another form.

To generate electricity, water must be in motion. This is kinetic (moving) energy. When flowing water turns blades in a turbine, the form is changed to mechanical (machine) energy. The turbine turns the generator rotor which then converts this mechanical energy into another energy form --

electricity. Since water is the initial source of energy, we call this hydroelectric power or hydropower for short.

At facilities called hydroelectric powerplants, hydropower is generated. Some powerplants are located on rivers, streams, and canals, but for a reliable water supply, dams are needed. Dams store water for later release for such purposes as irrigation, domestic and industrial use, and power generation. The reservoir acts much like a battery, storing water to be released as needed to generate power.

The dam creates an Ahead or height from which water flows. A pipe (penstock) carries the water from the reservoir to the turbine. The fast-moving water pushes the turbine blades, something like a pinwheel in the wind. The waters force on the turbine blades turns the rotor, the moving part of the electric generator. When coils of wire on the rotor sweep past the generators stationary coil (stator), electricity is produced.

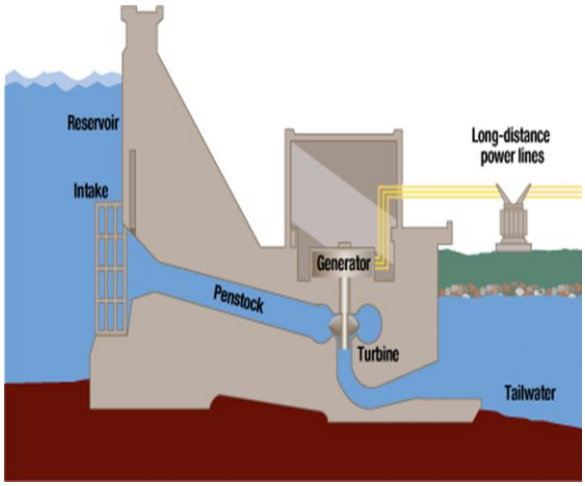


Fig- 55 Hydroelectric Power plant

- **Tourist centre**

Parks provide a great benefit to citizens, both those who live nearby and tourists. In addition to their many environmental benefits, including preserving plant and animal habitat, decreasing air pollution, and water filtration, parks create an economic benefit for both governments and individuals. Creating well planned parks and preserving sufficient land for them can generate financial returns that are often many times greater than the money initially invested into the project, even when maintenance costs are factored in.

Fig -56 Garden

Parks provide space for neighborhood residents to interact with each other and meet new people. They are also great spaces for events and for people to engage in recreational activities. This allows people to develop a sense of community. A park is perfect for a picnic, a concert, or a farmer's market whatever your community feels it needs.

Parks also provide great opportunities for parents to bond with children, and for children to make new friends in the neighborhood. A big park is also a great place for a child's birthday, allowing them to run around safely and learn to appreciate nature.

5.1.11 Rainwater harvesting

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation. Dew and fog can also be collected with nets or other tools. Rainwater harvesting differs from stormwater harvesting as the runoff is collected from roofs, rather than creeks, drains, roads, or any other land surfaces. Its uses include watering gardens, livestock, irrigation, domestic use with proper treatment, and domestic heating. The harvested water can also be committed to longer-term storage or groundwater recharge.

Rainwater harvesting is one of the simplest and oldest methods of self-supply of water for households, and residential and household-scale projects, usually financed by the user. However, larger systems for schools, hospitals, and other facilities can run up costs only able to be financed by owners, organizations, and governmental units.

Fig-57 Rainwater harvesting

6. Swatchh Bharat Abhiyan (Clean India)

6.1 Swatchhta needed in aghar village

In aghar village first one clean the place of water drinking facilities for animals locatted at the centre of village.Effect by that increase the diceases in an animal and human.so, that gram panchyat must clean that place for animal with proper way.

Fig -58 Water Tank for Animal

In aghar village no proper existing condition for the collection of solid waste in present day.so, that required collection of solid waste in propre way for healthy atmosphere.

Public Toilets must not only be constructed but also well maintained to assure their continued use. It is one of the crucial factors in making clean India a success that the public toilets are clean otherwise people will continue to relieve themselves in open place, which unfortunately they consider a cleaner option.

6.2 Guidelines-implementation in aghar village

Weaving and sharing inspiring stories from across the world about how they keep their country clean. Japan for example is well appreciated for its obsession for cleanliness in the world. Not only their roads are very clean, but their sewage water is also relatively clean as it is properly treated before it is discharged in drains. This also helps them keeping their rivers clean- something which we want to achieve in the form of a clean Ganga and for that matter other major rivers like Yamuna, Gomti, etc.

Blending the concept of lifestyle and health with the idea of cleanliness will buy some adopters in the world where lifestyle and health consciousness is very much a value.

Inspiring people to keep their houses clean and then move on to surroundings or community cleanliness.

It is a related concept of personal hygiene which has its bearings upon the personal and mental health, and this must be stressed upon.

The unit of action being an individual is taken into confidence and motivated to spread the idea of cleanliness not out of any compulsion but out of his/her conviction of cleanliness. He/she further becomes a part of chain in communication with his/her family members and friends and thus communicates through actual adopting of the value.

6.3 Activities done by student for aghar village

- ✓ To conduct outreach programs for creating awareness on Swachh Bharat through NSS.
- ✓ To produce energy and manure using bio-wastes.
- ✓ Plantation drives to increase the green cover and conservation of old trees.
- ✓ Self-sustainable units through energy production using solar panels.
- ✓ Plastic free environment.
- ✓ Development of Green Buildings concept in the society.
- ✓ Effective Waste management and recycling.
- ✓ Adoption of colonies for cleanliness and welfare.
- ✓ Rainwater harvesting.
- ✓ Proper disposal of medical waste.
- ✓ Creating awareness in the community through short films.

7.Village condition due to COVID-19

7.1 Taken steps in aghar village

- ✓ Village locals were informed by the sarpanch and talati about the pandemic situation and were also informed about the norms given by Government to fight this situation.
- ✓ Then sealed the village border to stop the movement of villagers and to restrict entry of others.
- ✓ With help of Government officers, Sarpanch and other village people they sanitized the village streets and houses and other places.
- ✓ People also started using sanitizer and mask when they went out of home.
- ✓ All the villagers were following Government norms of how to be safe from this situation and were also regularly taking account of updates by Government for this situation.

Fig-59 Discussion with Sarpanch

7.2 Steps taken by students while visiting the village:

- Mask was always use in this pandemic situation and washed our hands regularly.
- Implement social distancing practices that may include:
  - ✓ Cancelling assemblies, sports games and other events that create crowded conditions.
  - ✓ When possible, create space for children's desks to be at least one meter apart.
  - ✓ Teach and model creating space and avoiding unnecessary touching.

7.3 Any other steps taken by the students / villagers.

Provide awareness related to COVID-19 (HOW TO PROTECT FROM COVID)

- ✓ Wash your hands regularly with soap and water or clean them with alcohol-based hand rub.
- ✓ Maintain at least 1 meter distance between you and people coughing or sneezing.
- ✓ Avoid touching your face.
- ✓ Cover your mouth and nose when coughing or sneezing.
- ✓ Stay home if you feel unwell.
- ✓ Refrain from smoking and other activities that weaken the lungs.
- ✓ Practice physical distancing by avoiding unnecessary travel and staying away from large groups of people.

8. Sustainable Design Planning Proposal (Prototype Design)- Part- I

Road (Cement Concrete Road)

Scenario: -

In aghar village there is poor condition of all roads and made all weather type concrete roads. As per requirements, there is poor road condition. We need to improve that as per standard.

Design

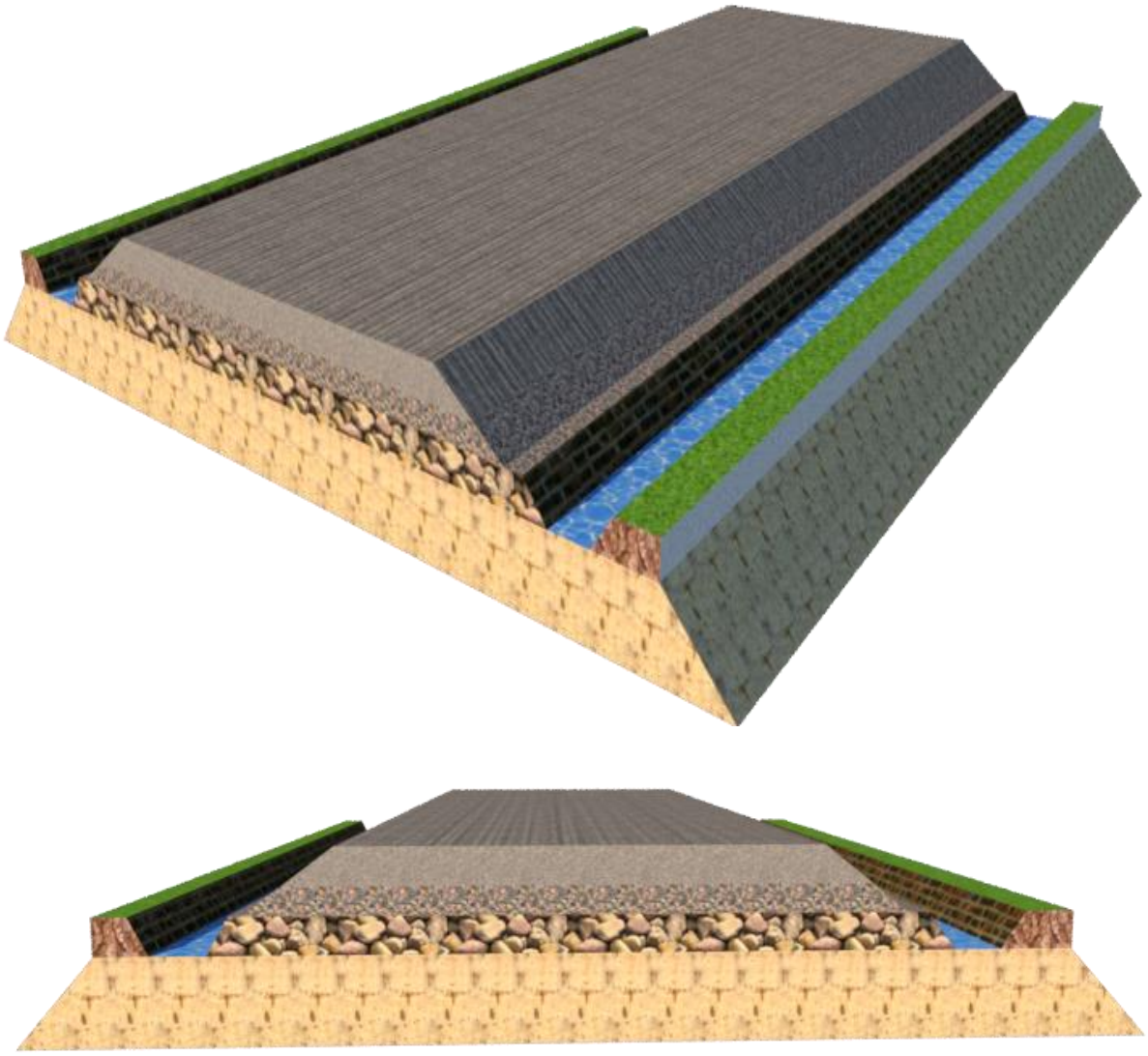


Fig-60 2D & 3D Plan for Road

Base 15 cm thick
Sub-Base 20 cm thick
Measurement Sheet: -

Table -5 Estimation Of Road

Sr. No.	Particulars of item	No.	Length (m.)	Width (m.)	Height (m.)	Quantity	Remark
1.	Box cutting in road crust & consolidating & dressing subgrade to the specified grade & camber	1	1000	3.5	0.35	**1225 m3**	H = 0.15+0.20 **= 0.35 m**
2.	Supplying consolidated soil gravel & stacked a roadside at regular intervals	1	1000	3.5	0.30	**1050 m3**	200 mm compacted when loose 200+(200/2) = **300mm**
	Labour for spreading & consolidating soil gravel	1	1000	3.5	0.30	**1050 m3**	
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 & including Brooming, Edging etc.	1	1000	3.5	0.15	**525 m3**	
4.	Providing necessary joints in concrete slab & filling the joints with bitumen.						Transverse joints = 1000/10=100
	a. For longitudinal joints	1	1000	_	_	**1000 rm**	
	b. For transverse joints @ 10m intervals	100	_	3.5		**350 rm**	Total joints = 1000+350 = 1350 rm

- **Abstract Sheet: -**

Sr. No.	Particulars of item	Unit	Quantity	Rate	Amount ₹	Amount P.
1.	Box cutting in road crust & consolidating & dressing subgrade to the specified grade & camber	m^3	1225	40	49000	**00**
2.	Supplying consolidated soil gravel & stacked a roadside at regular intervals	m^3	1050	150	**157500**	**00**
	Labour for spreading & consolidating soil gravel	m^3	1050	40	42000	**00**
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 & including Brooming, Edging etc.	m^3	525	600	315000	**00**
4.	Providing necessary joints in concrete slab & filling the joints with bitumen.	rm	1350	15	20250	**00**
		Total Amount = ₹ 583750.00				
5.	**Add 5% for contingencies & work charged establishment**	5% of **583750.00**			29188	**00**
		Grand Total = ₹ 612938				
		Rate per km = 612938.00				

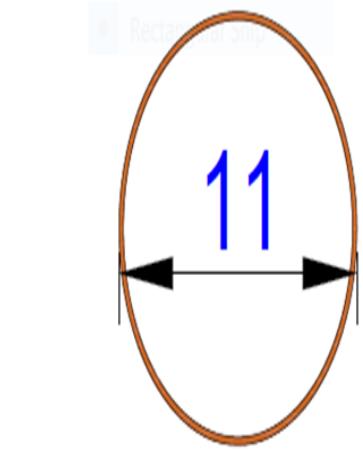
- **Bio-Gas Plant**

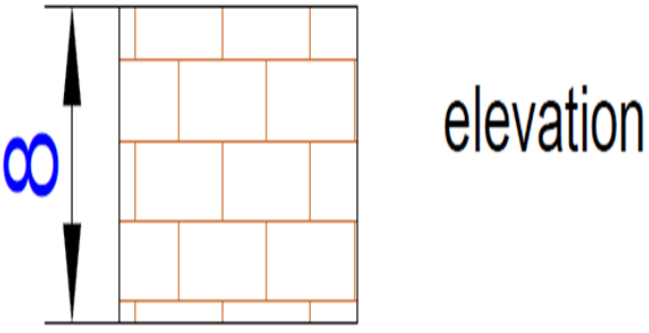
Biogas is a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen.

Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage green waste or food waste.

A biogas plant is one of the plants for renewable energy sources. It transforms the rural village into a clean village and provides gas as an energy source and gives fertilizer at the end.

In Aghar, most villagers are dependent on the agriculture side. so, we will be gone with renewable energy for economic growth and effective use of that energy in an easy way.





BASIC THINGS:

Total numbers of animals in village = 2000

As per standard data assume per day dung of animal=10.5 Kg. So, total per day dung = 2000 * 10.5 =21000 Kg. /day

DESIGN OF DIGESTER:

Assume retention period (RT) = 70 days.

Assume mixing proportion of solid and water is 1:2.

Now total amount of slurry per day (Sd) = Total per day dung + Water amount

= 21000 + (2*21000)

= 63000 Kg. /day

= 63000 Lit. /day

= 63.0 m3 / day Digester volume (Vd)

= Sd * RT = 63.0 * 70

= 4410 m3

Assume cylinder shaped biogas plant.

Provide total 6 numbers of units in different areas, so digester volume becomes for one unit= 4410 ÷ 6 =735 m3 So provide= 750 m3

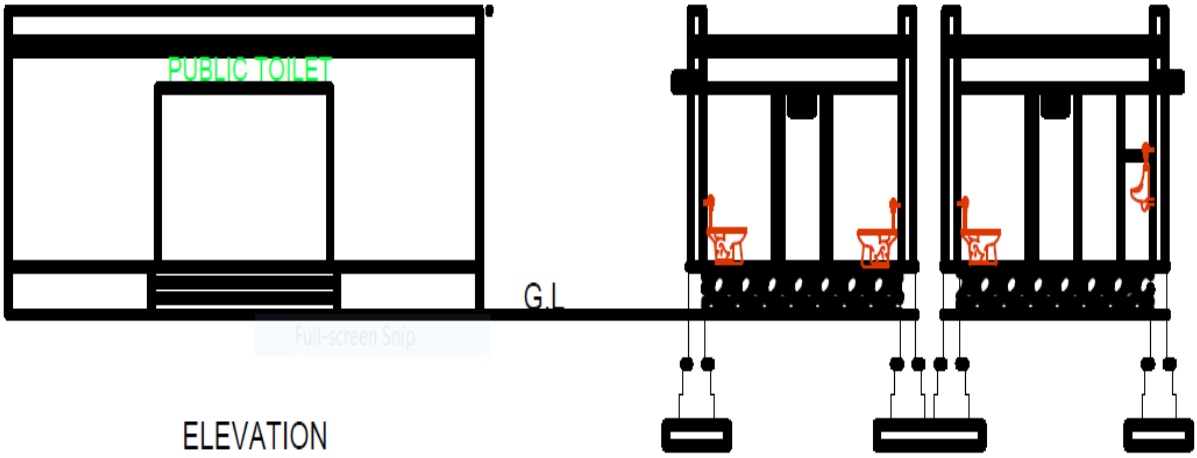
Total digester volume (Vd) = π r2 h= 750

= π r2 (h = 8 m)

So, dimensions of digester are h=8 m

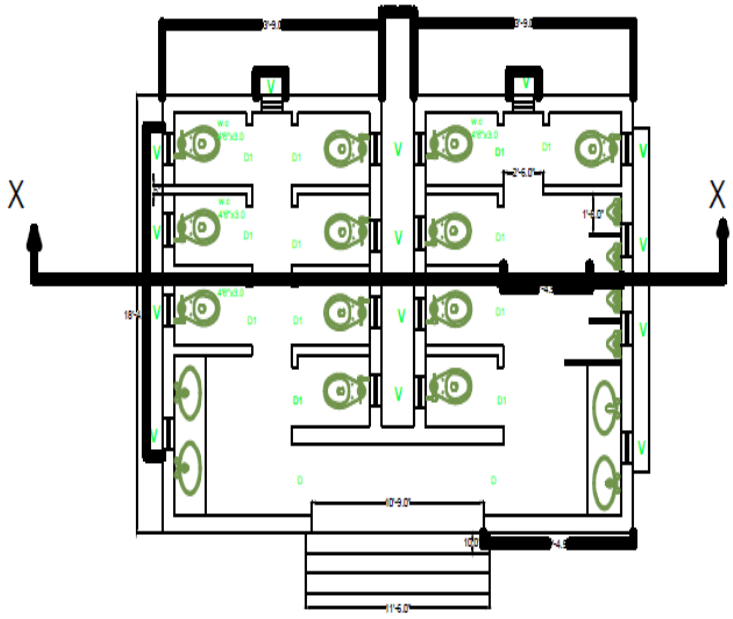
R= 5.5 m

- **Public toilet**



ELEVATION

SECTION AT X-X



PLAN

ELEVATION & 3D view

Estimation

Public Toilet							
MEASUREMENT SHEET							
Sr No	**Description**	**Nos**	**Length (ft)**	**Width (ft)**	**Height/DeptH (ft)**	**Quantity (Cu ft)**	**Total**
1	Excavation	16	15	3	7	1575	1575
2	Pcc	16	15	3	7	1575	1575
3	Brick Masonry Plinth						
4	Dpc	16	15	9”	4”	60	**60**
5	Brick Masonary For Super Structure	16	15	9”	7	1260	1260
6	Earth Filling					315	315
7	Concreting Below Flooring	16	4’6”	3’	4”	73.6	73.6
8	Outside Plaster	8	15	3	7	2520	2520
9	Inside Plaster	8	15	3	7	2520	2520
10	Granite	16	4’6”	3’		220.8	**220.8**
11	Wash Basing	4				4.000	**4.000**
12	Door						
	D	1	10	9”	7	52.5	52.5

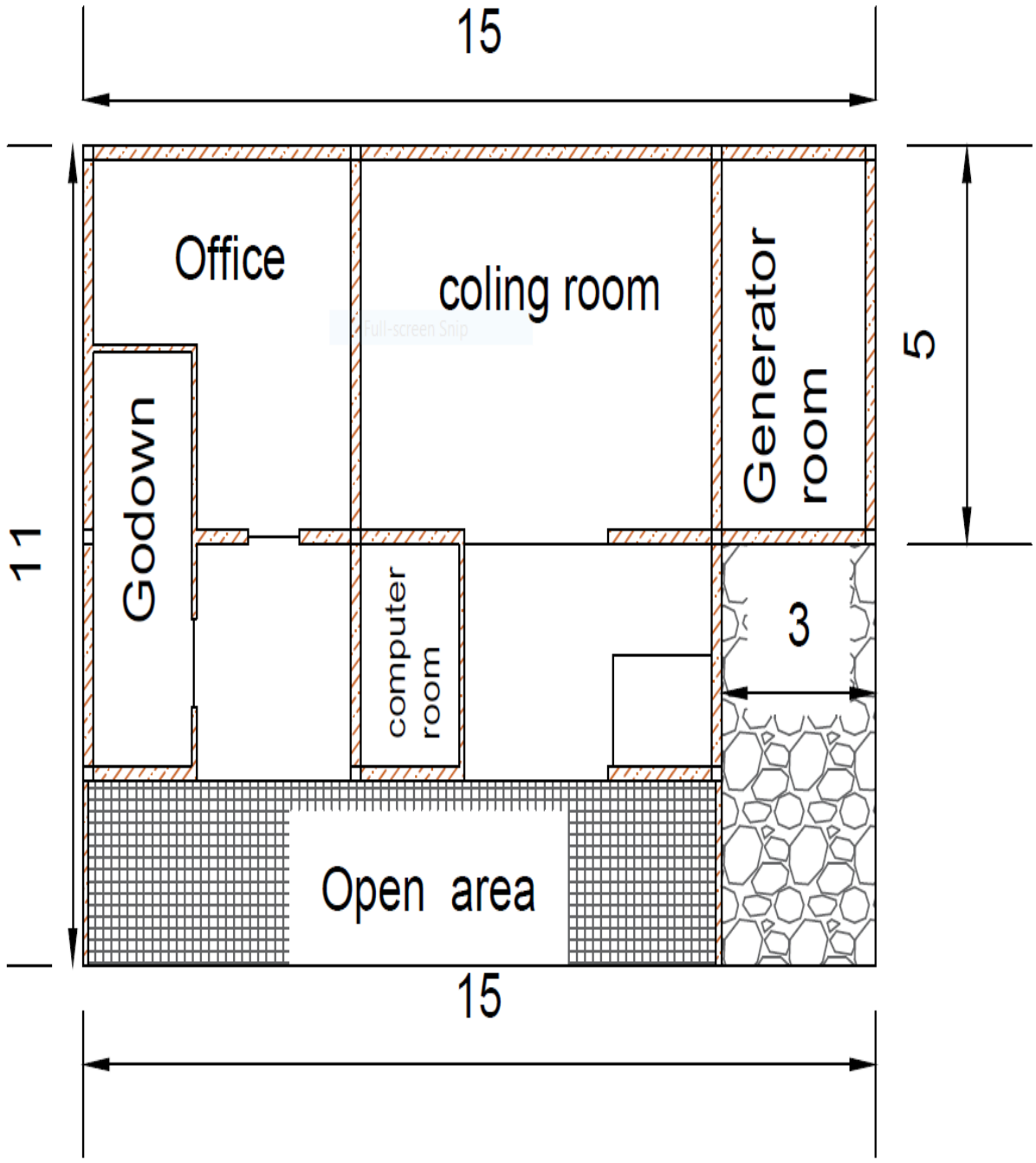
	D1	15	3	9”	5	168.75	**168.75**
13	Ventilator						
	V	18	1	1	9”	13.5	13.5

Public Toilet

ABSTRACT

SrNo	Description	Unit	Quantity	Rate	Amount
1	Excavation	Cu ft	1575	10	15750
2	Pcc	Cu ft	1575	84	132300
3	Earth Filling	Cu ft	315	8	2520
4	Granite	Cu sq	220.8	22	4857.6
5	Latrine Blocks	NOS.	12	350.00	4200
6	Urinal Blocks	NOS.	7.00	250.00	1750
7	Wash Basing	NOS.	4.00	350.00	1,400.00
8	Door	M2	16	1,600.00	25600
9	Ventilator	M2	16	500	8000
10	Slab	RS.	50 cu ft	1656	82800
	Total Amount				279179
	Contingecies 3%				8376
	10% contracture profit				27918
	Total Cost				**315473**

- **Dairy**



2D dairy plan

Interior view

Front elevation

- **Estimation using empirical equations: -**

A= Plinth area

= (15*5) + (12*6)

=147 m^2

1.cement in tone= 0.153 A + 0.57

=23.061 tone

=23061kg

=462 begs

2.sand in cu m = 0.47 A -7

=63 m^3

3.aggregate in cu.m = 0.145A + 1.5

=23 m^3

4.Briks = 226 A + 6680

=40000

5.steel in quintal =0.213 A – 3.14

=28.17 quintal

=2818kg

Particulars	Quantity/ Numbers	Rate (Rs.)	Per	Amount (Rs.)
1.Materials				
Cement	462	300	Beg	138600
Sand	63	900	m^3	56700
Aggregate	23	1000	m^3	23000
Bricks	40000	3.5	Nos	140000
Steel	2818	50	Kg	140900
Sundrises	-	-	-	2000
			Total	501200
2. Labours				
Mistry	100	500	Day	50000
Mason	225	400	Day	89698
Male coolie	150	300	Day	45000
Bhistie	25	100	Day	2500
Sundrises				1500
			Total	188698
3.Equipment cost	-	-	-	X Rs.

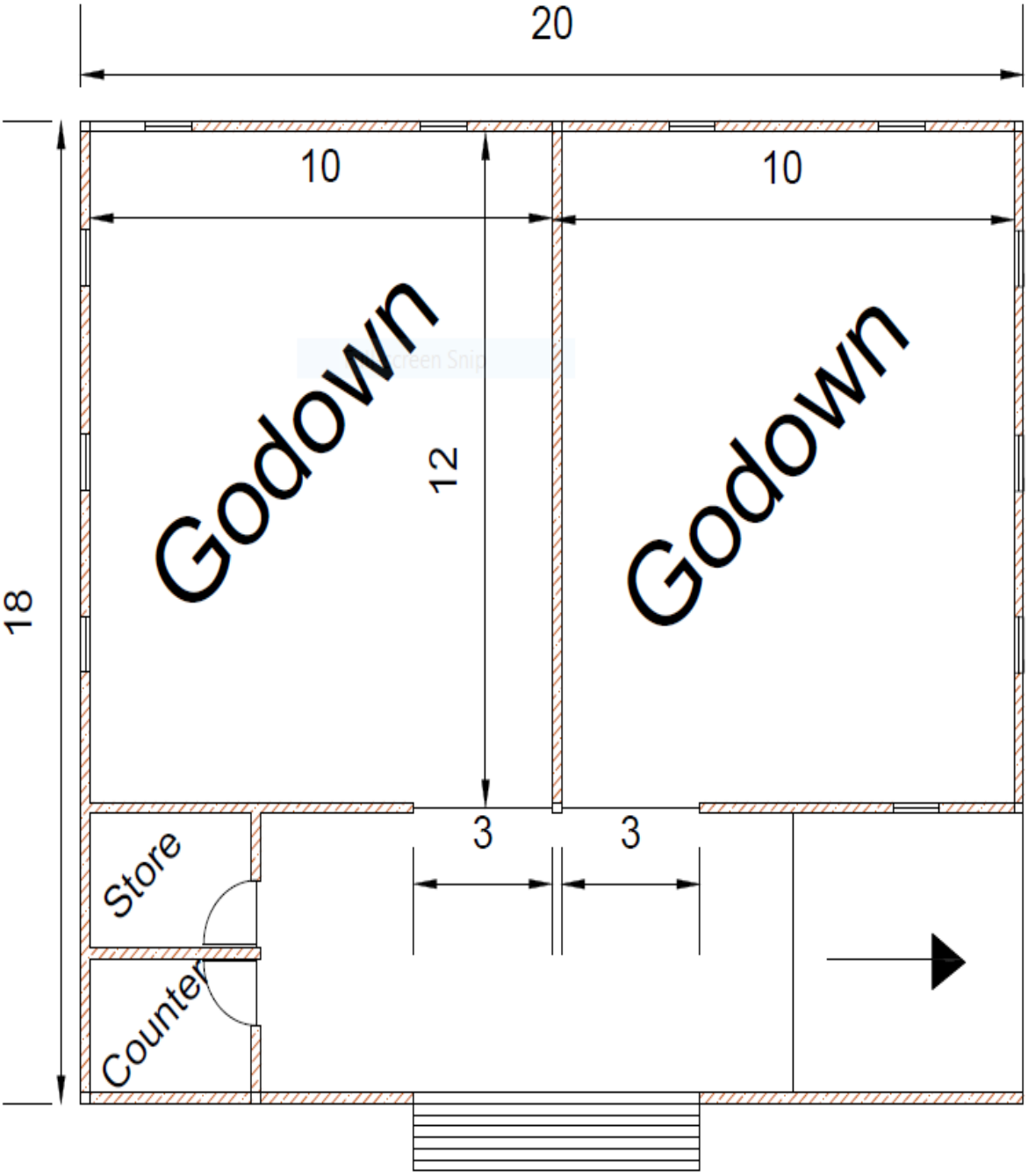
Material + labour = 689898 Rs.

10 % contractors = 68990 Rs.

1.5 % water charge = 10349 Rs.

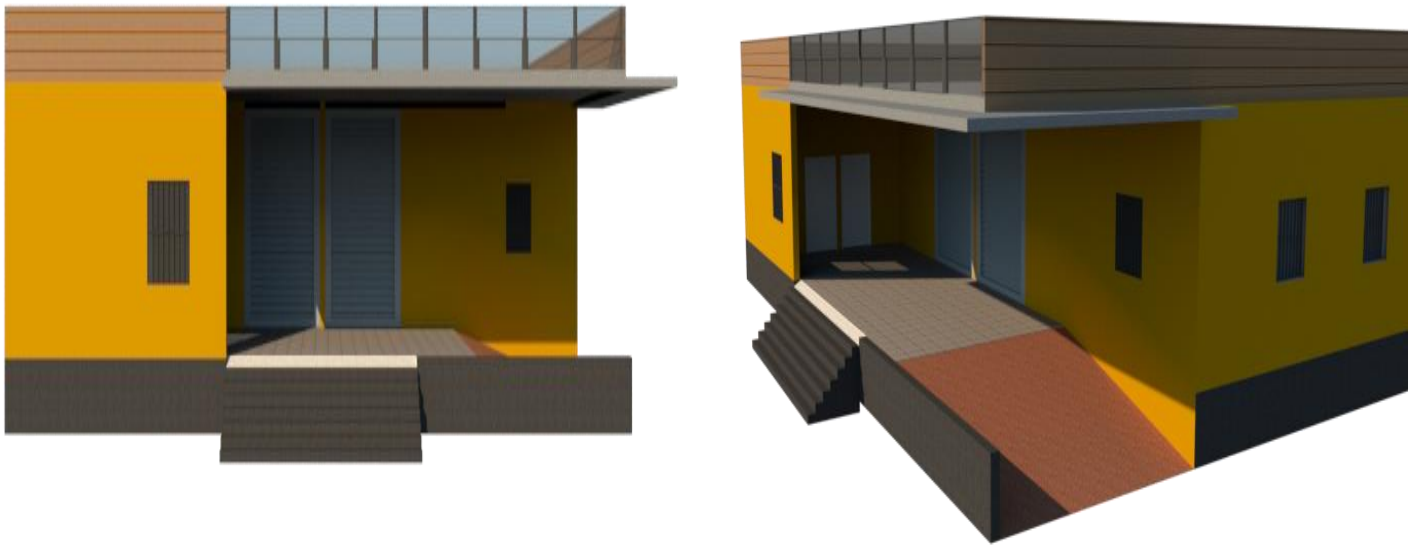
Final total=769237 Rs. + Equipment cost

- **Agro centre**



2D plan for Agro centre

Interior view



Front elevation & 3D view

Estimation using empirical equations: -

A= Plinth area

= 20 * 18

=360 m^2

1.cement in tone= 0.153 A + 0.57

=55.65 tone

=55650 kg

=1110 begs

2.sand in cu m = 0.47 A -7

=162 m^3

3.aggregate in cu.m = 0.145A + 1.5

=53.7 m^3

4.Briks = 226 A + 6680

=88000

5.steel in quintal =0.213 A – 3.14

=73.54 quintal

=7354 kg

Particulars	**Quantity/ Numbers**	**Rate (Rs.)**	**Per**	**Amount (Rs.)**
1.Materials				
Cement	1110	280	Beg	310800
Sand	162	800	m^3	129600
Aggregate	53.7	900	m^3	48330
Bricks	88000	3	Nos	264000
Steel	7354	45	Kg	330930
Sundrises	-	-	-	500
			Total	1084160 Rs.
2. Labours				
Mistry	150	500	Day	75000
Mason	200	400	Day	80000
Male coolie	200	300	Day	45000
Bhistie	25	100	Day	60000
Sundrises				500
			Total	260500

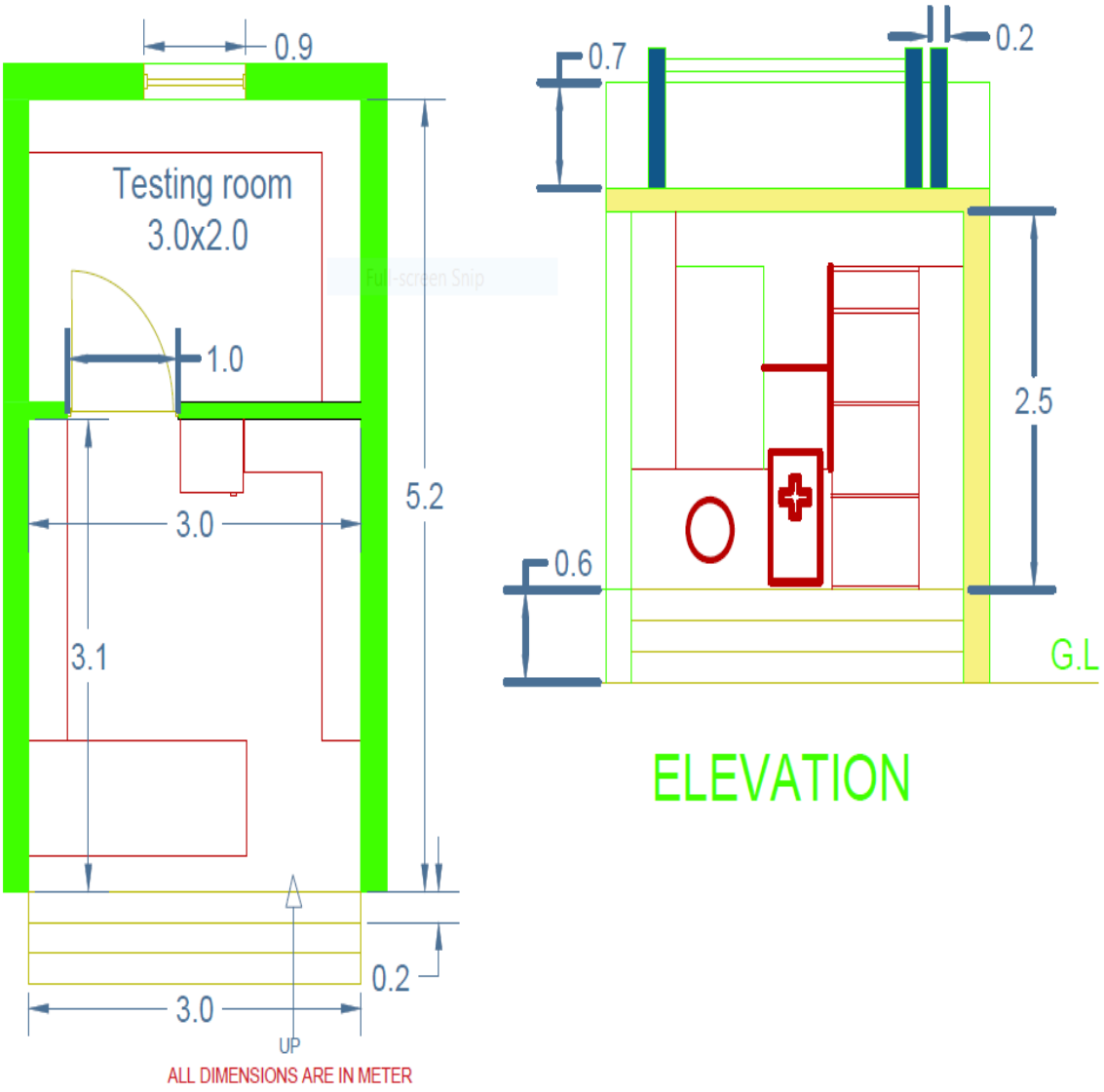
Material + labour = 1344660 Rs.

10 % contractors = 134466 Rs.

1.5 % water charge = 20170 Rs.

Final total=1499296 Rs.

- **Medical shop**



2D plan & 2D front elevation

3D front elevation

Isometric view

Measurement Sheet:-

S. No	. Particulars of Items	No	L	B	H	Q	Explanation
1.	**Earth Work excavatioin for foundation**						
	a) Long walls	2	6.4	0.9	1.4	16.128	L=5.5+.45+.45 =6.4 D=0.3+0.5+0.6=1.4
	b) Short walls	2	2.1	0.9	1.4	5.292	L= 3-0.45-0.45= 2.1
					Total	**21.42**	**m^3**
2.	**C.C.(1:4:8) bed for** foundation						
	a) Long walls	2	6.4	0.9	0.3	3.456	
	b) Short walls	2	2.1	0.9	0.3	1.134	
					Total	**4.59**	**m^3**
3.	**R.R.Masonry in CM (1:6) for**						
	a)Footings						
	i) Long walls	2	6.1	0.6	0.5	3.66	L=5.5+0.3+0.3=6.1
	ii) Short walls	2	2.4	0.6	0.5	1.728	L=3-0.3-0.3=2.4
					Tota	**6.324**	**m^3**
	b) Basement						
	i) Long walls	2	5.95	0.45	0.6	3.213	L=5.5+0.225+0.225=5.95
	ii) Short walls	2	2.55	0.45	0.6	1.377	L=3-0.225-0.225=2.55
					Total	**4.59**	**m^3**
	Total R.R Masonry for footing &basement					**Total: 6.324+ 4.59**	= 10.914
4.	**Brick masonry** with CM (1:6)forsuperstructure						
	a) Long Wall	2	5.8	0.30	3.00	10.44	L=5.5+0.15+0.15=5.8
	b) Short walls	2	2.7	0.30	3.00	4.86	L=3-0.15-0.15=2.7
					Total	**15.3**	**m^3**

S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
	Deductions						
	door	1	3	0.3	2.1	1.89	
	Windows	1	0.9	0.3	1.2	0.324	
					Total =	**(-)2.21**	**m^3**
	Net Brick Masonry		**= 15.3-2.21**		0.12	**13.09m** ^{3}	
5.	**R.C.C. (1:2:4) for**						
	a) Roof slab	1	5.5	3		1.98	
	b) Lintels over				0.15		
	Windows	1	1.5	0.3	0.3	0.202	
	c) Beams				0.3		
	i) Long beams	2	5.6	0.3	Total	0.99	
	ii) short beams	2	4.0	0.3		0.54	
					0.48	**1.53**	**m^3**
6.	**Sandfilling for**				0.1		
	basement	1	4.35	3.85		8.04	L=4.5-0.075-0.075=4.35 B=2.5-
7	**C.C.(1:4:8) for**	1	4.35	3.85	--	1.67	0.075-0.075=2.35
	flooring						
8	**Flooring with Mosaic tiles**	1	5.0	4.0		20.0	**m^2**
	Plastering with CM						
9	**(1:6)for superstructu Inside**						
	For walls	**re**			3.0		
	Out side						
	For walls Basement outside	1	16.2	--	3.87	48.6	L=2(5.1+3.0)=16.2
					0.6		
		1	17.8	--		68.89	L=2(5.5+3.4)=17.8
		1	21.6	--		12.96	H=3.0+0.12+0.75=3.87
	Deductions for opeinings						(upto parapet wall)
					Total		
	Doors Windows					**130.45**	
					2.1	6.3	**m^2**
		1x2	3	--	1.2	1.06	
		1x2	0.9	--		**7.36**	
	Net Plastering	**= 130.45 – 7.36**			**= 123.09 m^2**		**m^2**

S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
10	Plastering for Ceiling with CM(1:5)	1 t	5.5	3.0	--	16.5	**m²**
11	White Washing with two coats with Janatha cement. Same as quantity of plastering for walls and ceiling					143.09	(=123.09+20=143.09)
12	Colourwashing with two coats . Same as quantity of plastering for walls and ceiling					143.09	(=123.09+20=143.09)
13	Petty supervision and contingencies at 4% and roundingoff.						

Abstract Sheet:-

S.No.	Description of item	Quantity	Unit	Rate	Per	Amount
1.	Earth work excaation	**21.42**	m^3	465	$10m^3$	996.03
2.	Cement concrete(1:4:8)	**4.59**	m^3	4545	$1m^3$ m^3	8009.30
3.	RR.masonry in C.M.(1:5)	10.914	m^3	1391	$10m^3$	15181.37
4.	Sand filling in basement	8.04	m^3	195.20	m^3	155.9
5.	Brick masonry in country bricks of standard size in CM(1:8)	13.09	m^3	2291	m^3	29989.19
6.	R.C.C. (1:2:4) for lintels, beams etc.	1.732	m^3	6030	m^3m^3	10443.96
7.	R.C.C.(1:2:4) for slabs,	1.98	m^3	6030		11939.34
8.	Cement concrete (1:5:10) for flooring	1.67	m^2	1452	m^2	2424.84
09.	Supplying and fixing of country wood for windows and ventilators.	5.4	m^2	2300	$10m^2$	12420.00
10.	Plastering to all exposed surfaces of brick work and basement with C.M (1:5)	143.09	m^2	582	$10m^2$	8327.83
11.	White washing with best shell lime	143.09		116		1659.68
					Total	**101547.11**
12.	Povision for water supply and sanitary arangements @12.5%					12693.39
13.	Provision for electrification @7.5%					7616.03
14.	Povision for architectural appearance @2%					2030.94
15.	Provision for unforeseen items 2%					2030.94
16.	Provision for P.s.and contingencies @4%					4061.88

Grand Total Rs. 129980.29

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

After completion of visit & data collection the project carried out in the current semester by the group members which includes the design of a sustainable facilities.

Future scope would be study over other different urban amenities that would be sustainable in rural areas of aghar.

For part 1

Road (cement concrete road)-Because of poor condition

Biogas plant-80% villagers connect with agriculture.

Public toilet- Because of poor condition

Dairy- villagers connect with agriculture.

Agro center- there is no any agro center.

Medical shop- there is no any agro center.

For part 2

House design-90% kachha house so….
Library- For study purpose.
Higher secondary school- Required as per population.
Post office-Because of poor condition.
Drainage system-No existing system are there at present.
Chabutara- heritage design.

The village still lacks in maintenance of the houses. Taking this into consideration the estimation of its rehabilitation with other necessary amenities will be designed in the next semester.

In the next semester, we can provide community house design, solid waste management, rainwater harvesting, maternity homes, solar energy production, etc.….

10. Conclusion of the entire village activities of project

Vishwakarma Yojana is providing a special scheme for the development of the village by GTU and the Government of Gujarat in which students work together and collect data and information regards village development with the help of gram panchayat and stakeholders. The village has some basic facilities like drinking water, drainage system, pakka road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give a proposal regarding sustainable energy sources and solutions related to infrastructure problems.

As a part of the PMMS subject, we have given the project under the scheme of Vishwakarma Yojana phase VIII. Under this project, we have allotted the 'AGHAR' village of the 'PATAN' district. Under this project, we have visited the village and collected data regarding the existing infrastructure and required new proposed amenities.

During our village visit, we met to the Sarpanch, Talati and Villagers for the collection of information related to the village as existing and future development. The survey carried out for the collection of data from government offices like gram panchayat. We collected the data related total population of the 'AGHAR' village, male female ratio, literacy rate of village, growth rate, number of schools, various government schemes running for village development, area of village, agricultural area of village, major occupations, major crops taken, water supply source for drinking as well as irrigation water, transportation facilities, etc.

After data collection we have listed out the problems and proposed six designs for part-1 & six designs for part-2 such are as following……

For part 1

Road	**Dairy**
Biogas plant	**Agro center**
Public toilet	**Medical shop**

For part 2

Higher secondary school	**Chabutara**
Library	**Post office**
Housedesign	**Drainagesystem**

We will try to provide Sustainable Design Planning Proposal with respect to the problem faced by villagers that will make villagers fruitful.

11. References refereed for this project

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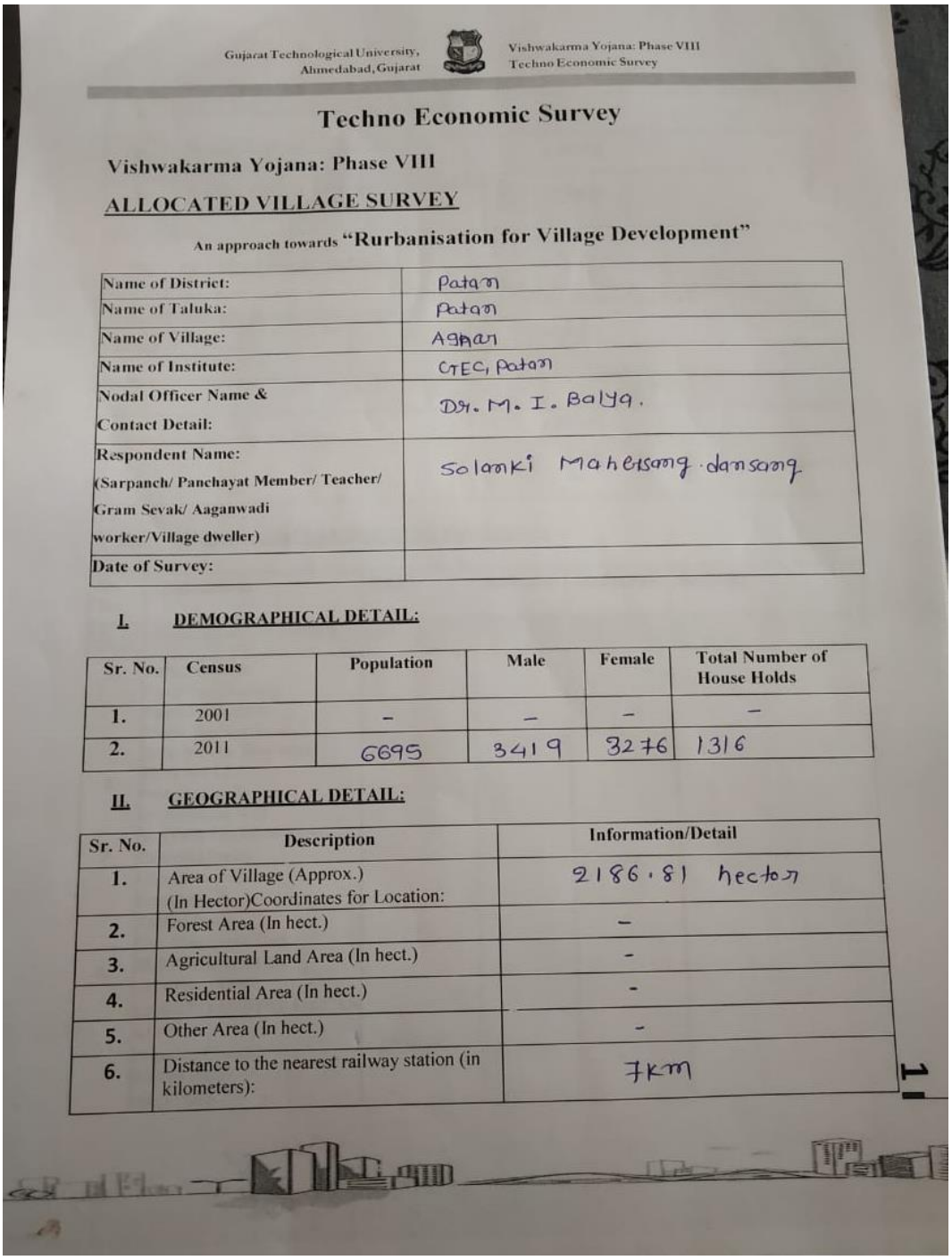
- **http://www.onefivenine.com/india/villages/Patan/Sidhpur/Jafaripura**
- **Aghar, Gujarat 384265 (google map)**
- **http://www.onefivenine.com/india/villages/Patan/Patan/Aghar**

12. Annexure attachment

12.1 Survey form of Village attachment in the report



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

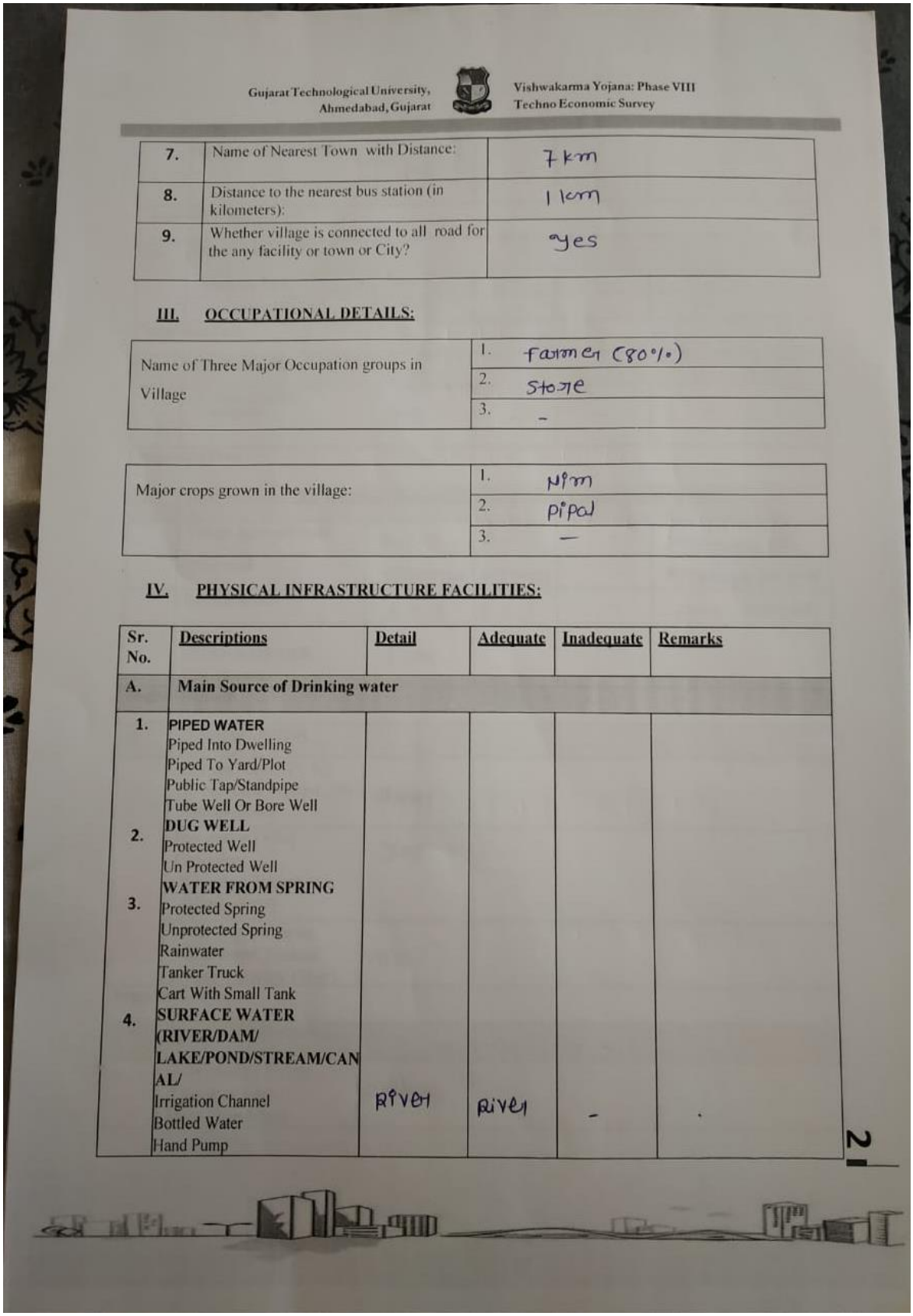
Name of District:	Patan
Name of Taluka:	Patan
Name of Village:	Aghar
Name of Institute:	GTEC, Patan
Nodal Officer Name & Contact Detail:	Dr. M. I. Baiya.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Solanki Maheshsang dansang
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	-	-	-	-
2.	2011	6695	3419	3276	1316

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	2186.81 hector
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):	7km



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

7.	Name of Nearest Town with Distance:	7 km
8.	Distance to the nearest bus station (in kilometers):	1 km
9.	Whether village is connected to all road for the any facility or town or City?	yes

III. OCCUPATIONAL DETAILS:

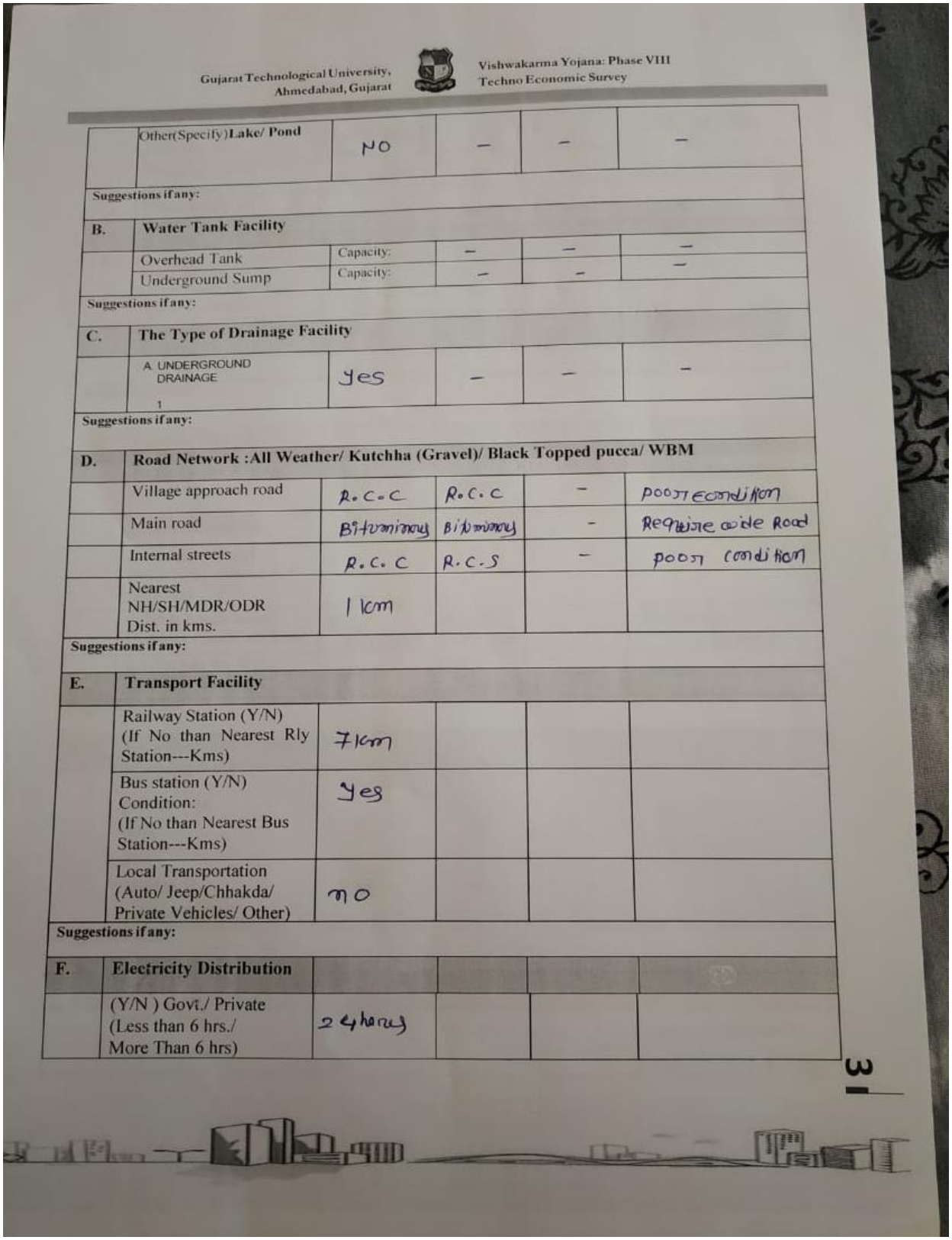
Name of Three Major Occupation groups in Village	1.	Farmer (80%)
	2.	Store
	3.	-

Major crops grown in the village:	1.	Nim
	2.	Pipal
	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				
2.	**DUG WELL**				
	Protected Well				
	Un Protected Well				
3.	**WATER FROM SPRING**				
	Protected Spring				
	Unprotected Spring				
	Rainwater				
	Tanker Truck				
	Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**				
	Irrigation Channel	River	River	-	
	Bottled Water				
	Hand Pump				

2



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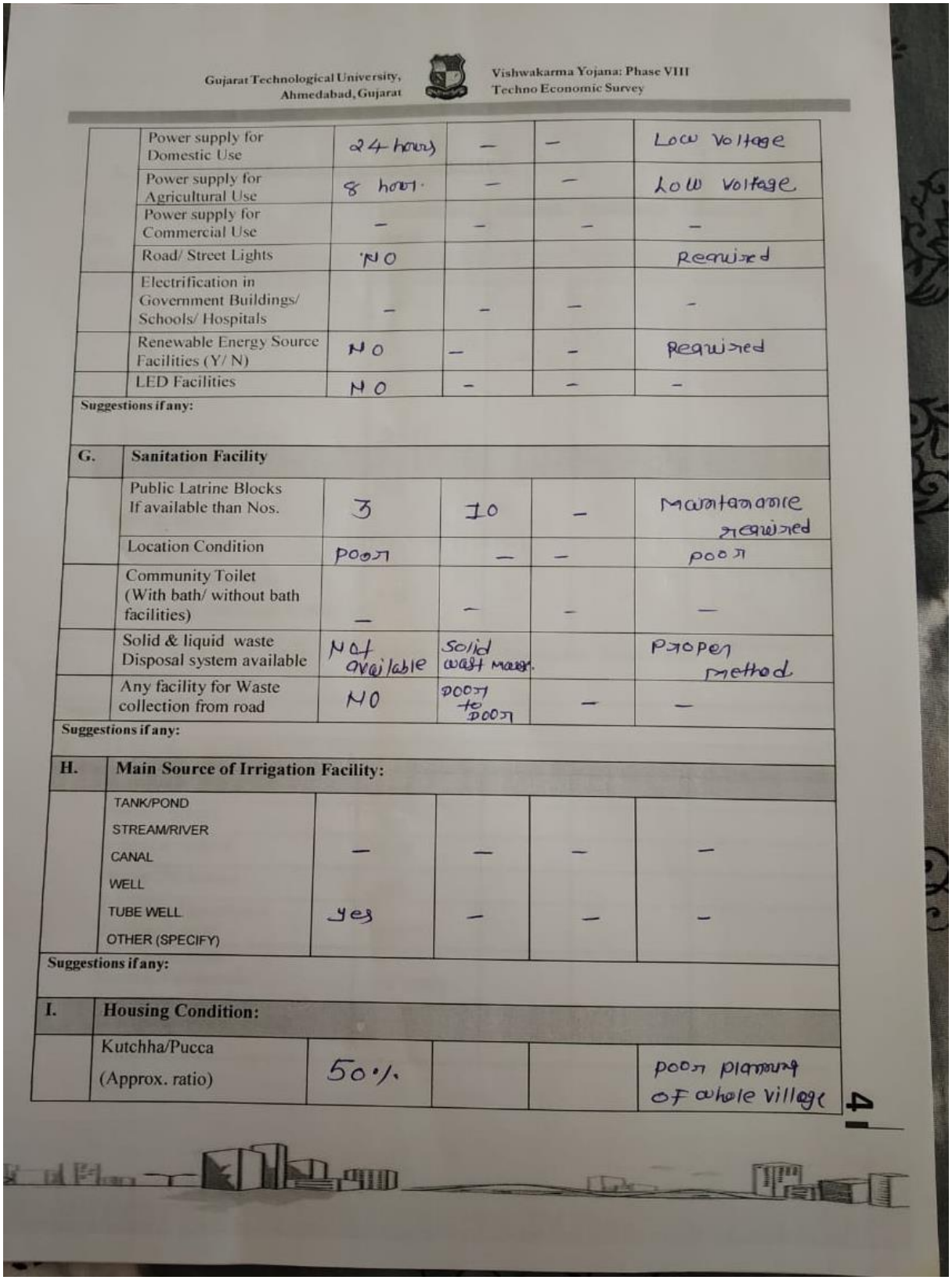
	Other(Specify)Lake/ Pond	NO	–	–	–
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	–	–	–
	Underground Sump	Capacity:	–	–	–
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	Yes	–	–	–
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	R.C.C	R.C.C	–	Poor Condition
	Main road	Bituminous	Bituminous	–	Require wide Road
	Internal streets	R.C.C	R.C.S	–	Poor condition
	Nearest NH/SH/MDR/ODR Dist. in kms.	1 km			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	7 km			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	no			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	24 hours			

3



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	Power supply for Domestic Use	24 hours	–	–	Low Voltage
	Power supply for Agricultural Use	8 hour.	–	–	Low Voltage
	Power supply for Commercial Use	–	–	–	–
	Road/ Street Lights	NO			Required
	Electrification in Government Buildings/ Schools/ Hospitals	–	–	–	–
	Renewable Energy Source Facilities (Y/ N)	NO	–	–	Required
	LED Facilities	NO	–	–	–

Suggestions if any:

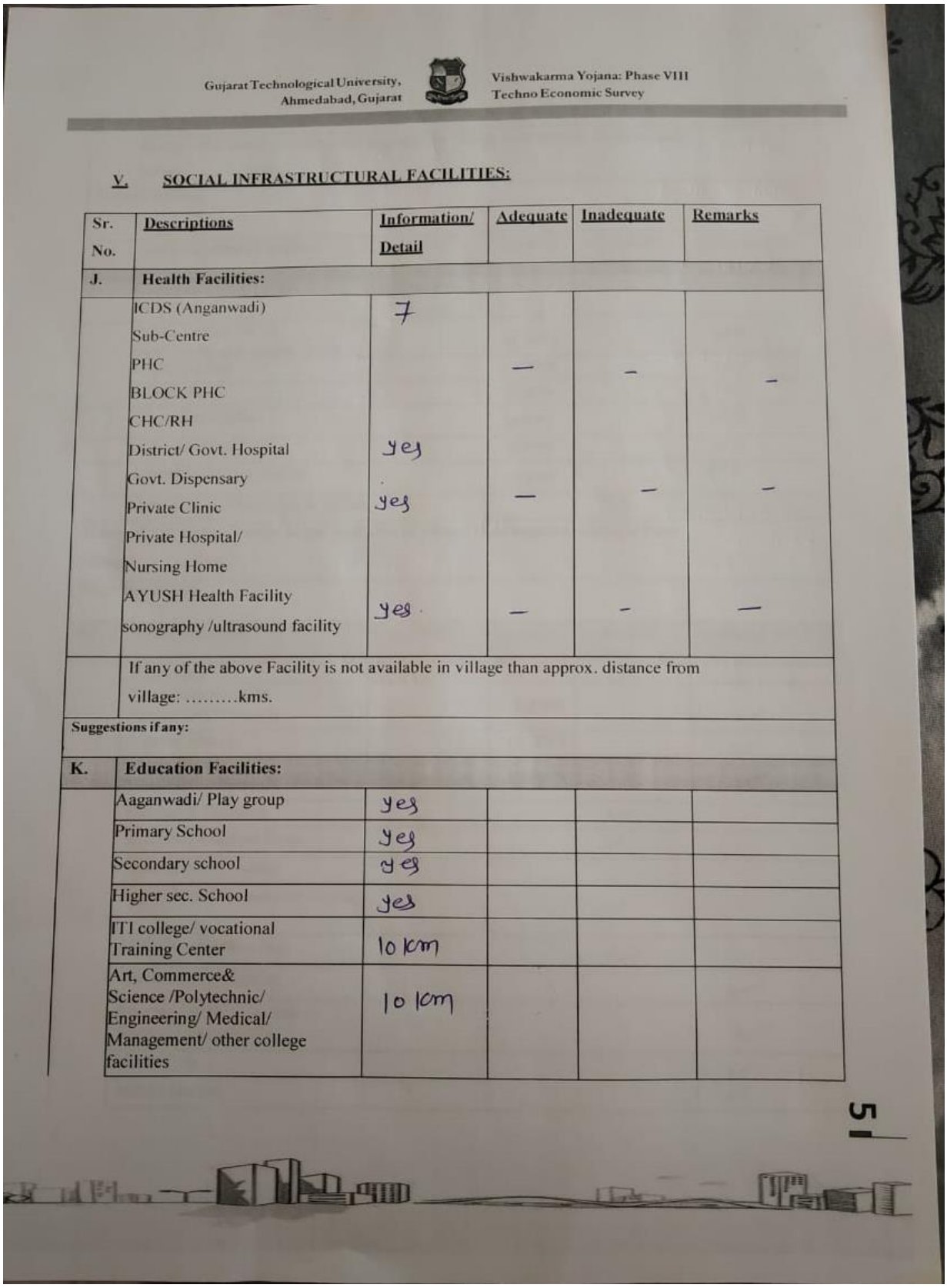
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	3	10	–	Maintenance required
	Location Condition	poor	–	–	poor
	Community Toilet (With bath/ without bath facilities)	–	–	–	–
	Solid & liquid waste Disposal system available	Not available	Solid waste Mgmt.		Proper method
	Any facility for Waste collection from road	NO	Door to Door	–	–

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL	–	–	–	–
	TUBE WELL	yes	–	–	–
	OTHER (SPECIFY)				

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	50%			poor planning of whole village



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Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	7			
	Sub-Centre				
	PHC		—	—	—
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital	yes			
	Govt. Dispensary				
	Private Clinic	yes	—	—	—
	Private Hospital/ Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility	yes	—	—	—
	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	10 km			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	10 km			

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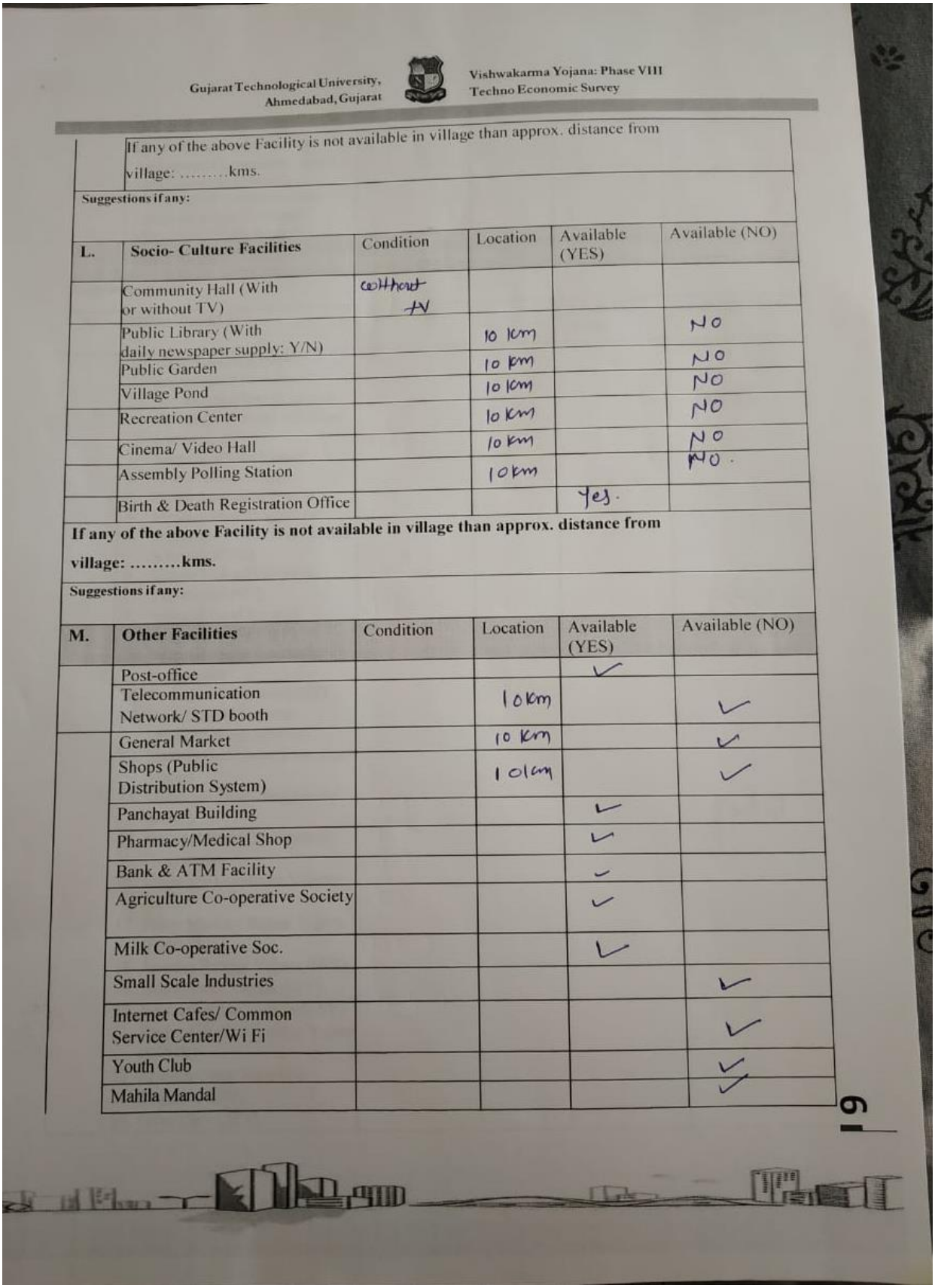

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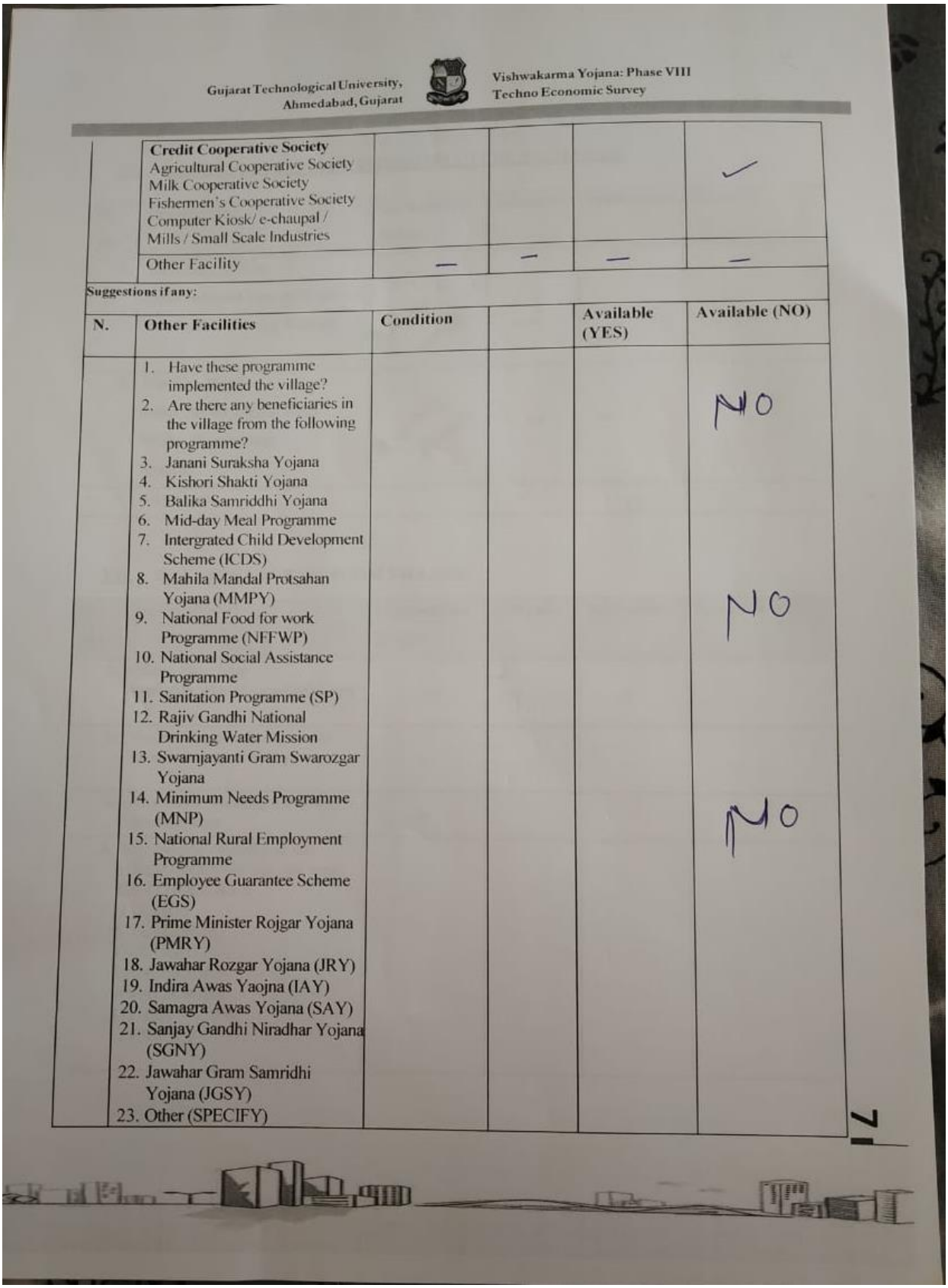
	If any of the above Facility is not available in village than approx. distance from village: .....kms.
Suggestions if any:	

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	without TV			
	Public Library (With daily newspaper supply: Y/N)		10 km		NO
	Public Garden		10 km		NO
	Village Pond		10 km		NO
	Recreation Center		10 km		NO
	Cinema/ Video Hall		10 km		NO
	Assembly Polling Station		10km		NO.
	Birth & Death Registration Office			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			✓	
	Telecommunication Network/ STD booth		10km		✓
	General Market		10 km		✓
	Shops (Public Distribution System)		10km		✓
	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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Techno Economic Survey

	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?				NO
	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)				NO
	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)				NO
	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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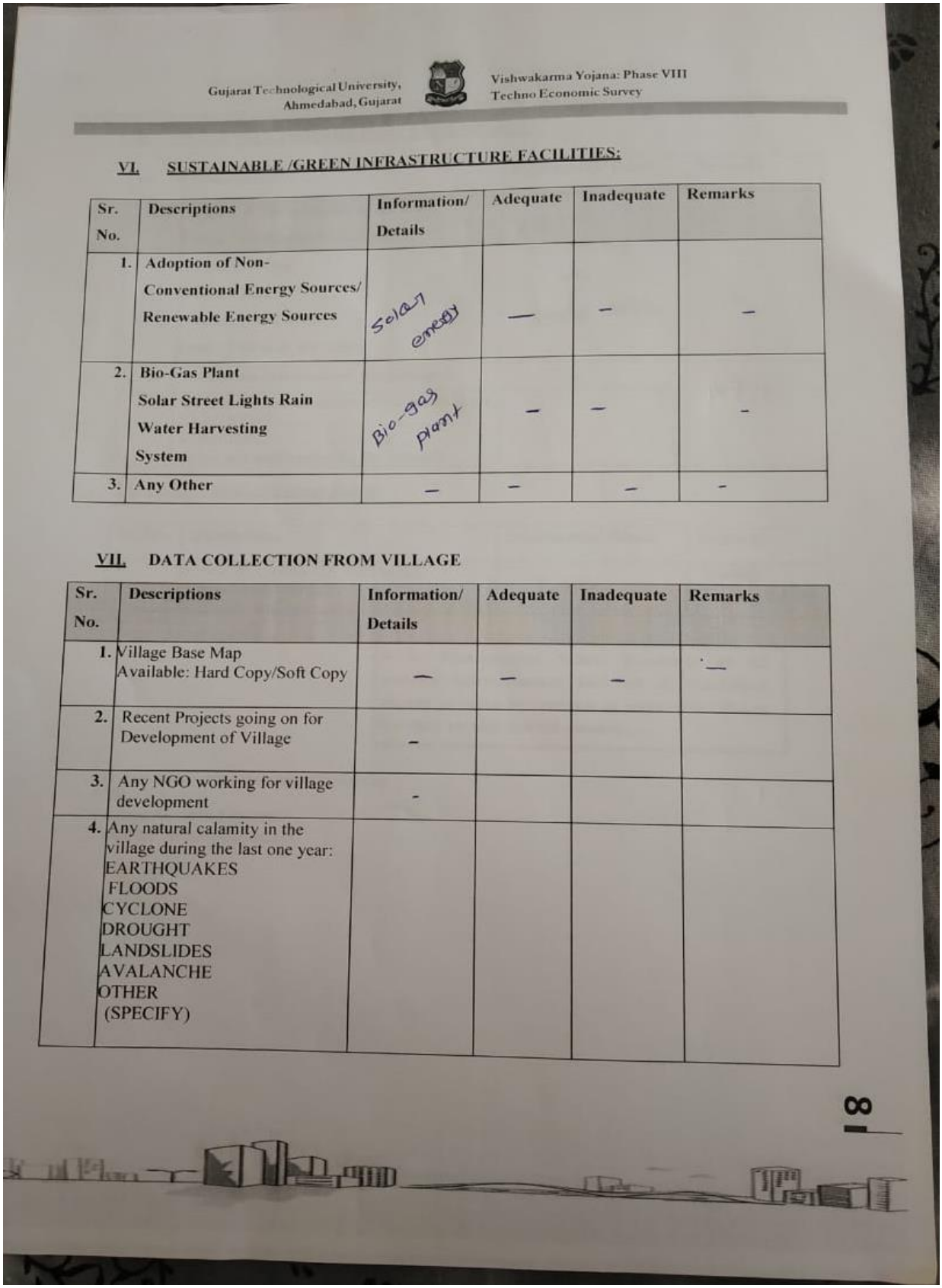

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

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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	public toilet + post offic	-
2.	Additional Information/ Requirement	-	-
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 ?	Lake	Useless condition

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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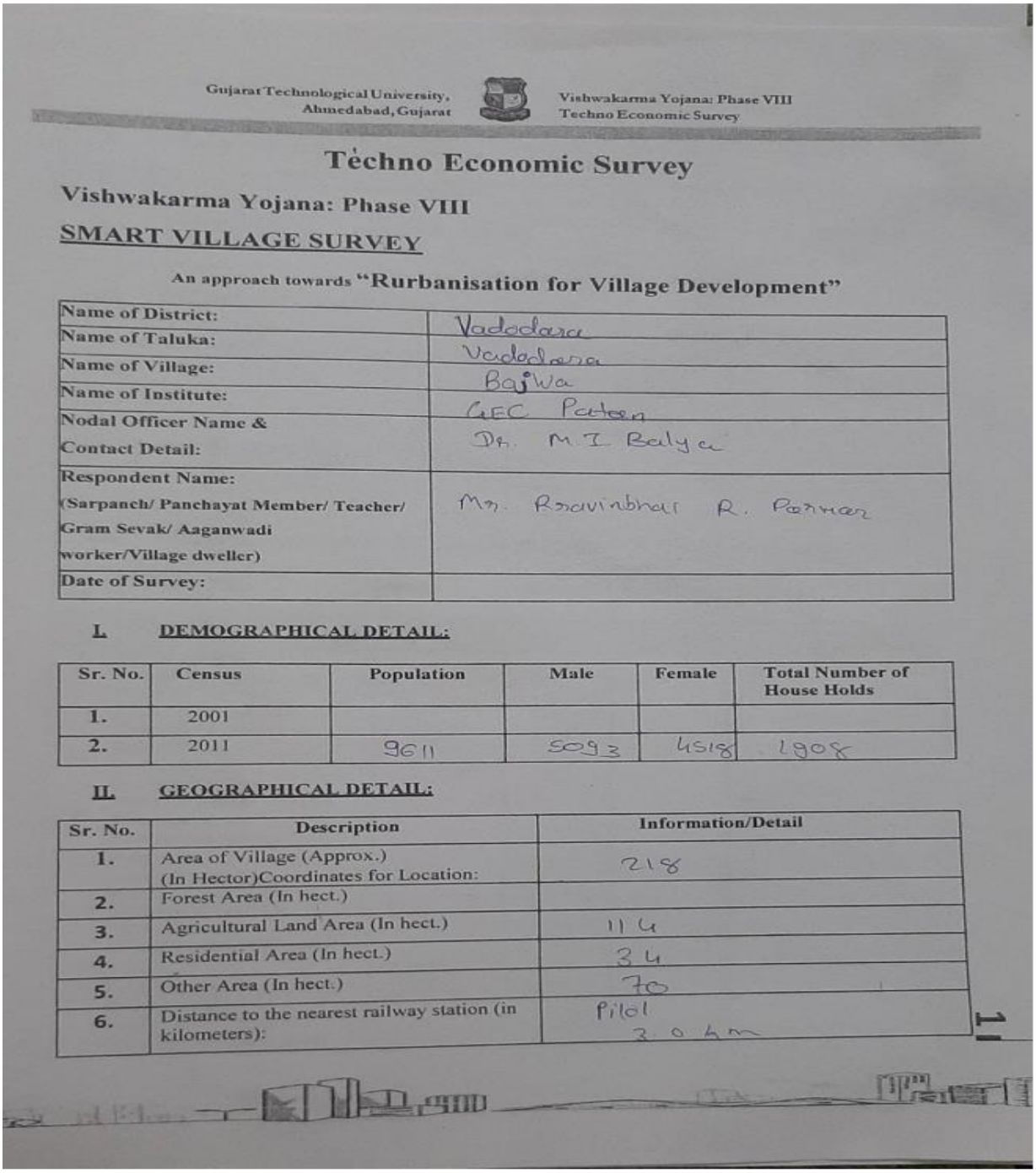
12.2. Smart Village Survey



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

Name of District:	Vadodara
Name of Taluka:	Vadodara
Name of Village:	Bajwa
Name of Institute:	GEC Patan
Nodal Officer Name & Contact Detail:	Dr. M I Baluch
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Mr. Ravinbhai R. Parmar
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	9611	5093	4518	1908

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	218
2.	Forest Area (In hect.)	
3.	Agricultural Land Area (In hect.)	114
4.	Residential Area (In hect.)	34
5.	Other Area (In hect.)	70
6.	Distance to the nearest railway station (in kilometers):	Pilol 30 Km

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Techno Economic Survey

7.	Name of Nearest Town with Distance:	Vadgam
8.	Distance to the nearest bus station (in kilometers):	Sawasi 2.0 km
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Private Job
	2.	Labourers
	3.	farmers

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				
2.	**DUG WELL**				
	Protected Well	2 Nos	✓		
	Un Protected Well				
3.	**WATER FROM SPRING**				
	Protected Spring				
	Unprotected Spring				
	Rainwater				
	Tanker Truck			✓	
	Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**				
	Irrigation Channel	Yes	✓		
	Bottled Water				
	Hand Pump	3	✓		
	Other(Specify)**Lake/ Pond**	Yes	✓		

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	3 No.	2lakh, 1lakh, 50k lit	
	Underground Sump	Capacity:	3 No.		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Not Adequate.			
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Black Top	✓		
	Main road	Yes	✓		R.C.C Road.
	Internal streets	Yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH → 2km NH - 2km			SH - dumral NH → Palanpur
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No			Nearest Railway - Pilol 3.1Km
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	NO			Nearest Bus Station Salvai - 20km
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)		✓		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes 24hrs			Three phase Connection

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	208 Connection			
	Power supply for Agricultural Use	40 connection			
	Power supply for Commercial Use	0			
	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.	No			Every house have Individual facility
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	No			Not require
	Solid & liquid waste Disposal system available	Yes			
	Any facility for Waste collection from road	Yes			

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND				
	STREAM/RIVER				
	CANAL				
	WELL	Yes			Lift irrigation System
	TUBE WELL	Yes			
	OTHER (SPECIFY)				11 Cl het

Suggestions if any:

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

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)				
	Sub-Centre	2 Nos.			
	PHC	No			
	BLOCK PHC				Nearest Pandi 5 km
	CHC/RH				
	District/ Govt. Hospital	Yes			
	Govt. Dispensary				
	Private Clinic	Yes			
	Private Hospital/	No			
	Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility				
	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 300			
	Primary School	Yes 3 No.			
	Secondary school	Yes 1 No			
	Higher sec. School	Yes 1 No			
	ITI college/ vocational Training Center	No			15 km
	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: .....kms.				

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

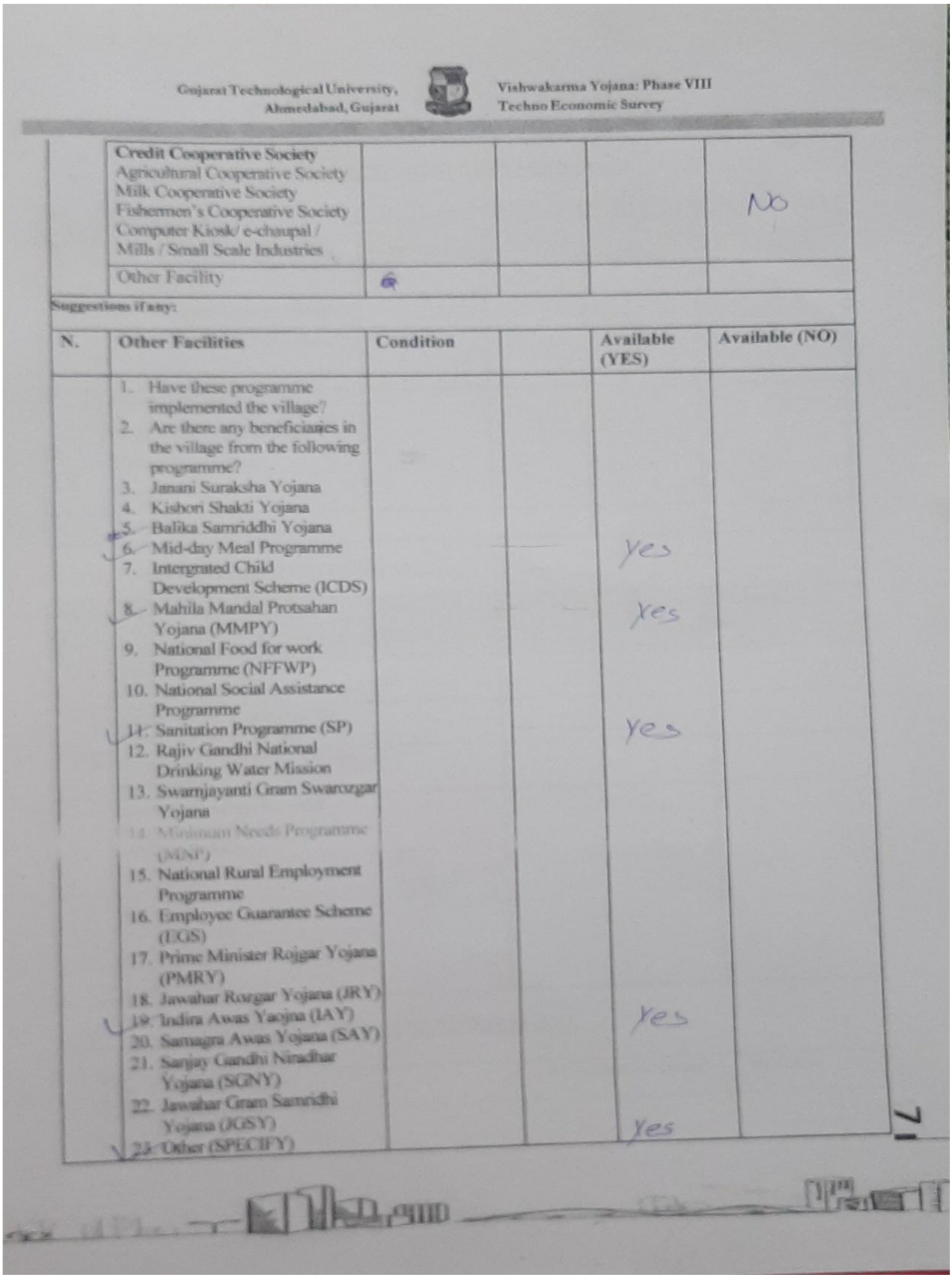
Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Adequate	Under Construction 3 KM	Yes	
	Public Library (With daily newspaper supply: Y/N)	Adequate	Bajwa 3 km	Yes	
	Public Garden				
	Village Pond		Bajwa	Yes	
	Recreation Center				No
	Cinema/ Video Hall				NO
	Assembly Polling Station			Yes	
	Birth & Death Registration	Adequate	Bajwa	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	Adquate	Bajwa	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				No
	Milk Co-operative Soc.			Yes	
	Small Scale Industries			Yes	
	Internet Cafes/ Common Service Center/Wi Fi		Bajwa	Yes	
	Youth Club				No
	Mahila Mandal	2 Nos.	Bajwa	Yes	



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries				No
	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			Yes	
	7. Intergrated Child Development Scheme (ICDS)				
	8. Mahila Mandal Protsahan Yojana (MMPY)			Yes	
	9. National Food for work Programme (NFFWP)				
	10. National Social Assistance Programme				
	11. Sanitation Programme (SP)			Yes	
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana				
	14. Minimum Needs Programme (MNP)				
	15. National Rural Employment Programme				
	16. Employee Guarantee Scheme (EGS)				
	17. Prime Minister Rojgar Yojana (PMRY)				
	18. Jawahar Rozgar Yojana (JRY)				
	19. Indira Awas Yaojna (IAY)			Yes	
	20. Samagra Awas Yojana (SAY)				
	21. Sanjay Gandhi Niradhar Yojana (SGNY)				
	22. Jawahar Gram Samridhi Yojana (JGSY)				
	23. Other (SPECIFY)			Yes	

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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

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

Surpanch of Bajoda

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12.3 Ideal Village Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

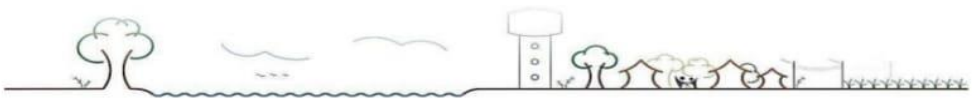
Name of Village:	**Jafaripura**
Name of Taluka:	**Sidhdhapur**
Name of District:	**Patan**
Name of Institute:	**GEC Patan**
Nodal Officer Name & Contact Detail:	**Dr. M.I.Balya**
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	**Maherali Kojar**
Date of Survey:	**4/11/2020**

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	575	287	288	122

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	374.21 hec.
	Forest Area (In hect.)	
	Agricultural Land Area (In hect.)	
	Residential Area (In hect.)	
	Other Area (In hect.)	
	Water bodies	from grampanchayat
	Nearest Town with Distance:	11 km (Sidhdhpur)



3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agriculture
	2. Cattle farming
	3. Small Bussiness

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated) • RO Water • Well (Covered/ Uncovered) • Hand pumps • Tube well/ Borehole • River/ Canal/ Spring/ Lake/ Pond	Treated Private Covered Borehole Borewell			
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	5000 lit		
	Underground Sump	Capacity:	5000 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				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	No			
Suggestions if any:					

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Pucca			c.c Road
	Main road	Pucca			c.c Road
	Internal streets	Pucca			c.c Road
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH (11 km)			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	11 km (Sidhdhpur)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	11 km (Sidhdhpur)			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Private Vehicles			
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. (More than 6 hr.)			
	Power supply for Domestic Use	Yes			
	Power supply for Agricultural Use	Yes			
	Power supply for Commercial Use	No			
	Road/ Street Lights	Yes			

	Electrification in Government Buildings/ Schools/ Hospitals	by Government	-	-	
	Renewable Energy Source Facilities (Y/ N)	No	-	-	Required
	LED Facilities	No	-	-	
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	2	-	-	4 required
	Location Condition	good	-	-	-
	Community Toilet (With bath/ without bath facilities)	without bath	-	-	-
	Solid & liquid waste Disposal system available	Yes	-	-	-
	Any facility for Waste collection from road	Solid Waste	-	-	-
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	canal tube well	-	-	-
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca (90%)	-	-	-

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Private Clinic			Govt. Hospital Require
	Private Clinic/Private Hospital/ Nursing Home	private clinic			
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	-	-	-
	Primary School	Yes	-	-	-
	Secondary school				
	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: .....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Without TV			

	Condition:	good			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			
	Public Garden Location: Condition:	Yes			
	Village Pond Location: Condition:	Yes			
	Recreation Center Location: Condition:	No			
	Cinema/ Video Hall Location: Condition:	No			
	Assembly Polling Station Location: Condition:	Yes			
	Birth & Death Registration Office Location: Condition:	No			
If any of the above Facility is not available in village than approx. distance from village: 11 kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	yes			
	Telecommunication Network/ STD booth	yes			

	General Market	shops			
	Shops (Public Distribution System)	Yes			
	Panchayat Building	Yes			
	Pharmacy/Medical Shop	Yes			
	Bank & ATM Facility	No			
	Agriculture Co-operative Society	Yes			
	Milk Co-operative Soc.	Yes			
	Small Scale Industries	No			
	Internet Cafes/ Common Service Center/Wi Fi	Wi Fi			
	Other Facility				
Suggestions if any:					

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

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

7. **Data Collection From Village**

Village Base Map **Available: Hard Copy/Soft Copy**	

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

8. **Additional Information/ Requirement:**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	**Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)**	-	Not Required
2.	**Additional Information/ Requirement**	-	-

9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Solar Energy and Rain Water Harvesting	-	Required

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

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

12.4 Gap Analysis of the Allocated Village

Gap analysis involves the comparison of actual performance with desired or potential performance. Gap analysis involves determining and improving the difference between requirements and current capabilities. It identifies gaps between current situation and optimize situation.

Table-6 Gap Analysis

Facilities	**Aghar**		
	Popilation:6695		
	Existing	**Required**	**Gap**
Education			
Aganwadi	7	7	0
Primary School	2	2	0
Secondary School	1	1	0
Higher Secondary School	0	1	1
College	0	0	0
Medical Facilities			
Gov. Dispensary	1	1	0
Medical shop	1	2	1
Transportation			
Bus Station	1	1	0
Railway Station	0	0	0
Auto Stop	0	0	0
Approach Road	0	1	1
Water Facilities			
Over Head Tank	1	2	1
Irrigation purpose	0	1	1
Lake development	-	-	1
Other			
Public Toilet	1	2	1
Drainage system	0	1	1
Post Office	1	1	0
Panchayat Building	1	1	0
Bio-Gas Plant	0	1	1
Library	0	1	1
Police station	0	0	0
Community Hall	1	1	0
Dairy	1	2	1
Agro Centre	0	1	1
Electric power station	1	2	1
Solid waste collection	0	1	1

12.5 Summary Details of All the Villages Designs

Table 7

No.	Village	Design	
		Part I	Part II
1	Kungher	1.Dwelling House 2.Open Window Composite Structure 3.Bio-Gas Plant 4.Pipe Culvert 5.Atm 6.Stone Pitching on Lack Boundary	1.Water Tank 2.Approach Road 3.Irrigation Method 4.Drainage System 5.Septic Tank 6.Solar Roof Top Plant
2	Vamiya	1.Bio-Gas Plant 2.Public Toilet 3.Community Hall 4.U/G sump 5.Chabutro 6.School sanitary complex	1.Solid Waste Management 2.Bus Station 3.Post Office 4. Dwelling House 5.Pavement in Graveyard with Paver Block 6.Garden
3	Aghar	1. Bio-Gas Plant 2. Approach Road 3. Public Toilet 4. Dairy 5. Agro centre 6. Medical shop	1. Post Office 2. Library 3. House Design 4. Drainage System 5. Chabutara 6. Higher secondary school
4	Bhilavan	1. Bus Station 2.Post Office 3.primary school 4.Aaganwadi 5.Entrance gate 6.Auditorium	1. Water Tank 2. Bio-Gas Plant 3.Gym 4.Bank 5.Library 6.Rainwater Harvesting

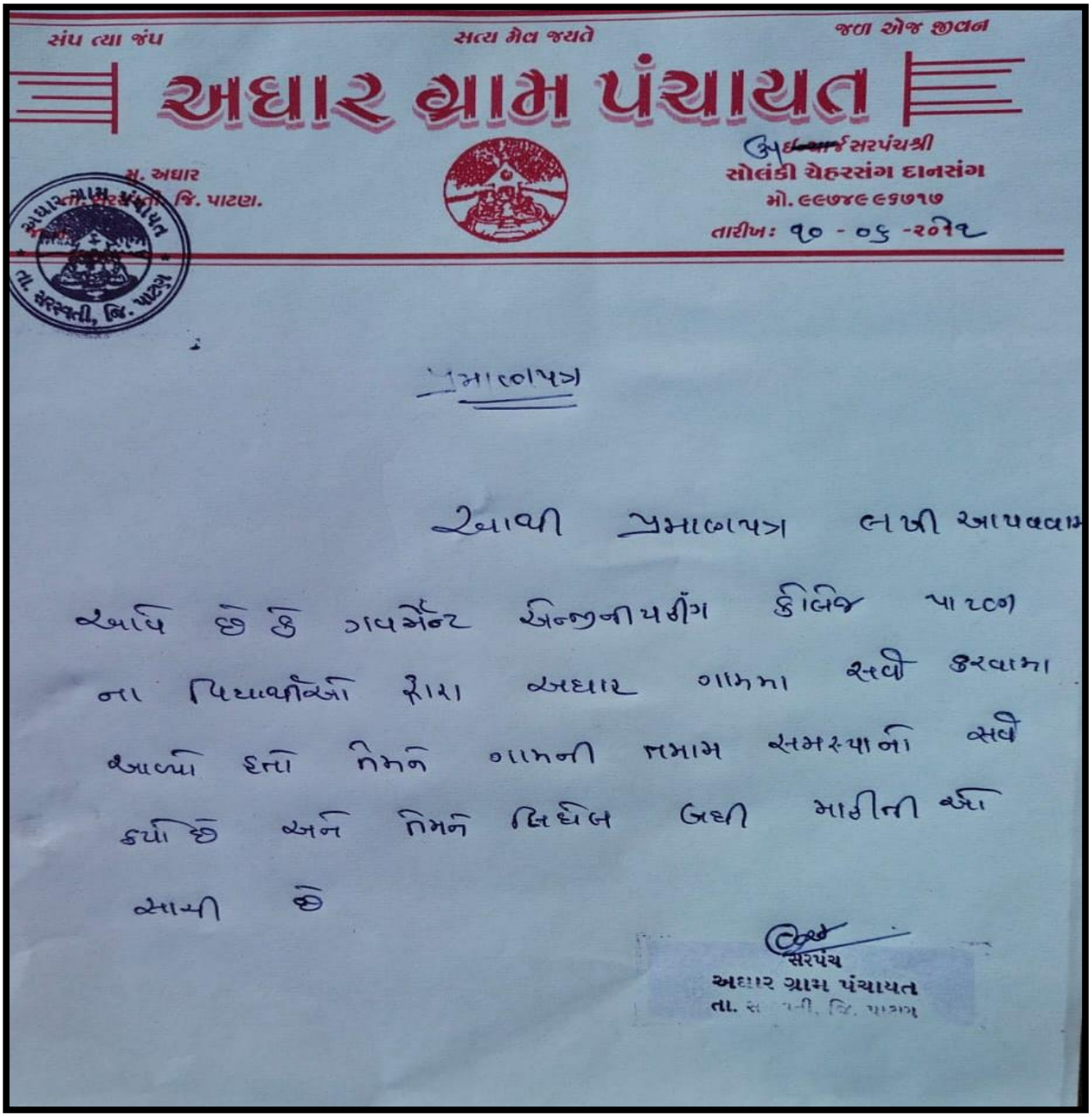
Summary of Photographs (village visits, Ideal, Smart Village or any other)

12.6 Village Interaction with sarpanch

As a part of PMMS subject we have chosen the project under scheme of Vishwakarma Yojana phase VIII. Under this project we are allotted aghar village of Patan district. Under this project we are supposed to visit the village to study existing infrastructure and to propose new amenity.

We visited aghar village. We meet village sarpanch at panchayat office. Here we inquired about the facilities available in the village like road, water supply, electricity etc. They were very helpful, and they give us detail information.

12.7 Sarpanch Letter



સંપ ત્યા જંપ સત્ય મેવ જયતે જળ એજ જીવન

અધાર ગ્રામ પંચાયત

મુ. અધાર
તા. સરસ્વતી, જિ. પાટણ.

~~ઉપ~~સરપંચશ્રી
સોલંકી ચેહરસંગ દાનસંગ
મો. ૯૯૭૪૯૬૧૭૧૭
તારીખ: ૧૦ - ૦૬ -૨૦૧૨

પ્રમાણપત્ર

આથી પ્રમાણપત્ર લખી આપવામ

આવે છે કે ગવર્મેન્ટ એન્જીનીયરીંગ કોલેજ પાટણ

ના વિદ્યાર્થીઓ દ્વારા અધાર ગામમા સર્વે કરવામા

આવ્યો હતો જેમને ગામની તમામ સમસ્યાનો સર્વે

કર્યો છે અને તેમને લિખીત જાણ માહીતી આપી

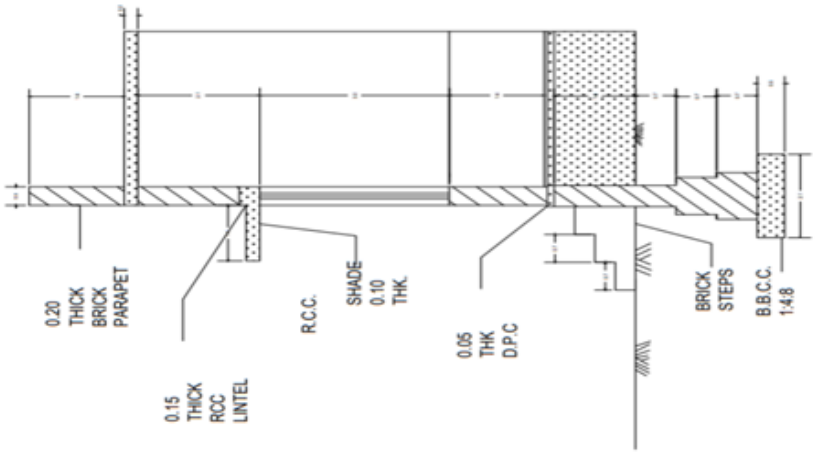
સાચી છે

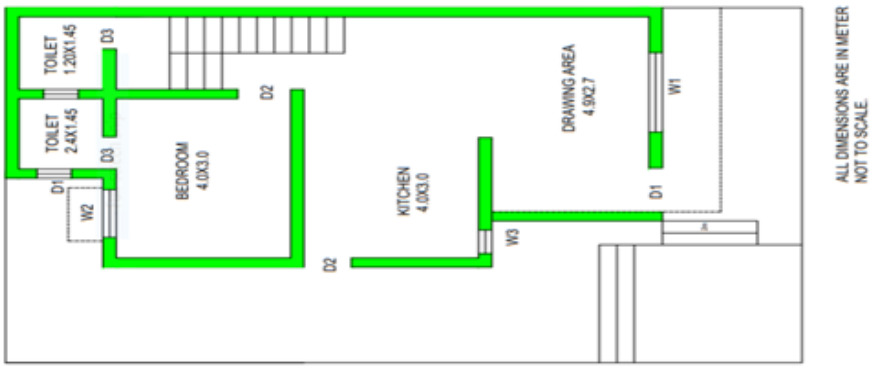
સરપંચ
અધાર ગ્રામ પંચાયત
તા. સ[illegible]ી, જિ. પાટણ

13.From the Chapter- 9 future designs of the aspects (Feasibility, Construction, Operation, and maintenance of various design options in Rural Areas along with cost with AutoCAD designs.

13.1 Design Proposals

13.1.1 House design





DOOR WINDOW SCHEDULE
D1=1.10X2.10
D2=0.90X2.10
D3=0.78X2.10
W1=2.0X2.0
W2=1.20X1.40
W3=0.6X1.40

Fig- 61- house plan with 3D view

- **Estimation using empirical equations: -**

A= Plinth area

= 5.80*12.115

=70.267 m^2

1.cement in tone= 0.153 A + 0.57

=11.3209 tone

=11320.9kg

=227 begs

2.sand in cu m = 0.47 A -7

=26.025 m^3

3.aggregate in cu.m = 0.145A + 1.5

=11.688 m^3

4.Briks = 226 A + 6680

=22600

5.steel in quintal =0.213 A – 3.14

=11.7968 quintal

=1179.68 kg

Particulars	Quantity/ Numbers	Rate (Rs.)	Per	Amount (Rs.)
1.Materials				
Cement	227	300	Beg	68100
Sand	26.025	1000	m^3	26025
Aggregate	11.688	1100	m^3	12900
Bricks	22600	4	Nos	90400
Steel	1179.68	50	Kg	59000
Sundrises	-	-	-	
			Total	230430
2. Labours				
Mistry	50	500	Day	25000
Mason	50	400	Day	20000
Male coolie	25	300	Day	7500
Bhistie	15	100	Day	1500
Sundrises				
			Total	54000
3.Furniture & MEP work	-	-	-	X Rs.

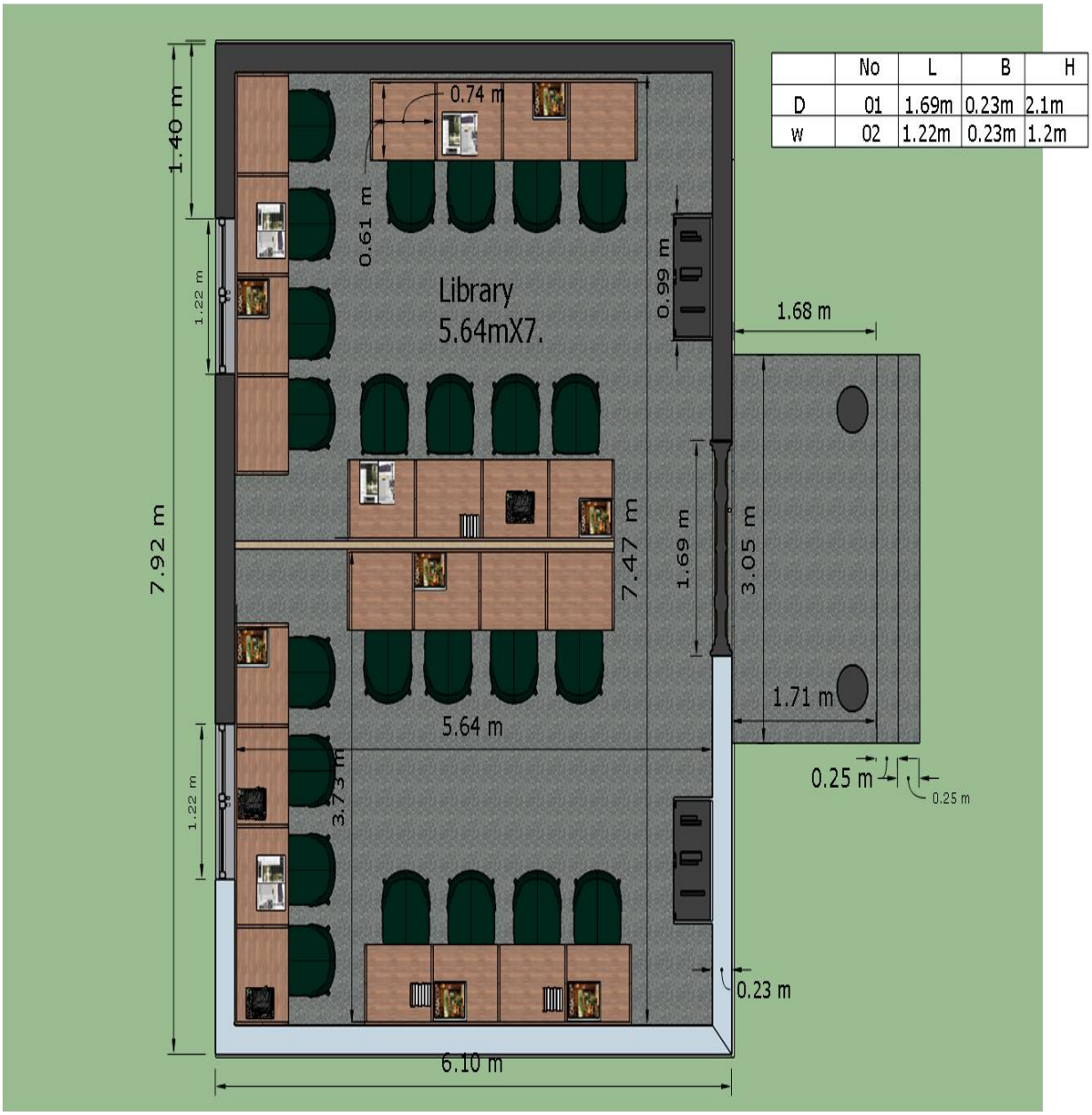
Material + labour = 284430 Rs.

10 % contractors = 28443 Rs.

1.5 % water charge = 4267 Rs.

Final total=317140 Rs. + Furniture & MEP work

13.1.2 Library



Library plan

Fig-62 library plan

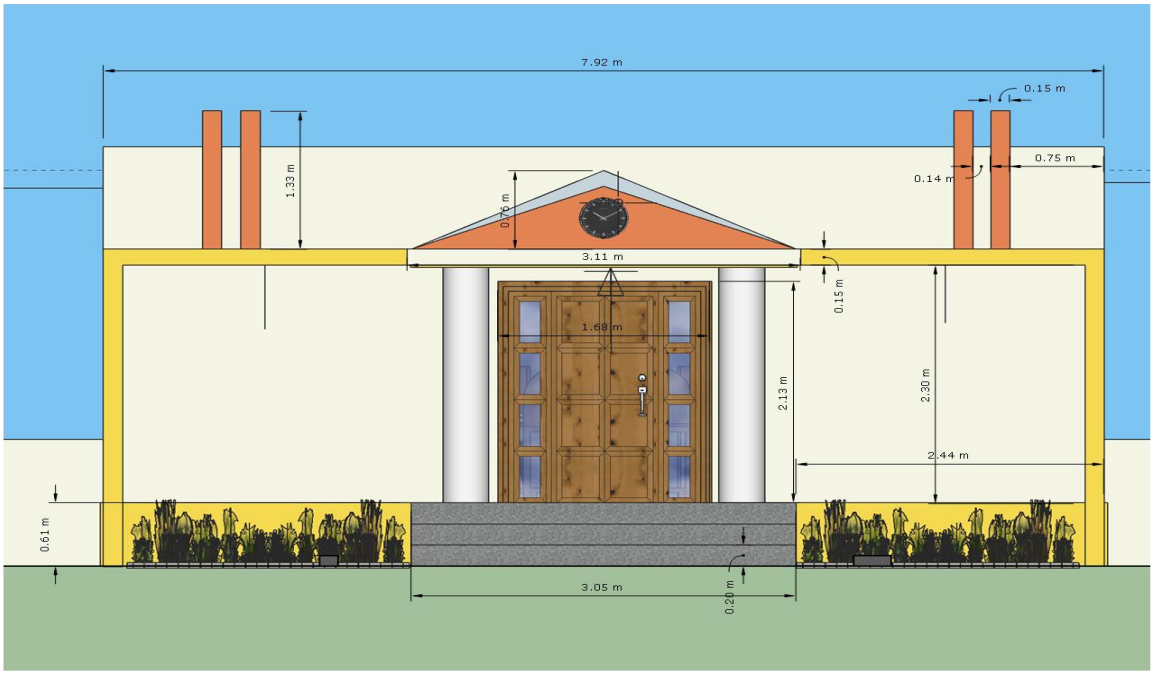


Fig-63 library front and interior view

Measurement Sheet

Item No.		No	Length(m)	Breadth(m)	Height(m)	Quantity
1	Excavation in foundation Long walls(vertical) L= 7.47 +2 x 0.115 + 2 x 0.45 = 8.6 m Short walls L= 5.64 + 2 x 0.115-2 x 0.45 = 4.97 m	2 2	8.6 4.97	0.9 0.9	1.5 1.5	23.22 m^3 13.42 m^3 Total quantity =36.64 m^3
2	Plain cement concrete (P.C.C.) in foundation in 1 : 3 :6. Long walls Short walls	 2 2	 8.6 4.97	 0.9 0.9 Total quantity= 7.32 m^3	 0.30 0.30	 4.64 2.68
3	Brickwork in foundation(up to plinth) long walls First step: L= 8.6 – 2 x 0.15 = 8.3 m Second step=8.3– 2x .05	 2 2	 8.3 8	 0.6 0.5	 0.2 0.2	 2.00 1.60

	= 8 m Third step : L= 8 – 2 x .05 = 7.7m Fourth step:L= 7.7–2x 0.05 = 7.4 m H=(1.5-0.3-3x0.2)+6 =1.2 m(No D.P.C given)	 2 2	 7.7 7.4	 0.4 0.3	 0.2 1.2	 1.23 5.33
	Short walls First step: L= 4.97+ 2 x0.15 = 5.27 m Second step =5.27+2x .05 = 5.57 m Third step: L= 5.57 + 2 x .05 = 5.87 m Fourth step= 5.87 +2x 0.05 = 6.17 m	 2 2 2 2	 5.27 5.57 5.87 6.17	 0.6 0.5 0.4 0.3	 0.2 0.2 0.2 1.2	 1.26 1.11 0.94 4.44
	Steps First step: Second step: Third step:	 1 1 1	 3.05 3.05 3.05	 0.75 0.50 0.25	 0.15 0.15 0.15 Total quantity	 0.34 0.23 0.114 18.60 m^3
4	Brick work in super structure in cement mortar 1:4 (up to slab) Long walls: L =7.4 m Short walls : L=6.17 m For Parapet wall:	 2 2	 7.4 6.17	 0.23 0.23	 3.0 3.0	 10.21 8.51

	Long walls:	2	7.4	0.23	0.45	1.53
	Short walls:	2	6.17	0.23	0.45	1.28
					total	21.53m^3
	Deductions for doors/Windows:					
	D	1	1.69	0.23	2.1	0.82
	W	2	1.2	0.23	1.2	0.66
						1.48m^3
	Deductions for Lintels: 15 cm bearing at each end					
	D	1	1.69	0.23	0.12	0.05
	W	2	1.2	0.23	0.12	0.07
						0.12m^3
	Net quantity = 21.53 -1.48 -0.12 = 19.93 m^3					
5	RCC work in slab, chajja and lintel R.C.C slab: L= 7.92 B = 6.10	1	7.92	6.10	0.12	5.80 m^3
	L=3.05 B=1.71	1	3.05	1.71	0.12	0.63 m^3
	R.C.C Chajja : W	2	1.7	0.6	0.10	0.102

	D RCC lintels	1	4.87	0.6	0.10 TOTAL	0.29 0.12 m^3 =6.9 m^3
6	2 cm thick marble flooring Room Verandah Door Sills D	 1 1 1	 7.47 3.05 1.69	 5.64 1.71 0.23	 - - -	 42.13 5.22 0.39 =47.74 m^2
7	Earth Filling in plinth H= 0.6 - 0.075 – 0.025 0.02 =0.48 m Room 1 Verandah	 1 1	 7.47 3.05	 5.64 1.71	 0.48 0.48	 20.22 2.50 =22.72 m^3

Abstract Of Quantities:

Item No	Particulars of Item	Quantity	Per	Rate	Amount Rs.
1.	Excavation in foundation	36.64 m^3	m^3	85	3,114
2.	Plain cement concrete (P.C.C) In foundation in 1 : 3 : 6	7.32 m^3	m^3	3200	23,424
3.	Brickwork in foundation	18.60 m^3	m^3	3200	59,520
4.	Brickwork in super structure in cement mortar 1 : 4	19.93 m^3	m^3	3500	69755
5.	RCC work in slab, chajja and lintel	6.9 m^3	m^3	800	5520
6.	2 cm thick marble flooring	47.74 m^2	m^2	500	23,870
7.	Earth filling in plinth	22.72 m^3	m^3	50	1136
8.	R.C.C. 1: 2: 4	2.11 m^3	1 m^3	9000	18990
	Column footing bars in kg	45.79kg	1kg	50	2289
	Column footing formwork	2.11m3	1m3	50	106

Total Rs. 2,07,724

Add 3% contingencies Rs. 6231

Add 2% work charge establishment Rs. 4154

Grand Total Rs. 2,18,109 **(Not including interior Quantity)**

13.1.3 Higher secondary school

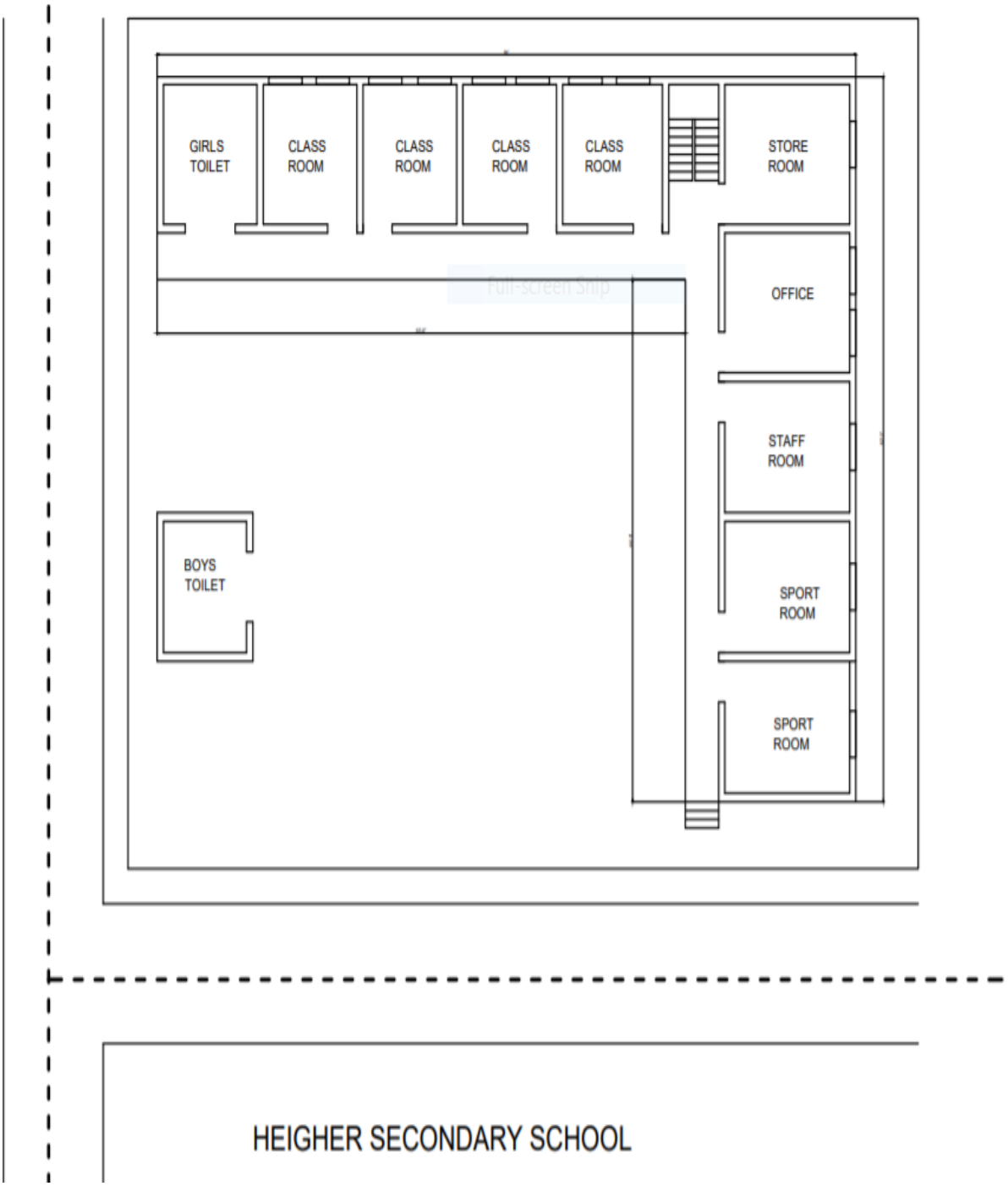


Fig-64- High school plan

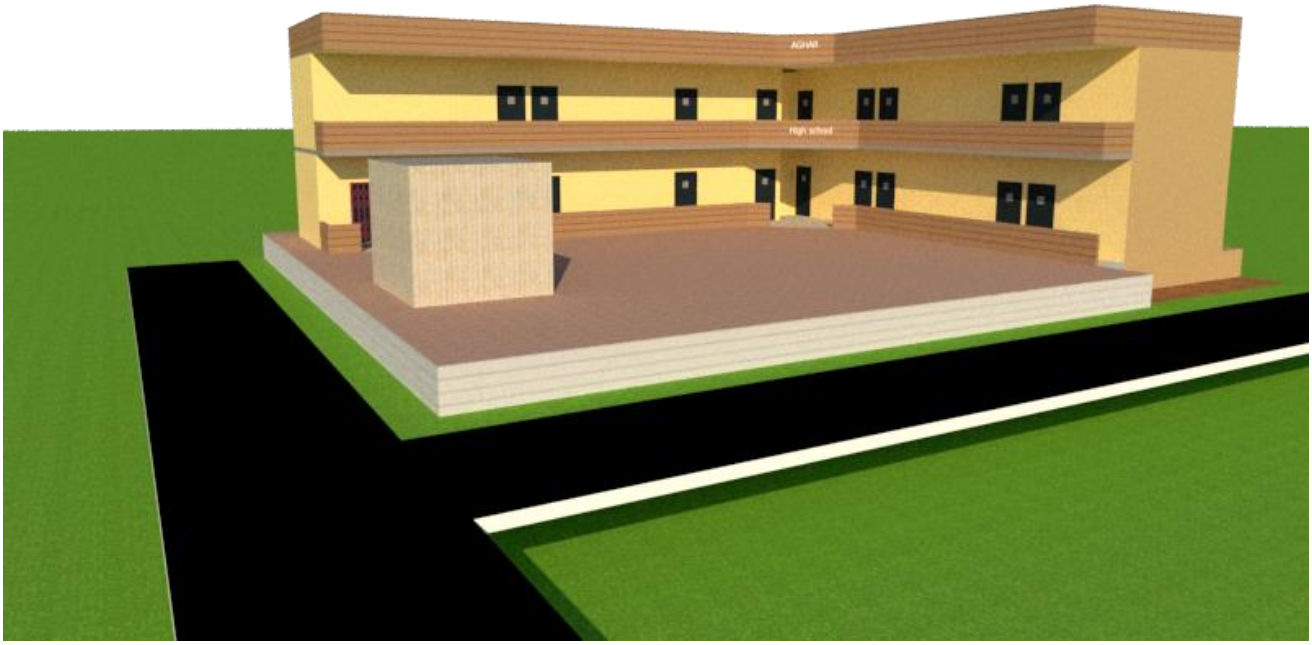


Fig-65- High school 3D view

- **Estimation using empirical equations: -**

A= Plinth area

= 25.609*18.978

=486.007 m^2

1.cement in tone= 0.153 A + 0.57

=74.929 tone

=74929kg

=1500 begs

2.sand in cu m = 0.47 A -7

=221 m^3

3.aggregate in cu.m = 0.145A + 1.5

=71.971 m^3

4.Briks = 226 A + 6680

=116600

5.steel in quintal =0.213 A – 3.14

=100.379quintal

=10037.95 kg

Particulars	Quantity/ Numbers	Rate (Rs.)	Per	Amount (Rs.)
1.Materials				
Cement	1500	300	Beg	450000
Sand	221	1000	m^3	221000
Aggregate	71.971	1100	m^3	79168
Bricks	116600	4	Nos	466400
Steel	10037.95	50	Kg	501897
Sundrises	-	-	-	2000
			Total	2*(1720465)
2. Labours				
Mistry	150	500	Day	75000
Mason	200	400	Day	80000
Male coolie	150	300	Day	45000
Bhistie	25	100	Day	2500
Sundrises				1500
			Total	2*(204000)
3.Tooles cost(required)	-	-	-	X Rs.

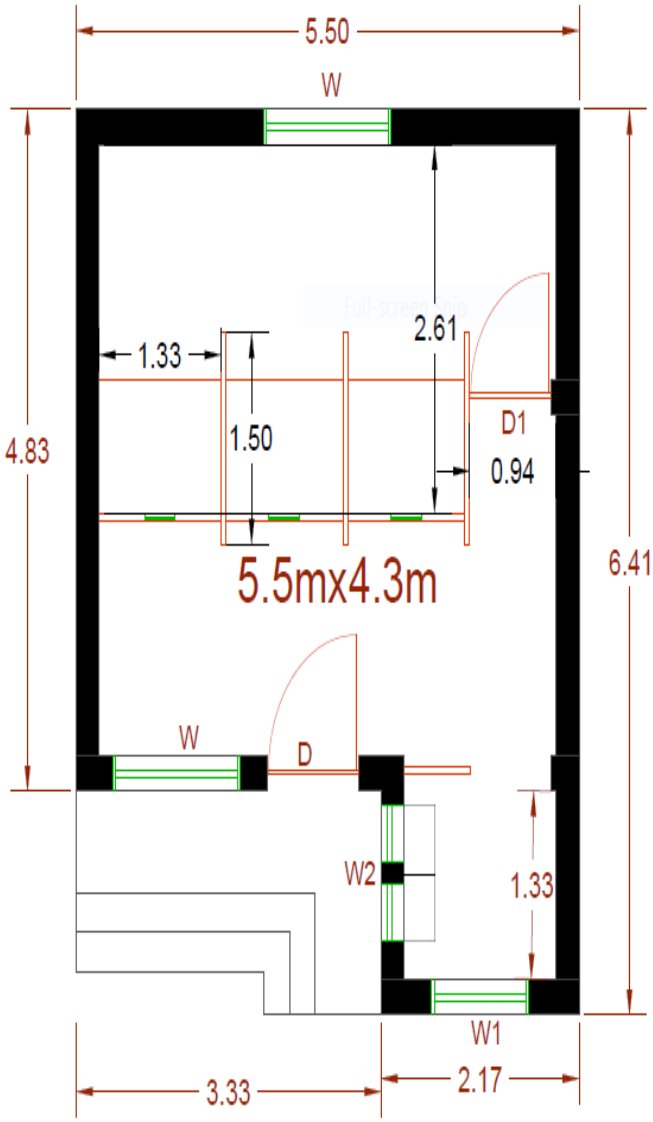
Material + labour = 3848930 Rs.

10 % contractors = 384893 Rs.

1.5 % water charge = 57733 Rs.

Final total=4291557 Rs. + Tool's cost

13.1.4 Post office



WINDOW	L	B	H
W	1.5m	0.3m	1.2m
W1	1.2m	0.3m	1.2m
W2	0.4m	0.3m	0.8m
Door	L	B	H
D	0.8m	0.2m	2.1m
D1	0.9m	0.2m	2.1m

All Dimentions are in m

Aghar Post office plan

Fig-66- Post office plan

Fig-67- Post office 3D & interior view

Measurement Sheet

Item No.		No	Length(m)	Breadth(m)	Height (m)	Quantity
1	Excavation in foundation Long walls(vertical) L= 5.5 +2 x 0.115 + 2 x 0.45 = 6.63 m Short walls-type 1: L= 4.3 + 2 x 0.115-2 x 0.45 = 3.63 m Short walls-type 2: L= 1.33 + 2 x 0.115-2 x 0.45 = 0.66m	3 2 2	6.63 3.63 0.66	0.9 0.9 0.9	1.5 1.5 1.5	26.85 m^3 9.80 m^3 1.78 m^3 Total quantity= 38.43 m^3
2	Plain cement concrete (P.C.C.) in foundation in 1 : 3 :6. Long walls Short walls,type-1 Short walls,type-2	 3 2 2	 6.63 3.63 0.66	 0.9 0.9 0.9 Total quantity= 3.79 m^3	 0.30 0.30 0.30	 5.37 1.96 0.36
3	Brickwork in foundation(up to plinth) long walls First step : L= 6.63 – 2 x 0.15 = 6.33 m	3	6.33	0.6	0.2	2.28

	Second step:L=6.33– 2x .05 = 6.23 m	3	6.23	0.5	0.2	1.87
	Third step : L= 6.23 – 2 x .05 = 6.13m	3	6.13	0.4	0.2	1.47
	Fourth step:L= 6.13–2x 0.05 = 6.03 m H=(1.5-0.3-3x0.2)+6 =1.2 m(No D.P.C given)	3	6.03	0.3	1.2	6.51
	Short walls type-1					
	First step : L= 3.63+ 2 x0.15 = 3.93m	2	3.93	0.6	0.2	0.94
	Second step:L=3.93+2x .05 = 4.03 m	2	4.03	0.5	0.2	0.80
	Third step : L= 4.03+ 2 x .05 = 4.13m	2	4.13	0.4	0.2	0.66
	Fourth step:L= 4.13+2x 0.05 = 4.23 m	2	4.23	0.3	1.2	3.05
	Short walls type-2					
	First step : L= 0.66+ 2 x 0.15 = 0.96m	2	0.96	0.6	0.2	0.23
	Second step:L=0.96+ 2x .05 = 1.06 m	2	1.06	0.5	0.2	0.21
	Third step : L= 1.06 + 2 x .05 = 1.16 m	2	1.16	0.4	0.2	0.19
	Fourth step:L= 1.16 +2x 0.05 = 1.26 m	2	1.26	0.3 Total quantity= 19.11 m^3	1.2	0.90

4	Brick work in super structure in cement mortar 1:4 (up to slab)					
	Long walls : L =6.03 m	2	6.03	0.3	3.0	10.85
	Long walls :L=6.03-2.3 = 3.73 m	1	3.73	0.3	3.0	3.36
	Short walls -1: L=4.23m	2	4.23	0.3	3.0	7.61
	Long walls-2 :L=1.26m	2	1.26	0.3	3.0	2.27
	For Parapet wall:					
	Long walls:	2	6.03	0.3	0.45	1.63
		1	2.17	0.3	0.45	0.29
	Short walls:	2	4.23	0.3	0.45	1.14
		2	1.26	0.3	0.45	0.34
	Deductions for doors/Windows:				total	27.49m^3
	D	1	0.9	0.3	2.1	0.57
	W	2	1.5	0.3	1.2	1.08
	W1	1	1.2	0.3	1.2	0.43
	W2	2	0.4	0.3	0.8	0.19
	O	1	1.57	0.3	3	1.41
		1	3.33	0.3	3	2.99
						6.4m^3
	Deductions for Lintels: 15 cm bearing at each end					
	D	1	0.9	0.3	0.12	0.03
	W	2	1.5	0.3	0.12	0.19
	W1	1	1.2	0.3	0.12	0.04
	W2	2	0.4	0.3	0.12	0.02

	Net quantity = 27.49 -6.4 -0.28 = 20.81m^2					0.28m^3
5	RCC work in slab ,chajja and lintel R.C.C slab : L= 5.5 + 3 x 0.3 = 6.4 m B = 3.63 + 0.66 + 2 x 0.3 = 7.06 m = 7.06 m R.C.C Chajja : W W1 W2 RCC lintels(From Item-4)	1 1 1 1 	6.4 1.8 2.73 2.17 2.23 	7.06 0.6 0.6 0.6 0.6 	0.12 0.10 0.10 0.10 0.10 	5.42 m^2 0.108 0.16 0.13 0.13 0.6 m3 0.28 m^3 =6.3 m^3
6	2 cm thick marble flooring Room 1 Room 2 Verandah Door Sills D	 1 1 1 1	 5.5 1.57 3.33 0.9	 4.3 1.63 1.63 0.3	 - - - -	 23.65 2.56 5.43 0.27 =31.91 m^2

7	Earth Filling in plinth H= 0.6 - 0.075 – 0.025 0.02 =0.48 m Room 1 Room 2 Verandah	 1 1 1	 5.5 1.57 3.33	 4.3 1.63 1.63	 0.48 0.48 0.48	 11.35 1.22 2.60
						=15.17 m^3

Abstract Of Quantities:

Item No	Particulars of Item	Quantity	Per	Rate	Amount Rs.
1.	Excavation in foundation	38.43 m^3	m^3	85	3,267
2.	Plain cement concrete (P.C.C) In foundation in 1 : 3 : 6	3.79 m^3	m^3	3200	12,128
3.	Brickwork in foundation	19.11 m^3	m^3	3200	61,152
4.	Brickwork in super structure in cement mortar 1 : 4	20.81 m^3	m^3	3500	72,835
5.	RCC work in slab, chajja and lintel	6.3 m^3	m^3	800	5,040
6.	2 cm thick marble flooring	31.91 m^3	m^3	500	15,955
7.	Earth filling in plinth	15.17 m^3	m^3	50	759

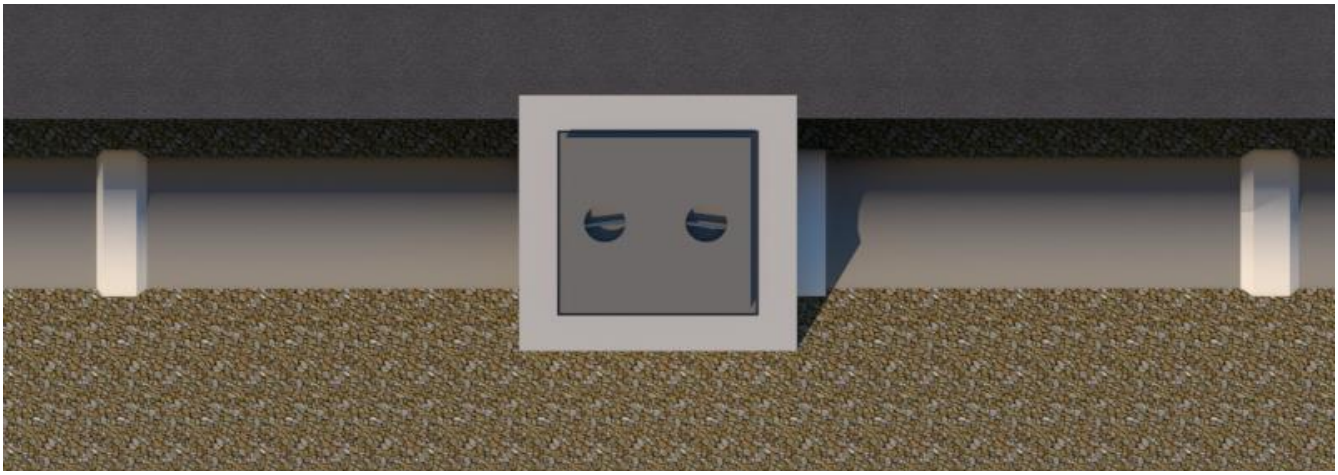
Total Rs. 1,71,136

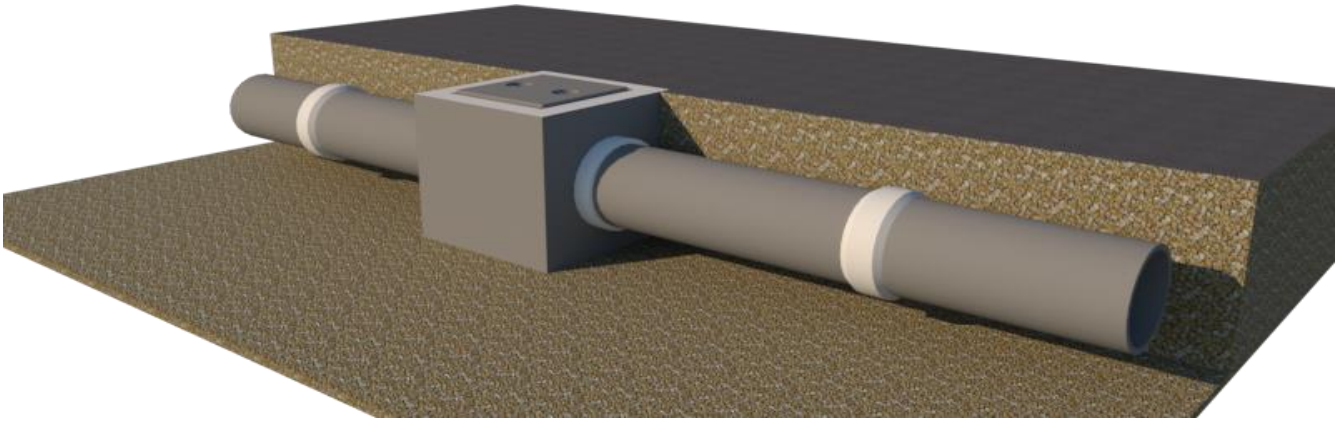
Add 3% contingencies Rs. 5,134

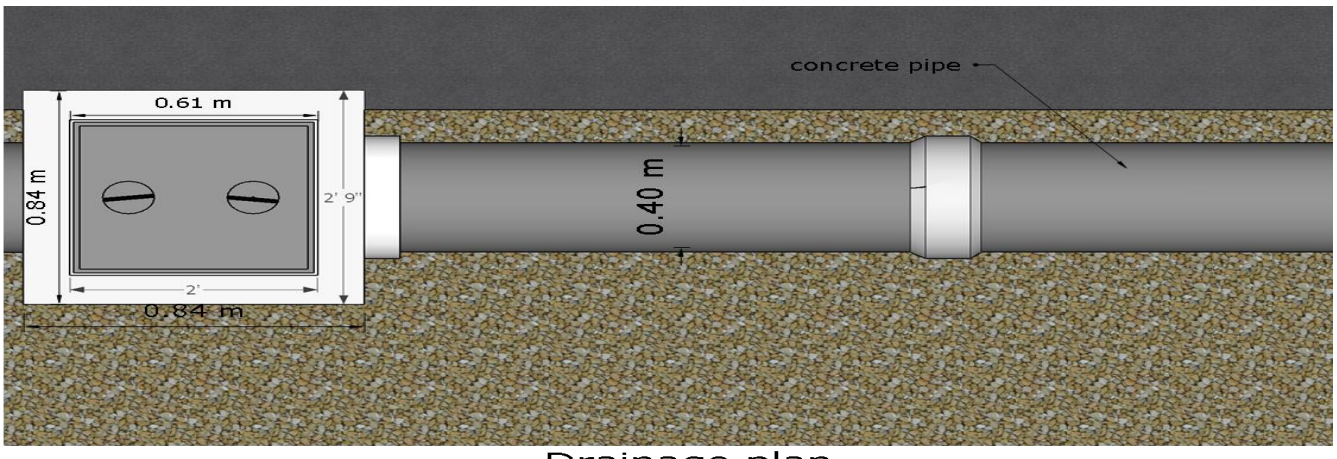
Add 2% work charge establishment Rs. 3,423

Grand Total Rs. 1,79,693 **(Not including interior Quantity)**

13.1.5 Drainage system







Drainage plan

Fig-68- Drainage system

Measurement Sheet

Item No.		No	Length(m)	Breadth(m)	Height (m)	Quantity
1.	Earthwork in excavation	1	100.00	0.84	0.84	70.56 m^3
2.	Brick work L =(0.84 x2)+(2x0.69)=3.13m	2	3.13	0.15	0.84	0.79 m^3
3.	Supplying and Laying NP3 pipe with collar joint	40	2.5	-	-	100 r m
4.	Providing Collar Joint for connecting pipe	39	-	-	-	39 NOS
5.	Earth filling = 70.56- (0.13x40)-0.79 =64.57 m^3	-	-	-	-	64.57 m^3
6.	Cement RCC Manhole cover With Frame	2	-	-	-	2 NOS

ABSTRACT SHEET:

Item No.		Unit	Quantity	Rate	Amount (rp)
1.	Earthwork in excavation	m^3	70.56	180.00	12,700
2.	Brick work L =(0.84 x2)+(2x0.69)=3.13m	m^3	0.79	700	553
3.	Supplying and Laying NP3 pipe with collar joint	r m	100	900.00	90,000
4.	Providing Collar Joint for connecting pipe	NOS	39	150	5850
5.	Earth filling = 70.56- (0.13x40)-0.79 =64.57 m^3	m^3	64.57	200	12914

6.	Cement RCC Manhole cover With Frame	NOS	2	1000	2000

Total Rs. 1,24,017

Add 5% for contingencies &

work charged Establishment. Rs. 6,200

Grand Total = Rs1,30,217 (for 100m length)

13.1.6 Chabutara

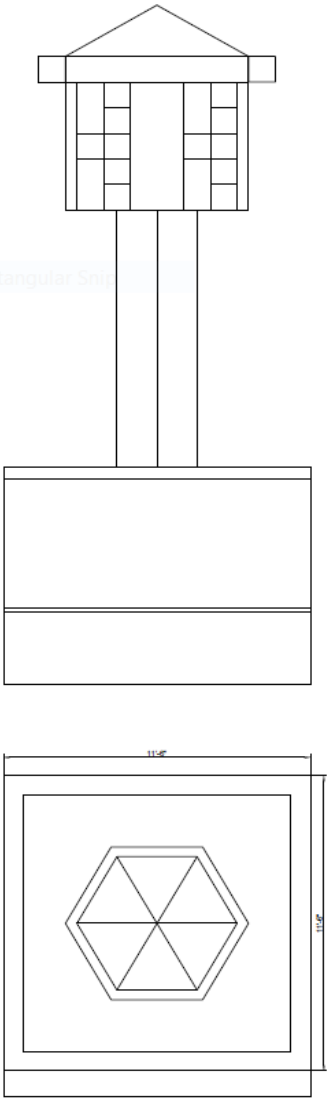


Fig-69- chabutara

Total center line = 46’

Net center line = 46’

Measurement sheet

Sr no.	Item Description	Nos	Length(m)	Width(m)	Height(m)	Quantity(cu.ft)	Total Quantity
1	Excavation for foundation in Soft ordinary soil. Total length = 13.2 m	-	46’	9”	24’	-	828
2	Providing and laying Foundation concrete (P.C.C.) (1:4:8) at Foundation.	-	46’	9”	6”	-	17.25
3	Providing and laying Brick masonry at foundation up to G.L.	-				-	-
	1st footing Total length= 13.2 m	-	46’	9”	6”	17.25	40.968
	2nd footing Total length= 1.2 m	-	46’	6”	6”	17.25	
	Brick masonry up to P.L.	-	46’	4.5”	4.5”	6.468	
4	Providing refilling of the ordinary soil in foundation trenches.	Refilling = Total Excavation – (P.C.C. + Brick masonry of 1st + Brick masonry up to G.L.) = 769.782cu. m.					
5	Providing and laying Brick masonry up to bottom of the Slab. Total length =	1	46’	9”	24”	828	828

	13.2 m						
	Deduction D	1	3’6”	9”	7’	18.375	18.375
							Total brickwork = 809.625 cu.ft.
6	Providing and Laying R.C.C. (1:2:4) work for 1st slab	1	11’6”	11’6”	6”	66.125	66.625
	R.C.C. Chajja(1:2:4) D	1	12’	1’	6”	6	6
							Total R.C.C. (1:2:4) Work =66.125 cu.ft.
7	Plaster						
	inside plaster Total length =	5	11’6”	11’6”		661.25	661.25
	Deduction D	1	3’6”		7’	24.5	24.5
							Total outside plaster = 685.75 sq.ft.
	outside plaster up to 1st slab	4	12’		12’	576	576
	Deduction D	1	3’6”		7’	24.5	24.5
							Total inside plaster = 600.5 sq. ft.
8	Flooring		11’6”	11’6”		132.25	132.25

Abstract Sheet

Sr no.	Particulars	Total Qty.	Rate	Per	Amount
1	Excavation for foundation in soft ordinary soil.	828	3	cu.ft.	2484
2	Providing and laying Foundation concrete (P.C.C.) (1:4:8) at foundation.	17.25	85	cu.ft.	1466.25
3	Providing and laying Brick masonry at foundation and plinth.	40.968	26	cu.ft.	1065.168
4	Providing refilling of the ordinary soil in foundation trenches.	769.782	3	cu.ft.	2309.35
5	Providing and laying Brick masonry upto bottom of the slab	828	100	cu.ft	82800
6	Providing and Laying R.C.C. (1:2:4) work	66.125	250	cu.ft.	16531.25
7	Providing 12 mm thick cement plaster in C.M. (1:4)	1287.5	4	cu.ft.	5150
8	Providing and fixing tile flooring	132.25	17	sq.ft.	2248.25
					Total cost in Rupees =114055

13.2 Reason for Students Recommending this Design.

✓ Aghar village has lack of primary facilities like library, public toilet, Drainage facilities, Approach Road, medical store, Agro center, pakka house etc…

✓ After providing these basic needed structures to village, villagers of Aghar village can live their routine life properly. And also the migration rate from Aghar village to city area will be decrease.

✓ Increase an employment in rural area due to such kind of project from government.

✓ If all basic amenities present in village area where must require so that development with save time, transportation cost all thing is minimize.

13.3 About designs Benefit of the villagers

✓ After providing these facilities villagers get better routine life.

✓ Library is used to gather for group activities for student and reading purpose.

✓ Public toilet is use full to villagers in daily routine for better hygiene.

✓ Pakka house which is protect from sunlight and mainly in monsoon season.

✓ Approach Road is provided for better transportation for villagers.

✓ Drainage facilities is use full to villagers in daily routine for better hygiene and ecofriendly environment.

✓ Agro center is use full to villagers regarding to agriculture purpose.

✓ Post office is helpful for post purpose.

✓ Higher secondary school which one is required for higher education for student of that village.

✓ Biogas plant in more ecofriendly now a days with economical way.

14. Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Earthquake Resistant Design Techniques for Buildings and Structures
Among the most important advanced techniques of earthquake resistant design and construction are:

- Base Isolation
- Energy Dissipation Devices

Base Isolation Method

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

Fig -70- Base Isolation

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 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 tends to vibrate back and forth in varying directions.

Deformation and Damages to Structures

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

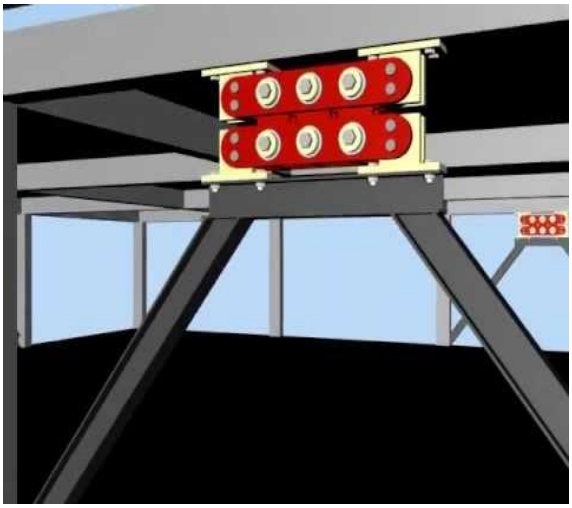
Response of Base Isolated Building

By contrast, even though it too is displacing, the base-isolated building retains its original, rectangular shape. It is the lead-rubber bearings supporting the building that are deformed. The base-isolated building itself escapes the deformation and damage, which implies that the inertial forces acting on the base-isolated building have been reduced. Experiments and observations of base-isolated buildings in earthquakes have been shown to reduce building accelerations to as little as 1/4 of the acceleration of comparable fixed-base buildings, which each building undergoes as a percentage of gravity. As we noted above, inertial forces increase, and decrease, proportionally as acceleration increases or decreases. Acceleration is decreased because the base isolation system lengthens a building's period of vibration, the time it takes for the building to rock back and forth and then back again. And in general, structures with longer periods of vibration tend to reduce acceleration, while those with shorter periods tend to increase or amplify acceleration. Finally, since they are highly elastic, the rubber isolation bearings don't suffer any damage. But the lead plug in the middle of our example bearing experiences the same deformation as the rubber. However, it generates heat. In other words, the lead plug reduces, or dissipates, the energy of motion, i.e., kinetic energy--by converting that energy into heat. And by reducing the energy entering the building, it helps to slow and eventually stop the building's vibrations sooner than would otherwise be the case, in other words, it damps the building's vibrations.

Energy Dissipation Devices

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

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



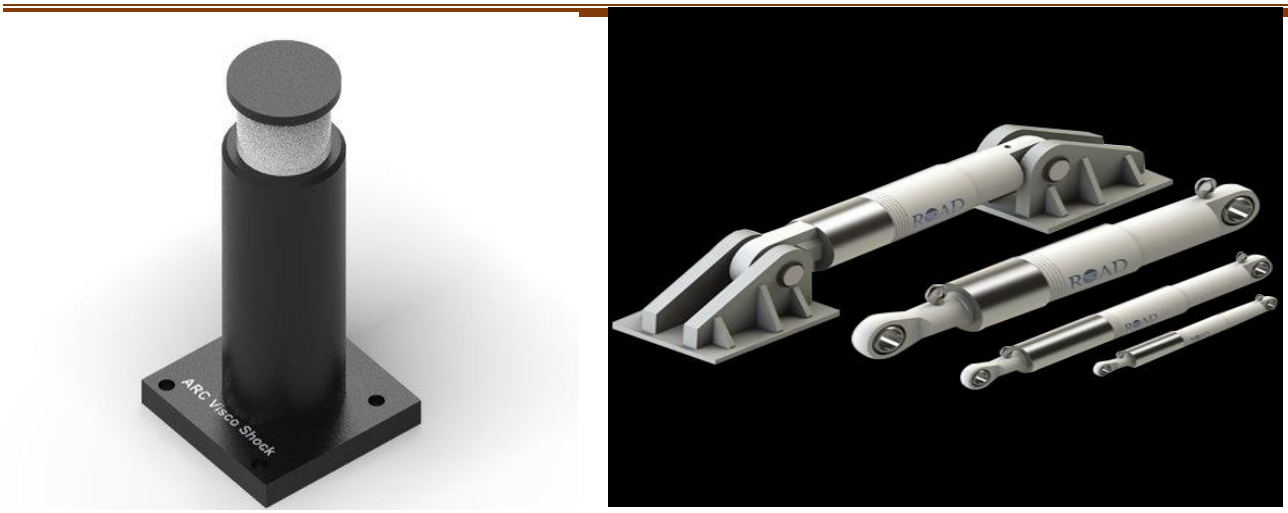
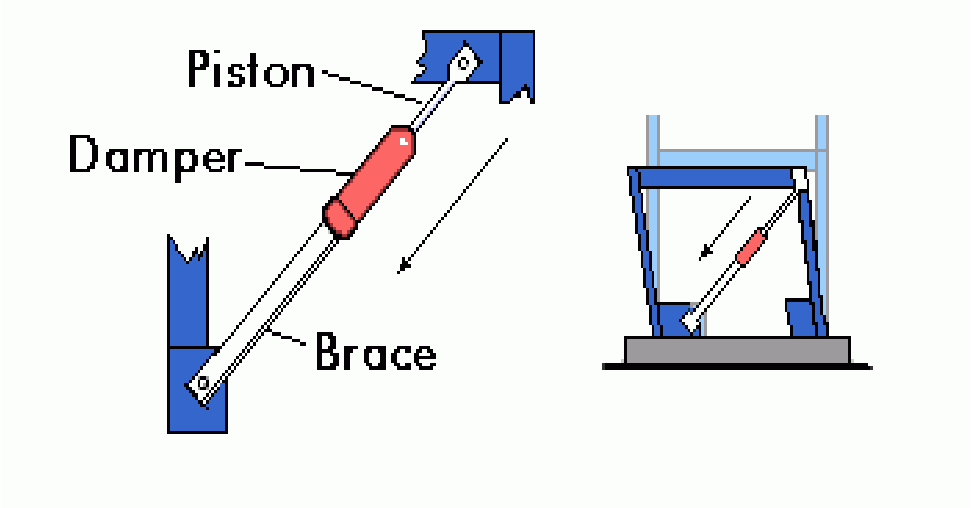


Fig- 71-Energy Dissipation Devices

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

Seismic Retrofitting Techniques

Seismic Retrofitting Techniques are required for concrete constructions which are vulnerable to damage and failures by seismic forces. In the past thirty years, moderate to severe earthquakes occurs around the world every year. Such events lead to damage to the concrete structures as well as failures. Thus, the aim is to Focus on a few specific procedures which may improve the practice for the evaluation of seismic vulnerability of existing reinforced concrete buildings of more importance and for their seismic retrofitting by means of various innovative techniques such as base isolation and mass reduction. So Seismic Retrofitting is a collection of mitigation technique for earthquake engineering. It is of utmost importance for historic monuments, areas prone to severe earthquakes and tall or expensive structures.

Keywords: Retrofitting, Base Isolation, Retrofitting Techniques, Jacketing, Earthquake Resistance

Introduction to Seismic Retrofitting Techniques:

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

Seismic Retrofitting of Concrete Structures:

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

Need for Seismic Retrofitting:

- To ensure the safety and security of a building, employees, structure functionality, machinery, and inventory
- Essential to reduce hazard and losses from non-structural elements.
- predominantly concerned with structural improvement to reduce seismic hazard.

- Important buildings must be strengthened whose services are assumed to be essential just after an earthquake like hospitals.

Problems faced by Structural Engineers are:

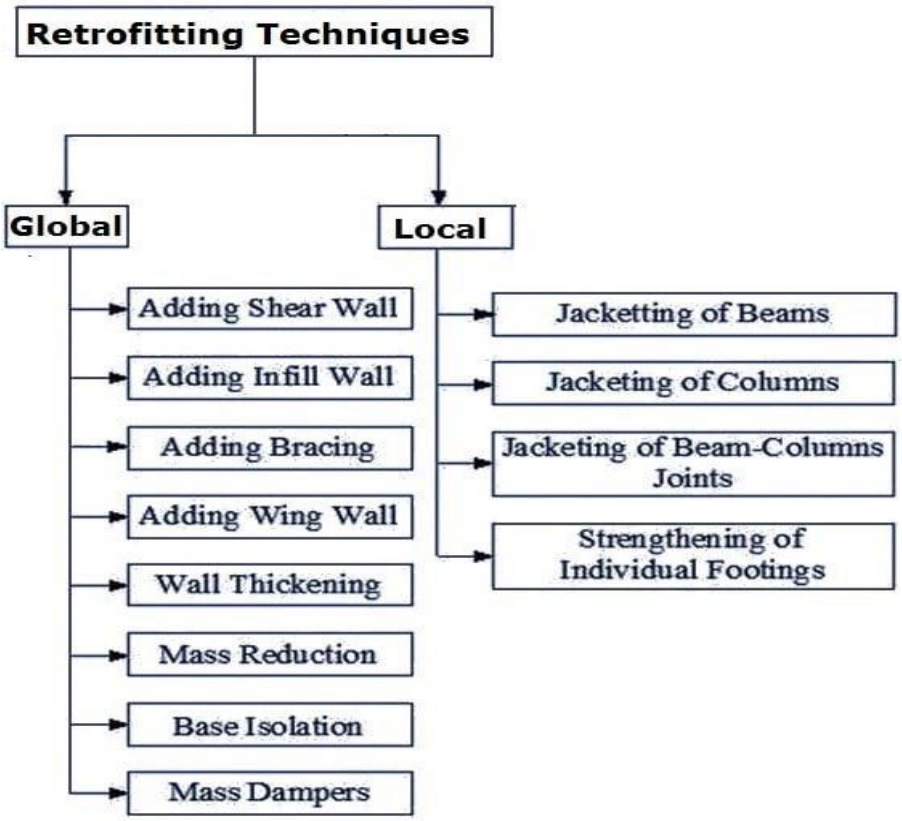
Lack of standards for retrofitting methods – Effectiveness of each methods varies a lot depending upon parameters like type of structures, material condition, amount of damage etc.,

Basic Concept of Retrofitting:

The aim is at:

- Upgradation of lateral strength of the structure
- Increase in the ductility of the structure.
- Increase in strength and ductility.

Classification of Retrofitting Techniques:



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.

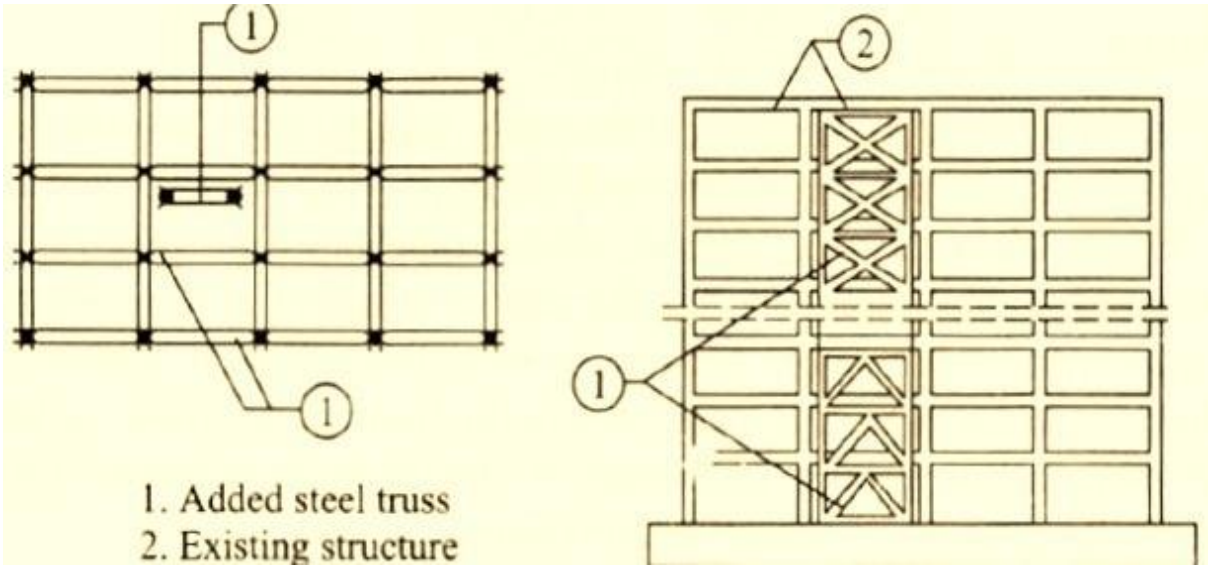
- **F**

Fig-72- Additional Shear Wall

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.

Bracings:



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

ADVANCED CONSTRUCTION TECHNIQUES – NECESSITY

✓ The building construction activity, especially the residential and commercial complex is highly labour intensive with very little mechanization. Approximately 35% of the total construction cost is spent on labour.

✓ The labourers have their limitations and may fail to meet the time limits. The quality of workmanship, too, differs from person to person. Hence, quality standards cannot be maintained. Wastage of material is considerably high as it is handled and utilized manually.

✓ The objective of the construction organizations should be 'speed and economy'. This cannot be achieved with labour oriented advanced construction techniques.

✓ Only studying and adopting modern industrial techniques and equipment is the solution. By this, one can save material, reduce labour expenses, and increase the speed of work, leading to the economy in construction.

✓ Though the scope of the subject is vast, in this chapter we shall discuss only the advanced techniques to be used in advanced construction techniques activities.

EQUIPMENT USED FOR SMALL AND MEDIUM CONSTRUCTION WORK

The equipment with proven utility in building construction may be as listed below.

- Chain and pulley block.
- Grouting pumps.
- Sprayers for painting work.
- Tile cutters.
- Portable hand drilling machines.
- Horizontal trolleys, wheelbarrows.
- Pumps.
- Vibrators for compaction of concrete, surface vibrators.
- Auto ramming concrete block machine.
- Sand washing machine.
- Vertical lifts, hoists, winches.
- M.S. tubular scaffolding, and formwork.
- Concrete mixers.
- Cranes.

- The engineer in-charge should study, develop, and implement the advanced techniques, to improve the quality of work, with speed and economy. Some of the techniques are listed below
- The different work stages through which basic material is converted into the finished product, maybe studied.
- The relation between different work stages are established as a flowchart.
- Works are planned and executed according to the work and time study.
- Planning and execution of the activities ís done according to bar charts, C.P.M., and P.E.R.T.
- Suggestions are put forth, discussed, and implemented to improve quality.
- Prefabricated and precast units are utilized, wherever possible.
- Admixtures and plasticizers are used for concreting and waterproofing.
- 'Design mix and weigh batching' are used for mass concreting.
- Easily detachable lightweight tubular structures are used.
- Modern methods of curing are adopted.
- Advanced adhesives and chemicals are used.
- Simultaneous execution of the activities are arranged.
- Work is executed in shifts.
- Activities are crashed.
- Task work is delegated to the laborers along with incentives.

COMPUTER FOR CONSTRUCTION MANAGEMENT

- By simplifying his job, a person can implement the technique of management. The manual methods of preparing bar charts, C.P.M., P.E.R.T., etc. have limitations. As the complexity of the project increases, computers prove advantageous.
- Computers can depict the entire network graphically and simultaneously provide a labor report of the progress of each task. Modifications and alterations can be incorporated and the effect on the remaining activities is automatically computed. This income a very useful option in time crashing. Computers provide a quick and easy reference to study the change in time estimate of one or more activities.

- P.E.R.T. involves statistical calculation for estimated times. Computers are useful in providing a guideline framework. It is useful in accurate computations, quick response, and the ability to react to modifications. This helps in saving time and money.

45.4 VARIOUS TECHNIQUES, EQUIPMENTS AND THEIR ADVANTAGES IN BUILDING CONSTRUCTION

SR. NO.	USE OF TECHNIQUE/ EQUIPMENT	WORK ACTIVITY	ADVANTAGES
01	Precast lintel and chajja	Masonry work above lintel level	Saving of time
02	Providing cavities in masonry during execution	Concreting of hold fast for doors and windows	Breaking of concrete block/brick is avoided, which saves labour time
03	Wheel barrows, trolleys cranes, chain pulley block	Shifting/lifting of any type of material	Shifting by manual head load is avoided. Maximum output with minimum efforts
04	Prefabricated units	Doors, windows, grills, walls, slabs, etc.	Fast erection, saving of time in casting and curing
05	Steel shuttering material	All centering work	Works out to be cheaper as more repetition is possible
06	Auto ramming block machine (For mechanical compaction)	Casting of concrete blocks for masonry	Increases the production and quality remarkably
07	Sand washing machines	Concreting, masonry, plastering	Decrease in silt content, results into better plastering and uniform higher strength concrete
08	Small capacity concrete mixers	Concreting at upper floors	Portable, speed and quality is maintained without extra consumption of cement
09	Sand screening machines	Masonry, plastering etc.	Time saving for screening and less wastage of sand

SR. NO.	USE OF TECHNIQUE/ EQUIPMENT	WORK ACTIVITY	ADVANTAGES
10	Form vibrator	Casting of slab	Better compaction, less honeycombing of the concrete
11	Tower hoist bucket	Transporting material e.g. bricks, sand, cement	Shifting of material vertically with speed and extra quantity
12	Travelling belt conveyor/trolley	Slab concreting	Labour required to transport wet concrete is reduced, speed and quality increases
13	Dumpers	Transporting building material	Unloading operation is easy, and can be done as and when required. Speed increases
14	Admixtures and plasticizers	Concreting and water-proofing	Increases the workability strength, reduces the curing period and improves the quality
15	Loaders	Shifting of material and refilling	Reduces the labour for loading of trucks. Speed increases
16	Road rollers	Compacting the filling material	Compaction is achieved as specified which is not possible manually
17	Plate/earth vibratory compactors	Compacting the filling material in building plinth	Rapid and better compaction than manual process of *dhummas*. Larger area can be covered
18	Pneumatic tools (Jack hammer)	Excavation in rock	Excavates the hard rock with ease where normal chisels do not work. Increases the output remarkably
19	Excavators	Excavation and levelling	Excavates, dumps and levels the soft strata as desired. Completes the work of three manual shifts in one shift
20	Bull-dozer	Dismantling and excavating	Dismantles and disposes off the excavated stuff as and when required
21	Vacuum de-watering system for concreting	Factory flooring for achieving better compressive strength	Saves cement, curing period is reduced

COMPUTER FOR STRUCTURAL DESIGN

Structural design is an engineering science and is most suited for computing. The designs of beams and slabs can be computerized. On keying in the various loads, sizes of steel and other parameters are ready for implementation. The designs are accurate and quick. Appropriate drawings can also be plotted through computer programs.

COMPUTER FOR ESTIMATION AND COSTING

It involves simple calculations like multiplication and addition. But whereas manual calculations might be faulty, the computer calculates with great speed and accuracy.

COMPUTER FOR ARCHITECTURAL AND INTERIOR DESIGN

The working drawings, electrical layouts, furniture drawings, etc. can be prepared with a computer. It develops a dimensional perspective and helps in better visualization. Any minor error is easily detected and can be modified before the actual work begins. The color scheme of the project or interior decoration can also be finalized with the help of computers.

COMPUTER FOR FINANCIAL MANAGEMENT

Financial management can be controlled through computerized financial and material schedules. Updated programs specify the monthly financial requirements. Work is never held up for lack of funds if computer technology is properly implemented.

OTHER BUILDING CONSTRUCTION TECHNIQUES – TECHNOLOGY

Some new, cost-effective and time-saving techniques used in building advanced construction technology are

LIGHTWEIGHT BLOCKS & CONCRETE

The density of normal concrete varies from 2200 to 2600 kg/m3 while that of lightweight concrete varies from 300 to 1850 kg/m³.

Advantage

- Reduction of dead load.
- Increases the progress of work.

- Lowers the handling cost.
- This leads to a lighter structural design.
- Advantageous for structures resting on weak soils.

FERROCRETE TECHNIQUES

Ferrocrete consists of wire mesh and cement mortar. The wire mesh is spaced closely & impregnated with a rich cement mortar mix.

Advantages

- It has got a higher ratio of tensile strength to weight and superior cracking behavior compared to R.C.C.
- It can be used for septic tanks, water tanks, fishing boats, roofs and wall panels for low-cost housing, bio-gas digesters, silos, kitchen otta, door and window frames, cupboard, etc.
- It is cheaper than conventional concrete.

EARTH MOVING MACHINES

For mass excavation works & a huge amount of filling, earthmoving machines are useful. They save considerable time & manpower.

Advantages

- Save time.
- Cost-effective.
- Save manpower.
- Useful for mass excavation & filling basements, canals, etc.

SLIP TUNNEL FORMWORK TECHNIQUES

For mass concreting of high-rise buildings, slip tunnel formwork can be used.

Advantages

- Save the de-shuttering & shuttering time.
- More number of repetitions for formwork
- More accuracy in work.
- Reduce labour.
- Overall quality increases, with a reduction in cost.
- Most suitable for identical vertical lifts.

PRECAST COMPONENTS

They are factory-made components of the building which are joined to form the structure.

Advantages

- Controlled quality of the final product.
- Better curing and higher strength due to mechanization.
- Saves space for raw material stackings.
- Reduces the requirement of skilled labour.
- Increase in construction speed due to symmetrical and simple joining methods.
- Saves, total project time.
- Dependability of the activities can be nullified & most of the activities can be taken up simultaneously.

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Soil mechanics is a branch of soil physics and applied mechanics that describes the behavior of soils. It differs from fluid mechanics and solid mechanics in the sense that soils consist of a heterogeneous mixture of fluids (usually air and water) and particles (usually clay, silt, sand, and gravel) but soil may also contain organic solids and other matter. Along with rock mechanics, soil mechanics provides the theoretical basis for analysis in geotechnical engineering, a subdiscipline of civil engineering, and engineering geology, a subdiscipline of geology. Soil mechanics is used to analyze the deformations of and flow of fluids within natural and man-made structures that are supported on or made of soil, or structures that are buried in soils. Example applications are building and bridge foundations, retaining walls, dams, and buried pipeline systems. Principles of soil mechanics are also used in related disciplines such as geophysical engineering, coastal engineering, agricultural engineering, hydrology and soil physics.

This article describes the genesis and composition of soil, the distinction between *pore water pressure* and inter-granular *effective stress*, capillary action of fluids in the soil pore spaces, *soil classification*, *seepage* and *permeability*, time dependent change of volume due to squeezing water out of tiny pore spaces, also known as *consolidation*, *shear strength* and stiffness of soils.

The shear strength of soils is primarily derived from friction between the particles and interlocking, which are very sensitive to the effective stress. The article concludes with some

examples of applications of the principles of soil mechanics such as slope stability, lateral earth pressure on retaining walls, and bearing capacity of foundations.

- Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, considering inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
- UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social, and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.
- Environment Impact Assessment in India is statutorily backed by the Environment Protection Act, 1986 which contains various provisions on EIA methodology and process.

The EIA Process

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

- **Screening:** The project plan is screened for scale of investment, location and type of development and if the project needs statutory clearance.
- **Scoping:** The project's potential impacts, zone of impacts, mitigation possibilities and need for monitoring.
- **Collection of baseline data:** Baseline data is the environmental status of study area.
- **Impact prediction:** Positive and negative, reversible and irreversible and temporary and permanent impacts need to be predicted which presupposes a good understanding of the project by the assessment agency.
- **Mitigation measures and EIA report:** The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probable environmental damage or loss.
- **Public hearing:** On completion of the EIA report, public and environmental groups living close to project site may be informed and consulted.

- **Decision making:** Impact Assessment Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping in mind EIA and EMP (Environment Management Plan).
- **Monitoring and implementation of environmental management plan:** The various phases of implementation of the project are monitored.
- **Assessment of Alternatives, Delineation of Mitigation Measures and Environmental Impact Assessment Report:** For every project, possible alternatives should be identified, and environmental attributes compared. Alternatives should cover both project location and process technologies.

  Once alternatives have been reviewed, a mitigation plan should be drawn up for the selected option and is supplemented with an Environmental Management Plan (EMP) to guide the proponent towards environmental improvements.

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

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

Water supply is the provision of water by public utilities, commercial organisations, community endeavors or by individuals, usually via a system of pumps and pipes. Aspects of service quality include Continuity of supply, water quality and water pressure. The institutional responsibility for water supply is arranged differently in different countries and regions (urban versus rural). It usually includes issues surrounding policy and regulation, service provision and standardization.

The cost of supplying water consists, to a very large extent, of fixed costs (capital costs and personnel costs) and only to a small extent of variable costs that depend on the amount of water consumed (mainly energy and chemicals). Almost all service providers in the world charge tariffs to recover part of their costs.

Water supply is a separate topic from irrigation, the practice and systems of water supply on a larger scale, for a wider variety of purposes, primarily agriculture.

Water supply systems get water from a variety of locations after appropriate treatment, including groundwater (aquifers), surface water (lakes and rivers), and the sea through desalination. The water treatment steps include, in most cases, purification, disinfection

through chlorination and sometimes fluoridation. Treated water then either flows by gravity or is pumped to reservoirs, which can be elevated such as water towers or on the ground (for indicators related to the efficiency of drinking water distribution see non-revenue water). Once water is used, wastewater is typically discharged in a sewer system and treated in a sewage treatment plant before being discharged into a river, lake or the sea or reused for landscaping, irrigation.

Sewerage systems

A sewerage system, or wastewater collection system, is a network of pipes, pumping stations, and appurtenances that convey sewage from its points of origin to a point of treatment and disposal.

Combined systems

Systems that carry a mixture of both domestic sewage and storm sewage are called combined sewers. Combined sewers typically consist of large-diameter pipes or tunnels, because of the large volumes of storm water that must be carried during wet-weather periods. They are very common in older cities but are no longer designed and built as part of new sewerage facilities. Because wastewater treatment plants cannot handle large volumes of storm water, sewage must bypass the treatment plants during wet weather and be discharged directly into the receiving water. These combined sewer overflows, containing untreated domestic sewage, cause recurring water pollution problems and are very troublesome sources of pollution.

In some large cities the combined sewer overflow problem has been reduced by diverting the first flush of combined sewage into a large basin or underground tunnel. After temporary storage, it can be treated by settling and disinfection before being discharged into a receiving body of water, or it can be treated in a nearby wastewater treatment plant at a rate that will not overload the facility. Another method for controlling combined sewage involves the use of swirl concentrators. These direct sewage through cylindrically shaped devices that create a vortex, or whirlpool, effect. The vortex helps concentrate impurities in a much smaller volume of water for treatment.

Separate systems

New wastewater collection facilities are designed as separate systems, carrying either domestic sewage or storm sewage but not both. Storm sewers usually carry surface runoff to a point of disposal in a stream or river. Small detention basins may be built as part of the system, storing

storm water temporarily and reducing the magnitude of the peak flow rate. Sanitary sewers, on the other hand, carry domestic wastewater to a sewage treatment plant. Pretreated industrial wastewater may be allowed into municipal sanitary sewerage systems, but storm water is excluded.

Storm sewers are usually built with sections of reinforced concrete pipe. Corrugated metal pipes may be used in some cases. Storm water inlets or catch basins are located at suitable intervals in a street right-of-way or in easements across private property. The pipelines are usually located to allow downhill gravity flow to a nearby stream or to a detention basin. Storm water pumping stations are avoided, if possible, because of the very large pump capacities that would be needed to handle the intermittent flows.

A sanitary sewerage system includes laterals, submains, and interceptors. Except for individual house connections, laterals are the smallest sewers in the network. They usually are not less than 200 mm (8 inches) in diameter and carry sewage by gravity into larger submains, or collector sewers. The collector sewers tie in to a main interceptor, or trunk line, which carries the sewage to a treatment plant. Interceptors are usually built with precast sections of reinforced concrete pipe, up to 5 metres (15 feet) in diameter. Other materials used for sanitary sewers include vitrified clay, asbestos cement, plastic, steel, or ductile iron. The use of plastic for laterals is increasing because of its lightness and ease of installation. Iron and steel pipes are used for force mains or in pumping stations. Force mains are pipelines that carry sewage under pressure when it must be pumped.

Alternative systems

Sometimes the cost of conventional gravity sewers can be prohibitively high because of low population densities or site conditions such as a high water table or bedrock. Three alternative wastewater collection systems that may be used under these circumstances include small-diameter gravity sewers, pressure sewers, and vacuum sewers.

In small-diameter gravity systems, septic tanks are first used to remove settleable and floating solids from the wastewater from each house before it flows into a network of collector mains (typically 100 mm, or 4 inches, in diameter); these systems are most suitable for small rural communities. Because they do not carry grease, grit and sewage solids, the pipes can be of smaller diameter and placed at reduced slopes or gradients to minimize trench excavation costs. Pressure sewers are best used in flat areas or where expensive rock excavation would be

required. Grinder pumps discharge wastewater from each home into the main pressure sewer, which can follow the slope of the ground. In a vacuum sewerage system, sewage from one or more buildings flows by gravity into a sump or tank from which it is pulled out by vacuum pumps located at a central vacuum station and then flows into a collection tank. From the vacuum collection tank the sewage is pumped to a treatment plant.

Pumps

Pumping stations are built when sewage must be raised from a low point to a point of higher elevation or where the topography prevents downhill gravity flow. Special nonclogging pumps are available to handle raw sewage. They are installed in structures called lift stations. There are two basic types of lift stations: dry well and wet well. A wet-well installation has only one chamber or tank to receive and hold the sewage until it is pumped out. Specially designed submersible pumps and motors can be located at the bottom of the chamber, completely below the water level. Dry-well installations have two separate chambers, one to receive the wastewater and one to enclose and protect the pumps and controls. The protective dry chamber allows easy access for inspection and maintenance. All sewage lift stations, whether of the wet-well or dry-well type, should include at least two pumps. One pump can operate while the other is removed for repair.

Wastewater treatment and disposal

The size and capacity of wastewater treatment systems are determined by the estimated volume of sewage generated from residences, businesses, and industries connected to sewer systems as well as the anticipated inflows and infiltration (I&I). The selection of specific on-lot, clustered, or centralized treatment plant configurations depends upon factors such as the number of customers being served, the geographical scenario, site constraints, sewer connections, average and peak flows, influent wastewater characteristics, regulatory effluent limits, technological feasibility, energy consumption, and the operations and maintenance costs involved.

The predominant method of wastewater disposal in large cities and towns is discharge into a body of surface water. Suburban and rural areas rely more on subsurface disposal. In either case, wastewater must be purified or treated to some degree in order to protect both public health and water quality. Suspended particulates and biodegradable organics must be removed to varying extents. Pathogenic bacteria must be destroyed. It may also be necessary to

remove nitrates and phosphates (plant nutrients) and to neutralize or remove industrial wastes and toxic chemicals.

The degree to which wastewater must be treated varies, depending on local environmental conditions and governmental standards. Two pertinent types of standards are stream standards and effluent standards. Stream standards, designed to prevent the deterioration of existing water quality, set limits on the amounts of specific pollutants allowed in streams, rivers, and lakes. The limits depend on a classification of the "maximum beneficial use" of the water. Water quality parameters that are regulated by stream standards include dissolved oxygen, coliforms, turbidity, acidity, and toxic substances. Effluent standards, on the other hand, pertain directly to the quality of the treated wastewater discharged from a sewage treatment plant. The factors controlled under these standards usually include biochemical oxygen demand (BOD), suspended solids, acidity, and coliforms.

There are three levels of wastewater treatment: primary, secondary, and tertiary (or advanced). Primary treatment removes about 60 percent of total suspended solids and about 35 percent of BOD; dissolved impurities are not removed. It is usually used as a first step before secondary treatment. Secondary treatment removes more than 85 percent of both suspended solids and BOD. A minimum level of secondary treatment is usually required in the United States and other developed countries. When more than 85 percent of total solids and BOD must be removed, or when dissolved nitrate and phosphate levels must be

reduced, tertiary treatment methods are used. Tertiary processes can remove more than 99 percent of all the impurities from sewage, producing an effluent of almost drinking-water quality. Tertiary treatment can be very expensive, often doubling the cost of secondary treatment. It is used only under special circumstances.

For all levels of wastewater treatment, the last step prior to discharge of the sewage effluent into a body of surface water is disinfection, which destroys any remaining pathogens in the effluent.

and protects public health. Disinfection is usually accomplished by mixing the effluent with chlorine gas or with liquid solutions of hypochlorite chemicals in a contact tank for at least 15 minutes. Because chlorine residuals in the effluent may have adverse effects on aquatic life, an additional chemical may be added to dechlorinate the effluent. Ultraviolet radiation, which can disinfect without leaving any residual in the effluent, is becoming more competitive with chlorine as a wastewater disinfectant.

Primary treatment

Primary treatment removes material that will either float or readily settle out by gravity. It includes the physical processes of screening, comminution, grit removal, and sedimentation. Screens are made of long, closely spaced, narrow metal bars. They block floating debris such as wood, rags, and other bulky objects that could clog pipes or pumps. In modern plants the screens are cleaned mechanically, and the material is promptly disposed of by burial on the plant grounds. A comminutor may be used to grind and shred debris that passes through the screens. The shredded material is removed later by sedimentation or flotation processes.

Secondary treatment

Secondary treatment removes the soluble organic matter that escapes primary treatment. It also removes more of the suspended solids. Removal is usually accomplished by biological processes in which microbes consume the organic impurities as food, converting them into carbon dioxide, water, and energy for their own growth and reproduction. The sewage treatment plant provides a suitable environment, albeit of steel and concrete, for this natural biological process. Removal of soluble organic matter at the treatment plant helps to protect the dissolved oxygen balance of a receiving stream, river, or lake.

There are three basic biological treatment methods: the trickling filter, the activated sludge process, and the oxidation pond. A fourth, less common method is the rotating biological contacter.

Trickling filter

A trickling filter is simply a tank filled with a deep bed of stones. Settled sewage is sprayed continuously over the top of the stones and trickles to the bottom, where it is collected for further treatment. As the wastewater trickles down, bacteria gather and multiply on the stones. The steady flow of sewage over these growths allows the microbes to absorb the dissolved organics, thus lowering the biochemical oxygen demand (BOD) of the sewage. Air circulating upward through the spaces among the stones provides sufficient oxygen for the metabolic processes.

Settling tanks, called secondary clarifiers, follow the trickling filters. These clarifiers remove microbes that are washed off the rocks by the flow of wastewater. Two or more trickling filters may be connected in series, and sewage can be recirculated in order to increase treatment efficiencies.

Activated sludge

The activated sludge treatment system consists of an aeration tank followed by a secondary clarifier. Settled sewage, mixed with fresh sludge that is recirculated from the secondary clarifier, is introduced into the aeration tank. Compressed air is then injected into the mixture through porous diffusers located at the bottom of the tank. As it bubbles to the surface, the diffused air provides oxygen and a rapid mixing action. Air can also be added by the churning action of mechanical propeller-like mixers located at the tank surface.

Under such oxygenated conditions, microorganisms thrive, forming an active, healthy suspension of biological solids—mostly bacteria—called activated sludge. About six hours of detention is provided in the aeration tank. This gives the microbes enough time to absorb dissolved organics from the sewage, reducing the BOD. The mixture then flows from the aeration tank into the secondary clarifier, where activated sludge settles out by gravity. Clear water is skimmed from the surface of the clarifier, disinfected, and discharged as secondary effluent. The sludge is pumped out from a hopper at the bottom of the tank. About 30 percent of the sludge is recirculated back into the aeration tank, where it is mixed with the primary effluent. This recirculation is a key feature of the activated sludge process. The recycled microbes are well acclimated to the sewage environment and readily metabolize the organic materials in the primary effluent. The remaining 70 percent of the secondary sludge must be treated and disposed of in an acceptable manner.

Variations of the activated sludge process include extended aeration, contact stabilization, and high-purity oxygen aeration. Extended aeration and contact stabilization systems omit the primary settling step. They are efficient for treating small sewage flows from motels, schools, and other relatively isolated wastewater sources. Both treatments are usually provided in prefabricated steel tanks called package plants.

15. Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society.

sr. no	Design Name	Period	Amount Expenditure (Rs)	Benefit
1	Biogas Plant	1 year	-	Economical (For gas Production)
2	Approach Road	1 year	612938	Easy to transportation
3	Public Toilet	1 year	315473	Healthy atmosphere
4	Dairy	immediately	769237	Milk collection and distribution
5	Agro Centre	immediately	1499296	Agriculture purpose
6	Medical shop	immediately	129980	-
7	Post office	1 year	179693	Post purpose
8	Library	immediately	218109	For student
9	House design	immediately	317140	Better live hood
10	Drainage system	immediately	130217	For Drainage purpose
11	Chabutara	immediately	114055	-
12	Educational institute	immediately	4291557	Education

16. Survey By Interviewing With Talati And/Or Sarpanch

As a part of PMMS subject we have chosen the project under scheme of Vishwakarma Yojana phase VIII. Under this project we are allotted aghar village of Patan district. Under this project we are supposed to visit the village to study existing infrastructure and to propose new amenity.

We visited aghar village. We meet village sarpanch at panchayat office. Here we inquired about the facilities available in the village like road, water supply, electricity etc. They were very helpful, and they give us detail information.

Gujarat Technological University,
Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/ No	Remarks
1	What are the sources of income in village?	yes	agriculture
2	What are the chances of employment in village?	yes	agriculture side
3	What are the special technical facilities in village?	no	recent technology use by farmer
4	Is any debt on village dwellers?	no	-
5	Are village people getting agricultural help?	yes	
6	Is women health awareness Program organized in village?	yes	
7	Are women having opportunity to work and income?	yes	
8	Child girl education is appreciated in village?	yes	
9	Facility of vaccination to child is available in village?	yes	
10	Are village people aware about child vaccination and done to each and every child as per norms?	yes	
11	Women help line number information is provided to village people?	yes	
12	Is water scarcity in village? How many days per year?	no	
13	Is village under any debt?	no	
14	Is any serious issue due to debt from bank or any person happened in village?	no	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	no	
16	Is any death of patient occurred due to unavailability of medical facility in village?	no	
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	no	
18	Is village improvement is observed in comparative scenario from past to present?	yes	agriculture, electricity
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	no	
20	Life Living standard of girls and women is appreciated and uplifted in village?	no	housing condition is very poor

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

17. Irrigation / Agriculture Activities and Alternate Techniques and Solution

Aghar Total area is 2186.81 hectares, Non-Agricultural area is 500 hectares and total irrigated area is 1000 hectares. Wheat, cattle seed, and cotton seed are agriculture commodities grow in this village. 8 hours agricultural power supply in summer and 8 hours agricultural power supply in winter is available in this village. Total irrigated area in this village is 1000 hectares from Boreholes/Tube wells 1000 hectares is the Source of irrigation.

Alternate techniques and solutions:

- High yielding varieties of seeds can be used.
- Chemical fertilizers can apply.
- Irrigation has been improved by utilizing properly both ground water and surface water resources of the State.
- Cold storage, logistics and improved infrastructure can be developed.

Different types of irrigation systems can be used for agriculture like

- Surface irrigation
- Drip irrigation
- Sprinkler irrigation
- Center pivot irrigation
- Lateral move irrigation
- Sub-irrigation
- Manual irrigation

Surface irrigation

Drip irrigation

Sprinkler irrigation

Center pivot irrigation

Lateral move irrigation

Sub-irrigation

Manual irrigation

18. Social Activities- COVID Awareness

Due to covid pandemic our students cannot do more social activities in aghar village. Our students insist to have precaution to covid. And promote villagers of aghar village about covid awareness.

- Give awareness about covid-19.
- Insist villagers to wear mask.
- Teach steps of hand wash to villagers.
- Give awareness about social distance.
- Inform villagers to use packing things after sanitation is done.
- Insist villagers to drink pure and hot water.
- Insist for Covid vaccination.

Fig-73- Covid vaccination

19.SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: AGHAR Gram Panchayat: AGHAR Block: PATAN

District: PATAN State: GUJRAT

1. Family Identity and Size

Name of Head of Household	MAHERSANGH							Male/ Female	M
SECC Survey ID:	-	Family Size	5	Over 18	4	6 to 18	1	Under 6	0

2. Category & Entitlement Details (Tick as appropriate)

Social Category [1]	OPEN	Life Insurance	1. All Adults 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	Yes
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]
MAHERSANGH	45	M	N	2	GRADUATE	Y	N	0
RAMESHBHAI	42	M	N	2	12	Y	N	0
KOMALBEN	20	F	N	1	12	Y	N	0

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	Deworming Done	Fully Immunised 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	
Before Eating	Soap	Other	Soap	Other	

6. Use of Mosquito Net

Children: Yes / No Adults: Yes / No

	Yoga	Games	Other Exercises
Adults	Y	N	N
Children			

8. Consumption of Tobacco

	Smoking	Chewing
Adults	-	-
Children	-	-

9. House & Homestead Data

Own House: Yes	No. of Rooms:4
Type: Semi Pucca	
Toilet: Open Defecation	
Drainage linked to House: Open	
Waste Collection System	No Collection System
Homestead Land: No	Kitchen Garden : No
Compost Pit: None	Biogas Plant: None

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

Source of Water		Distance
Piped Water at Home	Yes	
Community Water Tap	Yes	
Hand Pump (Public / Private) No		
Open Well(Public / Private) 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. Cultivable Area	
3. Irrigated Area		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
Do you use Chemical Insecticides	Yes
Do you use Chemical Weedicide	Yes
Do you have Soil Health Card	Yes
Irrigation: Canal/ Borewell	
Drip or Sprinkler Irrigation: Drip /Sprinkler	

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

Name	Unit	Quantity
Wheat	**Kg**	-
Cotton	**kg**	-

17. Livestock Numbers

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

18. What games do Children Play

19. Do children play musical instrument (mention)

Schedule Filled By:
Principal Respondent:
Date of Survey:

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: aghar

b. Block: aghar

c. District: patan

d. State: Gujrat

e. Lok Sabha Constituency: patan

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-1316 Total

Population-6695 Male -3456 Female -3376

SC HHs_____ ST HHs_____ OBC HHs_____ Other HHs_____

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	Y	

b.	Nearest Primary Health Centre (PHC)	Y	
c.	Nearest Community Health Centre (CHC)	Y	
d.	Nearest Post Office	Y	
e.	Nearest Bank Branch (Any)	Y	
f.	Nearest Bank with CBS Facility	Y	
g.	Nearest ATM	Y	
h.	Nearest Primary School	Y	
i.	Nearest Middle School	Y	
j.	Nearest Secondary School	N	10KM
k.	Nearest Higher Secondary School / +2 College	N	10KM
l.	Nearest Graduate College	N	10KM
m	Nearest ITI / Polytechnic Centre	N	10KM
n	Kisan Seva Kendra	N	10KM

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

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

x	Common Service Centre	N	10KM

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total-0 Public_____ Private_____ b. Mini Stadium - N Yes(Y) /No (N) *(Playground with equipment and sitting arrangement)*

V. Education, ICDS

a. Number of Angan Wadi Centres-7

b. Number of villages without Angan Wadi Centres_____

Names of such villages: _____

_____

c. Schools (Number)

Primary Private: 1 Primary Govt-2

Middle Private:_____ Middle Govt.:_____

Secondary Private:_____ Secondary Govt.:_____

Higher Secondary Private: _____ Higher Secondary Govt: _____

VI. Public Distribution System

	Item	Private Contractor	Women 's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
	Cereal (Rice/ Wheat/ Millets)			Y	Y			
	Kerosene			Y	Y			
	Other nention)			Y	Y			

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered

a.	Piped Water Supply Coverage to Villages	Covered **YES** Not Covered _____		
b.	Hand Pump Coverage in Villages:	Covered _____ Not Covered _____		
c.	Coverage under Covered Drains:	Covered _____ Not Covered		
d.	Coverage under Open Drains:	Covered _____ Not Covered _____		
e.	Villages with Household Electricity Connection (Numbers)	Connected **YES** Not Connected _____		

VIII. Land and Irrigation

	Private Lar	Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land		d.	Pasture / Grazing Land		g.	Check Dam	

b.	Irrigated Land		e.	Forests/ Plantations		h.	Wells/Bore Wells	
c.	Un-irrigated Land		f.	Other Common Land		i	Tanks /Ponds	

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

3

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	
b)	Number of Households receiving pension (old age, widow, disability)	
c)	Number of eligible Households who are not receiving pension	
d)	Number of Households eligible for Ration Card	
e)	Number of eligible HHs having ration cards	
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	
h)	Number of active Job Card holders under MGNREGA	
i)	Number of Job Card holders who completed 100 days of work during 2013-14	
j)	Number of shops selling alcohol	
k)	Number of BPL families	
l)	Number of landless households	
m)	Number of IAY beneficiaries	
n)	Number of FRA[2] beneficiaries	
o)	Number of Community Sanitary Complexes	
p)	Number of Households headed by single women	
q)	Number of Households headed by physically handicapped persons	

b.	Irrigated Land		e.	Forests/ Plantations		h.	Wells/Bore Wells	
c.	Un-irrigated Land		f.	Other Common Land		i	Tanks /Ponds	

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

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	
b)	Number of Households receiving pension (old age, widow, disability)	
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i)	Number of Job Card holders who completed 100 days of work during 2013-14	
j)	Number of shops selling alcohol	
k)	Number of BPL families	
l)	Number of landless households	
m)	Number of IAY beneficiaries	
n)	Number of FRA[2] beneficiaries	
o)	Number of Community Sanitary Complexes	
p)	Number of Households headed by single women	
q)	Number of Households headed by physically handicapped persons	

r)	Total number of Persons with Disability in the village	
s)	Number of SHGs	
t)	Number of active SHGs	
u)	Number of SHG Federations	
v)	Number of Youth Clubs	
w)	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

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

[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: AGHAR

b. Ward Number--

c. Gram Panchayat: AGHAR

d. Block: AGHAR

e. District: PATAN

f. State: GUJRAT

g. Lok Sabha Constituency: PATAN

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households-1316 Total | Population-6695 Female 3276 | Male 3456

SC HHs_____ ST HHs_____ OBC HHs_____ Other HHs_____

II. Access to Infrastructure/Amenities etc.

i. Access to Infrastructure / Facilities / Services		Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Y	
b.	Nearest Middle School	Y	
c.	Nearest Secondary School	Y	
d.	Kisan Seva Kendra	Y	
e.	Milk Cooperative /Collection Centre	Y	
g.	Health Sub Centre	Y	
h.	Bank	Y	
i.	ATM	Y	
j.	Bus Stop	Y	
k.	Railway Station	N	10KM

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

i. Access to Infrastructure / Facilities / Services		Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
1	Library	N	10KM
m	Common Service Centre	N	10KM
n	Veterinary Care Centre	N	10KM

ii. Road Connectivity

a. Habitations connected by All-weather Roads *(1-All 2-None 3-Some)* If 3 mention the name of the

habitations where not available:_____

iii. Drinking Water Facilities

a.Piped Water Supply Coverage to Habitations:_____ *(1-All 2-None 3-Some)* If 3 mention the name of the habitations not covered:_____

b.Hand Pump Coverage in Habitations: _____ *(1-All 2-None 3-Some)* If 3 mention the name of the habitations not covered:_____

iv. Coverage of Habitations under Waste Management System

a. Coverage under Covered Drains: _____*(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_____

b. Coverage under Open Drains: _____*(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_____

c. Coverage under Doorstep Waste Collection: *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_____

v. Coverage of Habitations under Electrification

a. Coverage under Household Connections: *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_____

b.Coverage under Street Lighting: All*(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_____

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters):
_____ b.Mini Stadium :_____Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres:_____

c. Schools (Number)

Primary Private: 1 Primary Govt-2

Middle Private:_____ Middle Govt.:_____

Secondary Private:_____ Secondary Govt.:_____

Higher Secondary Private: _____ Higher Secondary Govt: _____

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

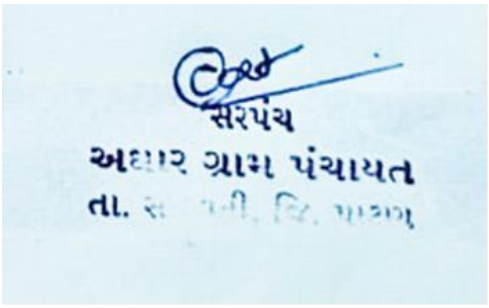
viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land		d.	Pasture / Grazing Land		g.	Check Dam	
	Irrigated and		e.	Forests/ Plnatations		h.	Wells/Bore Wells	
	c. Un-irrigated Land		f.	Other Common Land		I	Tanks /Ponds	

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

Name and Signature of Surveyor and Respondent'

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

3



Respected Sir,

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

Vishwakarma Yojana Phase-VIII AGHAR Village
1 message

Akbarhussain dasadiya <ahd35752@gmail.com> Wed, 23 Jun 2021 at 12:17 pm
To: collector-pat@gujarat.gov.in, ddo-pat@gujarat.gov.in
Cc: manjuralimomin1@gmail.com, principalgecpatan@gmail.com, rurban@gtu.edu.in

Respected Sir,

As a part of PMMS subject we had given the project under scheme of Vishwakarma Yojana phase VIII. Under this project we had allotted Aghar village of Patan district. Under this project we had visited the village to study existing infrastructure and to propose new amenity.

In Vishwakarma Yojana Phase VIII, we had assigned the village Aghar for survey. We visited the village and met the Sarpanch and Talati of the village and discussed about the infrastructure facilities available in village and other details about village. We had collected the data from the villages and proposed twelve new designs such as Biogas plant, road design, public toilet, dairy, agro Centre, medical shop, post office, library, house design, drainage system , chabutara, higher secondary school etc... to fulfill the requirement of existing population. The proposed designs are as under:

sr. no	Design Name	Period	Amount Expenditure (Rs)	Benefit
1	Biogas Plant	1 year	-	Economical (For gas Production)
2	Approach Road	1 year	612938	Easy to transportation
3	Public Toilet	1 year	315473	Healthy atmosphere
4	Dairy	immediately	769237	Milk collection and distribution
5	Agro Centre	immediately	1499296	Agriculture purpose
6	Medical shop	immediately	129980	-
7	Post office	1 year	179693	Post purpose
8	Library	immediately	218109	For student
9	House design	immediately	317140	Better live hood
10	Drainage system	immediately	130217	For Drainage purpose
11	Chabutara	immediately	114055	-
12	Educational institute	immediately	4291557	Education

So, this is for your kind information...
Please find the attached detailed Project Report of Aghar Village...
Thanks for sharing your valuable time to read this mail.

21. Comprehensive Report for the entire Village

In Vishwakarma Yojana Phase-8 we will find rural current issues and problems, listing out existing amenities and give best economical solution. We will give planning proposal of Physical Infrastructure, Social Infrastructure & Socio-Cultural Infrastructure facilities with method of giving Redesigning, Reimaging, Repair & maintenance, and Sustainable planning for basic need of village like government buildings, schools, health facilities, water supply and sanitation, waste disposal management system, electricity, road networks, irrigation facilities, community hall, Bio gas plant, drainage System , rainwater harvesting system, Solar energy utilization and other non-conversation energy sources utilization etc..

Our Village is aghar. aghar is a Village in Patan Taluka in Patan District of Gujarat State, India. It is located 10 km towards west from District headquarters Patan. In this phase of Vishwakarma Yojana, we had assigned the village aghar for survey. We visited the village and met the Sarpanch and Talati of the village and discussed about the infrastructure facilities available in village and other details about village. We have collected the data from the villages with different surveys and proposed six new design such as Bio-gas plant, road design, public toilet, Dairy, Agro centre and medical shop for part 1 and other new six design such as post office, Library, Chabutara, Drainage system, educational institute and house design for part 2 to fulfill the requirement of existing population.