DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII

AN APPROACH TOWARDS RURBANISATION

DHARUKA Village

BHAVNAGAR

District

Prepared By

NAME	BRANCH NAME	ENROLLMENT NO
PARMAR PANKAJ	Civil Engineering	180213106011
VALA BHAUTIK	Civil Engineering	180213106017

GOVERNMENT ENGINEERING COLLEGE, BHAVNAGAR

PROF.V.S. DAVE

ASSISTANT PROFESSOR & H.O.D. DEPT. OF CIVIL ENGINEERING

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 Engineering successfully submitted.

Detail Project Report For,

VILLAGE DHARUKA

DISTRICT BHAVNAGAR

Under

Vishwakarma Yojana: Phase-VII

In partial fulfilment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda. Ahmedabad- 3382424 Gujarat

During the academic year 2020-21

This project work has been carried out by them under our super vision and guidance.

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Pankaj Parmar	Civil Engineering	180213106011
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Date of Report Submission:	
Principal Name and Signature:	**Dr. G. P. Vadodaria**
VY-Nodal Officer Name and Signature:	
Internal(Evaluator) Guide Name and Signature:	**Prof. V.S. Dave**
College Name:	**GOVERNMENT ENGINEERING COLLAGE, Bhavnagar**
College Stamp:	

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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.

ABSTRACT

Vishwakarma Yojana project and how you do your vision project: Vishwakarma Yojana is an approach towards rurbanisation and Vishwakarma Yojana would provide "Design to Delivery" solution for development of villages in 'Rurban' areas. The team has conducted Vishwakarma Yojana Project for Dharuka Village with the vision of the developmental work in villages that could be undertaken as per the need of the village, in particular includes Physical, Social and Sustainable infrastructure facilities.

About your village description: According to Census 2011 information the location code or village code of Dharuka village is 516203. Dharuka village is located in Umrala Tehsil of Bhavnagar district in Gujarat, India. It is situated 6km away from sub-district headquarter Umrala and 45km away from district headquarter Bhavnagar. As per 2009 stats, Dharuka village is also a gram panchayat.

The total geographical area of village is 1483.83 hectares. Dharuka has a total population of 2,106 peoples. There are about 449 houses in Dharuka village. Umrala is nearest town to Dharuka which is approximately 6km away.

About existing village condition: In Dharuka village, drainage system is unavailable. The condition of roads is Poor except entrance. All the village roads are kucha roads. There is no transportation facility in the village. In the village lack of basic facilities like public toilet, poor condition of panchayat building, Drainage system, public garden, community hall, etc.

About your proposed designs your view for village development: For development of the village infrastructure facilities like panchayat building, rcc road and public facilities like bus station are required. For sustainable development of the village rain water harvesting system, recreation building may be provided. Based on the survey we tried to give design of required basic facilities to fulfill their needs. By providing these basic facilities to villager's migration rate will be decreased. And this is ultimate aim of the Vishwakarma yojana.

About future scope of the village development: According to UDPFI norms, the team can enhance and design basic facilities which are unavailable at present in the village. These may include but not limited to (a) physical infrastructure including Solid waste Management, Water supply in village, (b) social infrastructure including some Community Hall, Recreational club, socio cultural center, (c) Recreational Facilities like Joggers park, Redevelopment of existing pond of Dharuka village, etc. In a nutshell, the future scope would be study of urban replicating amenities that would be sustainable in rural areas of Bhavnagar.

Key Words: Rurban, Smart village, Gap analysis, Sustainable development

CONTENT

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma Yojana
TDO	Taluka Development Officer
DDO	District Development Officer
SH	State Highway
MDR	Major District Road
VR	Village Road
AR	Approach Road
PCC	Plain Cement Concrete
RCC	Reinforced Cement Concrete
BM	Brick Masonry
UDPFI	Urban Development Plans Formulation And Implementation
PHC	Public Health Center
SWOT	Strength Weakness Opportunity
NGO	Non-governmental Organization
PHC	Public Health Centre
CHC	Community health centre
APMC	Agricultural produce market committee
U/G	Underground sump
SC	Schedule caste
ST	Schedule Tribe
PMGSY	Pradhan Mantri Gram Sadak Yojana
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
IAY	Indira Awash Yojana
PMAGY	Pradhan Mantri Adarsh Gram Yojana
NRHM	National Rural Health Mission
SSA	SarvaSiksha Abhiyan
GP	Gram Panchayat
GL	Ground Level
PL	Plinth Level
LL	Lintel Level
SL	Slab Level
PRL	Parpet Level
Cu.mt.	Cubic Meter
Sq.mt.	Square Meter
Rn.mt.	Runing Meter

Chapter – 1
Ideal Village Visit from Dharuka Village

1.1 Introduction

Smart villages will serve as complementary engines of economic growth to smart cities producing goods and services for local rural markets as well as high-value-added agricultural and rural industry products for both national and international markets. And they will act as stewards for the environment as well as, in some cases, functioning as ecotourism hubs. Key enablers of these development benefits in smart villages are sustainable electricity supplies and the availability of clean and efficient appliances for cooking.

About 70% of India's population, or 750 million, live in its 600,000 villages. The average village has 200-250 households, and occupies an area of 5 sq. km. Most of this is farmland, and it is typical to find all the houses in one or two clusters. Villages are thus spaced 2-3 km apart, and spread out in all directions from the market towns. The market centres are typically spaced 30-40 km apart. Each such Centre serves a catchment of around 250-300 villages in a radius of about 20 km. As the population and the economy grow, several large villages are continually morphing into towns and market centres. Around 65% of the State's population is living in rural areas. People in rural areas should have the same quality of life as is enjoyed by people living in sub urban and urban areas. Further there are cascading effects of poverty, unemployment, poor and inadequate infrastructure in rural areas on urban centres causing slums and consequential social and economic tensions manifesting in economic deprivation and urban poverty. Hence Rural Development which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential. The present study deals with the same.

1.2 Timbi village visit from Bhavnagar District of Gujarat state

- Background & Study Area Location

The term rural development represents improvement in the quality of life of the people in rural areas. As per Chambers (1983), "rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need".

We have visit the village at the date of 12-09-2020, and acquire the information about the village like, it's geographical details, overall atmosphere, major places like school, temple, hospital, and living condition in village.

Name of Village:	TIMBI
Name of Taluka:	UMRALA
Name of District:	BHAVNAGAR
Name of Institute:	GOVERNMENT ENGINEERING COLLEAGE

Nodal Officer Name & Contact Detail:	PROF. V.S.DAVE
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SHRI, MANOJBHAI BHARVAD (TALATI CUM MANTRI)
Date of Survey:	

Table 1.2 General Details about village

1 Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	2640	1086	1120	480
ii)	2011	2856	1593	1377	529

Table 1.2 (A) Demographical details of Timbi

2 Geographical Detail:

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	915.52
	Forest Area (In hect.)	0.5
	Agricultural Land Area (In hect.)	750
	Residential Area (In hect.)	915.52
	Other Area (In hect.)	
	Water bodies	
	Nearest Town with Distance:	DHOLA(1KM AWAY)

Table 1.2(B) Geographical Detail of Timbi

1.2.1 Concept: Ideal Village, Normal Village:-

India lives in its villages, and the development of villages will be critical if we want to close the gap between the “haves and have not's” for better human development. In the Human Development Report (HDR) 2014, India ranks at 135th place both for the overall Human Development Index (HDI) and the Gender Development Index (GDI), a rating classed by the United Nations as ‘medium human development’.

One reason for the failure of rural development schemes has been the lack of a holistic focus on the village as a unit. Separate flagship schemes targeting different sectors such as health (NRHM), education (SSA) and livelihood (NREGA, NRLM) have been launched in the past, but met with limited success. The “Model Village” concept could address these challenges comprehensively. It can address resource deficits in each of these sectors, with adequate focus on the special needs of every village.

The idea of an “Adarsh Gram” or model village has been explored earlier as well, most notably through the **Pradhanmantri Adarsh Gram Yojana**, launched by the Central Government in 2009-10. The scheme was implemented in pilot mode in 1000 villages of

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

The major objectives of ideal village in context of normal village should be as follows:

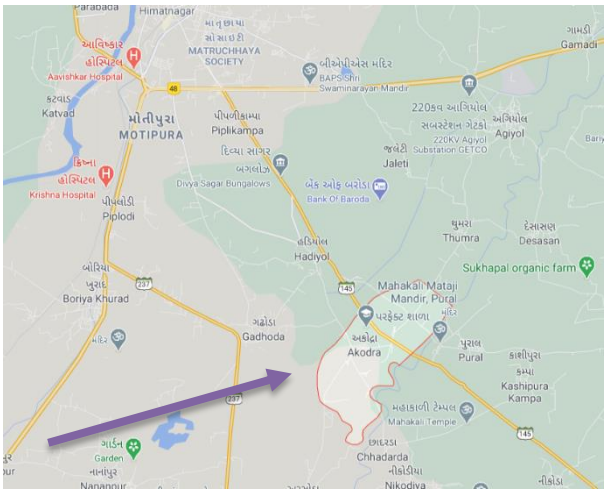
- Prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living.
- Make the model village a "hub" that could attract resources for the development of other villages in its vicinity.
- Provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.
- Contribute towards social empowerment by engaging all sections of the community in the task of village development.
- Create and sustain a culture of cooperative living for inclusive and rapid development.

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

Imagine a situation that you have reached a place where not even one person uses cash for their daily living. No! You have not reached to the barter system era. We are still in twenty-first century and this place is not imaginary, it's real. The place where no one carries cash, everyone uses electronic mode of fund transfer for their daily routine transactions–whether big or small. The place is Akodara village which is tagged as 'first digital village of India'.

Akodara is a village in Sabarkantha district of Gujarat, India. This village is located 64 kilometers away from the state capital Gandhi Nagar, 10 kilometers from Himmat Nagar and 41 kilometers away from district headquarter Sabarkantha. The village is under the administration of a Sarpanch who is the elected representative in the village.

Akodara village has received the tag 'first digital village of India'. The villagers use various cashless modes for payment of all goods and services. The financial transactions in Akodara village are done through digital modes, namely, SMS, net-banking, debit cards, etc. In 2015, ICICI Bank adopted this village under the Digital Village Project and has made it cashless by using digital technology. In January 2016, the project was started by the honourable Prime Minister Shri Narendra Modi, and MD and CEO of ICICI Bank Ms. Chanda Kochar in order to mark 60-year celebration of the existence of ICICI group. All the households of this village have savings bank accounts in the local ICICI Bank branch. The bank provided training to the village households to make them familiar with the digital technology in order to reduce dependency on the cash-based transactions. The village has almost 100 per cent financial literacy. Villagers used to have mobiles and now they comfortably use mobile banking for all financial transactions. Mobile banking is available in three languages, namely, Hindi, English and Gujarati. Akodara village also has its own official website.



Gujarat State Akodara Village

The grassroot leadership, community participation, decentralisation of powers to local bodies in rural areas and financial support in the form of various government schemes have brought far reaching changes in the rural landscape of India. Economic progress has to coincide with social progress which is inclusive, sustainable, and sensitive not only to its environment but to its people as well. The village has received several awards from the state as well as national government for its outstanding achievements and has become extremely popular across the country.

1.2.3 The Idea of a model/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[1][2] (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.[8][1][6][7][9] 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 a integrated village development plan, encompassing Personal, Human, Social, and Economic dimensions

Under this project the Foundation is adopting villages and putting efforts for sustainable development by providing basic amenities like sanitation, safe drinking water, internal road, tree plantation, water conservation. The Foundation is also working for inculcating moral values in the society and for improving the standard of living of the villagers. In the concept of "Smart Village" the development of the village shall be based on the five paths Retrofitting, Redevelopment, Green fields, e-Pan, Livelihood. Under the concept of Smart Village, the Foundation has adopted Village Dhanora, Teh. Bari, District Dholpur, a small and remote village of Rajasthan to develop it as India’s First Smart Village. The village is situated 30 km away from Dholpur district head quarter and 248 km from Jaipur. The population of the village is about 2,000. The village was devoid of its basic needs like sanitation, internal roads. It was also facing various other similar problems such as lack of access to potable water, non-

availability of water conservation system, encroachment on the roads, power fluctuation, non-availability of employment oriented education, unemployment and poverty, so on and so forth. Prof. Priyanand Agale Founder of Eco Needs Foundation and Dr. Satyapal Sing Meena (IRS) Joint commissioner of Income Tax has converted this idea into reality and now Dhanora has become role model of Rural Development. Dhanora village was also given an award by Prime minister of India Mr. Narendra Modi in the year 2018

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

Smart Village India gets its foundation from Mahatma Gandhi's vision of Adarsh Gram (model village) and Gram Swaraj (Village self-rule/independence). Gandhi in two texts, Hind Swarajand Gram (Village) Swaraj, promotes the concept of integrated rural development to impact majority of the population, as the primary initiative after India Independence in 1947. The Eco Needs Foundation has initiated the concept of "Smart Village".

Following the Gandhian vision and dream of Gram Swaraj (village level self-governance) (Bardhan, 2007), rural development has always been given critical salience in the planning process of independent India. It began with launching of the Community Development Programmes (hereafter CDP) in 1952 followed by the National Extension Services (hereafter NES) in 1953. These two programmes had ambitious objectives and envisioned community participation but failed miserably due to their topdown development paradigm (see the works of Sreedhar & Rajasekhar, 2014; Patel, 2014; UNDP, 2000). Later, successive Five-Year Plans led to the creation of essential physical and institutional infrastructure to bring about socio-economic changes in rural areas (Patel, 2014). The Fifth Five-Year Plan proposed different approaches to rural development such as Area Development, Target Group Approach, and comprehensive development approach. Schemes involving special financial and fiscal concessions, bank loans on soft terms, and capital subsidies were also introduced into underdeveloped areas to attract increased investments for development. (Patel, 2014). The Integrated Rural Development Programme (hereafter IRDP) launched in 1976 aimed at alleviating rural poverty and at holistic rural development through self-employment opportunities. The IRDP was conceptualized as a programme oriented towards development of a given area rather than development of a specific sector. It was designed to alleviate poverty through local level planning, taking into account the development of local resources including human resources through formulating projects on scientific lines.

IRDP also failed to realise its targets. “Swarnjayanti Gram Swarozgar Yojana” (SGSY) is a programme for self-employment of the rural poor and has been implemented since 1999, after restructuring and merging the erstwhile IRDP and its allied programmes. In 2011, the government announced National Rural Livelihood mission with an objective to further the cause of rural development. All these programmes have met with partial success but still much needs to be achieved. It is important to identify and understand specific concerns, needs, and challenges in different rural areas of the country and adopt specific policies rather than adopting a “one – size fits-all” approach. Universal programmes need to be tweaked to suit local requirements so that their success is guaranteed.

India has a chequered history of Panchayati Raj (rural grass-roots institutions) starting from self-sufficient and self-governing village communities to modern-day organized village

governance system in the format of Panchayati Raj Institutions or PRIs. The informal village level council of five elderly men (traditional Panchayats) and the present day democratically elected Panchayats state a lot about the deep-rooted culture of self-governance in this country. Sir Charles Metcalf called the traditional Panchayats of India little republics. However, these informal Panchayats suffered the onslaught of Mughal and British imperialism and could never be revived through democratic means in the pre- independence period. The CDP and NES were the first failed baby steps taken in that direction. The Balwant Rai Mehta Committee (1956) and Ashok Mehta committee (1966) recommended that a formal democratically elected structure had to be crafted at the grass-roots level in order to actualise the objectives of rural development programmes. Most of the other government committees7 also recommended that people's participation in planning and implementation and grass-roots leadership is a key to fructify objectives of rural development.

During his position as a Prime Minister of India, Late Shri Rajivbhai Gandhi's contribution to realising the Gandhian dream of rural self – governance is unforgettable. However, his government's initiative in the form of the 65th and 66th constitutional amendment bills was defeated in the upper house of the Indian Parliament. Finally, after the pronouncement of New Economic Policy in 1991, what followed in 1993 was a new polity policy in the form of the historic 73rd and 74th Constitutional Amendment Acts, which added the third tier to the Indian federal polity. These two acts constitutionally recognised rural local governance and made it responsible for performing twenty-nine functions. These functions are exclusively to be performed by a three-tier Panchayati Raj Structure which begins with Gram Panchayat (local body at the village level), Panchayat Samiti (local body at the block level, i.e. above village) and Zilla Parishad (local body at the district level, i.e. above block). This has led to decentralization of not only functions but also of functionaries and finances. It has widened the scope for people's participation in the process of rural as well as self-development. Joshi (2017) calls these Panchayats the central processing units of Indian democracy.

The above stated history can be concluded as a statement that 'These grass-roots level units are the schools of Indian democracy.' If they are fed with appropriate inputs, it will be easier to earn outputs that will strengthen democracy as a whole in India. These institutions have been strengthened through salient constitutional provisions such as reservation of seats for women and marginalised sections of the society, and constitution of state election commission and state finance commission. However, the ground analysis of these institutions reveals that they have not been honestly vested with the functions, functionaries, and financial resources in many states in India. This masses the spirit of decentralized democracy and hampers rural development programmes as well. In fact, it still remains a rubber stamp third tier of Indian federalism (Tremblay, 2001). Financial paucity is the biggest problem faced by the PRIs. If PRIs are to work as prime mechanism of development, they have to be given proper financial aid, especially in a global world. However, the situation is not so bad that it does not give us any ray of hope. Certain villages in India are growing exceptionally well. Hiware Bazar, located in the District of Ahmednagar, in Maharashtra, has transformed from a place fraught with issues to possibly the richest village in India. The sole reason for this fairy-tale change is one man called Popatrao Pawar. He banned all addictive substances to minimize expense and encouraged the villagers to invest in rainwater harvesting, etc. There are a record 60 millionaires in the village and barely any poor. From 168 below poverty line families in 1995, Hiware Bazar now has just three. The villagers continue to strive to see the day when not one

person is poor. Mawlynnong, a small village in Meghalaya, was awarded the prestigious tag of 'Cleanest Village in Asia' in 2003 by Discover India Magazine. Located at about 90 kilometres from Shillong, the village offers a skywalk that can be taken as you explore it. According to visitors, you cannot find a single cigarette butt or a plastic bag lying around there.8 Ankapoor is located in the District of Nizamabad in the state of Telangana. Ankapoor has been globally recognized as a "model agricultural village" for its achievements in introducing modern technologies in agriculture while ensuring the participation of all sections of the village community, particularly women. Organizations like the Indian Council for Agricultural Research (ICAR), International Rice Research Institute (IRRI), Manila and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have formally commended the developments in agriculture in the village. Kumbalangi is essentially a fishing hamlet that has developed as a unique rural tourist destination in Kerala's Ernakulam district. The Kumbalangi Integrated Tourism Village Project was launched in 2004, focusing on eco-tourism, while offering tourists a glimpse of the rich and rustic life of the Indian countryside. The important attractions in Kumbalangi include organic farm produce used to prepare meals for tourists, toddy tapping, and crab farming. To keep the village clean and serve its energy needs, households are also provided with subsidies for setting up mini biogas plants in their households. These villages in different parts of our country are guiding posts and give hope and optimism to work in the direction of holistic rural development.

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

Akodara is a village in Sabarkantha district of Gujarat, India. This village is located 64 kilometers away from the state capital Gandhi Nagar, 10 kilometers from Himmat Nagar and 41 kilometers away from district headquarter Sabarkantha. The village is under the administration of a Sarpanch who is the elected representative in the village. According to census India 2011, Akodara village has 236 houses with the population 1,191 individuals; out of which, 538 are males and 653 are females. The literacy rate of Akodara is 91.69 per cent, which is more than average literacy rate of the state of Gujarat that is 75.84 per cent. The population of children below 6 years of age is 84 in number, which is 7.05 per cent of the population of Akodara village; child sex ratio is approximately 867 and that of Gujarat state average is 890. The people from scheduled caste are 6.47 per cent of the total population of Akodara and that from Scheduled Tribe are 4.53 per cent. The Census India 2011 report shows that 401 people were involved in work-related activities, which comprise of 309 males and 92 females. A total of 98.50 per cent workers call their work as main work and 1.50 per cent workers are involved in minimal activities and earn their livelihood for less than 6 months. The nearest railway station is Hapa road railway station, however; Himmat Nagar Junction railway station is 10.4 kilometers far from the village. Sardar Vallabhbhai Patel International Airport is the nearest international airport, which is 75.3 kilometers away in Ahmadabad.

Imagine a situation that you have reached a place where not even one person uses cash for their daily living. No! You have not reached to the barter system era. We are still in twenty-first century and this place is not imaginary, it's real. The place where no one carries cash, everyone uses electronic mode of fund transfer for their daily routine transactions–whether big or small. The place is Akodara village which is tagged as 'first digital village of India'.

• The first of such useful interventions is financial inclusion and access to modern banking.

• This digitization has promoted use of technology in education.
• Audio-visual devices, computers, electronic tablets and electronic attendance of students is employed in schools throughout the village ("At Akodara, India's first digital village", 2015).
• All normal transaction of the bank was made by their mobile phones through net banking.
• There's a community-owned RO based water treatment plant.
• Wi-Fi tower for internet connectivity have been installed in the village ("Demonetisation: modi's cashless economy dream is a reality in this tiny Gujarat village", 2016).

- Villagers have 24 hours of electricity access. They also have their own waste based power generation plant to produce surplus electricity. Because of unavailability of raw material it is not operational science last six months. RO based drinking water has improved the health condition. Now it is hard to find any water borne disease in village.

- The village has a proper sanitation and drainage system, every house has a toilet and there is no public defecation. Water proof speakers across village has increased the speed of cooperative work in village. People are more aware and proactive for village development.

- After having a branch of State Bank of India in village financial transaction has become very easy, everyone in village has a bank account. ATM for cash withdrawal has improved the ease of transaction. Earlier one had to travel 10 kilometres to reach the nearest bank.

- Primary healthcare facility for villagers has reduced health complication, especially for women. Individual supervision of pregnant women and health education about child delivery has reduced the risk of maternal mortality, infant mortality rate has reached to zero.

- Vocational training for villagers has improved their employability. It has also enhanced the scope of their skill development.

- CCTV cameras has reduced the crime rate. Interestingly a theft case was detected and solved with the help of surveillance camera. It has improved the villager's security.

- WiFi services has made internet available to everyone. Youths are much aware about internet application that can be downloaded to mobile for various usage. It has improved the cashless transactions in villages, during demonetisation period this village was well prepared for cash crunch and available alternatives for money transactions.

- Minibus transportation across village and nearby places has solved a big problem for local transport, villages who traveled to sell their milk by their own convince can now reach to an identified place to sell their milk by spending only 2 rupees. Now females also can travel to sell milk with ease.

- With good primary education facility in village school dropout rate has reached to zero. A considerable change has been observed after smart village implementation. Couple of issues were observed regarding maintenance of the facilities. Once any system goes down it takes time to repair; in couple of cases the systems are not working since last 6 months.

- By developing local entrepreneurship and trade, a fixed cash flow can be made available for maintenance of the systems. As every village is unique, a proper study of socio economic potential will lead to a sustainable smart village. Sustainability of smart village is an important aspect to look for. This can be scope for further study.

- SMART VILLAGES'' can be the answer of current situation. This will help to reduce the migration from villages to towns and cities so the burden on cities will reduce in near future. It will create a suitable platform for villagers to have a sustainable life and economic growth and will improve quality of life for villagers.

- A well planned smart village with micro and small enterprises can provide villagers ample opportunity of employment. The potential of young India can be unleashed by a little change in our development strategy by focusing more on rural economy. 'Smart Villages' can go a long way in strengthening country's untapped potential to bring inclusive development for all.

ICICI bank Akodara

Akodara Village

Groung Akodara

School buses at Akodara

Perfect School at Akodara

Cricket team Akodara

Auditorium Hall at Akodara

Statue at Akodara

Fig.1.3 Ideal or Smart Village Detail Study with photograph

1.4 SWOT analysis of Ideal village / Smart Village

SWOT stands for Strengths, Weaknesses, Opportunities and Threats. A **SWOT analysis** can be carried out for a specific project, organisation or even a whole sector. This analysis leads to a richer understanding of what the project or organisation can offer, the key weaknesses that need to be worked upon in order to succeed, and where to bring in external partners for assistance.

Completing a SWOT analysis involves identifying and mapping the internal and external factors that are assisting or hindering you in achieving your goal. The SWOT analysis provides a good framework for reviewing current strategies and directions, or even to test an idea while exploring solutions. It is particularly helpful to do a SWOT Analysis before the start of a project.

Akodara village has received the tag ‘first digital village of India’. The villagers use various cashless modes for payment of all goods and services. The financial transactions in Akodara village are done through digital modes, namely, SMS, net-banking, debit cards, etc. In 2015, ICICI Bank adopted this village under the Digital Village Project and has made it cashless by using digital technology. In January 2016, the project was started by the honourable

Prime Minister Shri Narendra Modi, and MD and CEO of ICICI Bank Ms. Chanda Kochar in order to mark 60-year celebration of the existence of ICICI group. All the households of this village have savings bank accounts in the local ICICI Bank branch. The bank provided training to the village households to make them familiar with the digital technology in order to reduce dependency on the cash-based transactions. The village has almost 100 per cent financial literacy. Villagers used to have mobiles and now they comfortably use mobile banking for all financial transactions. Mobile banking is available in three languages, namely, Hindi, English and Gujarati. Akodara village also has its own official website.

The important financial transactions of the villagers, that is, selling the agricultural produce at the local area market or in *mandi* (rural market) or selling the milk and milk products at the cooperative societies have been made cashless through digital mode. All the schools from primary to higher secondary level in this village are fully equipped with smart boards, computer systems and tablets. The bank has also established a micro ATM-based solution to give the commission agents of the local *mandi* ease of making payments to farmers against their agricultural produce. Himmat Nagar, which is 13 kilometers from Akodara, is the first *mandi* in Gujarat to become cashless with this particular transaction facility. Three micro ATMs have been set up which are being used for payment of services such as usage of drinking water from a reverse osmosis (RO) plant set up by ICICI Bank; and for making payments against the purchase of goods. The villagers can also do banking transactions through Unstructured Supplementary Services Data (USSD) available on the National USSD Platform using mobile phones and registered mobile numbers.

his is one of the real working models of 100 per cent financial inclusion and access to the electronic banking. Every person in Akodara has a savings bank account with ICICI bank, which can be accessed through the local branch of the bank, ATM or through mobile phones via SMS. Their accounts are also linked to their Aadhar Cards which facilitate them to get all government benefits directly in their bank accounts. Earlier, widows used to spend almost 10–15 per cent of their total pension amount only on traveling to the district headquarters to receive their monthly pension; this direct transfer and easy access to their accounts is a boon for them and results in their real and significant savings. During demonetization period in India, when everyone was struggling to get new currency notes, people used to stand in long queues at ATMs and banks, there was no change in the life of people in Akodara. Not only payment system has been digitalized, but services such as education, agriculture and other basic facilities have also been made digital.The objective of Gram Sabha is to enable each and every voter in a village to participate in decision-making at the local level. It is a constitutional body consisting of all persons registered in the electoral rolls of the village Panchayat. It provides a political forum to people in the village where they can meet and discuss their common problems, and consequently, understand the needs and aspirations of the community. Thus, the Gram Sabha is expected to be an epitome of participatory, deliberative, and direct democracy. It is the body that should provide valuable inputs to the Gram Panchayat to lead local government effectively. The Gram Sabha is also to act as a watchdog in the interest of village communities by monitoring the functioning of the Gram Panchayat. However, the effectiveness of Gram Sabha has been marred by issues like social exclusion, dangerous information gap, political apathy on part of villagers, dependency syndrome, and political culture of patronage.

Furthermore, Joshi (2017) stresses low participation in Gram Sabha meetings and irregular and informal ways of its conduct as some of the major concerns at the grass roots. These field observations gleaned from the model village Punsari help us understand the fact that the physical development of a village does not necessarily promise change in its social environment.

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

- **APPROACHES**

The 'Smart Village-Smart Ward' programme will adopt the following approach in achieving its consequences with Swachh Village/Ward and sustainable development of resources as overall guiding principle:

1. Community Mobilizing for participatory local level development;
2. Converging government schemes and private and voluntary initiatives to achieve comprehensive development;
3. Building partnerships with voluntary organizations, co-operatives, academic and research institutions;
4. Attention to a life-cycle approach and gender sensitization;
5. Focusing on outcomes and sustainability;
6. Protecting local traditions and heritage of the village; and

- **TECHNOLOGIES USED IN SMART VILLAGES**

1. Wireless sensor network(WSN)
2. 3S
3. Cloud Computing
4. Big Data
5. Radio Frequency Identification (RFID)

- **AREA OF INTEREST IN SMART VILLAGES**

Following are some potential areas, where Smart Village may create measurable and significant impact:-

- **Smart Buildings –** security cameras , fire safety, electricity managements
- **Smart Dairy**-Remote supervision and monitoring in open fields and barns.
- **Smart Farming-** Satellite data for farm activities.
- **Smart agriculture-** Smart agricultural equipment for crop production.
- **Smart Weather and Irrigation**-Weather forecast water levels in dams.
- **Smart health care –**Smart beds and equipments to monitor patient.
- **Smart Education –** Interactive learning through videos
- **Smart surveillance system –** CC cameras and sensors to detect robber

- **EXPECTED OUTCOME OF THE PROGRAMME**

A 'Smart Village/Ward' encompasses sustainable and inclusive development of all sections of its Community, so. The 100 per cent achievement of the following basic amenities, they enjoy a high standard of living.

1. Homes for all – with access to toilet, safe-drinking water, and regular power
2. Skills and Village Enterprise development with bank and market linkages gave more flexible access to youth.

3. Has functional solid/liquid waste management system.
4. End all preventable maternal deaths and infant deaths.
5. Zero school drop outs of boys and girls up to 12th class.
6. Functional toilet, potable water, electricity available in Anganwadi Centres, schools.
7. Malnutrition free (children below 9 years of age).
8. No girl-child marriages (girls below 18 years of age).
9. Every village household has a functional bank account/PM Jan Dhan Bank Account.
10. Every GP/Ward has green trees plantations all over its geographic boundaries.
11. Every GP/Ward has functional water conservation and harvesting structures.
12. Every GP/Ward has functional Information Centre, Computer Lab, and Mee-Seva Centre.

1.6 Benefits of the visits of Ideal village / Smart Village

In context of Vishwakarma Yojana Project, the study of ideal / smart village strengthens the thinking process about how the allocated should be developed. One may think for the allocated villages in respect of Punsari Village:

- To trigger processes which lead to a holistic development of the identified Gram Panchayats
- To substantially improve the standard of living and quality of life of all section of the population through -
    - Improved basic amenities
    - Higher productivity
    - Enhanced human development
    - Better livelihood opportunity
    - Reduced disparities
    - Access to right and entitlements
    - Wider social mobilization
    - Enriched social capital
- To generate models of local level development and effective local government which can motivate and inspire neighboring Gram Panchayats to learn and adapt
- To nurture the identified Adarsh Grams as schools of local development to train other gram panchayat

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

- Different civil aspects required in ideal village/ smart village such as Good internal road connectivity, Drainage system, Proper Water distribution, Solid waste disposal, Bus station, Hospital, Canal facilities, Bank and ATM facilities, General hospital, Primary School, Dharm Shala, etc.. facilities should be present in ideal village/smart village,
- And diffrente electrical aspects like solar panel for government buildings, street lighting on roads, etc… facilities should available at the selected ideal village/smart village.
- Some civil/electrical aspect such as Good internal road connectivity, Drainage system, Proper Water distribution, Solid waste disposal, Canal facilities, Bank and ATM facilities, solar panel for government buildings, street lighting on roads, etc… facilities are not available in our selected village. Hence our village should not a ideal or smart village.After allocation of this facilities, an environment and infrastructure shoul be a more comfortable for local living people. And good connectivity between urban area and business centers

Chapter – 2

Literature Review – (Civil & Electrical Concept)

2.1 Introduction: Urban & Rural village concept

As per the Census of India (2011) document, the term 'urban' means constituents of urban area, which are Statutory Town (ST), Census Town (CT) and Outgrowths; while the term 'rural' means all the area other than urban area and whose basic unit is a revenue village. The urban village as an entity exists only as a concept. Administratively, it merges with the urban ward as soon it gets notified, but has starkly different characteristics from the rest of the ward. The rural-urban conflicts are strongly manifested here. Recently in Bhavnagar City, Adhewada Village has been merged in Bhavnagar Municipal Corporation and divided into 2 separate wards. Before few years, Sidsar Village – another village of Bhavnagar Taluka – was merged under the administrative boundary of Bhavnagar Municipal Corporation.

In the wake of current planning mechanisms, most of the urban villages have the pattern of development that emerges in these areas is haphazard and chaotic. Uncontrolled invasion of non-compatible land-uses and elimination of traditional interrelationships by outside and superfluous forces leads to the disintegration of the communities. As a consequence of economic and speculative forces unleashed on villages in the periphery of the metropolis, massive transformation in their physical form and socio-cultural setup takes place.

In the above context, it has been observed in Ahmedabad, before and after its involvement under Smart City Mission, some villages have experienced population growth rates of up to 700 per cent in a decade. The village is confronted with a forced upsurge of deleterious activities, but it lacks any mechanisms to control them earlier. Though, urban villages (just like Bavla in case of Ahmedabad) provide economic advantages such as cheap land prices and inexpensive housing to the service classes in the nearby metro city, their social and physical environment undergoes gradual upgradation. The land and property prices have evolved even in village Dholka, after Ahmedabad has been named in Smart City Mission !

At the country level, as an example of New Delhi, the journey for the rural village begins the day it is notified by the Municipal Corporation of Delhi (MCD) for acquisition. Panchayats are superseded and the Delhi Development Authority acquires the land for development works. The MCD deals with the supply of infrastructural facilities and once the development work is complete, the urban village is transferred to this body for maintenance and upkeep. The entire process may take anything between 15 to 20 years -- a fairly long period for a village to lie without coordinated administration. It is during this transition stage that maximum speculative development happens in the villages. Lack of land-use regulations give birth to several illegal colonies and absence of control over pollution norms result in small-scale polluting factories taking root. Some such as *Mundka* village in north Delhi emerge as the worst hit. Here environmentally hazardous activities such as the recycling of hospital waste and plastic waste thrive. Following the government's ban on polluting industries, several of them continue to quietly operate behind closed doors. As the city sleeps, these units come alive.

In vision of a Civil Engineer and in context of town planning and regional planning, any particular patch of land – ranging from a small area to a town/city – should be planned and grown in controlled fashion. After naming the team under allocated village as part of Vishwakarma Yojana Project (VIII Phase), the team has made up its mind with the generalized goals like identifying problems to be addressed based on priority, lowering the migration from rural to urban centers, providing better living conditions in rural area along with visualization of the planned & controlled progressive growth of an allocated village after a decade or two.

2.2 Importance of the Rural development

Rural development is important not only for the majority of the population residing in rural areas, but also for the overall economic expansion of the nation.

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

The primary task is to decrease the famine that exists in roughly about 70 percent of the rural population, and to make sufficient and healthy food available.

The secondary task is to ensure the availability of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication.

Rural development still remains the core of the overall development of the country. More than two-third of the country's people are 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 facilities to upgrade their standard of living

Rural development is a complete term that concentrates on the action taken for the development of rural areas, which improve the village economy. However, few areas that demand more focused attention and new initiatives are.

- Education
- Public Health and Sanitation
- Women Empowerment
- Infrastructure Development (e.g. electricity, irrigation, etc.)
- Facilities for agriculture extension and research
- Availability of Credit
- Employment opportunity

Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation. Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.

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

2.3Ancient Villages / Different Definition of: Rural Urban Villages

In the following content, various definitions of 'urban village' have been presented to know how the term has various horizon ranging from local level to international level and also in context of various research scholars as well as universities:

(1) As mentioned in topic no. 2.1, the urban village as an entity exists only as a concept. Administratively, it merges with the urban ward as soon it gets notified, but has starkly different characteristics from the rest of the ward. The rural-urban conflicts are strongly manifested here.

(2) As per the definition given by Gaigongmei Gangmei, "Urban village typically would mean a well-planned set-up with a village-concept of being fairly self-sufficient and not having the need to travel long distances to get daily things done. What is most important, perhaps, is that it's intended to tackle the problem of increasing population in cities."

(3) As stated in topic no. 2.1 and observed by Mr. Kapil Chaudhary – Urban Planner and Director of Spatial Designs that "The Delhi urban villages have some of these salient features, especially mixed-use zoning. What has become more apparent, thought, is how each urban village differs from each other."

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

(5) In July 2002, Biddulph M., et. al., stated the concept of 'urban village' and provided its use in cases like (a) To investigate the variety of values and meanings ascribed to developments informed by the urban village concept, on the part of all those individuals involved, (b) To assess the extent to which the urban village as a lived experience accords with the intentions and perceptions of those who promote and use it, (c) To assess the extent to which principles of development accord with user aspirations.

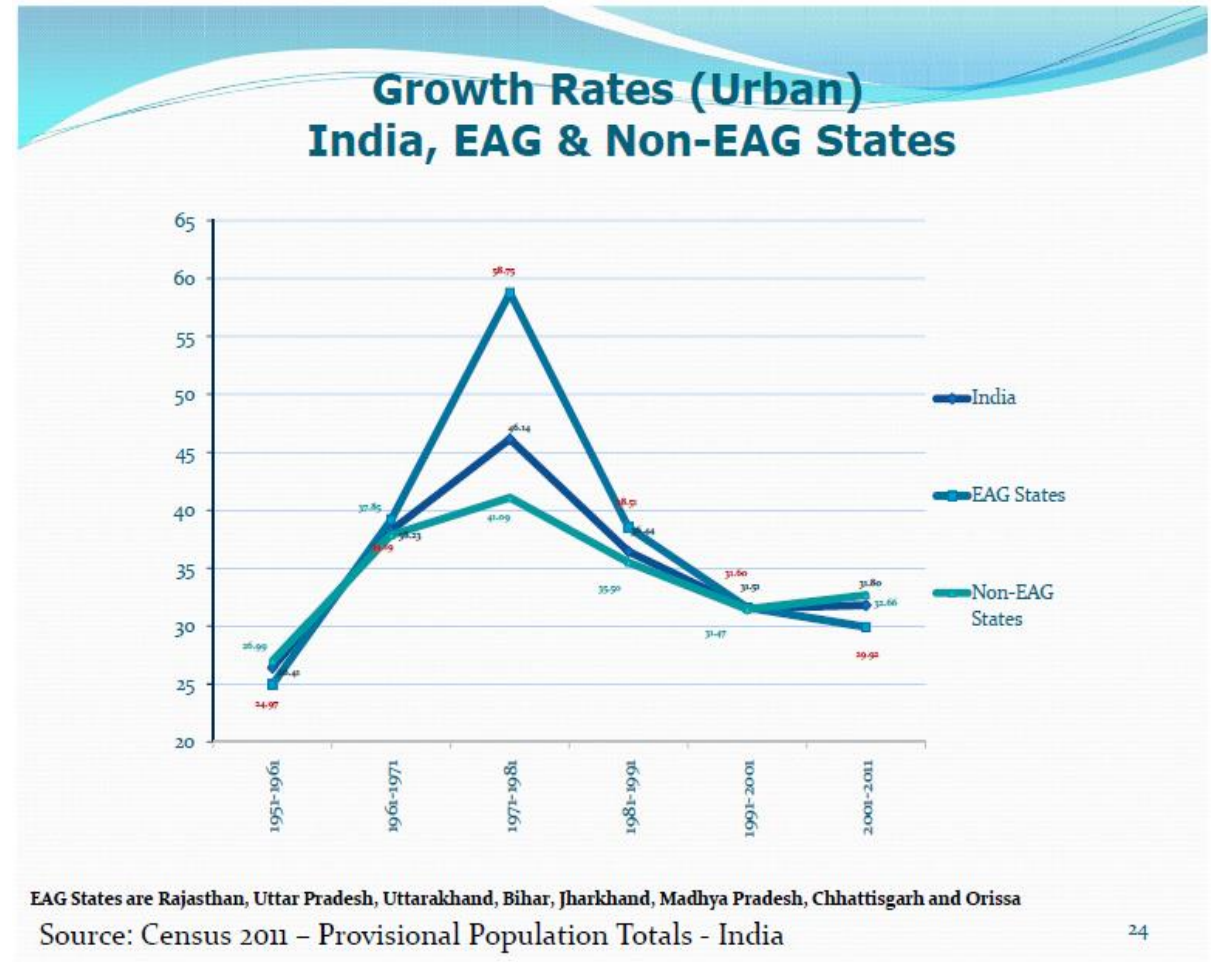
(6) In context of Mr. E. Christopher Mare, Doctoral Researcher of Village Design Institute, Fielding Graduate University (2006), has mentioned the concept of 'urban village' in context of a briefing sheet – practiced in U.K. – as "An urban village is a concept of settlement which is small enough to create a community in the truest sense of the word – a group of people who support each other, but big enough to maintain a reasonable cross section of facilities." Within the same report, the researcher mentioned one of the key characteristics of an urban village as "Each Urban Village is planned and developed through a Master Plan, backed by a series of codes, and an environmental action plan covering how the environmental impact of the village is to be managed and minimized."

Fig. 2.3 Census india 2011

On the other way, the concept of 'rural village' is very clear and specific in terms of the synonymous words' conjunction in the form of 'rural' and 'village'. There is very thin difference between the same. The team, based on the background of various colleagues and discussion with elders as well as faculties, identifies the difference in a way that when a person uses the term 'village' that means the location will have specific revenue boundary, agriculture as its main economy and has limited mix-zoning in land use; while when a person uses the term 'rural' that means it adds a sense of imaginary comparison in context of urban area and may comprise single or multiple villages who have either mix-zoning type of land use as well as agriculture and small scale industries as their major economy drivers.

One famous newspaper "The Hindustan Times" published an opinion type article with the headline as "India needs a rural centric development model" (24th July, 2020) stating in context of migration activities observed during the COVID-19 situation in India. It also revealed the fact that India is the second largest country in terms of numbers of migrant workers, while the first is China. The article concluded with the statement as "To convert the 'crisis into an opportunity', this is the alarming time for India to identify and implement rurban development models as well as rural centric development models."

Further, in an article of Retd. Prof. Vijay Kumar Sarabu, Warangal, India, who has published nearly 100 publications, has mentioned in his 'Way forward article' in October-2018 that "Government should go for appraisal of various rural development schemes and programmes in order to uplift rural areas. Rural entrepreneurship finds it difficult to take off is due to lack of capital accumulation, risk taking and innovation. The rural development programs should combine infrastructure development, education, health services, investment in agriculture and the promotion of rural non-farm activities in which women and rural population can engage themselves. Rural development and rural entrepreneurship is the way of converting developing country into developed nation." As a concluding approach of this topic, the following chart can be referred for urban and rural villages' origin, evolution and their present perspective for respective development in context of case study of San Joes City of California:



2.3 Scenario: Rural / Urban village

2.4 Scenario: Rural / urban village of India population Growth

As per the article published in Down To Earth*'s print edition (dated 16-31 October, 2019,) entitled as "Census 2021: India's Urban-Rural Conundrum", it is mentioned that if one is g*oing by census definition, a habitation is declared urba, if it has a minimum population of 5,000; at least 75 per cent of the male working population is engaged in non-agricultural pursuits; and population density is at least 400 people per sq km. Such habitations are called Census Towns.

For the first time in history, the Census 2011 reported a decline in the population growth rate of rural India. However, at that time India was still predominantly rural, with the urban population being just 30 per cent. Between Census 2001 and Census 2011, the number of Census Towns increased from 1,362 to 3,894. This indicates that people in rural areas are quitting farming or joining non-farm livelihoods. Another concern is that these non-farm jobs are mostly in urban areas. In recent years, these urban employment sources have not been able to meet the surging job demands due to the exodus from agriculture. As the latest economic data points out, manufacturing, construction and other related sectors have not been able to generate employment as they used to earlier. All these sectors are experiencing slowdown.

This leaves us with that big conundrum: We urbanise and celebrate it as a sure shot path to prosperity, but urbanisation doesn't provide basic livelihood to people who have migrated from rural areas. The trend that can be observed from past 5 to 6 decades is also presented below:

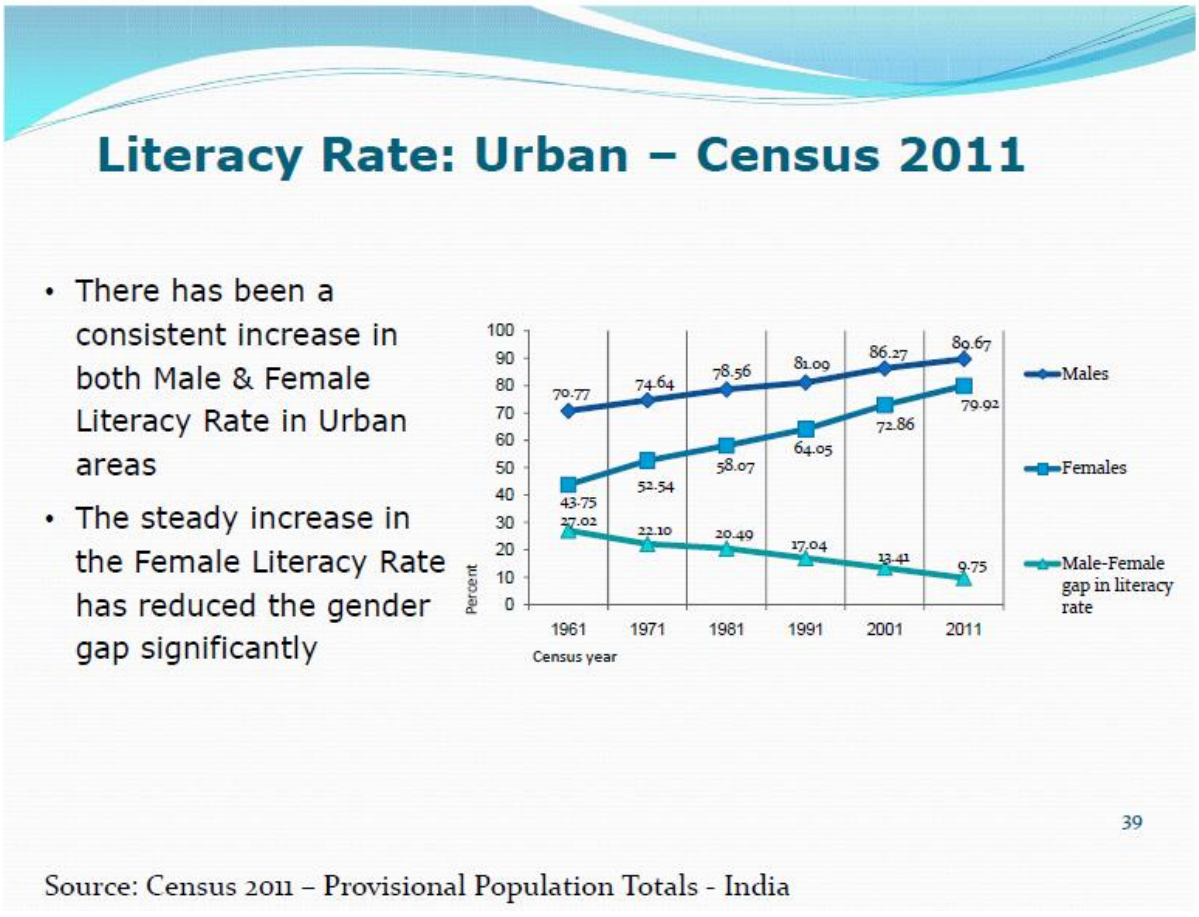


Fig. 2.4 Population census 2011

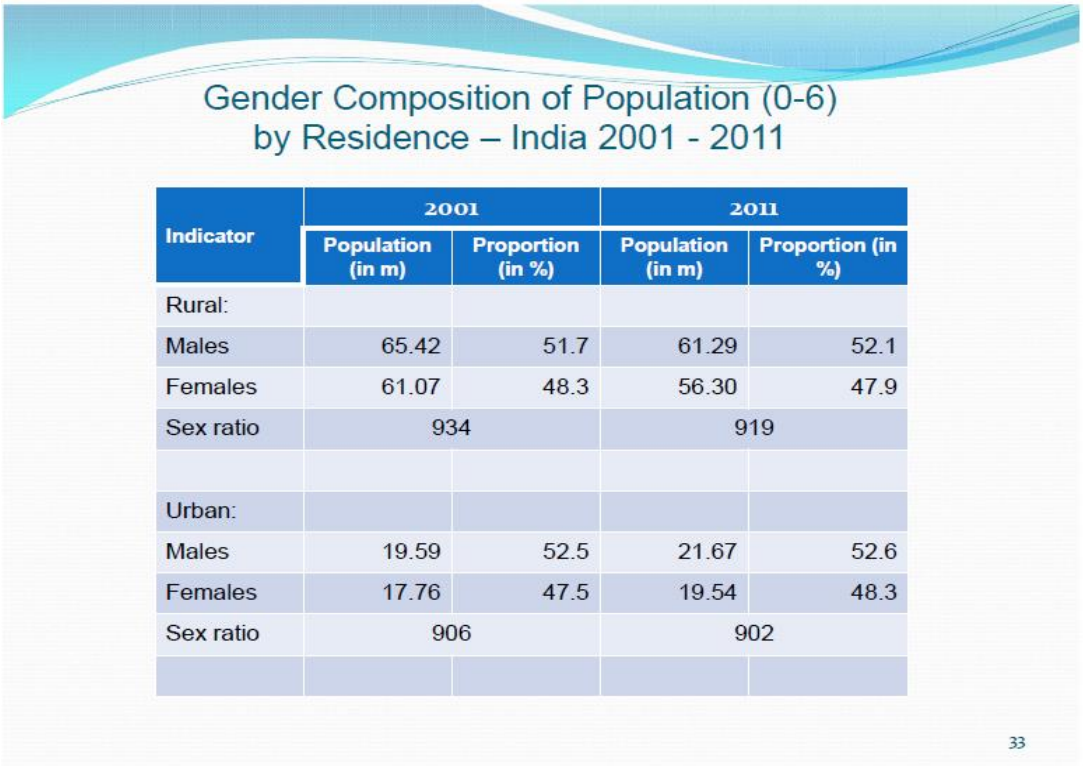
With the above latest article details, the team hereby wants to present some glimpse of Population Census of 2011 – Population – Growth – Variation, with the reference of "Rural – Urban Distribution of Population in India – Census 2011", by Dr. C. Chandramouli, Registrar General & Censor Commissioner of India – year 2011, which are as follows:

- Out of the total of 1210.2 million population in India, the size of Rural population is 833.1 million (or 68.84% of the Total Population).
- Urban population 377.1 million (or 31.16%) ; Increase in Rural areas: 90.4 million ; Increase in Urban areas: 91.0 million
- During 2001-11 the growth of Rural Population has been 12.18%
- Growth in Rural Population in India is steadily declining since 1991
- General decline in Rural Growth Rate among all 3 categories during the last decade 2001-11
- Whereas Non-EAG (Empowered Action Group) States have shown decline in growth since 1971-81, the EAG States (i.e. Rajasthan, Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Chhatisgarh and Orissa) have declined only during the last decade.
- Growth in Rural Areas in Non-EAG States during 2001-11 has sharply declined to 5.71%.
- There has been a spurt in growth of population in Urban areas in the country, which could be due to: Migration, Natural increase and inclusion of new area under 'urban

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

As per details from Census 2011, Gujarat has population of 6.04 Crores, an increase from figure of 5.07 Crore in 2001 census. Total population of Gujarat as per 2011 census is 60,439,692 of which male and female are 31,491,260 and 28,948,432 respectively. In 2001, total population was 50,671,017 in which males were 26,385,577 while females were 24,285,440. 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. Recently as per Gujarat census data, 83.92% houses are owned while 13.54% were rented. In all, 65.95% couples in Gujarat lived in single family. In 2011, 57.87% of Uttar Pradesh population had access to Banking and Non-Banking Finance Corporation. Only 3.13% of Uttar Pradesh population had internet facility which is likely to improve in 2021 due to Jio. 6.10% of family in Uttar Pradesh owned car while 34.14% owned two wheller. In few months we will also get details of election data for Gujarat.

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



Gender Composition of Population (0-6) by Residence – India 2001 - 2011

Indicator	2001		2011	
	Population (in m)	Proportion (in %)	Population (in m)	Proportion (in %)
Rural:				
Males	65.42	51.7	61.29	52.1
Females	61.07	48.3	56.30	47.9
Sex ratio	934		919	
Urban:				
Males	19.59	52.5	21.67	52.6
Females	17.76	47.5	19.54	48.3
Sex ratio	906		902	

33

Table 2.5 Gender Composition of population by residence- India 2001-2011

Description	Rural	Urban
Population (%)	57.40 %	42.60 %
Total Population	34,694,609	25,745,083
Male Population	17,799,159	13,692,101
Female Population	16,895,450	12,052,982
Population Growth	9.31 %	36.00 %
Sex Ratio	949	880
Child Sex Ratio (0-6)	914	852
Child Population (0-6)	4,824,903	2,952,359
Child Percentage (0-6)	13.91 %	11.47 %
Literates	21,420,842	19,672,516
Average Literacy	71.71 %	86.31 %
Male Literacy	81.61 %	90.98 %
Female Literacy	57.78 %	70.26 %

Fig. 2.5 population between rural and urban

2.6 Rural Development Issues – Concerns - Measures

The development of rural India is grim and scaling up more in coming days. The reason behind is that more fund is pumping for development at urban then rural and hence, migration is steadily increasing every year after Independence towards cities. Under SGSY programmes, some of the challenges identified by Chandra Dass (2004) are given below so as to overcome them:

1. There should be a regular follow-up of development of skills, maintenance of accounts, enhancement of productivity, marketing, selling etc.
2. There should be a regular follow-up of development of skills, maintenance of accounts, enhancement of productivity, marketing, selling etc.
3. Proper identification of local needs and demand-based trades to be encouraged.
4. Enterprises with a sustainable outlook, from the entrepreneur's point of view rather than from the stakeholder's point of view, should be evolved.
5. Ranking of areas of training for rural people to be done with sincerity. It includes agriculture, animal husbandry, handicrafts, food and paddy processing.
6. Very practical oriented syllabus for training is to be designed.
7. The trainers should have integrated outlook and must emphasis on practical training.
8. District level Marketing Information Centre (MIC) to be established.
9. Promoting opportunity for marketing outside their locality.
10. Quality of low-cost products with enhanced capacity of artisans to face global threat.
11. Code of conduct, value and moral education workshops for both stakeholders and beneficiaries need to be conducted.
12. Enhancing skills and knowledge programmes should also cover stakeholders and Panchayati Raj Institute (PRI) representatives.
13. Encouragement and special thrust required for PRIs and officials.
14. Opportunities for experiential learning, attending training and exposure visit for stakeholders and rural entrepreneurs should be increased in proportion to the increasing number of target groups.

In context of the above challenges, Mr. Vasava B., researcher from Veer Narmad University, Gujarat, has identified some of the practical suggestions and measures based on his experience while working with several rural area and NGOs like developmental, activist who are educating, making awareness and implementing projects at rural levels for the holistic development of all strata of class and caste, which are as follows:

1. Involvement Beneficiaries from the Beginning till End.
2. Planning to be done at Micro to Macro levels.
3. Creating Ownership of Project Work & Assets.
4. Educating Beneficiaries about the Project Proposal(s) through PRA Exercise.
5. Recruiting Committed, Honest and Trustworthy Local Personnel for Implementation of Project Activities.
6. High lighting major activities done by VOs/NGOs/Departments at Public place(s).

7. Avoiding shifting/transferring committed and hardworking staff till project work is completed.
8. Panchyati Raj Institutions' members should be paid salary/honorarium against their work –which will reduce malpractices and corruption.
9. Promoting Social Audit among all Stakeholders.
10. Strengthening Local Bodies like PRIs, Village Institutions, SHGs, VOs, etc.

Further, the researcher concluded with the statements that without giving proper exposure, training to all stakeholders and not having commitment, transparency, openness and honesty with beneficiaries it will be more challenges for development in rural India. But there is nothing is impossible for good things, yes, there may be lots of hurdles but when people's participation is there it will be achievable. If we have to reduce overcrowded cities then holistic approach is necessary for rural development; otherwise it will be wasting of money, energy, resources and many more. Strategies can be decided once the ground reality is understood in a proper manner and as per the situation, any strategy can be decided as per the community and their ideology, their past records and so on. Here it is given real example which cannot be possible everywhere, but everything is shown to beneficiaries, their participation is there from the beginning would lead towards sustainable development with less hazards.

2.7 Various Measures for Rural Development

Various infrastructure guidelines have been tabulated here for the provisions of different infrastructure facilities in context of Urban Development Plans Formulation and Implementation (UDPFI) guidelines.

Facilities	*Planning Commission/UDPFI Norms*
	Social Infrastructure Facilities
Education	
Aanganwadi	*Each or Per 2500 population*
Primary School	*Each Per 2500 population*
Secondary School	*Per 7,500 population*
Higher Secondary School	*Per 15,000 Population*
College	*Per 125,000 Population*
Tech. Training Institute	*Per 100000 Population*
Agriculture Research Centre	*Per 100000 Population*
Health Facility	
Govt/Panchyat Dispensary or Sub PHC or Health Centre	*Each Village*
PHC & CHC	*Per 20,000 population*
Child Welfare and Maternity Home	*Per 10,000 population*
Hospital	*Per 100000 Population*
Public Latrines	*1 for 50 families (if toilet is not there in home, especially for slum pockets &kuttcha house)*

Physical Infrastructure Facilities	
Transportation	
Pucca Village Approach Road	*Each village*
Bus/Auto Stand provision	*All Villages connected by PT (ST Bus or Auto)*
Drinking Water (Minimum 70 lpcd)	
Over Head Tank	*1/3 of Total Demand*
U/G Sump	*2/3 of Total Demand*
Drainage Network	
Open	
Cover	
Waste Management System	
Electricity Network	
Socio- Cultural Infrastructure Facilities	
Community Hall	*Per 10000 Population*
Public Library	*Per 15000 Population*
Cremation Ground	*Per 20,000 population*
Post Office	*Per 10,000 population*
Gram Panchayat Building	*Each individual/group Panchayat*
APMC	*Per 100000 Population*
Fire Station	*Per 100000 Population*
Public Garden	*Per village*
Police post	*Per 40,000Population*

Fig. 2.7 Infrastructure guidelines with the Norms

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

- ❖ According to UDPFInorms:

Facilities	Planning Commission/UDPFI Norms	Required as per Norms
Education		
Aganwadi	Each Village	1
Primary School	Each Village	1
Secondary School	Per 7,500 Population	2
Higher Secondary School	Per 15,000 Population	1
College	Per 125,000 Population	1
Tech. Training Institute	Per 100,000 Population	1
Agriculture Research Centre	Per 100,000 Population	1
Medical Facility		

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

Table No. 2.8 Guidelines/Norms for Villages for the provisions of different Infrastructure facilities

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

2.10 Other Projects / Schemes of Gujarat / Indian Government

The Government of Gujarat, having realised the importance of the all-inclusive rural development, has been constantly endeavoring to make rural life better. While it continues to do so, it has achieved fantastic results because of this sustained effort. The basis of Gujarat model of development is 'People's Participation', as it reflects in its pledge of 'Collective Efforts and Inclusive Growth'. The Rural Development stories emanating out of Gujarat show how the State Government has enabled people to uplift their livelihoods through this model.

Gujarat has effectively utilized the funding from Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a momentous initiative towards pro-poor growth, to create sustainable and productive assets and in turn helped boosting the rural economy, protecting the environment, empowering rural women, reducing rural urban migration and fostering social equity among others.

'Mission Mangalam' is an award-winning venture aimed at poverty elimination and women empowerment. It aims at uplifting women belonging to the poor families by giving them

enough support to enable them to utilize their skills and improve their conditions. The programme is implemented by Gujarat Livelihood Promotion Company.

Much of the area of this state remains arid with saline water which is unusable for the agricultural purpose. This area depends mainly on seasonal rain-water. Thus, to effectively manage and conserve rain-water, Watershed Management Programme was incorporated. It aims at promoting agriculture by eliminating the scarcity of water resource and in turn create employment opportunities for the rural families.

The state government recognizes the practical and social importance of one's own house and thus, Gujarat has been pro-active in the implementation of Indira Aawas Yojana, which provides pucca houses to the rural poor. With all this and more, the Government of Gujarat has been proactive in the amelioration of rural lives, and it aims at continuing its efforts with increased vigour.

But in above details, what may be the role of a student or academic institution, especially of a higher and / or technical education? The answer lies within the vision and mission of Vishwakarma Yojana Project under which the developmental work in villages that could be undertaken as per the need of the village in particular includes Physical infrastructure facilities (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication & Other), Social infrastructure facilities (Education, Health, Community Hall, Library, Recreation Facilities & other) and renewable energy (Rain water harvesting, Biogas plant, Solar Street lights & Other) for Sustainable development. Under the same scheme, the villages of “Rurban” area will be adopted by the engineering colleges under the Gujarat Technological University. The Engineering colleges would study the identified villages and make the recommendations on the application of technology to achieve integrated and comprehensive development, through project preparation and management.

CHAPTER – 3

Smart (Cities/ Village) Concept Idea and its Visit (Civil & Electrical Concept)

3.1 Introduction: Concepts, Definitions and Practices

There is no universally accepted definition of a smart city. It means different things to different people. The conceptualisation of Smart City, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have a different connotation in India than, say, Europe. Even in India, there is no one way of defining a smart city.
In the approach of the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities.

Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city.

The smart city proposal of each shortlisted city is expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a Pan-city feature with Smart Solution(s). It is important to note that pan-city is an additional feature to be provided. Since smart city is taking a compact area approach, it is necessary that all the city residents feel there is something in it for them also. Therefore, the additional requirement of some (at least one) city-wide smart solution has been put in the scheme to make it inclusive. For North Eastern and Himalayan States, the area proposed to be developed will be one-half of what is prescribed for any of the alternative models - retrofitting, redevelopment or greenfield development.
Regarding the concept of 'Smart Village', Government of India's Ministry of Rural Development has already launched 'Shyama Prasad Mukherji Rurban Mission (SPMRM) and this National Rurban Mission has identified a term 'Rurban Village', which has been adopted as a concept of 'Smart Village' for the report preparation by the team.
Large parts of rural areas in the country are not stand-alone settlements but part of a cluster of settlements, which are relatively proximate to each other. These clusters typically illustrate potential for growth, have economic drivers and derive locational and competitive advantages. Hence, making a case for concerted policy directives for such clusters, these clusters once developed can then be classified as 'Rurban'. Hence, taking cognizance of this, the advantages of clusters, both from an economic view point as well as to optimize benefits of infrastructure provision, the Mission aims at development of 300 Rurban clusters, in the next five years. These clusters would be strengthened with the required amenities, for which it is proposed that resources be mobilized through convergence of various schemes of the Government, over and

above which a Critical Gap Funding (CGF) would be provided under this Mission, for focused development of these clusters.

Mission's Vision

The National Rurban Mission (NRuM) follows the vision of "Development of a cluster of villages that preserve and nurture the essence of rural community life with focus on equity and inclusiveness without compromising with the facilities perceived to be essentially urban in nature, thus creating a cluster of "Rurban Villages".

Mission's Objective

The objective of the National Rurban Mission (NRuM) is to stimulate local economic development, enhance basic services, and create well planned Rurban clusters.

Mission's Outcome

The larger outcomes envisaged under this Mission are:

(i) Bridging the rural-urban divide-viz: economic, technological and those related to facilities and services,

(ii) Stimulating local economic development with emphasis on reduction of poverty and unemployment in rural areas,

(iii) Spreading development in the region,

(iv) Attracting investment in rural areas.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

Accordingly, the purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Area based development will transform existing areas (retrofit and redevelop), including slums, into better planned ones, thereby improving liveability of the whole City. New areas (greenfield) will be developed around cities in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services. Comprehensive development in this way will improve quality of life, create employment and enhance incomes for all, especially the poor and the disadvantaged, leading to inclusive Cities.

The purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Area-based development will transform existing areas (retrofit and redevelop), including slums, into better planned ones, thereby improving liveability of the whole City. New areas (greenfield) will be developed around cities 7 in order to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information and data to improve infrastructure and services. Comprehensive development in this way will improve quality of life, create employment and enhance incomes for all, especially the poor and the disadvantaged, leading to inclusive Cities. Following are various guidelines adopted for Smart City Development:

Culture, Government of India M.. National Mission on Cultural Mapping And Roadmap. Ministry of Culture, 2017.
Heritage City Development and Augmentation Yojana (HRIDAY). New Delhi, India: Ministry of Urban Development, Govt. of India, 2014.
Guidelines for Swachh Bharat Mission (SBM). New Delhi, India: Ministry of Urban Development, Govt. of India, 2014.
AMRUT Mission Statement and Guidelines In AMRUT Mission Guidelines. New Delhi, India: Ministry of Urban Development, Govt. of India, 2015.
Smart City Mission Statement and Guidelines In Smart Cities Mission Guidelines. New Delhi, India: Ministry of Urban Development, Govt. of India, 2015.

Each aspiring city competes for selection as a smart city in what is called a 'City Challenge'. There are two stages in the selection process. After the number has been indicated to the respective Chief Secretaries, as outlined in para 8 above, the State/UT will undertake the following steps/stages:

Stage 1 of the competition: Shortlisting of cities by States

The State/UT begins with shortlisting the potential smart cities on the basis of conditions precedent and scoring criteria and in accordance with the total number allocated to it. The first stage of the competition will be intra-state, in which cities in the State will compete on the conditions precedent and the scoring criteria laid out. These conditions precedent have to be met by the potential cities to succeed in the first round of competition and the highest scoring potential smart cities will be shortlisted and recommended to participate in Stage 2 of the Challenge.
The cities emerging successful in the first round of competition will be sent by the State/UT as the recommended shortlist of smart cities to MoUD by the stipulated date (to be indicated in the letter to Chief Secretaries).

Stage 2 of the competition: The Challenge round for selection

In the second stage of the competition, each of the potential 100 smart cities prepare their proposals for participation in the 'City Challenge'. This is a crucial stage as each city's Smart City Proposal (SCP) is expected to contain the model chosen, whether retrofitting or redevelopment or greenfield development or a mix thereof, and additionally include a Pan-City dimension with Smart Solutions. The SCP will also outline the consultations held with the city residents and other stakeholders, how the aspirations are matched with the vision contained in the SCP and importantly, what is the proposal for financing of the smart city plan including the revenue model to attract private participation. An evaluation criteria for the SCPs has been worked out by MoUD based on professional advice and this should act as guidance to the cities for preparing their proposal. The criteria and the documents to be sent with the application are also framed under Smart City Mission.

By a stipulated date, to be indicated by MoUD to the States/UTs, proposals will be submitted to MoUD for all these 100 cities. These will be evaluated by a Committee involving a panel of national and international experts, organizations and institutions.

The winners of the first round of Challenge will be announced by MoUD. Thereafter, while the winning cities start taking action on making their city smart, those who do not get selected will start work on improving their SCPs for consideration in the second round. Depending on the nature of the SCPs and outcomes of the first round of the Challenge, the MoUD may decide to provide handholding assistance to the potential Smart Cities to upgrade their proposals before starting the second round.

While in context of 'Smart Village' or 'Rurban Village' and for effective planning and development of rural areas, efficient use of rural land and investment for various activities like housing, physical and social infrastructure, transportation, etc. has to be made. This warrants that natural resources particularly rural land is used in an efficient and equitable manner. For the promotion of integrated and inclusive rural development, spatial planning becomes imperative. Hence, in the year 2019, the "Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters" were prepared and submitted to The Ministry of Rural Development by School of Planning and Architecture, New Delhi. Along with the report, the following three detailed reports have been published as an open source on the website platform by the Ministry of Rural Development.

Fig. 3.2 Government Vision in Rurban

Scheme for Selection Process

Below are given the scoring criteria to be used by the States/UTs to score the potential Smart Cities and send the names of cities with the highest scores to MoUD for their selection to participate in the Stage 2 of the Challenge:

1. Existing Service Levels

a. Percentage of increase over Census 2011 or Swachh Bharat baseline on number of household sanitary latrines, whichever is less (Form 2, Part -1) – 10 points,
b. Making operable Online Grievance Redressal System with response being sent back to complainant (Form 2, Part-2) – (Y/N) – 5 points,
c. At-least first monthly e-newsletter published (Form 2, Part-3) – (Y/N) – 5 points, and
d. Electronically place project-wise municipal budget expenditure information for the last two financial years on the website (Form 2, Part-4) – (Y/N) – 5 points.

2. Institutional Systems/ Capacities
   . Started to levy compensatory penalty for delays in service delivery (Form 2, Part 7) - (Y/N) – 5 points, and
   a. Has the total collection of internally generated revenue (e.g. taxes, fees, charges) shown an increasing trend during the last three FYs (2012-15) – (Form 2, Part 8) (Y/N) – 10 points.
3. Self-financing
   . Payment of salaries by ULB up-to last month (Form 2, Part-9) – 5 points,
   a. Audit of accounts up-to FY 12-13 (Form 2, Part-10) – 5 points,
   b. Percentage contribution of tax revenue, fees and user charges, rents and other internal revenue sources to the ULB Budget (actuals in 2014-15) – (Form 2, Part 11) – 10 points, and
   c. Percentage of operation and maintenance cost of water supply, which is met by collected user charges for supply of water during last FY (2014-15) – (Form 2, Part 12) – 10 points.
4. Past track record and reforms
   . Percentage of internal revenue sources (self-generated) budget funds used for capital works during FY (2014-15) – (Form 2, Part 13) – 10 points,
   a. Percentage of City-level JnNURM Reforms achieved (Form2, Part 14) – 10 points for six (6)ULB level Reforms, and
   b. Percentage of JnNURM projects completed, which were sanctioned during the original Mission period (upto 2012) (Form 2, Part 15) – 10 points.

3.3 Technological Options

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

- **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 liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure

services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. This strategy may also be completed in a shorter time frame, leading to its replication in another part of the city.

- **Redevelopment** will effect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.
- **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 in order to address the needs of the expanding population. One well known example is the GIFT City in Gujarat. Unlike retrofitting and redevelopment, greenfield developments could be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA).
- **Pan-city development** envisages application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better. For example, applying Smart Solutions in the transport sector (intelligent traffic management system) and reducing average commute time or cost of citizens will have positive effects on productivity and quality of life of citizens. Another example can be waste water recycling and smart metering which can make a huge contribution to better water management in the city.

3.4 Road Map and Safe Guards

- In context of ‘Smart Village’ or ‘Rurban Village’ and for effective planning and development of rural areas, efficient use of rural land and investment for various activities like housing, physical and social infrastructure, transportation, etc. has to be made. This warrants that natural resources particularly rural land is used in an efficient and equitable manner. For the promotion of integrated and inclusive rural development, spatial planning becomes imperative. Hence, in the year 2019, the “Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters” were prepared and submitted to The Ministry of Rural Development by School of Planning and Architecture, New Delhi. Along with the report, the following three detailed reports have been published as an open source on the website platform by the Ministry of Rural Development.

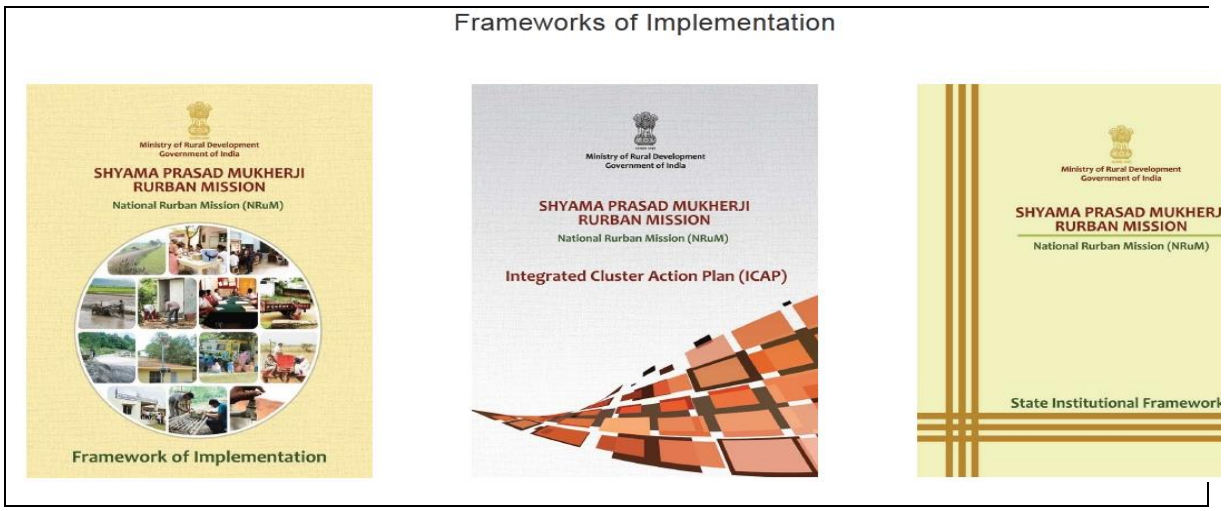


Fig. 3.4 Frameworks of Implementation

- Rurban Mission was implemented in 50 towns of Gujarat in 2011. The aim was to bridge the rural-urban divide and achieve balanced socio-economic development. Various yojanas like E-gram Vishvagram Yojana, Tirth Gram Yojana, Nirmal Gujarat, Swachha Gram Swasth Gram Yojana, Jamin Sampadan Yojana, Gram Mitra Yojana, Sardar Patel Awas Yojana were integrated to form Rurban schemes. As way forward, the various suggestions received in each of these included: (1) Encouraging public private partnership in physical and social infrastructure development etc., (2) Alliance of GSWC with spot exchanges, (3) Collaborations with NGOs, (4) Capacity building and skill development initiatives.
- For the smart cities, The implementation of the Mission at the City level will be done by a Special Purpose Vehicle (SPV) created for the purpose. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects. Each Smart City will have a SPV which will be headed by a full time CEO and have nominees of Central Government, State Government and ULB on its Board. The States/ULBs shall ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV so as to make it selfsustainable and could evolve its own credit worthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes. The execution of projects may be done through joint ventures, subsidiaries, public-private partnership (PPP), turnkey contracts, etc. suitably dovetailed with revenue streams.
- The SPV will be a limited company incorporated under the Companies Act, 2013 at the city-level, in which the State/UT and the ULB will be the promoters having 50:50 equity shareholding. The private sector or financial institutions could be considered for taking equity stake in the SPV, provided the shareholding pattern of 50:50 of the State/UT and the ULB is maintained and the State/UT and the ULB together have majority shareholding and control of the SPV.
- Funds provided by the Government of India in the Smart Cities Mission to the SPV will be in the form of tied grant and kept in a separate Grant Fund. These funds will be utilized only for the purposes for which the grants have been given and subject to the conditions laid down by the MoUD.

- The State Government and the ULB will determine the paid up capital requirements of the SPV commensurate with the size of the project, commercial financing required and the financing modalities. To enable the building up of the equity base of the SPV and to enable ULBs to contribute their share of the equity capital, GoI grants will be permitted to be utilized as ULBs share of equity capital in the SPV, subject to the conditions given in Annexure 5. Initially, to ensure a minimum capital base for the SPV, the paid up capital of the SPV should be such that the ULB's share is at least equal to Rs.100 crore with an option to increase it to the full amount of the first instalment of Funds provided by GoI (Rs.194 crore). With a matching equity contribution by State/ULB, the initial paid up capital of the SPV will thus be Rs. 200 crore (Rs. 100 crore of GoI contribution and Rs. 100 crore of State/UT share). Since the initial GoI contribution is Rs.194 crore, along with the matching contribution of the State Government, the initial paid up capital can go up to Rs.384 crore at the option of the SPV. The paid up capital may be enhanced in the subsequent years as per project requirements, with the provision mentioned above ensuring that ULB is enabled to match its shareholding in the SPV with that of the State/UT.
- After selection of the cities in Stage II of the Challenge, the process of implementation will start with the setting up of the SPV. As already stated, it is proposed to give complete flexibility to the SPV to implement and manage the Smart City project and the State/ULB will undertake measures. The SPV may appoint Project Management Consultants (PMC) for designing, developing, managing and implementing area-based projects. SPVs may take assistance from any of the empanelled consulting firms in the list prepared by MoUD and the handholding agencies. For procurement of goods and services, transparent and fair procedures as prescribed under the State/ULB financial rules may be followed. Model frameworks as developed by MoUD may also be used for Smart City projects.

3.5 Issues & Challenges

Poor urban spatial planning is evident in the city with residential and industrial areas developed without adequate supporting infrastructure such as public open spaces, education, healthcare and adequate road network etc.

- Proliferation of informal sector- both residential/commercial, large number of slums with every third resident in city is a slum dweller.
- More growth in private owned vehicles has resulted in traffic increase & congestion along with deteriorating air quality.
- Public transport sector within few cities of Gujarat is yet poor.
- High cost of water.
- Weak environmental resilience and waste management, nearly 50% of population have access to sewerage network and a few percentages of roads have storm water drainage.
- Tremendous potential for enhanced opportunities in youth-oriented education, skill development and commercial avenues.
- Entrepreneurial city with a culture focused on work and business; has heterogeneous & cosmopolitan population.

- Larger and increasing number of internet users in the state is suitably poised to enter a new era of economic and digital vibrancy by specializing in respective and quaternary sectors.
- Development/Investments under Super Corridor, IT Park, Medcity, nearby Industrial areas are expected to provide employment to the people in upcoming years.

Issues in 'Rurban Village'

	Desirable Component	Existing Situation
1	Skill Development training Linked to Economic Activities	Existing skills in the GP (Handicraft/Handloom/Industrial etc) Skilled members at the household level
2	Agri-services and Processing	Detail the existing Agri services and processing industries present in the cluster.
3	Digital Literacy	Detail the existing levels in terms of core IT infrastructure as well as general digital literacy levels at the HH and Village level.
4	24x7 Piped Water Supply	Existing levels of water supply at the household level.
5	Sanitation	Coverage of Individual Toilets in the GP at the household level.
6	Solid and Liquid Waste Management	Existing arrangement for solid and liquid waste management at the Household/Villa and Cluster level.
7	Access to Village Streets with Drains	Existing coverage of village streets and drains.
8	Village Street Lights	Coverage of existing GP streets with street lights.
9	Health	Access to clinics and health centres at the household and village level.
10	Up gradation of primary, secondary and higher secondary schools.	Existing nos of primary, secondary and higher secondary schools in the cluster and existing conditions.
11	Inter village roads connectivity	Connectivity between GPs within the cluster with roads and public transport
12	Citizen Service Centres	Existing no. of citizen service centres at the GP level.
13	Public transport	Existing levels of availability w.r.t. Public Transport facilities both intra and inter GP
14	LPG Gas Connections	Access to LPG connections at the household level (No of household with LPG connections).

Source: Respective Scheme Data Base/GP records/census of India/other reliable source.

Fig. 3.5 Issues in 'Rurban Village'

Challenges in 'Smart Cities'

- Unchecked growth of slums along with unplanned/haphazard development shall continue to pose greatest threat to city's rational growth and quality of life, which is receding.
- Slums are spread across various cities in varying degrees of squatter, have made delivery of services to urban poor difficult, negatively affecting the general visage of the city.
- Environmental degradation in various cities in general and contamination of natural drainage paths in particular coupled with inadequate public green/open spaces pose threat for the cities.
- Traffic congestion, rapid increase in private vehicles and lack of adequate multi-modal public transport options, unless mitigated shall continue to degrade air quality adversely impacting public health and increased commute times.

Challenges in 'Rurban Village'

Rurban Innovation Challenge is a step forward in identifying and seeking innovative solutions in order to facilitate ease of living in Rural India through world-class amenities. Start-ups, Innovators and citizens are invited to share innovative solutions in the following areas:

- Collection and treatment of Solid Waste in Villages
- Village Sewage/ Liquid Waste treatment and its reuse
- Improved accessibility of road transport to increase personal mobility and agriculture production
- Cost effective approach to Street lighting for road safety and reduction in crime after dark
- Ways to improve healthcare services in villages
- Facilitating Digital Literacy at Village level to bridge digital divide in the country
- Creating Employment Opportunities and amenities for Rural Youth
- Facilities and infrastructure for women in Rural India.

3.6 Smart Infrastructure - Intelligent Traffic Management

This can be understood with real life example in the form of success story. The success story of Smart City Ahmedabad Development Limited (SCADL) in transforming their manually operated bus transit system into a smart transportation system has to serve as the best example. Smart City Ahmedabad Development Limited (SCADL) partnered with NEC to build a transportation system that reflects a smart city.

A smart city is the one where everything from menial routines to tourist activities is effortless and having an intelligent transport management system truly aids this. The key is to have systematic processes and smart technologies in each part of the transportation. For example, the SCADL's smart transportation system took care of different aspects of the problem like - the lack of a strict schedule, the inconsistent and un-secure payment options, lack of tracking options for the vehicles, inefficient routing, etc.

Each of these aspects of the problem was assessed and an easy solution was set in place. The Automated Fare Collection Service (AFCS) facilitated the easy cashless payment option via prepaid RuPay card or smartphone for the passengers, while the Automatic Vehicle Location System (AVLS) allowed them to get the current location and other information of the bus, in real time. The Vehicle Planning Schedule and Dispatch System (VPSD) provided a revamped and optimized schedule for the buses and the Depot Management System (DMS) helped with the allocation and optimization of the crew and the overall bus operations. In addition to this, Passenger Information System (PIS) provided real-time bus information via mobile app, website, and in-station boards to enable passengers to plan their route and estimate waiting and arrival times.

This successful implementation of the intelligent transport management system stands testament to what the future can hold. This smart transportation system was successfully launched in 2017 and has played a monumental role in citing Ahmadabad as a smart city. This

success story stands as an inspiration to India's smart city dream. It proves that with proper processes that optimally utilize the power of IoT and data analyzing technology, building 100 smart cities is not farfetched. But it makes another thing much clearer - having an intelligent transport management system is the heart of making this dream a reality.

3.7 Cyber Security or any other concept

India’s digitalisation roadmap is expected to catapult its digital economy to 1 trillion USD by 2025. India is witnessing an unforeseen digital transformation, and at the same time, a rapid rate of urbanisation. The Government of India’s 100 Smart Cities Mission blends these digitalisation and urbanisation waves, and endeavours to accomplish urban renewal through a Pan-City Smart Solutions initiative, and technology-enabled ‘city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development)’. While the smart city initiative focuses on sustainable development of our cities and harnessing digital technologies for integrated citizen service delivery, it demands a strong focus on cyber security. It is imperative for stakeholders to review and make efforts towards ensuring the safety, security and privacy of citizens and enhancing our cities’ capability to mitigate cyber security risks.

Recognising cyber security as a key priority, the Ministry of Housing and Urban Affairs (MoHUA) published the ‘Cyber Security Framework for Smart Cities’ on 20 May 2016 and issued an advisory to all smart cities to drive conformance to this framework.

This report on ‘Creating cyber secure smart cities’, jointly developed by DSCI and PwC, is an attempt to reinforce the attention that smart city administrators need to give to cyber security in all their projects while incorporating smart solutions. The report acknowledges that cyber security is the combined responsibility of various stakeholders. With a fine blend of global and Indian instances, this report serves as a preliminary guide for smart city stakeholders to understand the risks and steps that need to be taken to enhance the cyber security posture of smart cities.

3.8 Retrofitting-Redevelopment-Greenfield Development District Cooling

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

- 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 liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large

number of smart applications will be packed into the retrofitted smart city. This strategy may also be completed in a shorter time frame, leading to its replication in another part of the city.

- Redevelopment will effect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.
- 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 in order to address the needs of the expanding population. One well known example is the GIFT City in Gujarat. Unlike retrofitting and redevelopment, greenfield developments could be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA).

3.9 Strategic Options for Fast Development

From ideation to implementation at various levels, the monitoring can work as a key medium and hence it can be suggested to have 3 levels of committees i.e. National level, State level and City level, as detailed below:

National Level: An Apex Committee (AC), headed by the Secretary, MoUD and comprising representatives of related Ministries and organisations will approve the Proposals for Smart Cities Mission, monitor their progress and release funds. This Committee will meet periodically, as considered necessary.

State Level: There shall be a State level High Powered Steering Committee (HPSC) chaired by the Chief Secretary, which would steer the Mission Programme in its entirety. The HPSC will have representatives of State Government departments. The Mayor and Municipal Commissioner of the ULB relating to the Smart City would be represented in the HPSC. There would also be a State Mission Director who will be an officer not below the rank of Secretary to the State Government, nominated by the State Government. The State Mission Director will function as the Member-Secretary of the State HPSC.

City Level: A Smart City Advisory Forum will be established at the city level for all 100 Smart Cities to advise and enable collaboration among various stakeholders and will include the District Collector, MP, MLA, Mayor, CEO of SPV, local youths, technical experts, and at least one member from the respective area.

The implementation of the Mission at the City level will be done by a Special Purpose Vehicle (SPV) created for the purpose. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects. Each smart city will have a SPV which will be headed by a full time CEO and have nominees of Central

Government, State Government and ULB on its Board. The States/ULBs shall ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV so as to make it self-sustainable and could evolve its own credit worthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes. The execution of projects may be done through joint ventures, subsidiaries, public-private partnership (PPP), turnkey contracts, etc suitably dovetailed with revenue streams.

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

The problem of access to safe drinking water and sanitation facilities in urban areas of India is a major concern. There is a need to reuse treated wastewater in order to meet the current and future demands for water.

The consistent increase in the rate of growth of India's population has also led to the increase in demand for water, particularly in the urban areas where the rate of increase is highler compared to rural areas. In 2001, urban population was 285 million and assuming water supply of 135 litres per capita per day, the domestic water demand is estimated at around 38,475 million litres per day (MLD), whereas as in 2011 urban population was 377 million with a domestic water demand of 50,895 MLD. It shows that growth in urban population leads to additional water demand of 12,420 MLD in urban areas. The water supply of 135 litres per capita per day (LPCD) as a service level benchmark should be given for domestic water use in urban local bodies. However, currently as per Central Public Health and Environmental Engineering Organisation (CPHEEO), an average water supply in urban local bodies is 69.25 LPCD. This indicates that there is a vast gap between the demand and supply of water in urban areas of India.

The problem of access to safe drinking water and sanitation facilities in urban areas of India is also a major concern. It is estimated that by 2050, half of India's population will be living in urban areas and will face acute water problems. At present, 163 million people do not have access to safe drinking-water and 210 million people lack access to improved basic sanitation in India. In urban areas, 96% have access to an improved water source and 54% to improved sanitation. Whereas in rural areas, which accounts for 72% of India's population lives, only 84% have access to safe water and only 21% for sanitation. In addition, there is a lack of wastewater treatment facilities to treat the wastewater of a growing population. There is a need to reuse treated wastewater in order to meet the current and future demands for water.

The prevention of pollution of water sources is extremely critical in order to continue to supply water of quality standards. Available data suggests that pollution levels have increased in surface water as well as groundwater. More than 100 million people in urban areas exposed to poor water quality. The a lack of sufficient infrastructure, services and funds to support water and wastewater treatment facilities required for an urban area further exacerbates the problem. Moreover, the drainage and solid waste collection services are not adequate in most of the urban areas. The systems are either poorly planned and designed, or operated without inadequate maintenance. Use of natural capacities of soil and vegetation (green infrastructure) can be applied to absorb and treat waste water. Natural systems are found to be more cost-effective and require low building, labour and maintenance costs.

The time has come to have a retrospect view on the water use and misuse to take serious actions that will lead towards sustainable urban water management. Sustaining healthy environments in the urbanized world of the 21st century represents a major challenge for human settlements, development and management. Again, flexible and innovative solutions are needed to cope with sudden and substantial changes in water demand for people and their associated economic activities.

In order to meet the future urban water challenges, there needs to be a shift in the way we manage urban water systems. An Integrated Urban Water Management approach must be adopted which involves managing freshwater, wastewater, and storm water, using an urban area as the unit of management. The approach encompasses various aspects of water management, including environmental, economic, technical, political, as well as social impacts and implications. The international convention has the broad aim of facilitating water for all in a safe and sustainable way, thereby aiming to achieve SDG 6.

This event will provide a platform to highlight current and future water related issues and recognize good water governance practices and solutions through discussions among water experts from various fields such as academics, research, policy, industry and civic society.

3.11 Initiatives in village development by local self-government

Different ministries of the government of India formulate various development schemes not to raise the profit but to maximise the welfare of the people. Some schemes like National Rural Livelihood Mission, MGNREGA, Bharat Nirman etc. are made by the government for rural development of India.

Some important facts related to the various rural development schemes are mentioned below for the aspirants of some prestigious exams like IAS/PCS/SSC/CDS/Banking etc.

1. Deen Dayal Upadhyay Grameen Kaushal Yojna
2. Roshni: Skill Development Scheme for Tribals
3. Swachchh Bharat Mission
4. Sansad Adarsh Gram Yojna
5. Heritage Development and Augmentation Yojna (HRIDAY)
6. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)
7. National Rural Livelihood Mission
8. Pradhan Mantri Gram Sadak Yojna
9. Training to Rural Youth for Self Employment (TRYSEM)
10. Antyodaya Anna Yojna (AAY)
11. Village Grain Bank Scheme
12. National Rural Health Mission
13. Aam Aadmi Bima Yojna
14. Kutir Jyoti Programme
15. Sarva Siksha Abhiyan

Table 3.11 initiatives in village development by local self-government

Table 4: The Central Government Allocation of Financial Resources to Panchayats

financial years (figures in million Rs.)

States	1996/97	1997/98	1998/99	´99-2000	´95-2000
Andhra Pradesh	877.50	877.50	877.50	877.50	3510.0
Arunachal Pradesh	11.30	11.30	11.30	11.20	45.10
Assam	333.40	333.400	333.40	333.40	1333.60
Bihar	1268.00	1268.00	1267.90	1268.00	5071.00
Goa	14.80	14.80	14.80	14.70	59.10
Gujarat	48.00	48.00	48.00	48.01	1920.10
Haryana	206.60	206.60	206.60	206.60	826.40
Himachal Pradesh	80.05	80.05	80.04	80.04	321.80
Jammu & Kashmir	94.00	94.00	94.00	94.39	375.90
Karnataka	554.40	554.40	554.40	554.50	2217.70
Kerala	447.00	447.00	447.00	447.10	1788.10
Madhya Pradesh	871.70	871.70	871.70	871.80	3486.90
Maharashtra	867.50	867.50	867.50	867.60	3470.01
Manipur	23.30	23.30	23.30	23.20	93.10
Meghalaya	21.60	21.60	21.70	21.60	86.50
Mizoram	7.40	7.40	7.30	7.30	29.40
Nagaland	11.60	11.60	11.60	11.70	46.50
Orissa	502.50	502.50	502.50	502.40	2009.90
Punjab	258.40	258.40	258.40	258.30	1033.50
Rajasthan	530.50	530.50	530.60	530.60	2122.20
Sikkim	4.80	4.80	4.70	4.70	19.00
Tamil Nadu	718.30	718.30	718.40	718.40	2873.40
Tripura	34.80	34.80	34.90	34.90	139.40
Uttar Pradesh	1898.80	1898.80	1898.80	1898.80	7595.20
West-Bengal	833.60	833.60	833.60	833.70	3334.50
Grand total	10952.30	10952.30	10952.30	10952.40	43809.30

Source: Government of India 1995; Report of the 10th Finance Commission, Delhi

Fig. 3.11 (a) The Central government allocation of financial resources to panchayats

3.12 Smart Initiatives by District Municipal Corporation

The Bombay Provincial Municipal Corporation (BPMC) Act (1949) is the governing act for the Ahmedabad and Surat Municipal Corporations, while Bhavnagar Municipal Corporation was constituted under the Gujarat Municipalities Act (1963). Because of these acts, and the constitutional amendments, the municipal corporations have been relatively financially autonomous bodies. It becomes the responsibility of the local bodies (Municipal Corporation/ Urban Development Authority/ Municipality) to provide for the services of water supply and distribution, sewerage collection and treatment, solid waste collection and disposal, and Urban transportation including roads, flyovers, by passes, bus and/ or rail network for urban transportation. The Bhavnagar Municipal Corporation has maintained the transparency and developed contact medium through digital medium in the form of website and mobile based

application. An illustration of various services are given as part of screenshot from BMC's website.

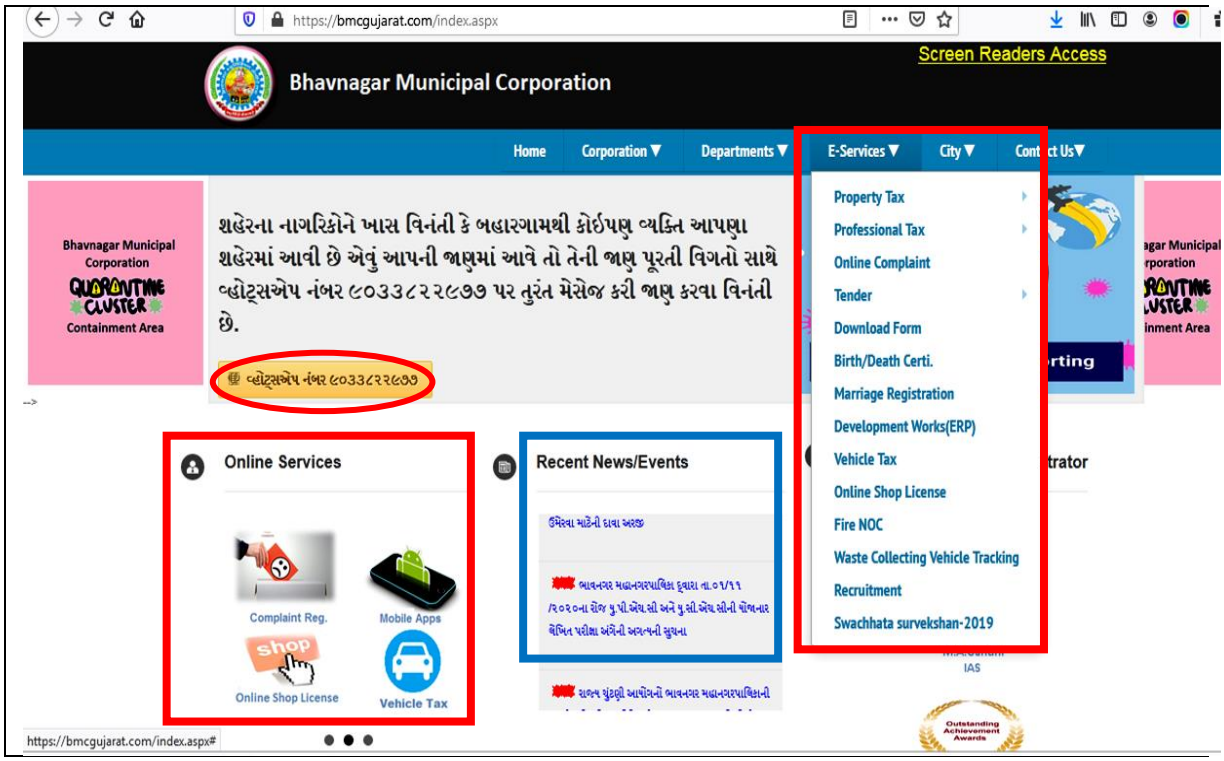


Fig. 3.12 BMC E-Services

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

There is no any project either at present or under pipeline contributed working by Government / NGO / Other as part of Digital Country Concept either in Bhavnagar City or District.

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

Worldwide Initiatives for Smart Villages:

Smart Village initiative: new thinking for off-grid communities worldwide and IEEE Smart Village: Empowering off-grid communities are both worldwide active and striving to meet the SDG 2030, especially goal 7, Affordable and Clean Energy. The first one promotes access to sustainable energy as a main catalyst for the development of good education and healthcare systems, access to clean water, sanitation, economic growth, enhanced security, gender equality, etc. The most important vision of the Initiative is to apply more holistic and integrated approaches to enable the access to the energy in the rural contexts, while connecting/involving governments, developmental and private sector in the process. The component most emphasized is how to connect renewable sources of energy with ICT. The activities of the Initiative are taking place in six large regions, namely East Africa, West Africa, South Asia, South-East Asia, South America, and Central America, Caribbean, Mexico—the so-called

developing world with limited possibilities to access (educational, electrical, economic and other) infrastructure. To find the most suitable solutions, there is a wide range of professionals working on the field and otherwise: villagers, NGOs, development organizations, entrepreneurs, policy makers, engineers, and experts from the field of humanities. Their search for solutions is encompassing and, based on long-term research, analyzing local and regional circumstances, identifying cross-cutting issues and proposing suitable solutions. More than 30 workshops have been organized where more than thousand stakeholders from 70 countries have presented their views and evidence. By now, the majority of their activities were funded by Cambridge Malaysian Education and Development Trust and Malaysian Commonwealth Studies Centre.

Similarly, the IEEE Smart Village initiative is aiming to promote off-grid communities through education and the creation of sustainable businesses in the energy sector. The initiative was originally established as a Community Solutions Initiative (2009) and took over the current name in 2014. The activities are spread worldwide, by now serving more than 50,000 people, living in 34 villages, mostly located in African continent (e.g., Benin, Cameroon, Kenya, Malawi, Namibia, Nigeria, South Sudan, Zambia), but also in Haiti and India. Its main financing mechanism is fundraising. Besides the development of energy-smart villages mentioned before, the main products of the initiative's efforts are a SunBlazer II—a mobile solar-based power base station and Learning beyond the Light Bulb—a nine-month program of remote study that enables the exchange of practices of all communities in order to create the mutual benefit, and equips the students with knowledge on different development models and other skills and knowledge needed for the fieldwork.

One of the most propulsive worldwide programs is the CIGAR research program on Climate Change, Agriculture and Food Security (CCAFS) that started in 2011. The program is funded by the CIGAR fund and different donors (e.g., Australia, Irish Aid, Netherlands, New Zealand, Switzerland, Thailand, UK Aid, US Aid, the EU, and the International Fund for Agricultural Development). Within its framework, the concept of Climate Smart Villages is being developed and put into practice in different parts of the world, whereas the ones with the most climate-related difficulties are chosen (West and East Africa, Latin America, South and Southeast Asia). This is an ever evolving program where different stakeholders (researchers, politicians, framers, local residents) are collaborating in order to find the most productivity enhancing and smart solutions considering the local conditions. Their solutions are based on smart technologies and services, designed in collaboration with local people, and aim at lessening the climate footprint from the perspective of the developing agricultural activities, while not reducing their benefits for the given community. The program is claimed to be very successful, as there is more than 30 existing climate-Smart Villages all over the globe. More importantly, the villages are on a good track to being sustainable in the long term as the program aims to train the local people and not providing locals with the external teachers on the long-term basis. Within this objective, an important role is also played by women. One of the other practical outputs of the program is, for example, the CCAFS Climate Analogues Tool for making rain and climate predictions, developed to help smaller farmers make decisions based on accurate information.

Initiatives, Operation and Implementation in India

Perhaps one of the most extensive and most recent attempts of smart transformation development is India. Firstly, urbanization of India is increasing rapidly as never before. According to the predictions of the United Nations, by 2050, almost 814 million of Indian people will live in towns and cities, which is twice as many as today. Secondly, in 2015, the Government of India, Ministry of Urban Development launched a nationwide program Smart city mission. The aim of the Mission is the comprehensive development of (physical, institutional, social, economic) infrastructure, and thus improvement of the quality of life and to attract people and investments. The governmental mission covers 100 cities, selected in the "City Challenge" process, but also recognizes that there is no single definition of the Smart City that would encompass important factors for all the different cases and therefore aims to set the examples that could be replicated in various regions and cities within the country.

Thirdly, a Smart City initiative was supplemented by the Indian Smart Villages Initiative aimed at harnessing the benefits of ICT for the people living in the rural sites. Despite the urbanization processes, in India, around 67% of population still lives in the rural areas, but rural-urban migrations are posing big problems in India. For example, according to the estimates of Indian Ministry of Statistics and Programme Implementation, in years 2009/2010 more than 60% of the male rural-urban migrations was due to employment related reasons. Agriculture only has a minor part in the Indian economy (e.g., around 17%), compared to the services sector that is flourishing (almost 54%). As it has been stated by Srivatsa, to somehow maintain the "equilibrium" between the urban and rural areas, the smart development of both has to be parallel and simultaneous. In this way, the large migration from rural to urban areas can be limited or even stagnate [5] (p. 4). It is anticipated that carefully designed Smart Villages will provide a basic framework for local people to enhance their participation on a local level and to improve their economic, social and living conditions and thus make their community stronger and more flexible for the challenges of the outside world. Within the "Digital India" plans, Indian government envisages that, by the year 2019, 250,000 Indian villages will have access to the internet and telecommunications networks. Therefore, there is a need to design and develop villages that have established good endo- and exogenous connections, e.g., they have good connections to the outside world, but, at the same time they maintain their independence in providing employment and services. To summarize, in the Indian case, two approaches are used as being complementary, Smart Villages serving as engines to Smart Cities' economic growth, by producing services and goods for rural but also for wider (inter)national markets. Unfortunately, there is no synthesis on how many Smart Villages has already been developed/ established in India, there are only some fragmented lists and websites dedicated to specific villages, which makes it difficult to keep up with the numbers.

A closer look at the initiatives working at the worldwide level presented above enables us to make some very broad conclusions. Looking at the main objectives and activities taking place within their frameworks, but also regarding some other reports [27,28] and models, the energy sector lies at the core of dealing with sustainable and smart community development. Even though the focus on sustainable energy supply is not explicitly in the forefront of the global developmental initiatives, it is implicitly involved within other objectives, such as lessening the climate footprint of agricultural practices. As it will become more evident in the next sub-chapter, a closer look at the European practices reveals also that focus areas of global initiatives have different social and economic conditions and therefore propose different solutions adapted to needs of the communities. Whereas global initiatives are primarily focusing on the areas

with the lack of basic infrastructure (electricity, water supply, internet access, etc.), the European initiatives are working in the areas with basic infrastructure already provided and are therefore addressing different challenges of smart and sustainable development through products and services with social, economic, and environmental benefits.

3.15 Visit of Dholavishi Smart Village for the Vishwakarma Yojana Project

Dhola is a census town and former petty Rajput princely state in Bhavnagar district, in the state of Gujarat, western India. Dhola was one of many non-salute states in Gohilwad prant on Saurashtra peninsula, comprising only the village. Under the British raj, the colonial Eastern Kathiawar Agency was in charge of it. In 1901 it comprised only the village, with a population of 261, yielding 1,800 Rupees state revenue (1903-4, all from land), paying 384 Rupees tribute to the Gaikwar Baroda State and Junagadh State. Dhola is located at 21.88°N 71.78°E.[2] It has an average elevation of 56 metres (183 feet). Dhola was a Railway Junction in Bhavnagar State Railway. Dhola has good internal road connectivity, hospitals, good street lighting, Medicals, All necessity stores retc.

As of 2001 India census,[3] Dhola had a population of 8049.

- Males constitute 52% of the population and females 48%.
- Dhola has an average literacy rate of 67%, higher than the national average of 59.5%: male literacy is 75% and, female literacy is 58%.
- In Dhola, 14% of the population is under 6 years of age

Fig. 3.15 (C) Panchayat Kacheri Dhola

Fig. 3.15 (D) Dhola Juncion

Chapter 4.

About Dharuka Village:-

4.1 Introduction:-

4.1.1 Introduction about Dharuka Village:-

Dharuka is a Village in Umrala Taluka in Bhavnagar District of Gujarat State, India. Dharuka is located at the 21.7904°N and 71.8408°E on coordinates. It is located 33 KM towards west from District head quarters Bhavnagar.12 KM from Umrala and 211 KM from State capital Gandhinagar.

4.1.2 Need of the study:-

The need of the study is to provide the basic requirements of people in the village and for Urban Development of the village. For this purpose the information of the village is collected based on different categories such as Education, Water Facilities, Drainage Facilities, Transportation Facilities, Primary Health Care, Bank Facilities, Public Toilets, Community hall and other amenities.

65% of the population of the country lives on agriculture which contributes only 15 % to the country's GDP. If we compare this with China which has a similar sector contribution to the GDP, only 30% of people depend on agriculture whereas in country like USA just 2% of the people are dependent on agriculture. Rurbanisation addresses this concern and imbalance by providing alternate jobs to rural masses dependent upon agriculture. So it is very important to develop rural area compare to urban one.

4.1.3 Objectives of the study:-

The project is aimed collect all the report or data of human primary necessity like education, health facility, transportation services, roads, water facility, electricity, sanitation and drainage, population, the coming plans for developing villages, and standard of living of that village like how many people are below poverty line, Upper –middle class, banking, telecom, post and telegraph, co-operative sectors other public amenities like community hall, public garden, children park, village pond, public library, solar energy, ongoing schemes of NGO or other funding agencies.

The various objectives of this project are:

- To study the existing growth, characteristics and development of villages.
- To study the existing infrastructures facilities and its management issues phasing by villages.
- To analyse all feasibility parameters and relevant factors for sustainable development of villages.
- To evolve strategic planning proposal in the form of physical infrastructures such as storage reservoirs.

4.1.4 Approach & Methodology:

In the final year of degree in Civil Engineering, the subject of Project is introduced, so that the student of Engineering can get knowledge of Real life problems and its solutions. The student can get aware of the field work and Planning and Designing of any Civil engineering structure. We select Dharuka village from Bhavnagar under Umrala taluka for Planning and Designing of various structures like water storage tank, storage building, rain water harvesting, sewerage system, rcc road in Dharuka village. For the study of village we gone to village and met with sarpanch, and other villagers.

For get further information and study of village, we were survey of village by techno economic survey and we got the information about the existing facilities of physical, social, and socio cultural infrastructures by primary and secondary survey.

Based upon the survey information and existing facilities gap analysis was prepared. Suitable amenities were planning, designing, estimating which are necessary for well development of village.

4.1.5 Scope of the Study:-

The information and the recommendation derived from this survey helps to take appropriate decisions for launching new indentified products and services in the existing supply chain of the Dharuka to improve the lifestyles of the villages. The primary data collected regarding their willingness to pay for identified products and services and systemic knowledge generated by this will result in the creation of a resource for other future study.

4.2 Base Location map, Land map, Gram Tal map:-

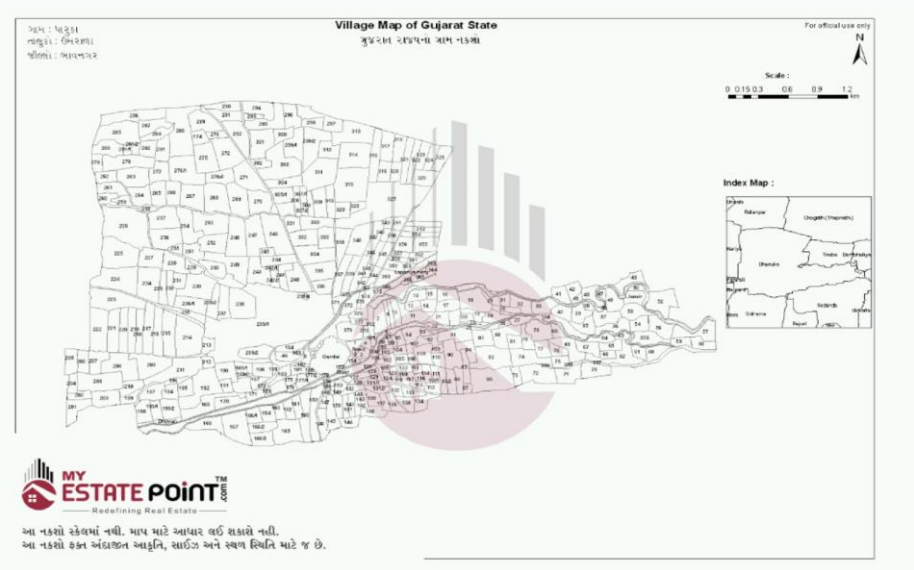


Fig. 4.2 (A) Village map of Dharuka

Fig. 4.2 (B) Dharuka village in Gujarat state.

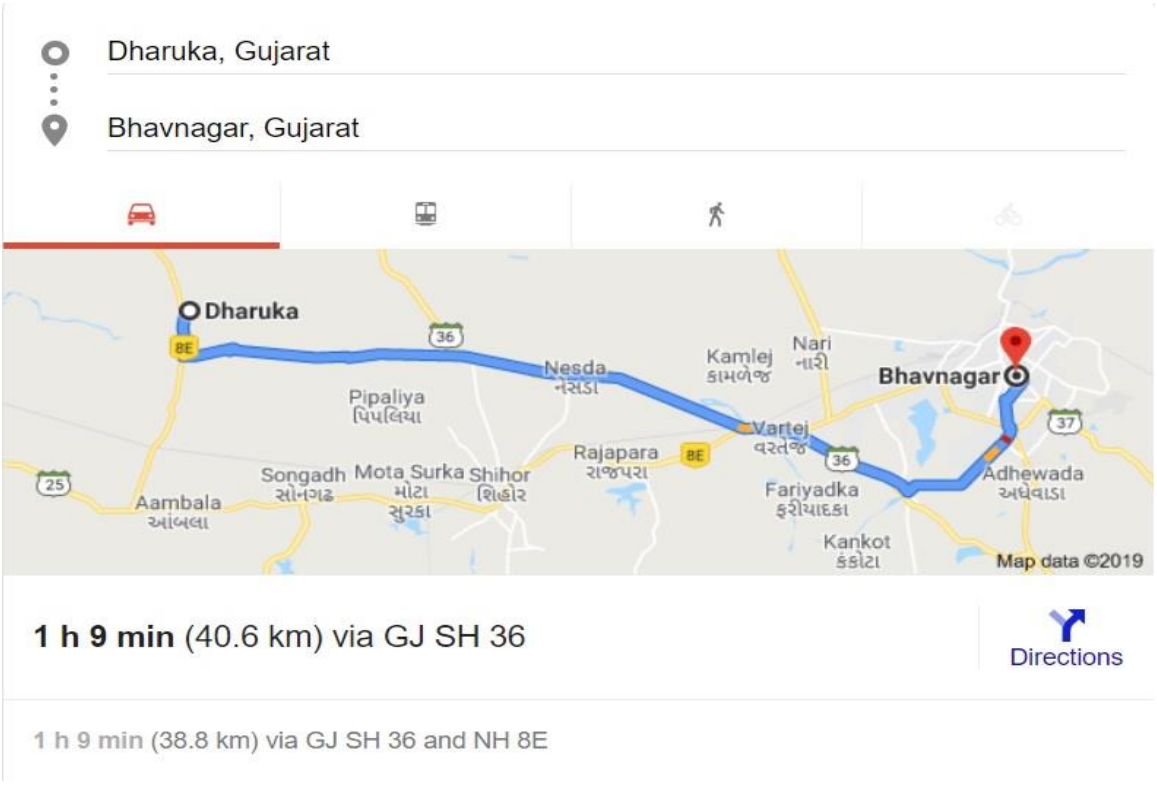


Fig. 4.2 (C) Distance from Bhavnagar to Dharuka

4.2.1 Physical & demographical Growth:-

Population Statistics

In Dharuka village population of children with age 0-6 is 231 which makes up 10.97% of total population of village. Average Sex Ratio of Dharuka village is 1004 which is higher than Gujarat state average of 919. Child Sex Ratio for the Dharuka as per census is 958, higher than Gujarat average of 890.

Dharuka village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Dharuka village was 63.6% compared to 78.03 % of Gujarat. In Dharuka Male literacy stands at 73.63 % while female literacy rate was 54.14 %. As per constitution of India and PanchyatiRaaj Act, Dharuka village is administrated by Sarpanch (Head of Village) who is elected representative of village.

4.2.2 Economic generation profile

In Dharuka village out of total population, were engaged in work activities. 99.60 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 0.40 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1233 workers engaged in Main Work, 45 were cultivators (owner or co-owner) while 500 were Agricultural labourer.

particulars	total	male	female
Total No. of houses	449	-	-
Population	2106	1051	1055
Child (0-6)	231	118	113
Schedule caste	149	75	74
Schedule Tribe	2	1	1
Literacy	63.84%	73.63%	54.14%
Total worker	1233	660	573
Main worker	736	-	-
Marginal worker	497	22	475

Table 4.2.2 Economic generation profile

4.2.3 Requirement of village

Fig. 4.2.3 Requirement of village

4.3 Data collection of Dharuka village (Photographs, charts/tables)

4.3.1 Methods for data collection

- we visit the Dharuka village and meet the Headman of village, panchayat member, villagers, and get information about village.
- Also we need help of Internet and some information get through internet like, village map, population statistical, work profile etc.

4.3.2 Primary details of survey details:-

The primary details of survey is like the population of village, no. of houses there, available facilities are there, there need facilities, actual problems faced by the villagers, villagers work profile, map of village, how many grants are arrived at village and for which work purpose.

4.3.3 Average size of houses and no. of people in the one houses and geo taping of houses of village:-

The average size of houses in the village is around 500 sq.ft and in the one house there are average 5 peoples in the room.

4.3.4 Material available locally in the village and materials out sourced by the villagers:-

The materials available in the village for construction is Black cotton soil, Bricks, and Husk of Crops etc,

And the out sourced of the materials are all except the bricks.

4.3.5 Geographical details:-

Dharuka is a Village in Umrala Taluka in Bhavnagar District of Gujarat State, India. Dharuka is located at the 21.7904°N and 71.8408°E on coordinates. It is located 33 KM towards west from District head quarters Bhavnagar.12 KM from Umrala and 211 KM from State capital Gandhinagar.

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1293 hec.
2.	Forest Area (In hect.)	0.23 hectares
3.	Agricultural Land Area (In hect.)	irrigation area 775.85 hectare
4.	Residential Area (In hect.)	15 hec.
5.	Other Area (In hect.)	11.32 hec. (non-agriculture area)
6.	Distance to the nearest railway station (in kilometers):	11 Km

7.	Name of Nearest Town with Distance:	Umrala (6 km)
8.	Distance to the nearest bus station (in kilometers):	Available within village
9.	Whether village is connected to all road for the any facility or town or City?	Yes

Table 4.3.5 Geographical details

4.3.6 Demographical details of Village:-

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	2283	1136	1147	449
2.	2011	2106	1051	1055	449

Table 4.3.6 Demographical details of village

4.3.7 Occupational details:-

Name of Three Major Occupation groups in Village	1. Dharuka yuva Sangathan
	2. Jay Kalubapu Group
	3. -
Major crops grown in the village:	1. Cotton
	2. Wheat
	3. Sesame

Table 4.3.7 Occupational details

4.3.8 Agricultural details/organic farming :-

Agricultural area of Dharuka village is 13.60 Hector. 60 % workers of village are attached with agricultural activities. Village farmers are farming cotton, ground nut and wheat mainly as their crops. In recent time farmers of village are getting vision on organic farming and its techniques by young farmers by the help of local authority.

4.3.9 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses:-

Dharuka village does not have any big Manufacturing Hub but some small scale Industries like manufacturing of tools used in agriculture are produced in welding shops Of village.

4.3.10 Tourism development available in the village for attracting the Tourist

- In dharuka village there are some religion places.
- Two temple are famous in village, first is Ramapir temple and second is bhathiji temple.

4.3.11 Approved action plan of Dharuka

Approved Action Plan Report

Plan Year	State	District panchayat & equivalent	Block Panchayat & equivalent	Village Panchayat & equivalent
2020-2021	GUJARAT	BHAVNAGAR	UMRALA	DHARUKA

Plan Summary

Total Amount Alloted(in Rs.)								Total Planned Outlay(in Rs.)							
Tied				Untied				Tied				Untied			
SC	ST	General	Total	SC	ST	General	Total	SC	ST	General	Total	SC	ST	General	Total
0	0	585687	585687	0	0	617367	617367	0	0	594257	594257	0	0	594257	594257

Sectoral View

Sector	Planned Outlay							
	Scheme							
	Tied				Untied			
	SC	ST	General	Total	SC	ST	General	Total
Drinking water	0	0	294257	294257	0	0	0	0
Roads	0	0	0	0	0	0	594257	594257
Sanitation	0	0	300000	300000	0	0	0	0
Total	0	0	594257	594257	0	0	594257	594257

Scheme View

Scheme Name	Component Name	Amount Alloted	Planned Outlay

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Fig. 4.3.11 Approved Action Plan of Village

4.4 infrastructure details (with photographs)

4.4.1 Main Source of Drinking water

In Dharuka village only piped Water is Main Source OF Drinking water. Water Capacity of Underground storage tank is enough but supply at the house hold is not enough to commence daily needs, here water is supply every 4 or 5 days for nearly 15 minutes. Water can't be bored due to salinity of ground water

4.4.2 Drainage network and sanitaion facilities

In dharuka village 15 Cm Dia. Humed Pipe is used for Drainage facility, in some areas this facilities are not available.

Some of house are having W.C. / Bath facilities. There is no proper Public Toilet & Bath Blocks in the dharuka village.

4.4.3 Transportation and road network

A connecting road of other villages are all pucca roads and the other approach and internal roads are katchha in dharuka village.

4.4.4 Housing condition

In the village there is mixed type of buildings/houses like kachha and pakka makan. It contains 33% Pucca Makan and 64% Kachha Makan.

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

Village contains following infrastructure Facilities,

In the Health sector Village has no Primary health centre. Village has a Primary School of 1st to 8th standard, and it has Anganwadi building with the primary school building. But Village does not have any higher secondary school and library or community hall.

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

In this village the following infrastructure needs maintenances or new building construction,

1. Primary school needs new building/renovation.
2. Anganwadi needs new building.
3. Some of the RCC roads needs repair and maintenance work.
4. Some Internal street CC block pavement is under settlement.
5. Panchayat office building need to maintenance.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

1. Telecommunication Network and internet facilities are available and they are in good working condition.
2. Village need to build Internet cafes, common service centers and wifi.

4.4.8 Sports Activity as Gram Panchayat

Sport activities are not conducted by gram panchayat

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

This village has a pond at outside of village but does not have socio-cultural Facilities, public garden, park or other recreation facilities

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

No such facilities are available, need to construct public toilets with self-cleansing system of drainage, need to improve drainage system and the sanitation system.

4.4.11 Any other details

In village the following infrastructure need new building construction,

1. public gardens
2. Bank and ATM facilities
3. Recreation centers like sports club/video halls
4. Public library
5. Medical shop/Pharmacy

4.4.5 Electrical Concept

In Dharuka village availability of electricity is not 24x7, village has good electrical facilities present in a village.

4.5.1 Renewable energy source planning particularly for villages

Currently there are no planning or upcoming projects for village about Renewable energy source because there are lack of basic facilities available in village.

4.5.2 Irrigation Facilities

Irrigation facilities in village are inadequate due shortage of water in village.

There is urgent based need of Water supply facilities. Even drinking water in school are supplied by tankers.

4.5.3 Electricity Facilities within the Area

Yes, the village has government electricity distribution 24 x 7 hour.

4.6 Existing Institution like - Village Administration – Detail Profile

1. Public Health centres
2. ICDS (Anganwadi)
3. Primary school

4.6.1 BachatMandali

There is no Bachat Mandalis in vicinity of village.

4.6.2 DudhMandali

In this village there is already established milk co-operative society

4.6.3 Mahila forum

There is no Mahila forum in vicinity of village.

4.6.4 Plantation for the Air Pollution

There are no need of plantation for air pollution due to less vehicles in village and does not have factory which may lead to air pollution. The village having a lots trees and most the villagers are connected with the farming.

4.6.5 Rain Water Harvesting - Waste Water Recycling

We need to construct rain water harvesting to overcome the scarcity of water problems in village. And fulfil the water requirement of villagers.

4.6.6 Agricultural Development

Agricultural development in this village is at very well production, there is no need to increase yield of crop production.

4.6.7 Any Other

Main sources of income of the villagers are from;

1. Farmers
2. Labours

Chapter 5.

Technical Options with Case Studies

5.1 Concept (civil)

5.1.1 Construction-site Robots

1. The first applications of robotic technologies to the construction industry were designed in Japan during the 70's, in order to improve the quality of prefabricated elements for modular residential buildings. Since then, robots started spreading in the construction industry, slowly moving from factories to actual construction sites [1, 2, 3]. Differently from other industry fields, where the introduction of robotics technologies radically changed the way human workers operate, the construction industry has not fully experienced its "robotic revolution" yet. As a result, various operations that require high power and/or high accuracy (such as panel positioning, plumbing, material handling) are still manually performed by human workers in very inefficient and dangerous ways. Not by chance, some studies strongly suggest that productivity in the construction industry has been declining over the last decades [4] and that the conventional construction paradigm has reached its technological performance limit [5]. Even though the barriers that are preventing robots to spread within the construction industry are well known, some recently emerged trends started fostering the adoption of novel technologies. 1Arup's website: https://www.arup.com/ As far as scientific research is concerned, there is no doubt that also the robotics community has demonstrated a growing interest towards applications in the construction industry in the last 15-20 years. Not by chance, the number of scientific publications targeting construction scenarios has experienced a significant growth over the last two decades, as it is demonstrated by Figure 1. From the application point of view, these scientific publications have confronted almost every construction-related application context. Naturally, heavy-duty operations have been tackled, like for instance façade installation [6, 7, 8], forestry [9], mining [10] and generic earthworks [11, 12]. Several solutions have also been developed in order to facilitate inspection of buildings and infrastructures [13, 14, 15]. Finally, in accordance with the trends that will be introduced in the following sections, more recent contributions tackled novel application contexts like for instance realization of wooden buildings [16], interior and exterior renovation [17, 18, 19, 20], additive manufacturing [21, 22] and also decommissioning of nuclear power plants [23, 24].

On the other hand, as far as research topics are concerned, construction-related contributions have explored both consolidated and recent topics in the robotics field: inverse kinematics calculations [25, 26], control architectures [27, 28, 29], trajectory planning algorithms [30], teleoperation strategies [31, 32], Human-Machine Interfaces (HMIs) [33, 34], autonomous vision [35, 36], [37], usage of Unmanned Aerial Vehicles (UAVs) [38]. Another topic that is worth mentioning is represented by the integration with Building Information Modelling (BIM) [39, 40, 41].

Given this scenario, it is clear that both a thorough review of the state of the art of robotic technologies in the construction industry and a detailed assessment of their implementation at different stages of the construction process could be beneficial to identify future research directions and to steer future development activities. With this in mind, the authors realized a survey in order to (i) draft a detailed picture of the state of the art, (ii) identify promising application contexts from both the industry and the research point of view and (iii) underline what skilled professionals expect from robotic technology in the con- 35th International Symposium on Automation and Robotics in Construction (ISARC 2018) Figure 1. Number of publications labelled with the keywords "construction robotics" and/or "construction robot" over the last two decades. Data extracted from Google Scholar. struction

industry. In detail, the survey has been realised by submitting two distinct questionnaires to Arup's most experienced technical and business leaders. The first questionnaire aimed at defining the current

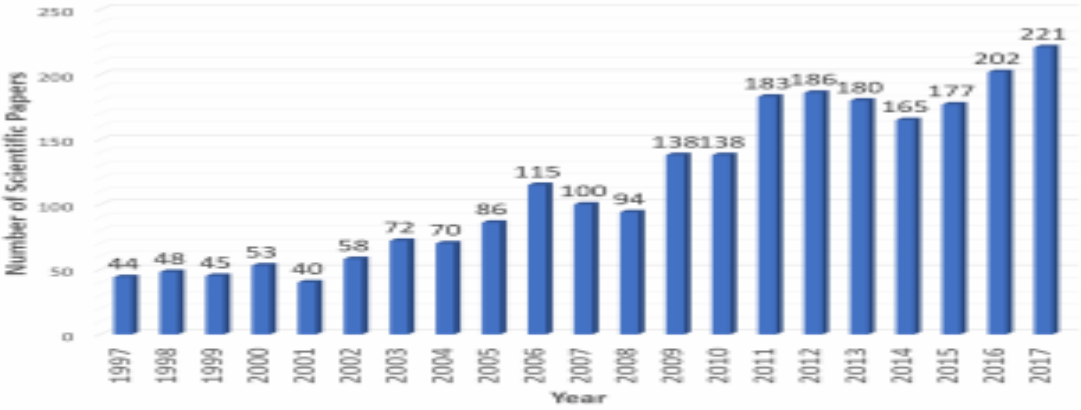


Figure 1. Number of publications labelled with the keywords "construction robotics" and/or "construction robot" over the last two decades. Data extracted from Google Scholar.

scenario, while the second one aimed at identifying possible future opportunities. This paper discusses how the questionnaires have been designed and presents the corresponding results. Section 2 deeply discusses barriers, drivers and trends that are influencing the adoption of robotic technologies in the construction industry. Then, Section 3 introduces the first survey and presents the corresponding results, while Section 4 describes the methodology and the results of the second survey. Finally, Section 5 reports some hypothesis regarding future opportunities.

2 Robotics in the Construction Industry

As mentioned before, the spreading of robotic technologies within the construction industry has historically encountered strong resistance, due to several well known barriers. Nowadays the situation is rapidly changing thanks to some recently emerged drivers that are accelerating innovation processes within the construction industry. Moreover, these drivers originated some clearly recognizable trends that are changing the way buildings are planned, built and maintained. In the remainder of this Section these barriers, drivers and trends are explained in detailed.

2.1 Barriers

The main factors that have prevented the spreading of robotic technologies in the construction industry can be listed as follows:

• **Site-related Challenges**: the inherently unstructured nature of construction sites prevents straightforward integration of robotic technologies already used in factories;

• **Sceptical Attitude:** the main stakeholders involved in the process (construction companies, clients and regulatory bodies) are characterized by a strong tendency to stick to well consolidated practices rather than to innovate and adopt novel technologies;

• **Complexity of the Supply Chain:** the number of different stakeholders and the fragmentation of the supply chain entails a strong inertia towards innovation due to extremely varying interests and needs;

• **Variety of the Markets:** regional markets have intrinsic differences (regulations, cost of materials, cost of workforce, quality requirements for products, etc.) that imply different requirements;

• **Variability of Buildings Typologies:** every building can be considered as unique due to the many differences that apply to its shape, materials, components used and locations. Consequently, flexible and easy to adapt technologies are required.

2.2 Drivers

Moving to the drivers that are fostering innovation processes within the construction, the following ones were identified:

• **Scarcity of Resources:** cost of materials traditionally used for construction purposes is increasing, while availability is decreasing;
• Urbanization: in order to build within densely populated urban areas it is necessary to rationalize the way buildings are designed and to employ compact and flexible machines in the construction process;

• **Ageing Workforce:** construction workers are rapidly ageing and technologies that can reduce physical effort and fatigue will be increasingly needed;

• **Connectivity and Convergence**: construction workers are becoming more and more used to new technologies, thus making it easier for them to adapt to the introduction of robots in their workplace;

• **Environmental Friendliness:** construction sites will need to progressively reduce polluting emissions, thus fostering the diffusion of electric powertrain systems;

• **Safety:** safety-oriented technologies will play a crucial role in reducing the number of accidents and injuries, in line with latest safety regulations. 35th International Symposium on Automation and Robotics in Construction (ISARC 2018) 2.3 Current Trends Finally, robotics-related trends that are currently gaining momentum in the construction industry include:

• **Additive Manufacturing:** 3D printing simultaneously allows to rationalize the consumption of resources and to customize products to specific needs;

• **Internet of things:** the possibility to continuously acquire and share data is enabling novel paradigms, like for instance remote control of machines and predictive maintenance;

• **Integration with BIM:** the availability of 3D and 4D (time) information models will foster robotization of construction sites by making all the design information and the data collected on-site available in real-time to construction robots. As a result, quality of planning, construction and maintenance processes will increase, while execution time will decrease;

• **Augmented an Virtual Reality:** integration of AR an VR will improve training strategies and allow effective remote operations of robots [42, 43, 44];

• **Circular Economy:** construction industry is moving from a linear consumption model (use-consumedispose) towards a circular one (use-recover-recycle). In this context automation and digitalization will act as key enablers.

3 First Survey: State of the Art for Robots in Construction

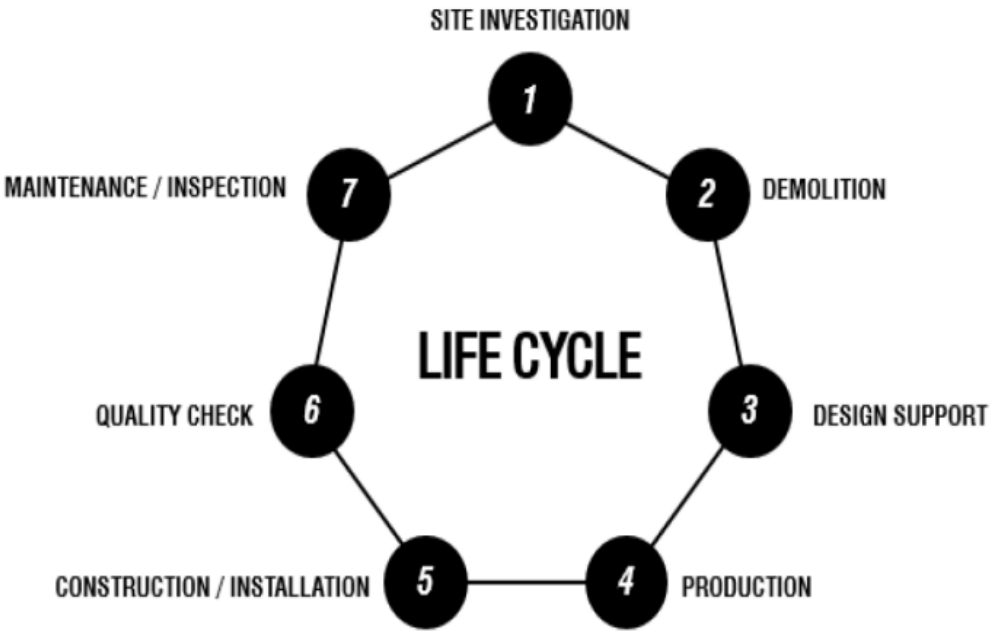
The first survey aimed at understanding the current occurrence of advanced construction machines and robots in key construction sectors, through the life-cycle of a project. To do so, a decomposition of the construction process lifecycle has been proposed, as well as six different application sectors have been prioritized for the investigation.

3.1 Construction Process Life-cycle

The default life-cycle of a construction project can be decomposed into the following main phases (see also Figure 2):

• **Site investigation:** this phase includes any action to assess the status of a construction site both for existing buildings/infrastructures and new built. It could include scanning of a building interior, inspection of basements as well as geotechnical survey;

• **Demolition:** this phase includes the set of actions needed to demolish a portion or a whole of a building/infrastructure. Might also include disassembly when possible and requested by the project; Figure 2. Construction Process Life-Cycle.



• **Design Support:** this phase includes actions to allow a more precise and actual design process, allowing the designer to know more details about any pre-existence at building/infrastructure or site level;

• **Production:** this phase includes the set of actions performed in the making at either the component or at the system level. For the purpose of this paper, we refer to production specifically for in-factory processes;

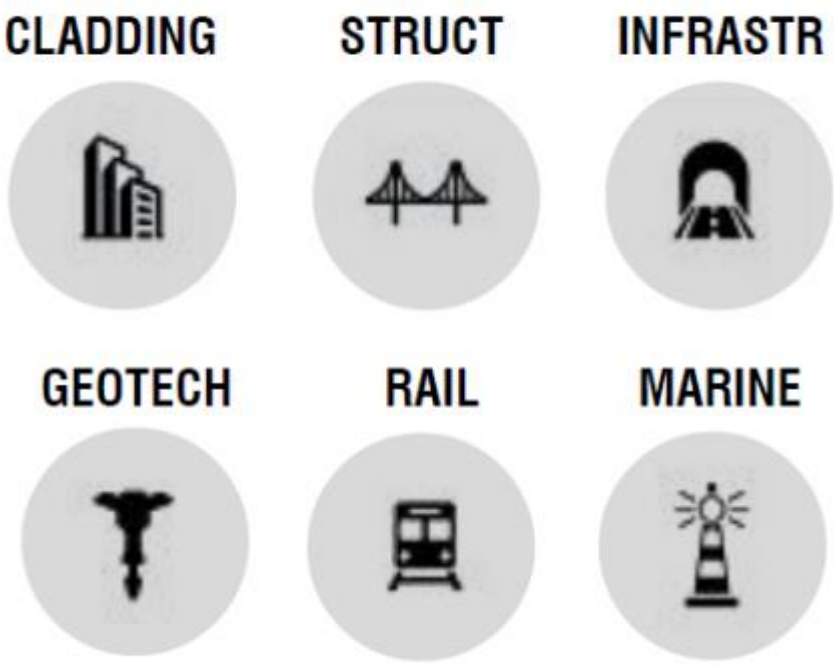
• **Construction / Installation:** this phase includes the set of actions performed during either the construction or the installation of a building/infrastructure portion or its whole. For the purpose of this paper, we refer to construction and installation referring to on-site processes;

• **Quality Check:** this phase refers to the actions performed at completion of the construction and installation process to assess the quality and the right execution of the process;

• **Maintenance / Inspection:** this phase includes the set of actions to assess the status of a building/infrastructure until its end of life. These phases are seen as the most meaningful, and those ones where a construction robot could have a significant impact.

3.2 Priority Sectors for Application

On the basis of their experience and market knowledge, Arup's experts identified a set of high priority sectors for application in construction to be investigated within the survey. As shown in Figure 3, these sectors are:

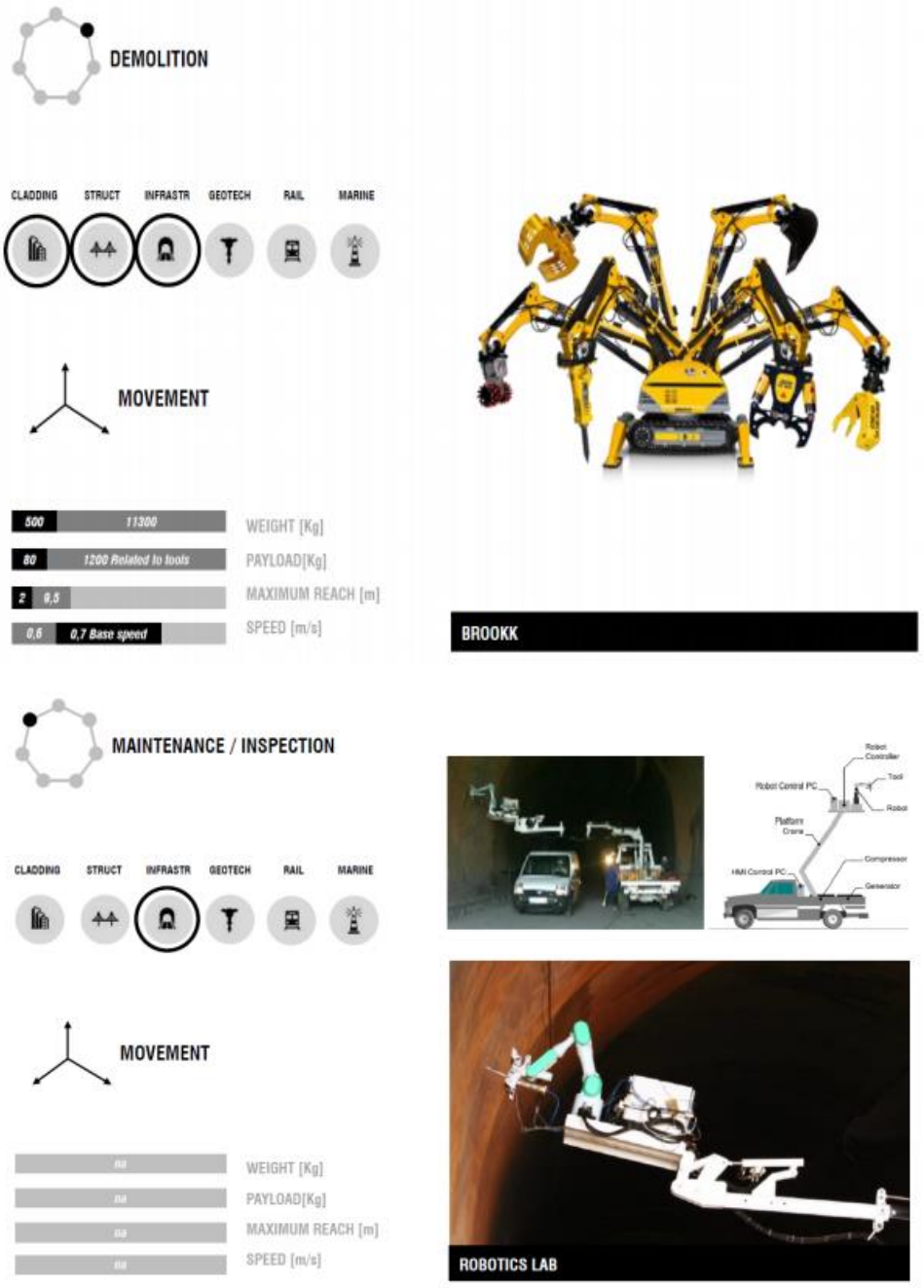


• **Building Cladding:** this sector includes all the parts (components and systems) used at the level of the building envelope being this of any size, form and complexity, from small rain-screen panels to large unitized façade panels; 35th International Symposium on Automation and Robotics in Construction (ISARC 2018) Figure 3. Priority Sectors for Application.
• **Building Structures:** this sector comprises all the parts (components and systems) used to provide adequate structural performance to a building;
• **Infrastructures:** for the purpose of present research, we considered this as the sum of the parts (components and systems) used to make a tunneling project;
• **Geotechnical Engineering:** for the purpose of present research, we considered this as the sum of the processes necessary to perform surveying and construction of underground areas or parts of a building/infrastructure;
• **Railway:** for the purpose of present research, we considered this as the sum of the parts (components and systems) used to make a railway project;
• **Marine Engineering:** for the purpose of present research, we considered this as the sum of the processes necessary to perform surveying and construction of marine and cost areas or parts of a submerged building/infrastructure.

3.3 Examples of Case Studies

In order to clarify the methodology used to conduct the survey, two distinct case studies have been reported here. The first example refers to the line of remotely operated demolition machines realized by Brokk2. Figure 4, shows some data regarding weight (500 − 1300 kg), maximum payload (80 − 1200 kg), maximum reach (2.00 − 9.50 m) and travelling speed (0.60 − 0.70 m/s) of the different machines. More interestingly, the diagram also reports the result of

the survey in terms of mapping between the specific case study and life-cycle phases (in this case only demolition), and between the machine and the corresponding sector (cladding, structural and infrastructural engineering).



2Brokk's website: http://www.brokk.com/ Figure 4. First Survey: remotely operated demolition machines produced by Brokk. Figure 5. First Survey: Tunnel inspection robot developed by Universidad Carlos III de Madrid. A different case study is described by Figure 5, where an example of tunnel inspection robot is considered. Clearly, this case study robot has been matched with the maintenance/inspection phase and with the infrastructural engineering sector.

Chapter no. 6

Swachh Bharat Abhiyan

6.1 Swatchhta needed in allocated village -Existing Situation with photograph

"Cleanliness is Godliness" is the mantra of Mahatma Gandhiji, Father of Nation. He demonstrated, propagated and insisted for individual and community cleanliness throughout his life. Following his footprints, Swachh bharat Mission campaign achieved encouraging results. This vision will be translated into action by bringing in community participation for clean toilets and integrated waste management to make Gujarat open defecation free, zero waste, dust free, plastic free and green. The objectives of the Swachh Bharat Mission are:

- To bring improvement in general quality of life in Urban and Rural areas.
- Encouraging sustainable sanitation facilities through creating awareness and health education, giving inspiration to communities and Panchayati Raj Institutions.
- Encouraging affordable and proper technology for ecological life and sustainable sanitation.
- The schools which are not covered under Sarva Siksha Abiyan be covered, to provide Anganwadi centers of rural area with proper sanitation and health facilities and provide active engagement about health education and sanitation facilities to students.
- Focusing on solid and liquid waste in Urban and Rural areas for entire cleanliness, develop environmental sanitation system being arranged by community.
- When we visit the village there is no definite place to dispose solid waste, all the villagers are disposal there solid or any house waste are dispose at the side of main road and villagers speaks that place as name of Ukarda.
- There are many sectors to see very bad condition in the cleanliness like KOlivada, Maftanagar, Plote vistar, Harijanvas, etc.
- And some sector are also seen as clean as better like Mainbajar, Madhi, Pachayat Road, Rajputana sectore, Patelsheri etc.,
- Village Headman was place one one or two persons to clean the village street, but the capacity of only two people was not arrived at all places of village.
- Principle of School was very aware subject to cleaniness, we observed the school is very clean, and atmospheric of school is very clean and fresh.

- Villagers Need one defined place to dispose solid as well liquid waste, and some awareness about cleaniness.
- On our team view we observed that not good awareness about cleanliness of villages, they need some definite place to dispose solid waste, some meetings and awareness programs about Swachhta.


fig. Existing situation in Dharuka

6.2 Guidelines - Implementation in allocated village with Photograph

The general features of Swachh Bharat Mission are given below:

- Implementation and monitoring at State level by Swachh Bharat Mission.
- Phase-wise implementation of block wise programme from 2014-15 to 2018-19.
- Determination of "Zero waste" policy in the State.
- Formation and implementing of "Public Health Bye-Laws for all cities.
- Sanitation for all
- Formation of task force for supervision of programme for all cities at City Level.
- Free health check-up of sanitation and drainage employees twice in a year.
- Planning of eco-friendly crematorium in the Municipalities.
- Ratings of cities for cleanliness to inter cities, cleanliness competition and prizes.
- Financial / technical assistance to Local Self Government bodies, training and capacity building.
- Intensive sanitation drive for first 3 Months.
- Public awareness and public participation.

- Bring about an improvement in the general quality of life in the urban areas.
- Accelerate sanitation coverage in urban areas.
- Generate felt demand for sanitation facilities though awareness creation and health education.
- Cover schools/ Anganwasis in urban areas with sanitation facilities and promote hygiene education and sanitary habits among students.
- Encourage cost effective and appropriate technologies in sanitation.
- Eliminate open defection to minimize risk of contamination of drinking water sources and food.
- Convert dry latrines to pour flush latrines, and eliminate manual scavenging practice, wherever in existence in urban areas.
- In context of above features and under Swachh Bharat Mission, following guidelines have been framed by Government of India. The guidelines are with hyperlink, so that the successors in Vishwakarma Yojana can get an advantage of directly referring the guidelines and can find the report worth reading:

No.	Title
1	Swachh Bharat Mission - Urban Guidelines
2	G.R. Pay & Use Toilet
3	G.R. Individual Toilet
4	G.R. Pay & Use Block
5	Gujarat State Urban Solid Waste Management and Sanitation Policy-2018
6	Solid Waste Management Rules 2016
7	Plastic Waste Management Rules 2016
8	Gujarat Waste Energy Policy 2016
9	Construction and Demolition Rules 2016
10	Advisory on decentralised composting
11	Bulk Waste Generator Book
12	C&D Waste Ready Reckoner
13	Waste to Wealth
14	GR Of Kailashdam
15	UD AND UHD GR DATED-20.01.2015 FOE 'OPEN DEFECATION FREE TOWNS'

Table 6.2 Guidance and training by Samities

Provide guidance and training to ensure Nigrani Samitis and similar committees include members of all castes, religions, genders and political sides. promote appropriate technology options elsewhere. Facilitate committees and villagers to appraise, analyse and plan action for swachhta. Promote Cleanliness (with attention to operation and maintenance) in schools and

anganwadis to ensure high standards, becoming role models for the areas they are in the village. Give priority to providing accessible water supplies in all seasons for better cleanliness.

6.3 Activities Done by Students for allocated village with Photograph

Because of prevailing pandemic situations of COVID-19, the team members were unable to practice any activities in the allocated village, but the team has observed various points and can recommend following practices either to be initiated or continued to be carried forward by the villagers:

- ✓ Elimination of open defecation
- ✓ Eradication of Manual Scavenging
- ✓ Adoption of Modern and Scientific methods for Solid Waste Management
- ✓ Make people aware about behavioral change regarding healthy sanitation practices including for the cases of household toilets, public toilets and communal toilet facilities
- ✓ Spreading generate awareness about sanitation and its linkage with public health
- ✓ Capacity Augmentation for local bodies to create an enabling environment for private sectors (if any)
- ✓ Comprehensive Sanitation Planning, implementation and monitorin

Fig. 6.3 (A) Dharuka Village

Fig. 6.3 (B) Dharuka Village

Chapter no. 7

Village condition due to Covid-19

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

The nation-wide lockdown imposed in India from March 25 to May 31, 2020 following the breakout of the COVID-19 pandemic affected rural India in diverse ways. This was only to be expected given the great variation in production systems and socio-economic conditions in villages across agro-ecological zones. However, the impact is differential across socio-economic classes and regions of the country, which are observed and narrated by the researchers T.S. Modak, S. Baksi and D. Johnson, which are presented below:

1. The impact on harvesting operations in the irrigated villages was limited, mainly because of the easy availability, and widespread use of combine harvesters in most of the surveyed villages. While it is too early to conclude, one can argue that the use of machines for various agricultural operations has received a thrust under the current crisis. In rainfed villages, being the lean agricultural season, the opportunities for farm employment were already restricted.

2. The major impact on agriculture, however, was in terms of access to marketing channels, and price received for the produce. In villages of Punjab and Kerala, there was active intervention by respective State governments to ensure procurement at fair prices. Such institutional mechanisms were absent in other States. The local market channel of sale through small traders and merchants had collapsed, and gravely impacted poor peasants for whom these traders were the main channel. Restricted mobility hindered access to regulated markets even for richer capitalist farmers. The disruption of the supply chain has led to a slump in the local farm harvest prices for most agricultural produce. Producers of perishable goods, particularly vegetables, were severely affected. Among them, the worst hit were poor peasants, without any access to storage facilities or procurement centers.

3. While agricultural operations were not affected much in the irrigated villages, a tendency seemingly encouraged by the lockdown is an expanded use of family labour among smaller landowners. The tendency to use family and exchange labour among poor peasants implies that the scope of agricultural wage work was lower for manual workers during the lockdown.

4. Non-agricultural work, which was crucial in the lean agricultural season, had completely collapsed. In the complete absence of non-farm employment, workers, and even artisans, were being forced to seek employment in agriculture. The reduced mobility due to the lockdown also implied that workers who otherwise regularly migrated for work were now competing for agricultural employment. As a consequence, a downward pressure on rural wage-rates was already beginning to be felt. The Covid-19 lockdown has broken down the complementary relationship between agricultural and non-agricultural work, where the surplus labour from the former was usually absorbed by the latter.

5. Despite income flows drying up for all socio-economic classes to varying degrees, the immediate impact was most severely felt by manual workers and poor peasants who did not

have any savings. With meagre cash in hand, no home produce for consumption, and lack of employment, the class of manual workers were certainly the worst affected. In addition, a major blow to the class of manual workers, and poor peasants has been the complete breakdown in receipt of remittances. The combination of low levels of income, ineffective public distribution systems, and negligible income-support had serious implications for subsistence of these households, leading to increased indebtedness especially from informal sources. The class of landlord and capitalist farmer was the least impacted by the lockdown. Better access to storage facilities and regulated markets implied that their farm incomes were relatively protected. Also, they had sufficient cash in hand and food stocks for daily household consumption.

To sum up, the Covid-19 lockdown has worsened the already prevalent distress in the Indian countryside especially for manual worker and poor peasant households. There is also a fear that if the lockdown restrictions are prolonged, crop production in the kharif season will be severely affected. Government intervention is critical to maintain a basic level of household consumption and to resume normal agricultural production.

The allocated village for the team has not been proven as a difference maker than the other and in context of above mentioned situations. Below are the steps taken in the allocated village:

- While implementation the lockdown in the village, all villagers are locked in their houses and the villagers observed some fair of Covid-19.
- The headman of village was Sprays the chemicals of Sanitation in all Sectors, also spread the flumes of Neem tree.
- Headman also aware the villagers to Cleanliness, sanitation, Social distancing etc.
- About 80% villagers are faced unemployment due to lockdown, Economically we faced the high level problems, some villagers migrants in the other towns for job.
- Headman also organized the Ukala Programs for increase body power for fight against covid-19.
- Crops of the Farmers fail due to not available storage buildings for crops storage and selling facilities during lockdown.

7.2 Activities Done by Students for allocated village with Photograph

Because of prevailing pandemic situations of COVID-19, the team members were unable to practice any activities in the allocated village, but the team has observed various points and can recommend following practices either to be initiated or continued to be carried forward by the villagers to fight against COVID-19:

- ✓ Making the villagers aware about initial preparedness through following common and specific guidelines levied by Central and State Governments time by time.
- ✓ Identifying the possibilities of development of screening facilities either at village entrance or common entrance point of either Taluka or nearby region.
- ✓ Tracing the contacts or migrants in the village.
- ✓ Testing to treatment facilities and centers in the village.
- ✓ Identifying manpower augmentation and training

- ✓ Suggesting various locations for temporary shelter homes either for isolation or for quarantine.
- ✓ Analysing post COVID-19 effects on agriculture, industry, employment and per capita income at village level.
- ✓ Simplifying administration, health-care and other local mercantile / industrial processes and strategies.
- ✓ Encouraging health workers, school teachers and aanganwadi people.

7.3 Any other steps taken by the students /villagers

As mentioned earlier, the team members found themselves unable to carry out any activities or steps because of COVID-19 Pandemic situation, but based on the village visit, following points can be suggested either as simultaneous or parallel to points suggested in above topic no. 7.2:

- ✓ Continuous contact between Gram Panchayat and District Level Control Room or Task Force for getting latest guidelines, practices and steps taken for fighting against COVID-19 Pandemic situations.
- ✓ Continuing the practice of social distancing, wearing masks and consulting health care units without shying.
- ✓ Distribution of food, fruit, dairy products, grain, vegetables, oils, petroleum products, etc. should be observed so that neither scarcity nor rush can be observed.
- ✓ Inter-village and intra-village active cases movements as well as rural to urban to and fro migration should be observed and recorded so that contact tracing can be practiced effectively.
- ✓ Awareness to governance through social media and digital platform should be practiced, which may lead less movement for various purposes.
- ✓ Making villagers aware and educated have become must, even if they are vaccinated in nearby future.

Chapter-8.

Sustainable Design Planning Proposal Part- I

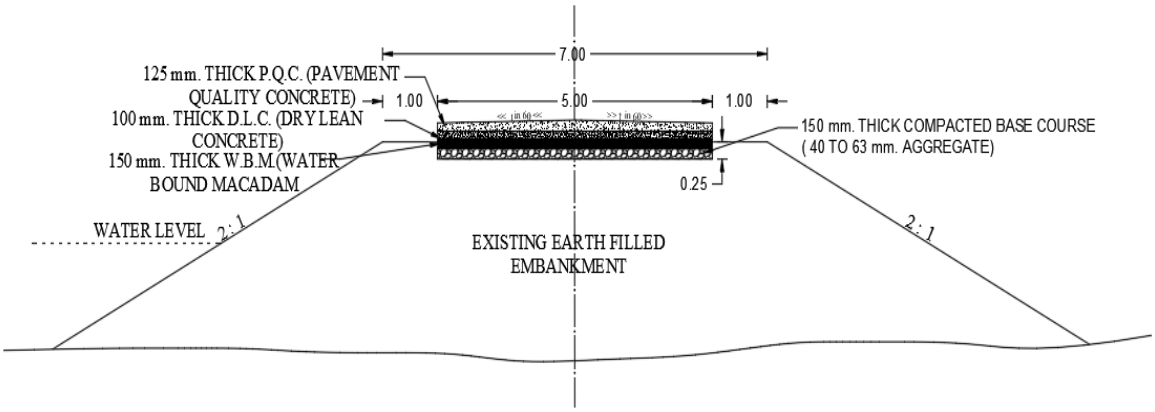
8.1Design Proposals:-

8.1.1 Sustainable Design – RCC Road

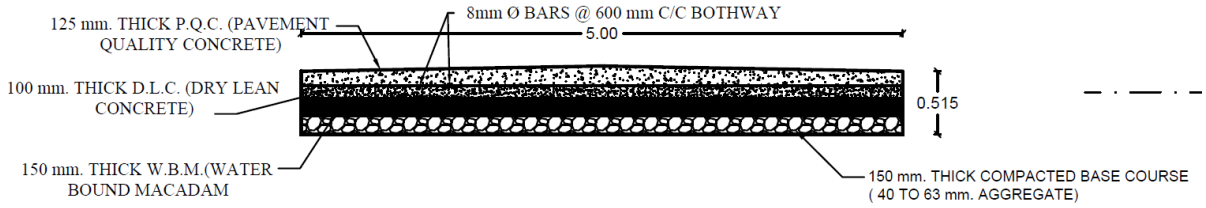
Fig.8.1.1 Existing Kachaa Road

- Name of work: construction of R.C.C. road at dharuka, sub-station to bhathiji tample
- Adopted typical cross section of R.C.C. pavement road

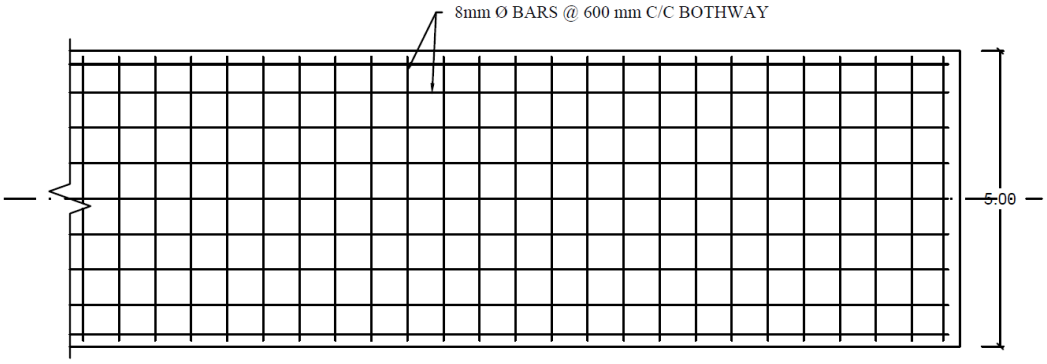
(This drawing is in N.T.S., original drawing is at the last of report)



ADOPTED TYPICAL CROSS SECTION OF R.C.C. PAVEMENT ROAD



Adopted typical cross section of R.C.C. road



PLAN SHOWING DETAILS OF REINFORCEMENT

- **ABSTRACT SHEET**

ABSTRACT SHEET					
		Estimated Cost			806587.00
Item No.	Description of Item	Qty	Rate	Per	Amount
1	Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed up to All LEAD LIFT		65.50		
	Add 1% LC		0.65		
		178.00	66.15	Cu.m.	11774.70
2	Collection carting & staking of Machine Cut Crushed Stone Aggregate of Hard Quality on road site including all taxes and royalties.....Etc. comp. (i) 40mm to 63 mm Size aggregate		602.35		

			6.02		
		116.00	608.37	Cu.m.	87605.28
3	Collection carting & staking Murrum on road site including all taxes and royalties.....Etc. comp.		204.12		
			2.04		
		29.00	206.16	Cu.m	7421.76
4	Spreading the stone aggregate for rolling and W.B.M. including filling the interstices to required camber and gradient (excluding spreading of Blind age (i) 40mm to 63 mm Size aggregate(HB)		157.00		
			1.57		
		116.00	158.57	Cu.m.	18394.12
5	Spreading blind age or road crust filling the gaps in metal and leveling to camber and gradient as directed.(i) Murrum		92.70		
			0.92		
		29.00	93.62	Cu.m.	2714.98
6	Rolling and consolidating water bound macadam (except laterite and Kankar) including watering not exceeding 150mm thickness (Main layer including binding materials) including filling in depressions which occur during the process.(B) With roller exceeding 8 tone and not exceeding 12 tone.		9.50		
			0.09		
		710.00	9.59	Smt.	6808.90
7	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- hand broken stone aggregates (40 mm) nominal size) and curing complete including cost of formwork WITH PANNEL VIBRATOR and Average 100 mm thick				
	(A) Foundation and Plinth		2321.00		
	Add LC 1%		23.21		
		71.00	2344.21	Cu.m.	166438.91
8	Providing & laying controlled cement concrete M-300 & curing complete excluding the cost of form work etc. comp. (Average 0.125m Thick)		3939.00		
	Add LC 1%		39.39		
		89.00	3978.39	Cu.m.	354076.71

9	Compaction & finishing of cement concrete surface by Trimix incl. surface vibrator, power floater , power trawler & as per instruction etc. Comp including groove cutting		78.00		
	Add LC 1%		0.78		
		710.00	78.78	Sq.m.	55933.80
10	supplying and spreading hardner on finishing surface use minimum 3.5kg/ sqmt		60.00		
	Add LC 1%		0.6		
11	8 mm. dia. HYSD main steel in road with 600 mm. c/c road		46		
	Add LC 1%		0.46		
		955.79	46.46	kg.	44406.00
		710.00	60.60	Sq.m.	43026.00
Total Amount Rs……					798601.16
Add 1% QC Rs……					7986.01
Total Amount Rs……					806587.17
Say Total Amount Rs……					806587.00

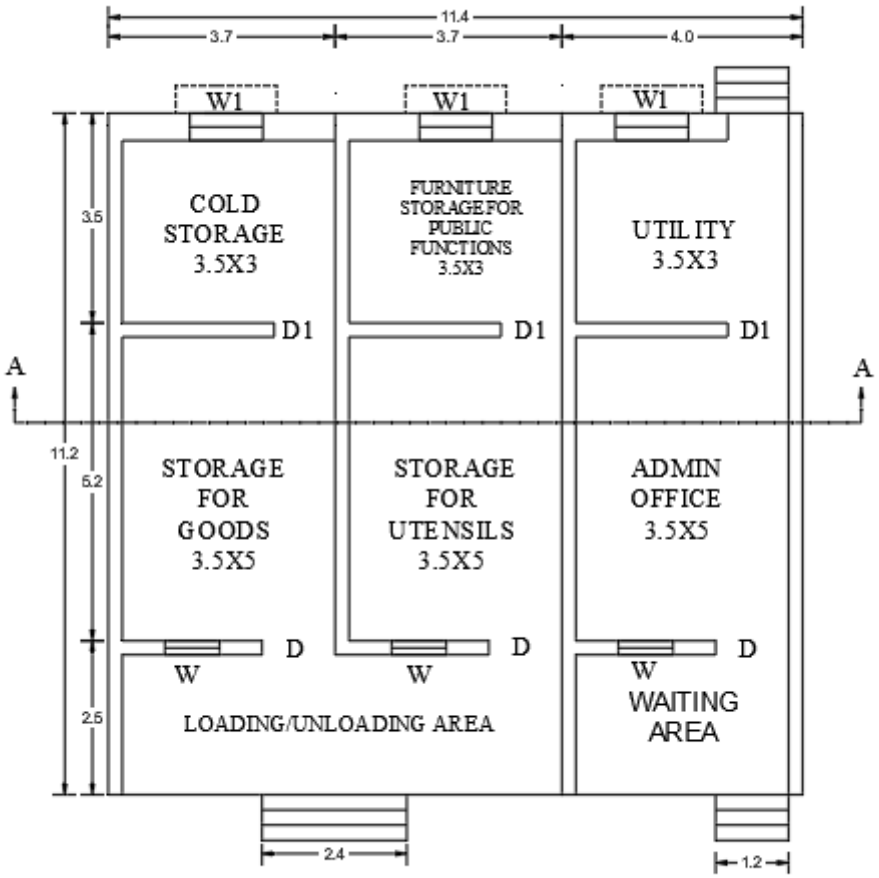
MEASUREMENT SHEET							
Item No.	**Description**	**Nos.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	Box cutting the road surface to proper slope and camber for making a base of road work including removing the excavated stuff and depositing on the road side slope as directed up to 50.0 mt lead [ch-26/ item no.8.0.]						
		1	142.00	5.00	0.25	177.50	Cumt.
		Say Total Qty.				**178.00**	Cumt.
2	Collection carting & staking of Machine Cut Crushed Stone Aggregate of Hard Quality on road site including all taxes and royalties.....Etc. comp.						
	(i) 40mm to 63 mm Size aggregate	1	142.00	5.00	0.15	106.50	
	Add 8% for Voids	1	106.50	0.08		8.52	
		Total Qty				115.02	Cumt.
		Say Total Qty.				**116.00**	Cumt.
3	Collection carting & staking Machine Cut Stone Dust on road site including all taxes and royalties.....Etc. comp.						
	Take 25% of Item No-2	1	116.00		0.25	29.00	Cumt.
		Say Total Qty.				**29.00**	Cumt.

4	Spreading the stone aggregate for rolling and W.B.M. including filling the interstices to required camber and gradient (excluding spreading of Blindage)						
	As per Item No. 2.	1	116.00			116.00	Cumt.
		Say Total Qty.				**116.00**	Cumt.
5	Spreading blindage or road crust filling the gaps in metal and leveling to camber and gradient as directed.(i) Murrum						
	As per Item No. 3	1	116.00		0.25	29.00	Cumt.
		Say Total Qty.				**29.00**	Cumt.
6	Rolling and consolidating water bound macadam (except laterite and Kankar) including watering not exceeding 150mm thickness (Main layer including binding materials) including filling in depressions which occur during the process. (B) With power roller exceeding 8 tone and not exceeding 12 tone. in 1 cmt WBM =6.66 smt						
		1	142.00	5.00		710.00	Sq.Mt
		Say Total Qty.				**710.00**	Sq.Mt
7	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- hand broken stone aggregates (40 mm) nominal size) and curing complete including cost of formwork WITH PANNEL VIBRATOR and Average 100 mm thick						
		1	142.00	5.00	0.10	71.00	Cumt.
		Say Total Qty.				**71.00**	Cumt.
8	Providing & laying controlled cement concrete M-300 & curing complete excluding the cost of form work etc. comp. Average 0.125m thick						
		1	142.00	5.00	0.125	88.75	Cumt.
		Say Total Qty.				**89.00**	Cumt.
9	Compaction & finishing of cement concrete surface by Trimix incl. surface vibrator, power floater, power trawler & as per instruction etc. Comp including groove cutting						
		1	142.00	5.00		710.00	Sq.Mt
		Say Total Qty.				**710.00**	Sq.Mt
10	supplying and spreading hardener on finishing surface use minimum 3.5kg/ sqmt (RA)						
		1	142.00	5.00		710.00	Sq.Mt
		Say Total Qty.				710.00	Sq.Mt

11	8 mm. dia. HYSD main steel in road with 600 mm. c/c road						
	length	237	4.9	0.395		458.71	kg.
	width	8	141.9	0.395		467.08	kg.
	binding wire					30	kg.
		Say Total Qty.				955.79	kg.

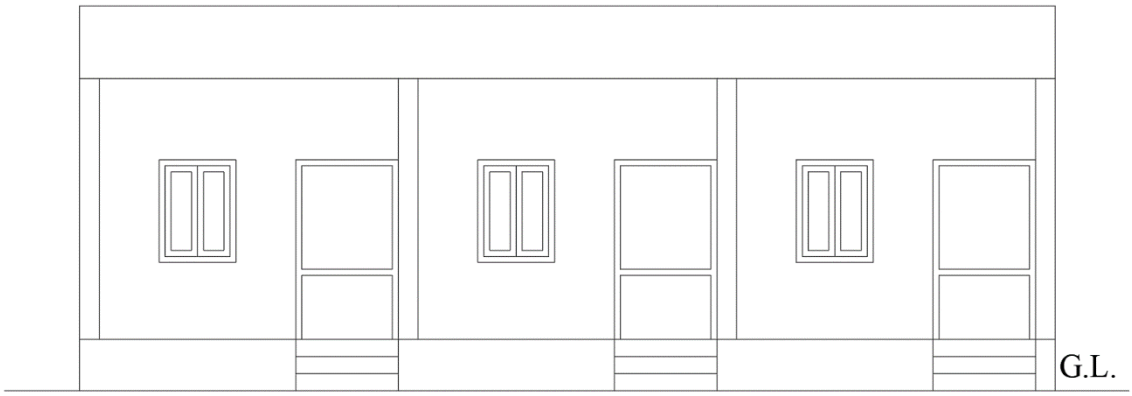
8.1.2 Storage buildings:-

- Name of work: Storage Building
- As per requirement of villagers we designed a storage building for goods, utensis, furniture and one cold storage.
- We design the storage buildings in the form of Units, each unit contain 3 storage buildings.

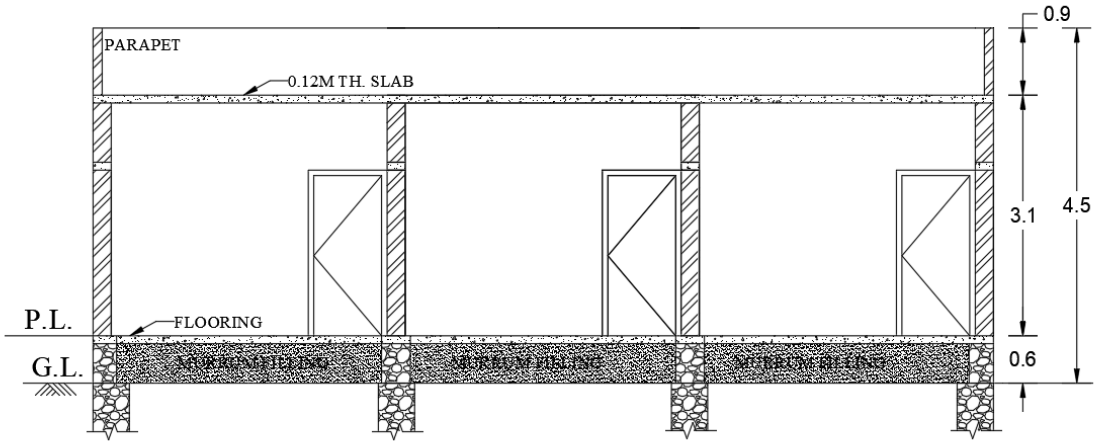


PLAN

(This drawing is in N.T.S., original drawing is at the last of report)



ELEVATION



SECTION @ A-A

Fig. 8.1.2 3D View Storage Building

- **ABSTRACT SHEET**

Estimated Cost Rs. 636403(One Unit)					
Item No.	Particulars of Item	Quantity	Per	Rate	Amount RS.
1	Excavation in Foundation	103.66m3	M3	85	8811
2	Plain cement concrete (P.C.C) in foundation and steps in 1:4:8	15.26m3	m3	3000	45780
3	Brickwork in foundation(up to GL)	36.20m3	m3	3200	1,15,840
4	Brickwork in super structure in cement mortar 1:6	80.8m3	m3	3500	2,82,800
5	RCC work in slab,Chajja (1.6 m projection) and lintel) (0.1 m bearing on wall)	16.99m3	m3	8800	149512
6	Earth filling in excavation trenches	67.12m3	m3	50	3356
				total=	Rs. 6,06,100
	ADD 2% contigencies				Rs. 12122
	ADD 2% work charged establishment				Rs. 12122
	Grand Total= Rs. 636403				Rs. 636403

Name of Work: Storage Building							
Measurement Sheet							
Item no.	Item Description	No.	L	B	H	Q	Unit
1	excavation in foundation	4	11.8	0.9	1.4	59.472	m3
	Long walls:						
	L = 3+5+2+2x0.3+2x0.15+2x0.45 = 11.8 m						

	H = 0.9+3x0.1+0.2 = 1.4m						
	Short Walls:						
	L= 3.5+2x0.15-2x0.45 = 2.9m	12	2.9	0.9	1.4	43.848	m3
	Below steps	6	1.4	0.4	0.1	0.336	m3
	L= 1.2+0.1+0.1= 1.4m						
	B = 0.3+0.3+0.1-0.3 = 0.4m						
2	Plain cement concrete (p.c.c) in foundation and steps in 1:4:8						
	Long walls:	4	11.8	0.9	0.2	8.496	
	Short Walls:	12	2.9	0.9	0.2	6.264	
	Below steps	6	1.4	0.7	0.1	0.588	
					Total=	15.348	m3
3	Brick work in foundation (up to ground level)						
	Long Walls:						
	First step: L=11.8 - 2x0.15= 11.5m	4	11.5	0.6	0.1	2.76	
	Second Step: L= 11.5 - 2x0.0.5 =11.4m	4	11.4	0.5	0.1	2.28	
	Third Step: L= 11.4- 2x0.05 = 11.3 m	4	11.3	0.4	0.1	1.808	
	Fourth Step: L= 11.3 - 2x0.015 = 11.2 m	4	11.2	0.3	0.9	12.096	
	Short Walls:						
	First step: L= 2.9+2x0.15 = 3.2m	12	3.2	0.6	0.1	2.304	
	Second Step: L=3.2 +2x0.05 = 3.3 m	12	3.3	0.5	0.1	1.98	
	Third Step: L=3.3 +2x0.05 = 3.4 m	12	3.4	0.4	0.1	1.632	
	Fourth Step : L = 3.4 + 2x0.05 = 3.5m	12	3.5	0.3	0.9	11.34	
					total=	36.2	m3
4	Brickwork in superstructure in cement mortar 1:6					0	
	Long Walls (G.L. to Plinth)	4	11.2	0.3	0.45	6.048	
	Short Walls(G.L. to plinth)	12	3.5	0.3	0.45	5.67	
	Long Walls (Plinth to	4	11.2	0.3	3	40.32	

	slab)						
	Short Walls(Plinth to slab)	9	3.5	0.3	3	28.350	
	Brick steps: Lower step	6	1.2	0.6	0.15	0.648	
	Upper step	6	1.2	0.3	0.15	0.324	
					total=		
	Parapet walls:						
	long walls: L= 11.2m	2	11.2	0.2	0.9	4.032	
	short walls: L= 3x3.5 +2x0.3+2x0.10=11.3m	2	11.3	0.2	0.9	4.068	
					total=	8.1	m3
	Deduction for Door/Windows						
	D	3	1.2	0.3	2.1	2.268	
	D1	6	1	0.3	2.1	3.78	
	W	3	1.2	0.3	1.2	1.296	
	w1	3	0.9	0.3	1.2	0.972	
					(-)	8.316	m3
	Deduction for RCC lintels:						
	Bearing= 0.1m						
	D	3	1.4	0.3	0.15	0.189	
	D1	6	1.2	0.3	0.15	0.324	
	W	3	1.4	0.3	0.15	0.189	
	W1	3	1.1	0.3	0.15	0.1485	
					(-)	0.8505	m3
	so, Net quantity= 81.86+8.10-8.31-0.85 = 80.8 m3						
5	RCC work in Slab, Chajja (0.6 m projection) and lintel (0.1m bearing on wall)						
	Slab:						
	L= 11.2m						
	B= 3x3.5 +4x0.3=11.7 m	1	11.2	11.7	0.12	15.7248	m3
	Chajja:						
	Window, W1	3	1.1	0.6	0.1	0.198	
	Door, D1	3	1.2	0.6	0.1	0.216	
	Lintels					0.85	
					total=	16.9888	

6	Earth filling in excavation trenches:						
	total excavation for walls= 59.47+ 43.85 = 103.32 m3						
	Brickwork up to G.L (deduct) =36.20 m3						
	PCC (-) =15.35m3						
	Earth filling in excavation trenches: = 51.77m3						

8.1.3 Rain water Harvesting:-

We designed a water tank for the rain water storage. And we take the roof area of above designed storage building.

- Data fined:
  - Roof area = 127.68 m^2
  - Average annual rainfall = 0.59 m
  - Runoff Coefficient = 0.85
  - Evaporation Coefficient = 0.80
  - Daily Requirements = 10 litre/capita
- Annual water harvesting potential :
  - = Area of Rooftop (m^2) x Avg. Annual Rainfall (m) x Run-off Coefficient x Coefficient of Evaporation
  - = 127.68 x 0.59 x 0.85 x 0.80
  - = 51.22 m^3
  - = 51225 litre
- The tank capacity has to be designed for dry period (the period between two consecutive rainy seasons). With monsoon extending over 4 months, the dry season is of 245 days is considered.
- Drinking water requirement for storage building for dry season
  - = 245 x 4 x 10
  - = 9800 litre
- As a safety factor, the tank should be designed 20% larger than required,
  - Quantity of water to be stored in the tank
  - = 1.20 x 9800
  - = 11760 litre
  - = 11.76 m^3
- Assume h=2.0 m So A= 5.88 m^2
  - L=3 m
  - B=2 m
- Size of Rectangular Tank = 3 x 2 x 2
  - Thus, Volume of Tank = 12 m^3

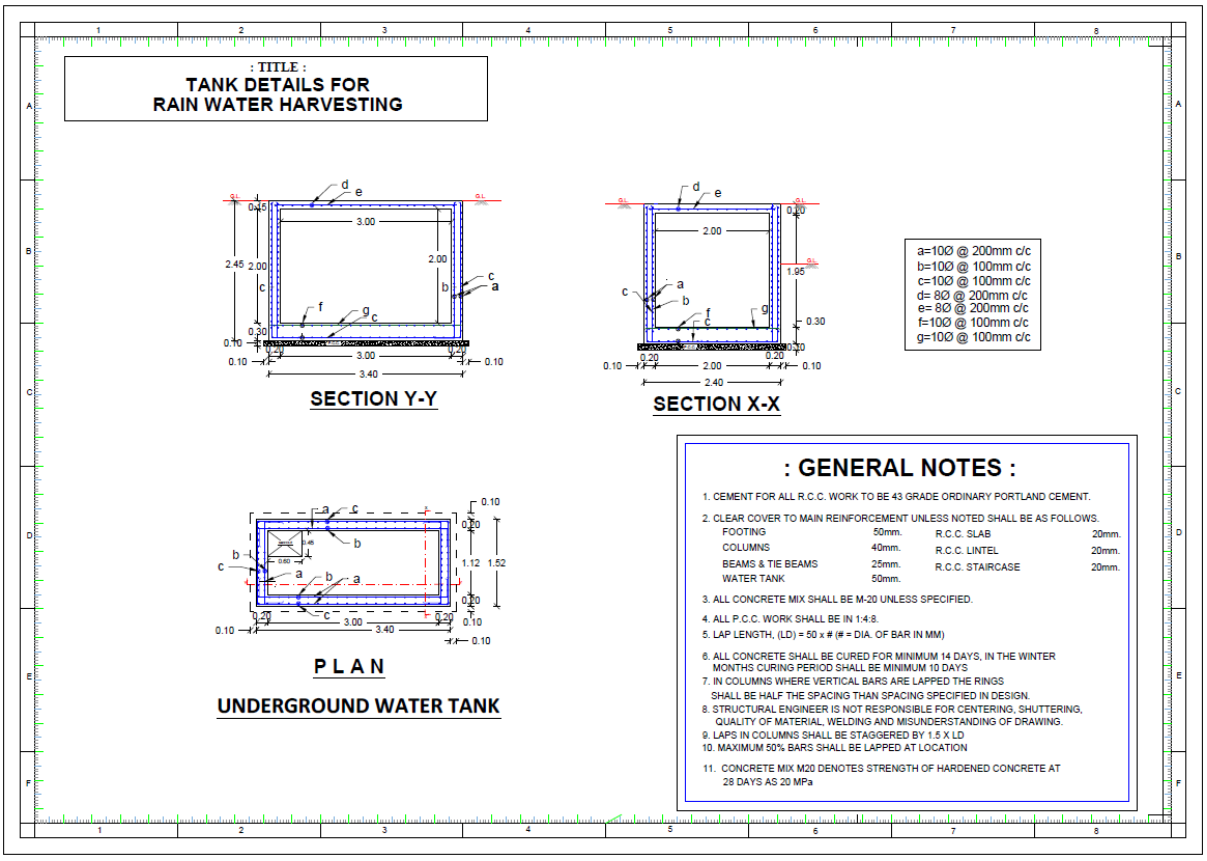
(Note: Detail drawing of underground water tank is at the last of report)

➢ Estimate of Rainwater Harvesting Storage Tank:

Sr. No.	Description of Item	No.	L	Total L	B	H	Q	Total Q
1.	Excavation	1	3.6	-	2.6	2.55	23.87	23.87
	L= 3+0.6 = 3.6 m							
	B= 2+0.6 = 2.6 m							
	H= 2 m							
2.	Concreting							
	L.W.	2	3.0	6.0	0.2	2.0	2.4 m^3	8.154 m^3
	S.W.	2	2.6	5.2	0.2	2.0	2.08 m^3	
	Top Slab	1	3.4	2.4	-	0.15	1.224 m^3	
	Bottom slab	1	3.4	2.4	-	0.30	2.45 m^3	
3.	PCC in Bottom Slab	1	3.6	-	2.6	0.10	0.94 m^3	0.94 m^3
4.	Plaster							
	L.W.	2	3.0	6.0	-	2.0	12 m^2	20 m^2
	S.W.	2	2.0	4.0	-	2.0	8 m^2	
5.	Water Proofing Cement Paint							
	L.W.	2	3.0	6.0	-	2.0	12 m^2	20 m^2
	S.W.	2	2.0	4.0	-	2.0	8 m^2	
6.	Reinforcement							
	8mm dia. Bars	30	3	-	-	0.395	35.55 kg	596.12 kg
	10mm dia. Bars	80	2.0	-	-	0.62	99.2 kg	
		160	2.3	-	-	0.62	228.16 kg	
		48	3.4	-	-	0.62	101.18 kg	
		68	2.4	-	-	0.62	101.18 kg	
	Binding wire						25 kg	

➢ Abstract Sheet

Total estimate cost 1307347.84						
Sr. No.	**Quantity**	**Unit**	**Description of Item**	**Rate**	**Per**	**Estimated Cost**
1.	23.87	m^3	Excavation	300	m^3	Rs. 7161
2.	8.154	m^3	Concreting	3940	m^3	Rs. 32126
3.	0.94	m^3	PCC	2721	m^3	Rs. 2557.74
4.	20	m^2	Plaster	117	m^2	Rs. 2340
5.	20	m^2	Water Proofing Cement Paint	37	m^2	Rs. 740
6.	596.12	Kg	Steel	46	Kg	Rs. 27421.52
Total						**Rs. 72,350**



8.1.3 Tank details for rain water harvesting

8.1.4:- Water Supply Storage and Distribution:-

➢ Design the rectangular underground water tank:-

As per the Grants and requirement of village (Dharuka) we design the rectangular water tank for capacity of 80000 L

-solution

Volume=6 X 4 X 3.35

=80400 L (> 80000 L)

Hence provide tank having size 6m x 4m x 3.5m.

Consider free board=150mm

Water depth=3.5-0.15=3.35m

$\frac{L}{B}=\frac{6}{4}=1.5 < 2$

The top portion of the wall (H-h) will be designed as continues frame.

$h = \frac{H}{4} = \frac{3.5}{4} = 0.875m < 1\ m$

Bottom 1m will be design as a cantilever.

Design constants

For M-30 concrete,

$\sigma cbc = 10\ N/mm^2$, $\sigma st = 130\ N/mm^2$

Hence,

$$m = \frac{280}{3}\sigma cbc = \frac{280}{3\ x\ 10} = 9.33$$

$$k = \frac{m\sigma cbc}{m\sigma cbc + \sigma st} = \frac{9.33\ x\ 10}{9.33\ x\ 10 + 130} = 0.418$$

$$j = 1 - \frac{k}{3} = 1 - \frac{0.418}{3} = 0.861$$

$$q = \frac{1}{2}\sigma cbc \cdot k \cdot j = \frac{1}{2}\ 10 \cdot 0.418 \cdot 0.861 = 1.80$$

Condition I:

Tank is empty and surround soil is saturated.

Pressure at depth (H-h) i.e. 2.5m from top, when outside soil saturated is,

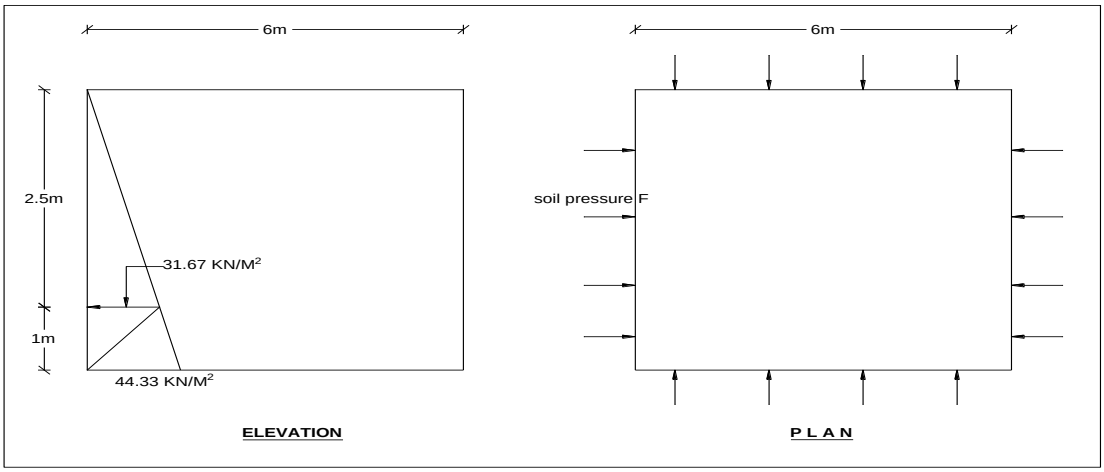
$p = Ka \cdot Y' (H-h) + Yw (H-h)$.

$= \frac{1}{3}$ x 8 x 2.5 + 10 x 2.5

$= 31.67\ KN/m^2$

Hence,

$$Ka = \frac{1-\sin 30}{1+\sin 30} = \frac{1}{3}$$



Distribution Factor (D.F.)

JOINT	MEMBER	K	∑k	Df = k/∑k
A	AB	4EI/6=0.67EI	1.67EI	0.4

	AD	4EI/4=1EI		0.6

Moment Distribution: (saving joint A)

D		A		B	
	0	0.6	0.4	0	D.F.
	-	42.22	-95.01	-	FEM
	-	31.67	21.12	-	BALANCE
	-	73.89	-73.89	-	FINAL MOMENT

B.M. @ the center of long span AB,

$= \frac{pl^2}{8}$ – Ma

$= \frac{31.67\ X\ 6^2}{8}$ - 73.89

= 68.82 KN.M.

B.M. @ the center of long span AB,

$= \frac{pb^2}{8}$ – Ma

$= \frac{31.67\ X\ 4^2}{8}$ - 73.89

= -37.66 KN.M.

Direct compression in long wall = p x B/2

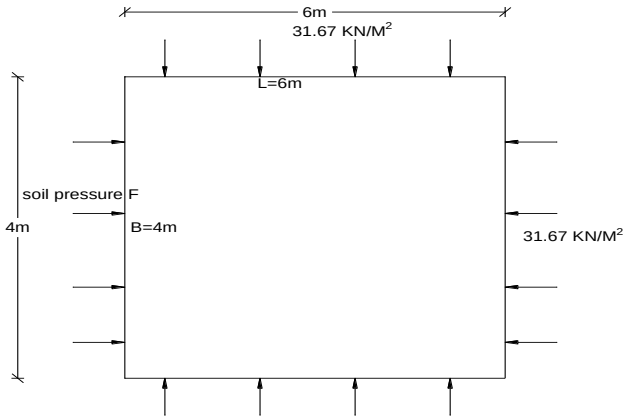
= 31.67 x 4/2

= 63.34 KN.M.

Direct compression in long wall = p x L/2

= 31.67 x 6/2

= 95.01 KN.M.



(A) Design of Long wall :

(i) At support:

M = 73.89 KN.M.

C= 63.34 KN.M.

M= q bd^2

73.89 x 10^6 = 1.80 x 1000 x d^2

d = 202.6 mm

d (Adopted) = 250mm

Hence,

D = 250 + 50

= 300 mm

Ast for moment = $\frac{m}{\sigma st \cdot j \cdot d}$

= $\frac{73.83}{130 \text{ x } 0.861 \text{ x } 250}$

= 2640.58 mm^2

Provide 20 mm dia. At 110 mm c/c (Ast = 2856 mm^2)

Check for comparison:

Max. comp. stress = $\frac{63.34 \text{ x } 10^3}{1000 \text{ x } 500}$ = 0.127 N/mm^2

For M-30, σa = 8 N/mm^2

0.127 N/mm^2 < 8 N/mm^2……ok.

Distribution steel :

Min. Ast = 380 mm^2

Ast on each face = 360 mm^2

Therefore provide 10mm dia. @ 210mm C/C on each face in vertical direction.

(ii) At center :

M = 68.62 KN.m

C = 63.34 KN (compressive)

Tension occurs at the inner face.

x = d-150 = 250 – 150 = 100 mm

Modified moment

= 68.62 – Cxx

= 68.62 – 63.34 x 0.10

= 62.28 KN.m.

Ast for moment = $\frac{m}{\sigma st \cdot j \cdot d}$

$= \frac{62.28\ x\ 10^6}{130 \text{ x } 0.80 \text{ x } 250}$

= 2226 mm^2

Total Ast required at mid span = 2226 mm^2/m height.

Provide 20 mm at 140 mm c/c, on liquid face in horizontal direction.

Hence,

(Ast = 2244 mm^2)

(B) Design of short walls:

(i) At support :

M = 73.89 KN.m.

C = 95.01 KN (compression on long walls)

Provide 20 mm dia. At 180 mm C/C at support in horizontal direction on remote face (Ast = 2850mm^2)

Distribution steel:-

Min Ast = 360 mm^2

Provide 10 mm dia. at 210 mm C/C (374mm^2) on each face in vertical direction. Face in vertical direction.

(ii) At support :

M = 31.66 KN.m.

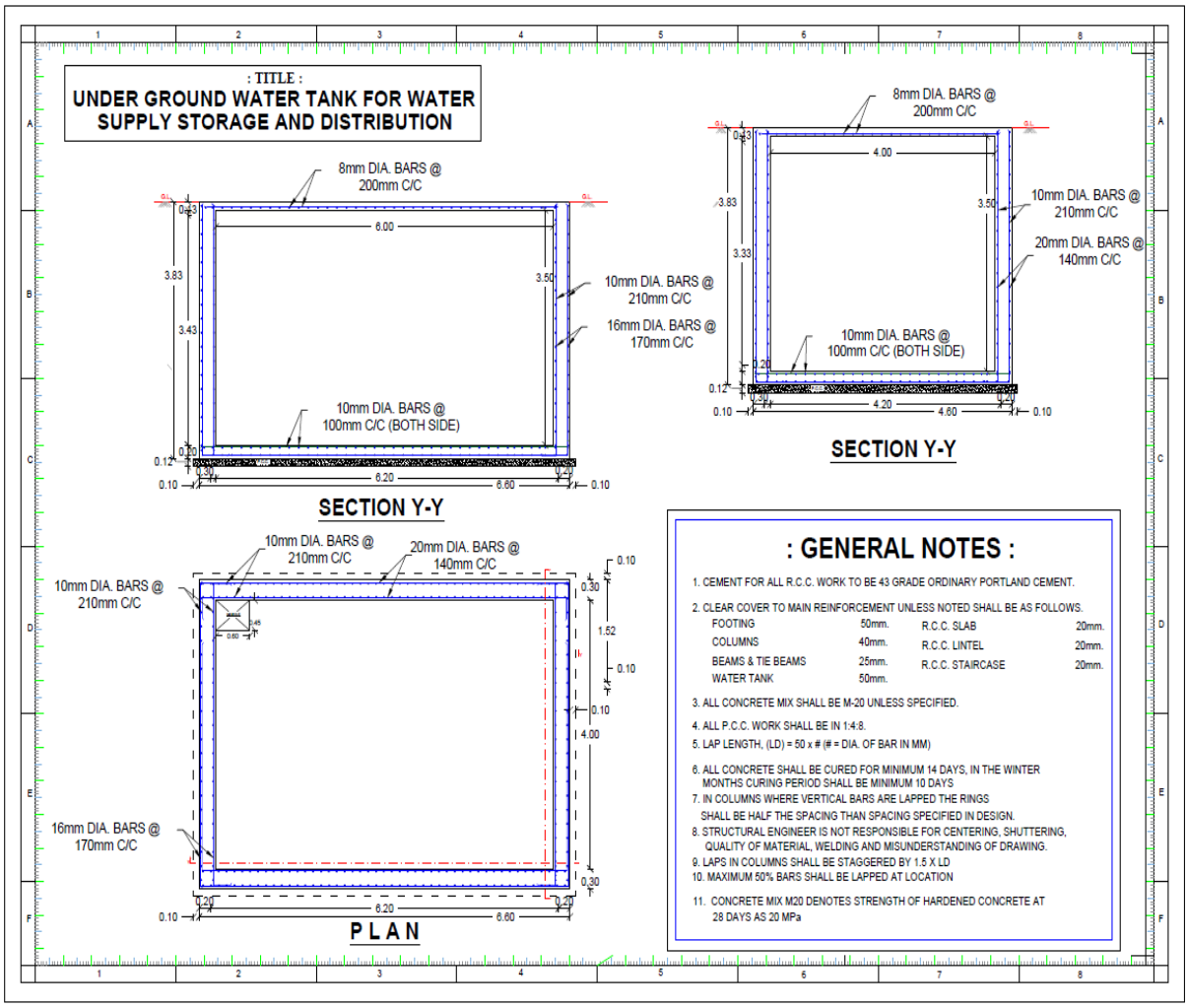
C = 95.01 KN (tension on face)

Ast required = $\frac{31.66\ x\ 10^6}{130 \text{ x } 0.861 \text{ x } 250}$

= 1131.42 mm^2

Total Ast required = 1131.42 mm^2

Provide 16 mm dia. At 170 mm C/C (Ast = 1183mm^2) (on horizontal face).



➢ MEASUREMENT SHEET:-

Item no.	Item description	No.	L	B	H	Q	Unit
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas,as directed by Engineer-in-Charge. (6 x 4 x 3.5) extra cutting in the sides of length and breath and height (6.5 x 4.5x 3.67)	1	6.5	4.5	3.67	107.3475	m3
2	PCC at bottom in 12cm Depth	1	6	4	0.12	2.88	m3
3	Rcc Slab at the Bottom of the water tank	1	6	4	0.2	4.8	m3

4	Rcc wall Up to the ground level in all four sides	1	20	0.3	3.5	21	m3
5	Slab on top of the tank	1	6	4	0.125	3	m3
6	Tiles work in the inner face of water tanks	1	20	-	3.5	70	m2
7	Tiles Work at the bottom of the water tank	1	6	4	-	24	m2
8	2 HP open well pump ISI marked with all accessories i.e. starter panel, Volta meter, amp. Meter, required length and size of cable suitable for pump etc all labour and material required	1				1	nos.
9	Providing and fixing 1.25 mm thick MS sheet cover heisted on MS angle 40 X 40 X 5 mm cover frame	1				1	nos.

- **ABSTRACT SHEET:-**

ESTIMATED COST:- 229133.8					
NO	PARTICULARS	Q	Rate	Unit	Amount Rs.
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas, as directed by Engineer-in-Charge. (6 x 4 x 3.5) extra cutting in the sides of length and breadth and height (6.5 x 4.5x 3.67)	107.35	230	Cum	24690.5
2	Disposal of surplus excavated earth/soil (as received from excavation of foundation including all work	107.35	135	Cum	14492.25
3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete up to ground level	1954	55	kg	107470
4	Cantering and Shuttering including strutting, propping, slab etc. and removal of form	168.86	280	m	47561

5	1 HP open well pump ISI marked with all accessories i.e. starter panel, Volta meter, amp. Meter, required length and size of cable suitable for pump etc all labour and material required	1	18000	each	18000
6	Providing and fixing 1.25 mm thick MS sheet cover heisted on MS angle 40 X 40 X 5 mm cover frame	2	1500	each	3000
7	Tiles work in the inner face of water tanks(145 Rs. per m2 including all material and labour cost) take 20% extra tiles	96	145	m2	13920
			total cost Rs.		229133.8

8.1.5:- Sewerage system in Mafatnagar of Dharuka:-

DRAINAGE SYSTEM:

NOTE: - Due to worst condition of covid-19 pandemic we don't carried out profile levelling at Mafatnagar area of the Dharuka village. And we were not permitted from the collage to carry out survey. Hence we have not mentioned profile levelling details.

In Mafatnagar of dharuka area there is no drainage system is provided. So it caused many problem related to sanitation and health and aesthetic appearance. So good drainage system is needed to be develop in the village of good sanitation.

There are Main 3 advantages of drainage system are……

- **Prevents Water Accumulation:**

Drainage systems can prevent water accumulation that can lead to flooding by directing the water away from your home. Water that over-accumulates in your yard may kill plants. Drainage systems also prevent the accumulation of stagnant water, which can encourage mosquitoes to breed.

- **Reduces Soil Erosion:**

Over time, stagnant water accumulated can make soil muddy, which in turn can cause soil to erode. Drainage systems maintain balanced moisture in your garden to reduce soil erosion.

- **Removes Toxic Materials and Disease Organisms:**

Continuous, heavy rains may cause the water to rise, which can lead to flash floods, especially when you live near a big body of water. Often these flash floods bring contaminated water into your soil. Drainage systems can remove these toxic materials by draining them away from your yard.

- **Drainage system with reference to the dharuka village :-**

First step to we conducted for sanitary facilities is to collect data like profile levelling of that area, its old sanitary facility, available fund to construct sewerage system. Profile levelling was we collect at the one surveyor company whose conduced many surveys in the village.

As per NBC code in rural area 70 to 100 lpcd are supplied for various purpose. Now we assume 70 % total waste water generated from supplied water.

Following figure shows number of houses per street and we assumed average 5 household per house. The black line representing the direction of main sewer line based on RL of the Points.

Calculation the total sewage discharge conduct the pipeline:-

Total number of house hold at the mafatnagar area point is 283.

So, total population of it= 283*5=1415

Now we predict the future population by geometric increase method…. Growth rate=17.28

P2021= 1415(1+17.28/100) = 1660

Now take extra 5 % for commercial shops and other common facilities like schools, hospitals etc.

Total population=1660+83=1743

Now take 100 lpcd supply in the village as per NBC code. And total 70 % of it is generated as waste water.

Amount of water=1743*70=122010 lpcd = 0.0239 M^3 /S

Assume velocity=0.7 M/S Q=VA A=0.0239/0.7=0.034125 M^2

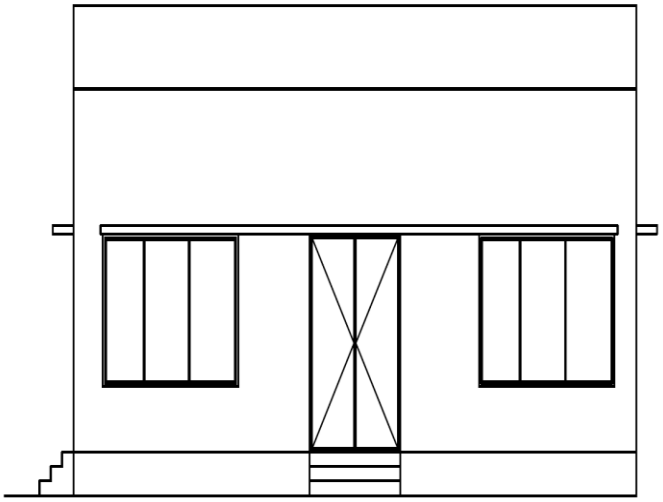
D=20.84 cm for circular pipe.

So provide main pipe of 30 cm diameter…

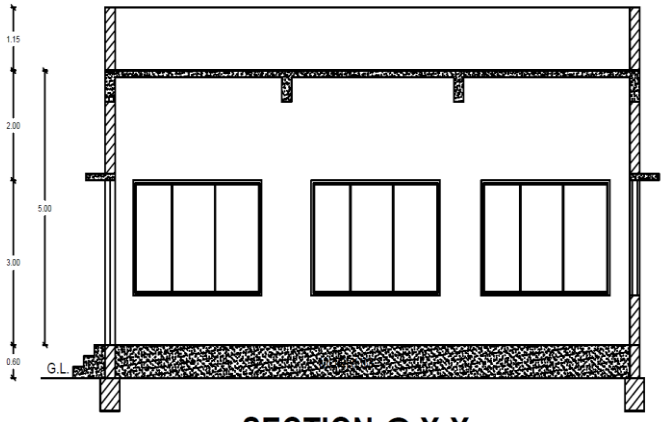
(Due to not availability of profile levelling data we designed only diameter of pipe.)

8.1.6 Recreation center (design of indoor games building)

Recreation is an activity of leisure, leisure being discretionary time.[1] The "need to do something for recreation" is an essential element of human biology and psychology. Recreational activities are often done for enjoyment, amusement, or pleasure and are considered to be "fun".
In the allocated village of dharuka there is only indoor games centre is required for enjoyment, amusement, or something for recreation.We provide the one recreation room of size 12 x 12 m in our village.



ELEVATION



SECTION @ X-X

PLAN

Fig. 8.1.6 3D View of Recreation Centre

- **Measurement sheet:-**

SR. NO.	DISCRIPTION	NOS.	Length	Width	Depth	Total	Unit
1	Excavation For Foundation In Ordinary Soil.						
	For One Column = 1x1x1.20	12	1.00	1.00	1.20	14.40	cu.mt.
	Provide One Column At Every 4 M Interval						
2	P.C.C. In Foundation	12	1.00	1.00	0.10	1.20	cu.mt.
3	Brick Masonry						
	Plinth	1	36.92	0.23	0.60	5.09	cu.mt.
	C.L. Length=36.92mt.						
	Net C/L Length=C.L-(1/5)Xwxnos.Junction						
	Net C/L Length=36.92-(1/5)X0.23x0 = 36.92						
	Width Of Wall= 0.23mt.						
	Height=0.6mt						

	Ground Floor	1	36.92	0.23	5.00	42.46	cu.mt.
	C.L. Length=36.92mt.						
	Width Of Wall= 0.23mt.						
	Height=5						
			total brick masonry			47.55	cu.mt.
	Deduction						
	D1	1	2.00	0.23	3.00	1.38	cu.mt.
	D2	1	1.80	0.23	3.00	1.24	cu.mt.
	D3	1	1.50	0.23	3.00	1.04	cu.mt.
	W1	12	3.00	0.23	2.10	17.39	cu.mt.
			total deduction			21.05	cu.mt.
			Net brick masonry			26.51	cu.mt.
4	R.C.C. Footing Concrete						
	1)Footing Without Slope		1.80	1.50	0.30	0.81	cu.mt.
	2)Footing With Slope						
	A1 = 1.8X1.5 =2.70 Mt.Sq.						
	A2 = 0.230X0.345 = 0.08 Mt.Sq.						
	H=0.75mt.						
	Vol. Of Sloping Portion					1.44	cu.mt.
	Total	12	total vol.	2.25	cu.mt.	27.00	cu.mt.
5	R.C.C. dowels Concrete	12	0.23	0.35	1.80	1.71	cu.mt.
6	R.C.C. Plinth Beam Concrete	1	36.92	0.23	0.45	3.82	cu.mt.
	For Indoor Games Room						
	Width Of Beam= 0.23mt.						
	Height=0.45mt						

7	R.C.C. Column Concrete	12	0.23	0.35	7.40	7.05	cu.mt.
	Nos. Of Column=12						
	Width=0.230						
	Depth=0.345						
8	Lintel / Chajja Concrete	1	20.05		0.10	2.01	cu.mt.
	For Indoor Games Room						
	Area Of Hatch In Lintel Lvl. Layout Plan						
	Total=40.01sq.Mt.						
	Width Of Beam= 0.23mt.						
	Height=0.45mt						
9	Slab Concrete						
	Beam	1	45.45	0.20	0.35	3.14	cu.mt.
	For Indoor Games Rooms						
	Width Of Beam= 0.23mt.						
	Height=0.345mt						
	Slab	1	50.40		0.13	6.30	cu.mt.
	Area Of Slab=12.6x12.6						
	Total Concert Work In Footing					27.00	cu.mt.
	Total Concrete Work In Columns					10.87	cu.mt.
13	Murum Filling In Plinth						
	Indoor Games Room	1	12.00	12.00	0.60	86.40	cu.mt.
			Total filling			86.40	cu.mt.
14	P.C.C At Plinth Level						
	Indoor Games Room	1	12.60	12.60	0.10	15.88	cu.mt.
			Total			15.88	cu.mt.

15	D.P.C. On Plinth Beam						
	C.L. Length=36.92mt.	1	36.92	0.23		8.49	sq.mt.
	Width Of Wall= 0.23mt.						
	Height=0.07mt						
16	Sill Work						
	Sill Work On Chajjas						
	D1	1	2.00	1.46		2.92	sq.mt.
	D2	1	1.80	0.45		0.81	sq.mt.
	D3	1	1.50	0.45		0.68	sq.mt.
	Wash Area Top Design	2	2.00	0.23		0.92	sq.mt.
		1	1.88	0.23		0.43	sq.mt.
	W1	4	1.96	0.45		3.53	sq.mt.
	W2	1	1.62	0.45		0.73	sq.mt.
	W4	8	1.06	0.45		3.82	sq.mt.
	Balcony	2	1.93	0.30		1.16	sq.mt.
		2	3.16	0.30		1.90	sq.mt.
	Sill Work On Windows Bottom						
	W1	12	3.00	0.07		2.52	sq.mt.
			Total sill work			19.40	sq.mt.
17	Internal Plaster						
	Internal Plaster	4	12.00		5.00	240.00	sq.mt.
		2	3.86		2.95	22.77	sq.mt.
	Ceiling	1	12.00	12.00		144.00	sq.mt.
	Total Internal Plaster					406.77	sq.mt.
18	External Plaster						
	Plinth Plaster	1	3.65		0.60	2.19	sq.mt.
		1	1.23		0.60	0.74	sq.mt.

		1	3.16		0.60	1.90	sq.mt.
		1	7.02		0.60	4.21	sq.mt.
		1	7.00		0.60	4.20	sq.mt.
	External Plaster	1	3.65		3.05	11.13	sq.mt.
		1	1.23		3.05	3.75	sq.mt.
		1	3.16		3.05	9.64	sq.mt.
		1	7.02		3.05	21.41	sq.mt.
		1	7.00		3.05	21.35	sq.mt.
	Total External Plaster					80.52	sq.mt.
	For Both Side Plaster Is Same So The Deduction Will Be Calculated Only One Side						
	Deduction						
	D1	1	1.00		2.10	2.10	sq.mt.
	D2	5	0.90		2.10	9.45	sq.mt.
	D3	5	0.75		2.10	7.88	sq.mt.
	W1	4	1.50		1.30	7.80	sq.mt.
	Total Deduction					27.23	sq.mt.
	Net External Plaster					53.29	sq.mt.

- **Abstract sheet**:

SR.NO.	DISCRIPTION	Q	PER	RATE	PER	RS.
1	Excavation For Foundation Up To 1.5 M Depth Including Excavation For Foundation Up To 1.5 M Depth.	70.45	CU.MT.	300.00	CU.MT.	Rs 21,135.00
2	PCC : Providing And Laying Cement Concrete 1:3:6 (1-Cement : 3-Coarse Sand : 6-Hand Broken Stone Aggregates 40mm Nominal Size) And Curing Complete Excluding Cost Of Formwork In Foundation And Plinth (Up to 10 Ton)	3.57	CU.MT.	2255.00	CU.MT.	Rs 8,050.35

3	Footing: Providing And Laying Ordinary Cement Concrete 1:2:4 (1-Cement 2- Coarse Sand : 4- Graded Stone Aggregates 20 Mm Nominal Size) Exposed Work With Curing Etc.	14.28	CU.MT.	3800.00	CU.MT.	Rs 54,264.00
4	Columns : Providing And Laying Ordinary Cement Concrete M-20 Grade Finishing Smooth With Curing Etc. Complete Including The Cost Of Formwork But Excluding The Cost Of Reinforcement.	10.00	CU.MT.	4200.00	CU.MT.	Rs 42,000.00
5	Beams : Providing And Laying Ordinary Cement Concrete M-20 Grade Finishing Smooth With Curing Etc. Complete Including The Cost Of Formwork But Excluding The Cost Of Reinforcement Rcc Work.	10.98	CU.MT.	4200.00	CU.MT.	Rs 46,116.00
7	Slab: Providing And Laying Ordinary Cement Concrete 1:2:4 (1-Cement 2- Coarse Sand : 4- Graded Stone Aggregates 20 Mm Nominal Size) Exposed Work With Curing Etc. Complete Including The Cost Of Formwork But Excluding The Cost Of Reinforcement For R.C.C Work.	9.87	CU.MT.	4964.00	CU.MT.	Rs 48,994.68
8	Providing Mild Steel Reinforcement For Rcc Work Including Bending, Binding And Placing In Position Complete Up to Floor Two Level, Incl. Anti-Corrosive Treatment.	930.77	Kg	43.00	Kg	Rs 40,023.11
9	Providing H.Y.S.D. For Reinforcement For Rcc Work Including Bending, Binding And Placing In Position Concrete Up to Floor Two Level, Incl. Anti-Corrosive Treatment.	2000.00	Kg	50.00	kg	Rs 100,000.00
10	Total Brick Work	47.90		3000.0	CU.MT	Rs

				0	.	143,700.00
11	INTERNAL PLASTER: Providing 15mm Thick Cement Plaster In Single Coat On Rough (Similar)Side.	206.66	SQ.MT.	117.00	SQ.MT.	Rs 24,179.22
12	External: 20 Mm Thick Sand Faced Cement Plaster On Walls. At All Heights Above Ground Level Consisting Of 12 Mm Thick Backing Coat Of C.M. 1:3 (1 Cement : 3 Sand) And 8 Mm Thick Finishing Coat Of C.M. 1:1 (1 Cement : 1 Sand) Etc. Complete.	137.55	SQ.MT.	150.00	SQ.MT.	Rs 20,632.50
17	Providing And Fixing 35 Mm Thick Shutters For Doors, Windows And Clear Story Windows	61.24	SQ.MT.	2267.00	SQ.MT.	Rs 138,831.08
	TOTAL					Rs 687,925.94

8.2 Reason/benefits for Students Recommending this Design

Sr.no	Design	Reason for Students Recommending this Design
1.	RCC road(Bhathiji mandir to Sapteshan)	As existing road is kucha type makes it difficult for transportation in rainy season
2.	Rain water harvesting	In summer season, these is scarcity of water, so nullity this problem rain water harvesting is provided
3.	Water supply and storage facilities	Panchayat required the storage tank for the storage of municipality supplied water.
4.	Storage building	Storage bulding is required by villagers to store appliances of the different cast of villagers
5.	Recreation building(indoor game room)	To provide indoor games facilities in the village to make young generation knowledge full, skillfull and generate new skill by young generation in sports activities.
6.	Sewerage system on Mafatnagar of Dharuka	In the mafatnagat there is required to disposal facilities of sewage, so we suggest and design the pipeline system in the Mafatnagar.

Table 8.2 Reason/ benefits for students recommending this design

Chapter-9

Proposing designs for Future Development of the Village for the Part-II Design:-

Through our study we will try to planning and designing might be including provisions of all the facilities suggest by us, then we focus on the improvement in the existing facilities. Our aim is to work according to new upcoming T.P. scheme in Dharuka village.

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

As Per the requirement and future development of the village we are trying to proposing the designs are as belows:-

- Short height retaining wall (average length 500m)
- Bituminous road near bridge
- Washing Ghat at mafatnagar
- For Washing ghat, surface circular water tank
- Army training centre near School
- Large sports ground
- Rcc in the main bajar
- Aarogya Kendra

This all amenities may stop migration from the village towards the urban area.

By performing this project we are able to reduce the pressure on the urban area. As well as this amenities are very much helpful for overall development of the village.

Chapter-10
Conclusion of the Entire Village Activities of the Project:-

The project work started with the basic data collection, survey work and it progressed through meeting with headman, Talati-cum-Mantrishri and Principal of the existing school. The gap analysis was later framed and 6 various design problems were identified. The proposed solutions are framed in such a way that the village can enhance the overall physical, social and educational conditions of villagers and can promise the sustainable growth of the village in context to the Bhavnagar City, in which the village falls.

The concluding remarks of the project in the form of team details, problem definition and designed solutions are as follows:

Village and Team Details					
Village name:	**Team details:**	**(1) Enrollment No.:**	**180213106011**	**(1) Name**	**PARAMAR PANKAJ**
Dharuka		**(2) Enrollment No.:**	**180213106017**	**(2) Name**	**BHAUTIK VALA**

Problem Definition and Design Details			
Sr. No.	**Problem Definition**	**Capacity (mention unit)**	**Estimated cost (in Rs.)**
Design - 1	**Sustainable Design Rcc Road**	**142 m**	**806587**
Design - 2	**Storage Building**	**101.25 m^2 (carpet area)/unit**	**636403**
Design - 3	**Rain water harvesting**	**11760 litre**	**72,350**
Design - 4	**water supply storage and distribution**	**80000 litre**	**229133.8**
Design - 5	**sewerage system in mafatnagar of dharuka**	**70 lpcd**	**200000**
Design - 6	**recreation center**	**144 m^2 (carpet area)**	**687,925.94**

Table 10 Problem definition and design details

It is truly believed by the project team that if the above mentioned design solutions are implemented then the village can replicate the basic facilities of nearby city and be able to lessen the migration from the village to nearest or other cities. The growth of the village can be enhanced and the prosperity as well as living conditions of the people can be well-furnished in a controlled way, such that it can fulfill the dream of father of our nation, Shri Mohandas Karamchand Gandhiji that "*The true India lives in the village.*"

Chapter-11 References referred for this project:-

Our references consist of both physical and online references. As for physical we had visited the village interacting with people there and collecting the data.

- UDPFI Guidelines
- Schedule of rates
- Google maps
- Urban and Regional development plans formulation & implementation guidelines, 2014, by Urban development ministry, central govt. of india.
- RCC road design Guidelines by IRC
- Building planning and drawing by Dr. N. Kumara Swamy & A. Kameshwara Rao, Charotar Publication.

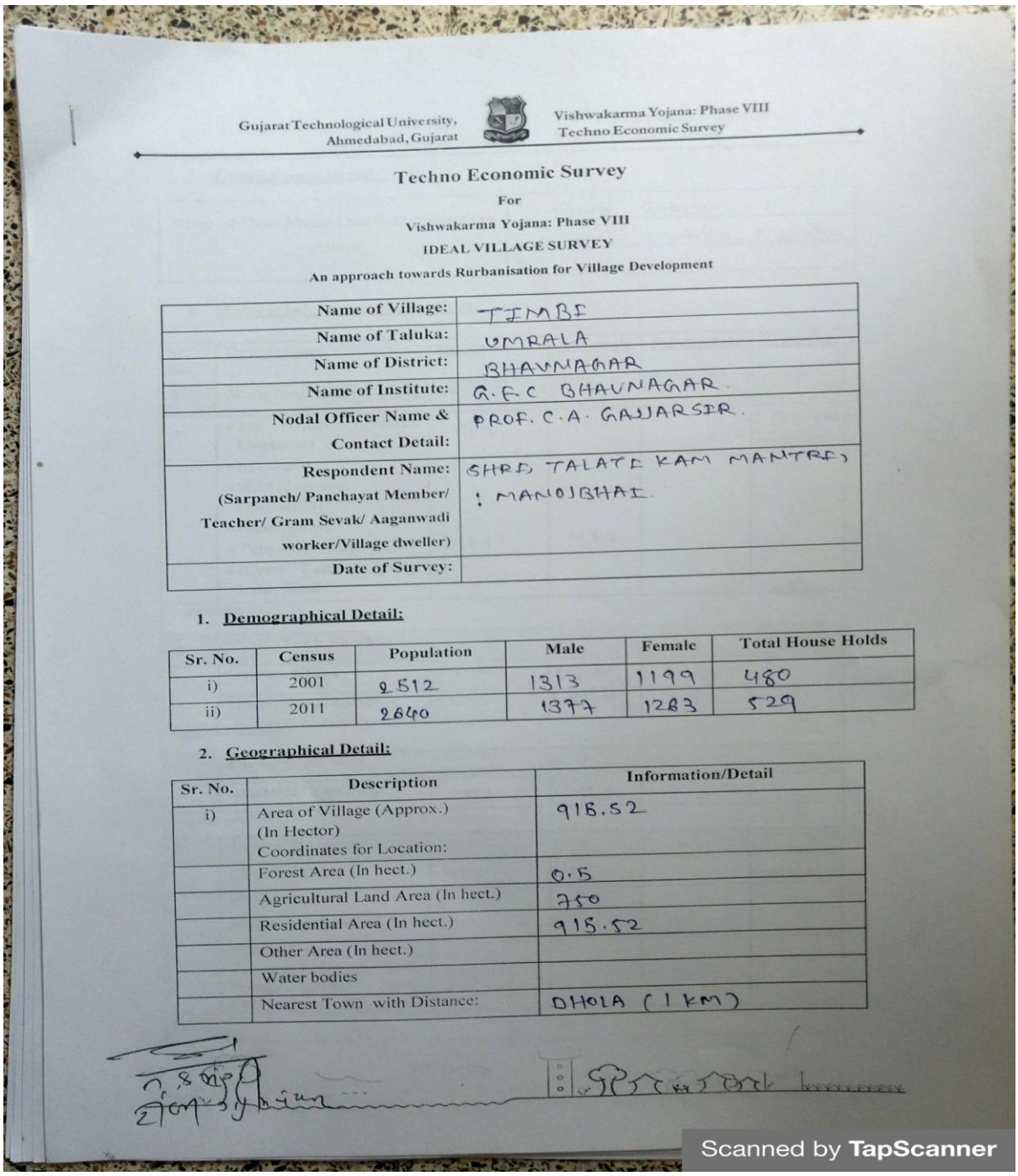
Some of the online references are mentioned below

- http://swactchbharaturban.in
- http://smartcities.gov.in
- http://censusindia.gov.in
- http://rorgujarat.gov.in
- http://pradhanmantriyojna.co.in
- http://grampanchayat.gov.in
- http://grampanchayattender.guj.in
- Gujarat.info
- http://gujmap.gov.in

Chapter-12. Annexure attachment

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

- **Techno Economic Survey For Vishwakarma Yojana: Phase VIII IDEAL VILLAGE SURVEY an approach towards Rurbanisation for Village Development**



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	TIMBI
Name of Taluka:	UMRALA
Name of District:	BHAVNAGAR
Name of Institute:	G.E.C BHAVNAGAR.
Nodal Officer Name & Contact Detail:	PROF. C.A. GAJJARSIR.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SHRI TALATI KAM MANTRI ; MANOJBHAI.
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	2512	1313	1199	480
ii)	2011	2640	1377	1263	529

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	915.52
	Forest Area (In hect.)	0.5
	Agricultural Land Area (In hect.)	750
	Residential Area (In hect.)	915.52
	Other Area (In hect.)	
	Water bodies	
	Nearest Town with Distance:	DHOLA (1 KM)

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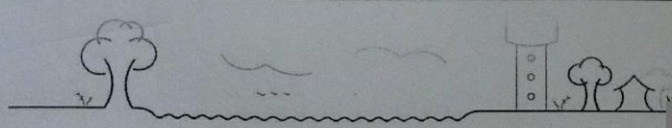
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

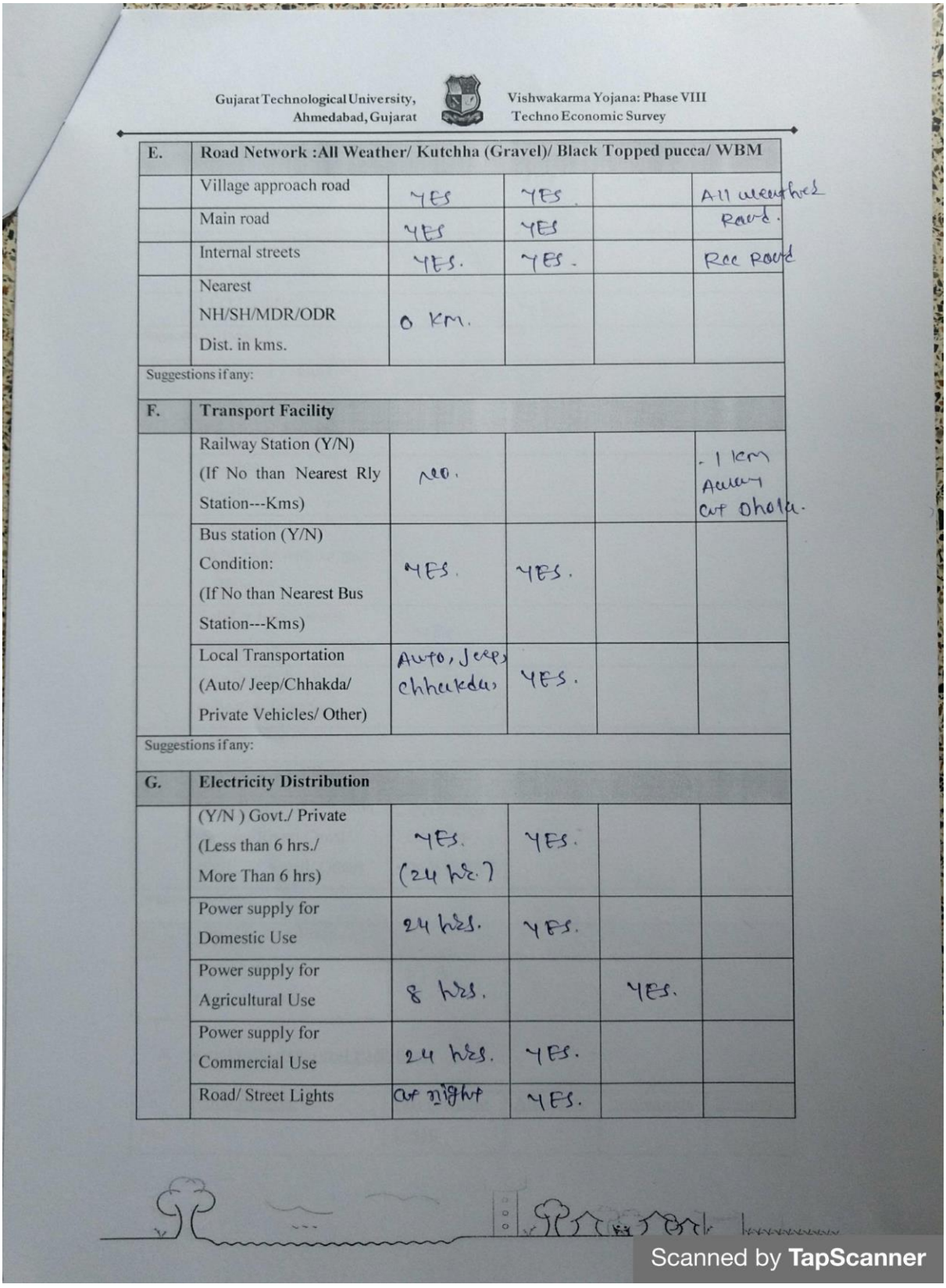
3. **Occupational Details:**

Name of Three Major Occupation groups in Village	1. Yuva Group. 2. Timbi mahila Mandal. 3.

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	YES YES.	YES. YES.		Treated/ pipeline
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	60,000 lit.		
	Underground Sump	Capacity:	1,25,000 lit.		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	YES	YES.		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	YES.			- closed.
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants				
Suggestions if any:					





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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	YES	YES		All weathered Road.
	Main road	YES	YES		
	Internal streets	YES.	YES.		Rcc Road
	Nearest NH/SH/MDR/ODR Dist. in kms.	0 KM.			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No.			1 KM Away Out Dhola.
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	YES.	YES.		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Jeep, Chhakda,	YES.		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	YES. (24 hr.)	YES.		
	Power supply for Domestic Use	24 hrs.	YES.		
	Power supply for Agricultural Use	8 hrs.		YES.	
	Power supply for Commercial Use	24 hrs.	YES.		
	Road/ Street Lights	Out night	YES.		

	Electrification in Government Buildings/ Schools/ Hospitals		YES		
	Renewable Energy Source Facilities (Y/ N)				
	LED Facilities		YES.		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.				
	Location Condition				
	Community Toilet (With bath/ without bath facilities)				
	Solid & liquid waste Disposal system available	YES.			
	Any facility for Waste collection from road	YES.			
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	- Canal, well, tubewell	YES.		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	1:3			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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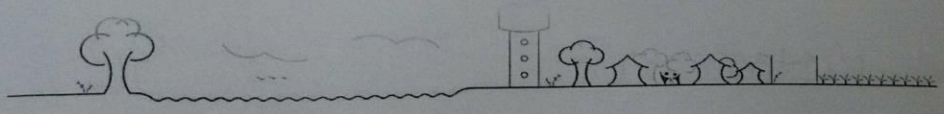
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC: (150 beds)			
	Private Clinic/Private Hospital/ Nursing Home		YES.		
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group		YES		
	Primary School		YES		
	Secondary school	NO			
	Higher sec. School	NO.			
	ITI college/ vocational Training Center		YES.		
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	NO.			



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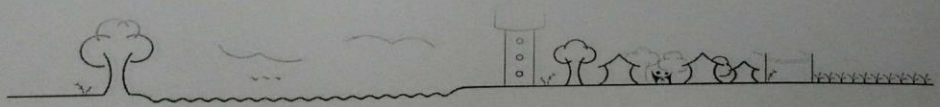
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:				
	Public Garden Location: Condition:	- Sewing place is available.			
	Village Pond Location: Condition:				
	Recreation Center Location: Condition:				
	Cinema/ Video Hall Location: Condition:				
	Assembly Polling Station Location: Condition:	School.			
	Birth & Death Registration Office Location: Condition:	Gram panchayat	YES.		

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

Suggestions if any:

N.	Other Facilities				
	Post-office		YES		
	Telecommunication Network/ STD booth				



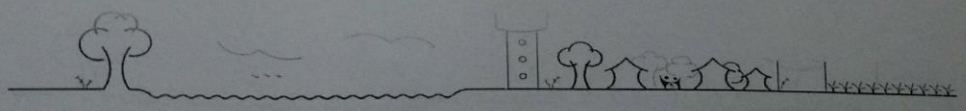
	General Market				
	Shops (Public Distribution System)		YES		
	Panchayat Building		YES		
	Pharmacy/Medical Shop		YES		
	Bank & ATM Facility		YES		
	Agriculture Co-operative Society		YES		
	Milk Co-operative Soc.		YES		
	Small Scale Industries	NO.			
	Internet Cafes/ Common Service Center/Wi Fi	NO.		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

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Soft copy (Available).



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

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)		
2.	Additional Information/ Requirement		

9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.			

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

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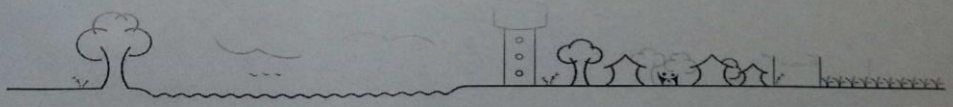
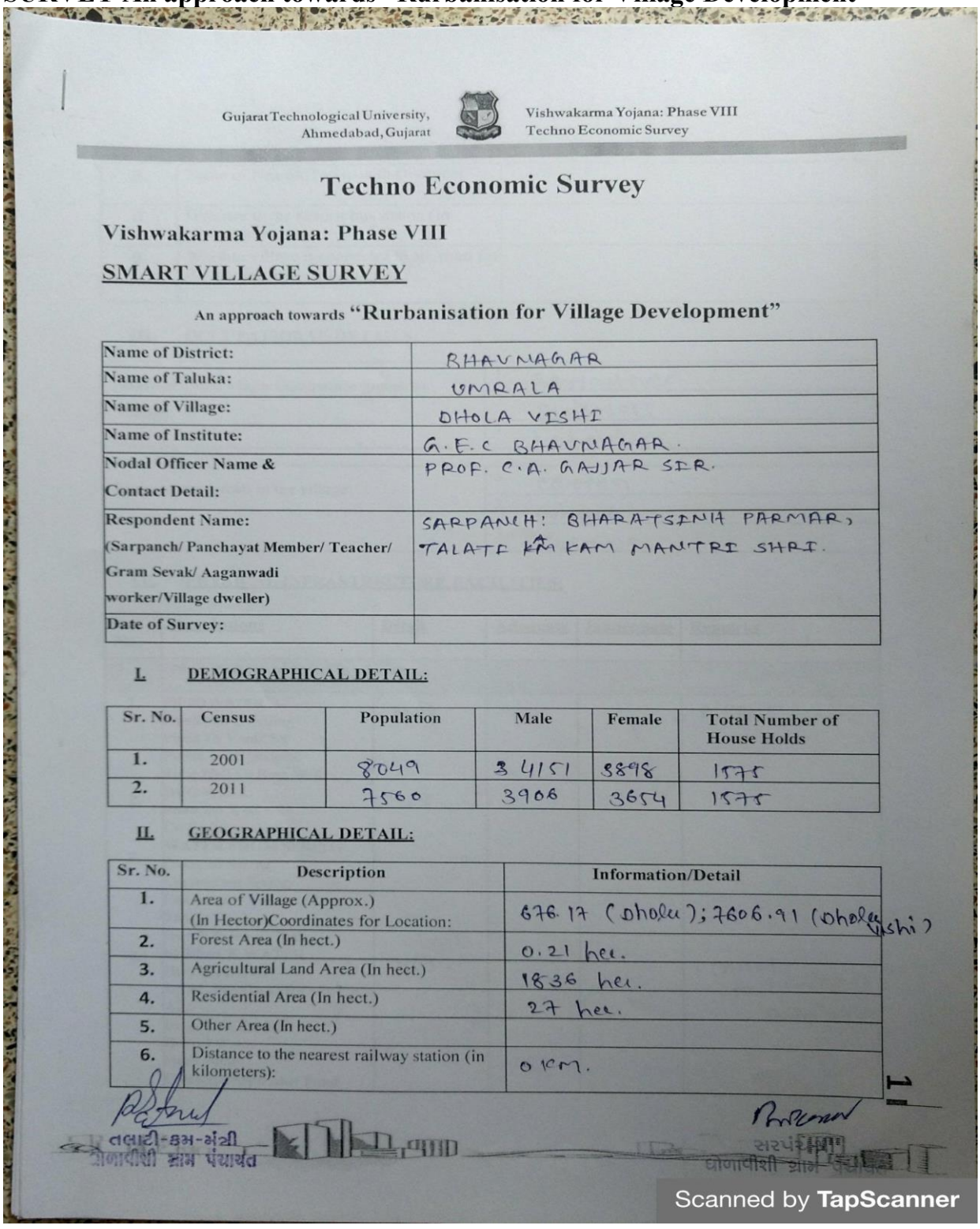
Email ID: rurban@gtu.edu.in



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

- **Techno Economic Survey Vishwakarma Yojana: Phase VIII SMART VILLAGE SURVEY An approach towards "Rurbanisation for Village Development"**



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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:	BHAVNAGAR
Name of Taluka:	UMRALA
Name of Village:	DHOLA VISHI
Name of Institute:	G.E.C BHAVNAGAR.
Nodal Officer Name & Contact Detail:	PROF. C.A. GAJJAR SIR.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SARPANCH: BHARATSINH PARMAR, TALATI KAM MANTRI SHRI.
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	8049	3 4151	3898	1575
2.	2011	7560	3906	3654	1575

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	676.17 (Dhola); 7606.91 (Dhola Vishi)
2.	Forest Area (In hect.)	0.21 hec.
3.	Agricultural Land Area (In hect.)	1836 hec.
4.	Residential Area (In hect.)	27 hec.
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	0 km.

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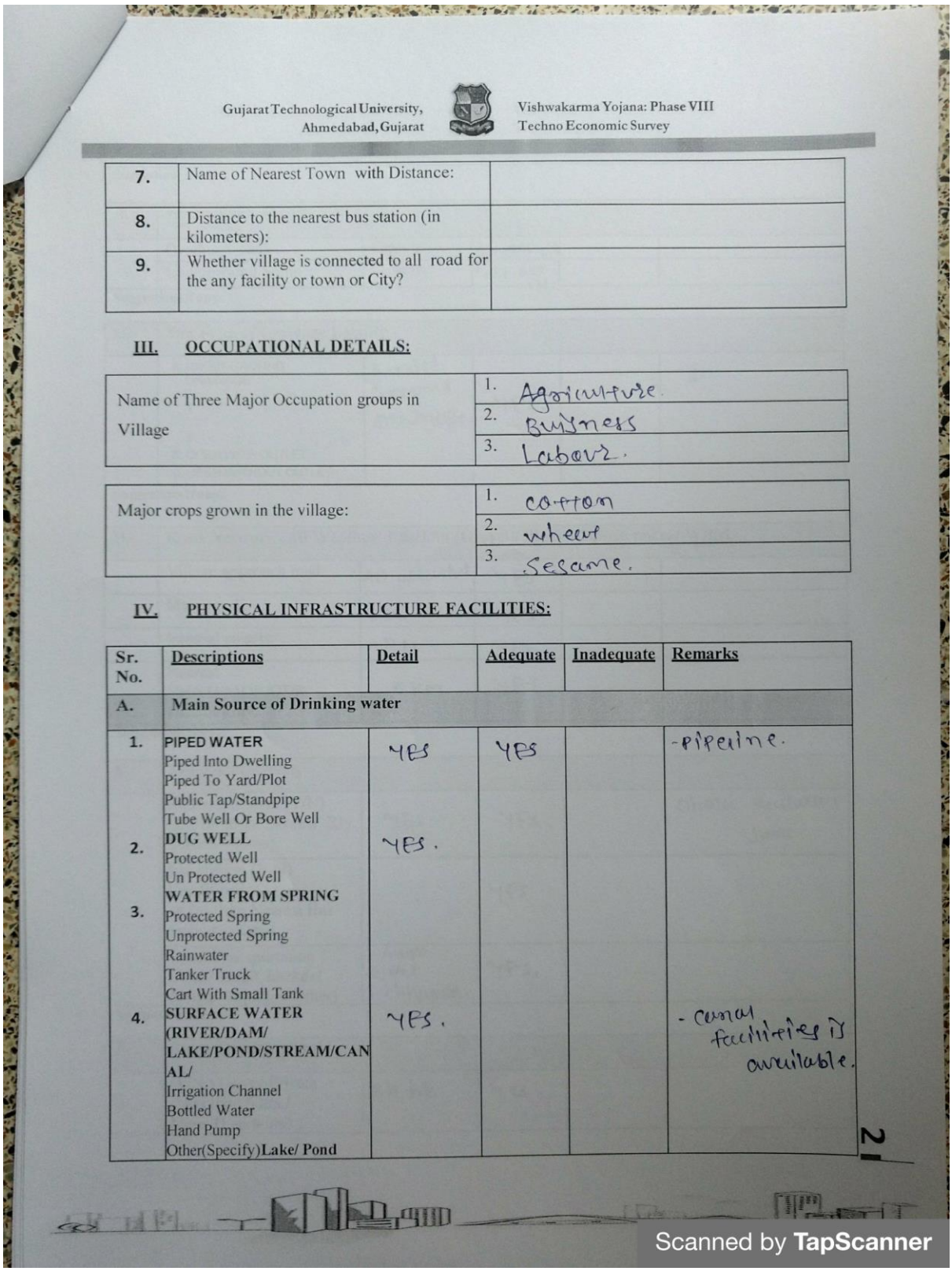

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Agriculture. 2. Business 3. Labour.
Major crops grown in the village:	1. cotton 2. wheat 3. Sesame.

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	YES	YES		-Pipeline.
2.	**DUG WELL** Protected Well Un Protected Well	YES.			
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 Bottled Water Hand Pump Other(Specify)**Lake/ Pond**	YES.			- canal facilities is available.

2

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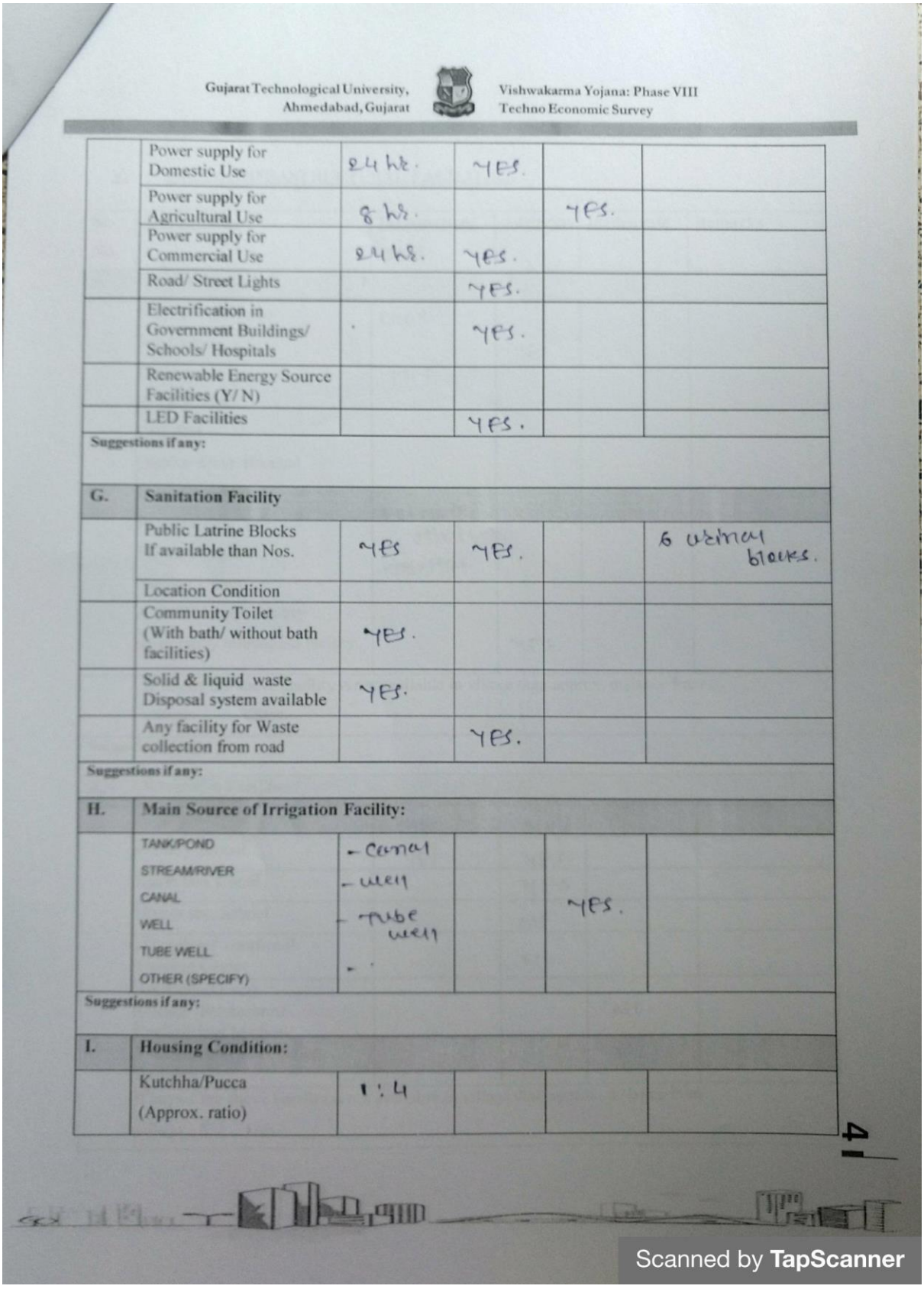
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:						
B.	**Water Tank Facility**					
	Overhead Tank	Capacity:	60,000 Lit			
	Underground Sump	Capacity:	1,28,000 Lit.			
Suggestions if any:						
C.	**The Type of Drainage Facility**					
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Under Ground Drainage.	YES.		-	
Suggestions if any:						
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**					
	Village approach road	All weather	YES			
	Main road	RCC	YES			
	Internal streets	RCC	YES			
	Nearest NH/SH/MDR/ODR Dist. in kms.	0 Km.	YES.			
Suggestions if any:						
E.	**Transport Facility**					
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	YES	YES.		Dhola Railway Junc.	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)		YES.			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	- Auto - Jeep - Chhakda.	YES.			
Suggestions if any:						
F.	**Electricity Distribution**					
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	24 hrs.	Yes.			

3



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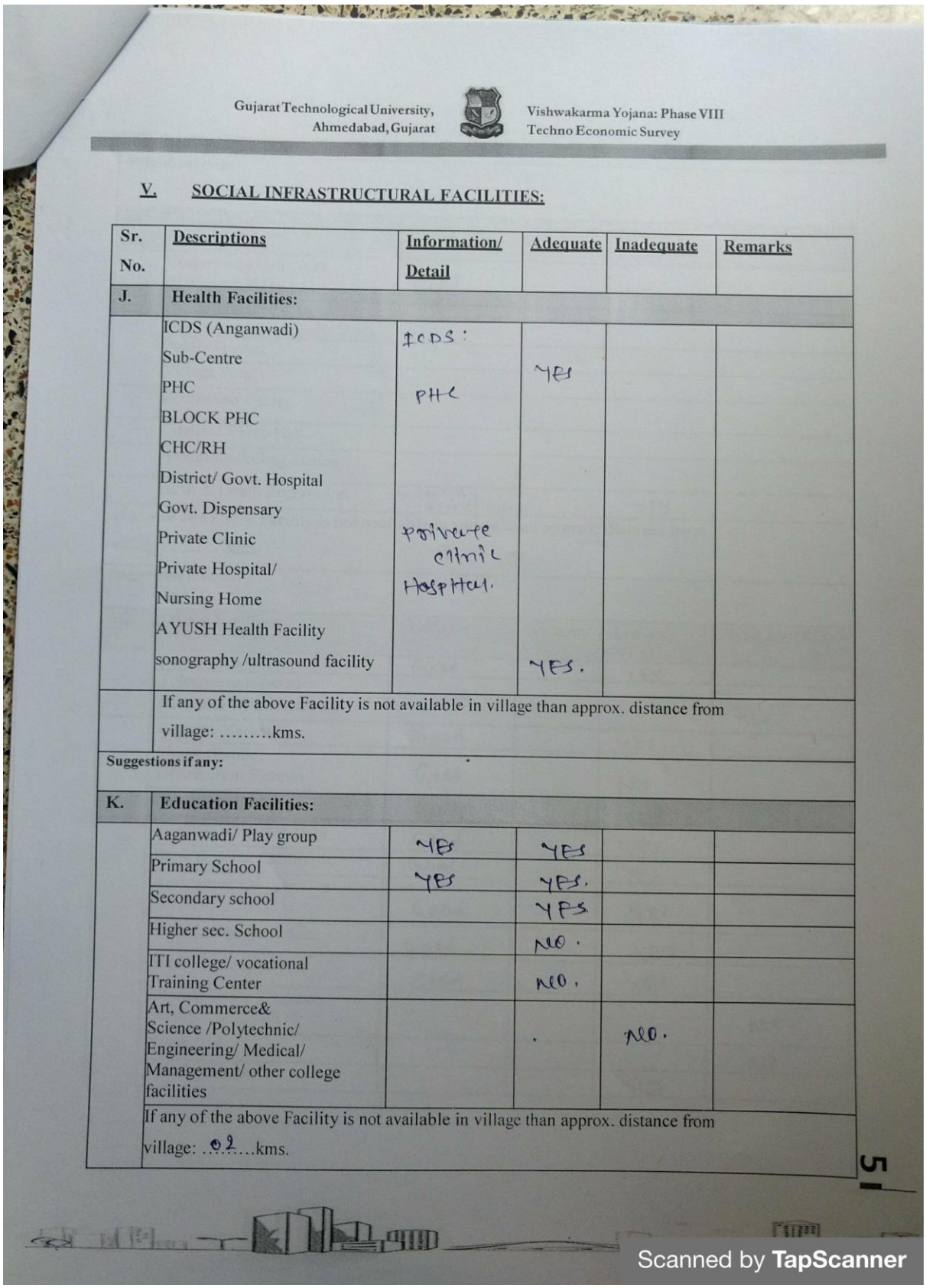
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	24 hr.	YES.		
	Power supply for Agricultural Use	8 hr.		YES.	
	Power supply for Commercial Use	24 hr.	YES.		
	Road/ Street Lights		YES.		
	Electrification in Government Buildings/ Schools/ Hospitals		YES.		
	Renewable Energy Source Facilities (Y/ N)				
	LED Facilities		YES.		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	YES	YES.		6 urinal blocks.
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	YES.			
	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 TUBE WELL OTHER (SPECIFY)	- Canal - well - Tube well -		YES.	
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	1 : 4			

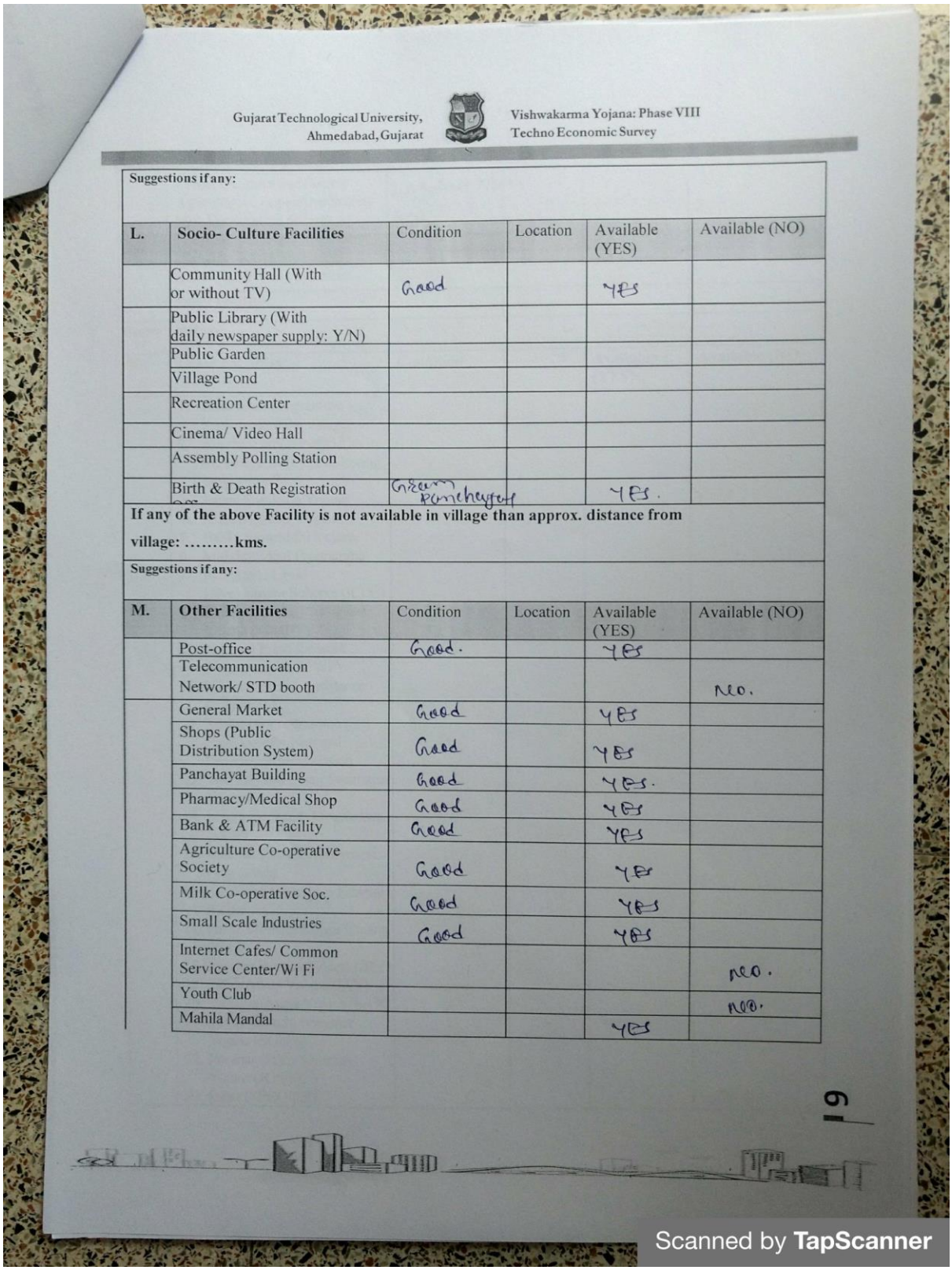
4



V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	ICDS:			
	Sub-Centre		YES		
	PHC	PHC			
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital				
	Govt. Dispensary				
	Private Clinic	Private clinic			
	Private Hospital/ Nursing Home	Hospital.			
	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	YES		
	Primary School	YES	YES.		
	Secondary school		YES.		
	Higher sec. School		NO.		
	ITI college/ vocational Training Center		NO.		
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities		.	NO.	
	If any of the above Facility is not available in village than approx. distance from village: 02....kms.				

51



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

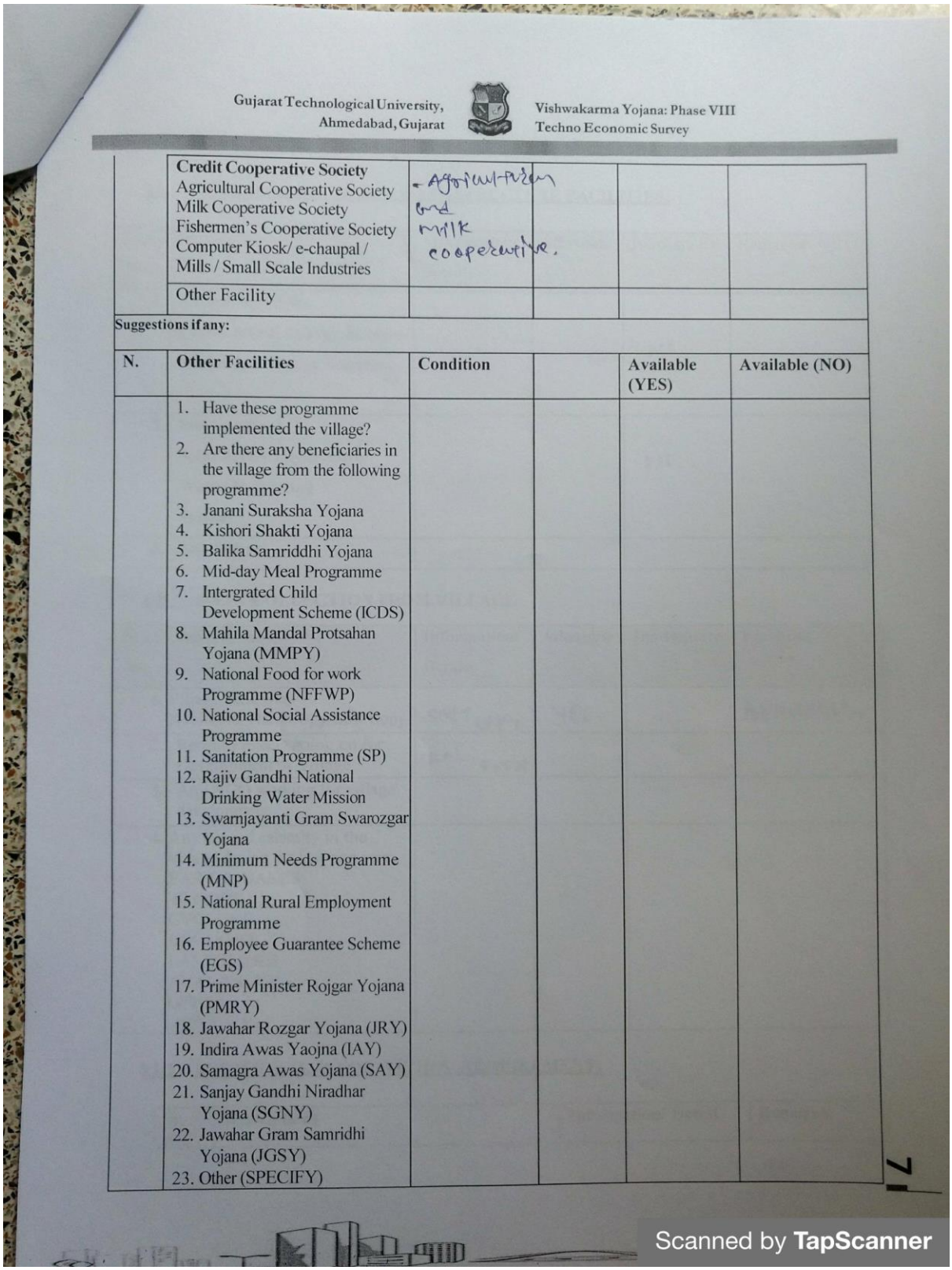
L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Good		YES	
	Public Library (With daily newspaper supply: Y/N)				
	Public Garden				
	Village Pond				
	Recreation Center				
	Cinema/ Video Hall				
	Assembly Polling Station				
	Birth & Death Registration	Gram Panchayat		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	Good.		YES	
	Telecommunication Network/ STD booth				NO.
	General Market	Good		YES	
	Shops (Public Distribution System)	Good		YES	
	Panchayat Building	Good		YES.	
	Pharmacy/Medical Shop	Good		YES	
	Bank & ATM Facility	Good		YES	
	Agriculture Co-operative Society	Good		YES	
	Milk Co-operative Soc.	Good		YES	
	Small Scale Industries	Good		YES	
	Internet Cafes/ Common Service Center/Wi Fi				NO.
	Youth Club				NO.
	Mahila Mandal			YES	

19



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

Suggestions if any:

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

17

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources			Neo.	
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System			Neo.	
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	Soft copy	Yes.		Available.
2.	Recent Projects going on for Development of Village	Ree Road			
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)	/			

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

8

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	- All Govt. buildings are needed Maintenance.	
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.

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Email ID: rurban@gtu.edu.in

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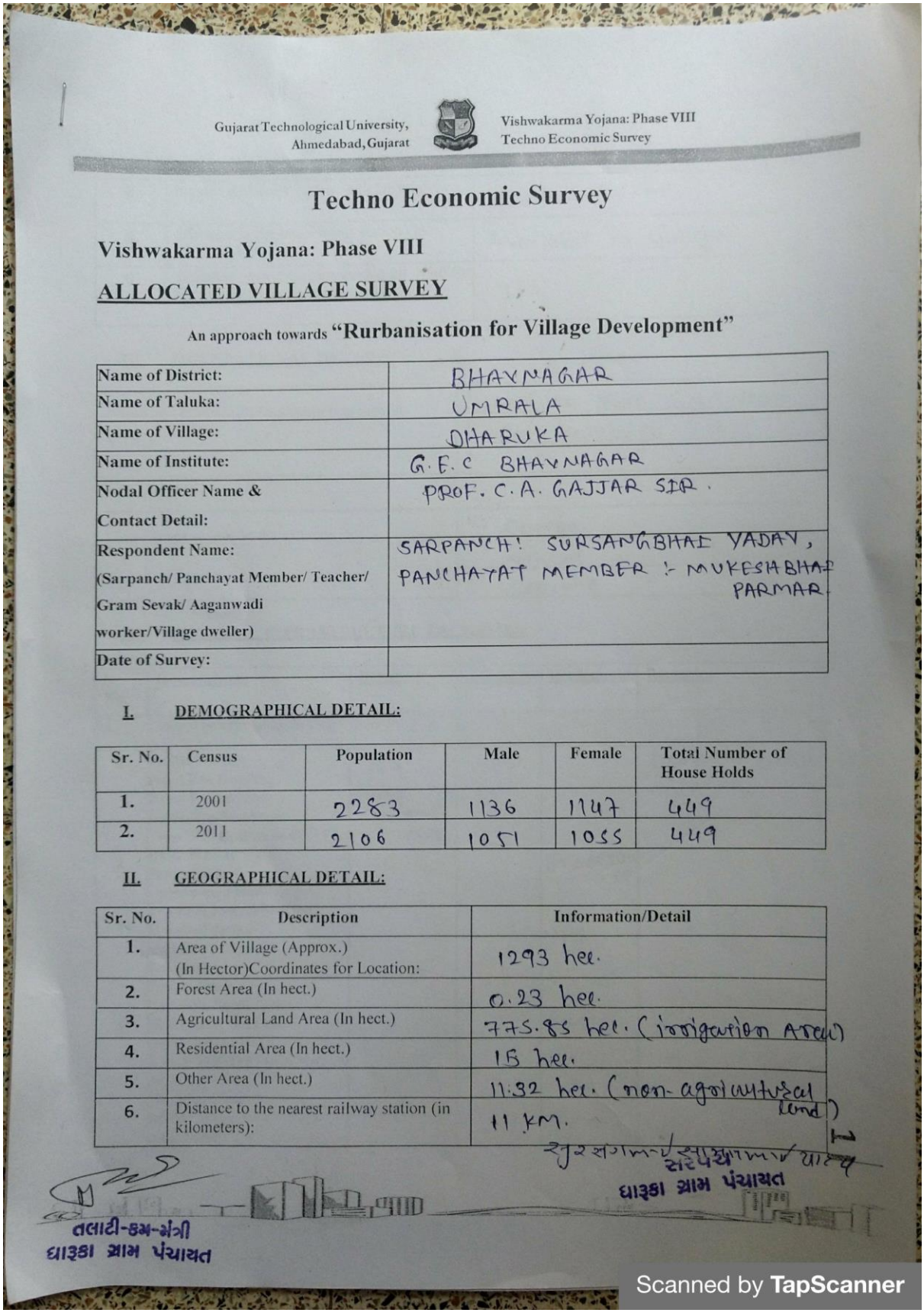
16

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



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	BHAVNAGAR
Name of Taluka:	UMRALA
Name of Village:	DHARUKA
Name of Institute:	G.E.C BHAVNAGAR
Nodal Officer Name & Contact Detail:	PROF. C.A. GAJJAR SIR.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	SARPANCH: SURSANGBHAI YADAV, PANCHAYAT MEMBER :- MUKESHBHAI PARMAR.
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	2283	1136	1147	449
2.	2011	2106	1051	1055	449

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1293 hec.
2.	Forest Area (In hect.)	0.23 hec.
3.	Agricultural Land Area (In hect.)	775.85 hec. (irrigation Area)
4.	Residential Area (In hect.)	15 hec.
5.	Other Area (In hect.)	11.32 hec. (non-agricultural land)
6.	Distance to the nearest railway station (in kilometers):	11 KM.

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Techno Economic Survey

7.	Name of Nearest Town with Distance:	UMRALA (6 KM)
8.	Distance to the nearest bus station (in kilometers):	Available in village.
9.	Whether village is connected to all road for the any facility or town or City?	YES.

III. OCCUPATIONAL DETAILS:

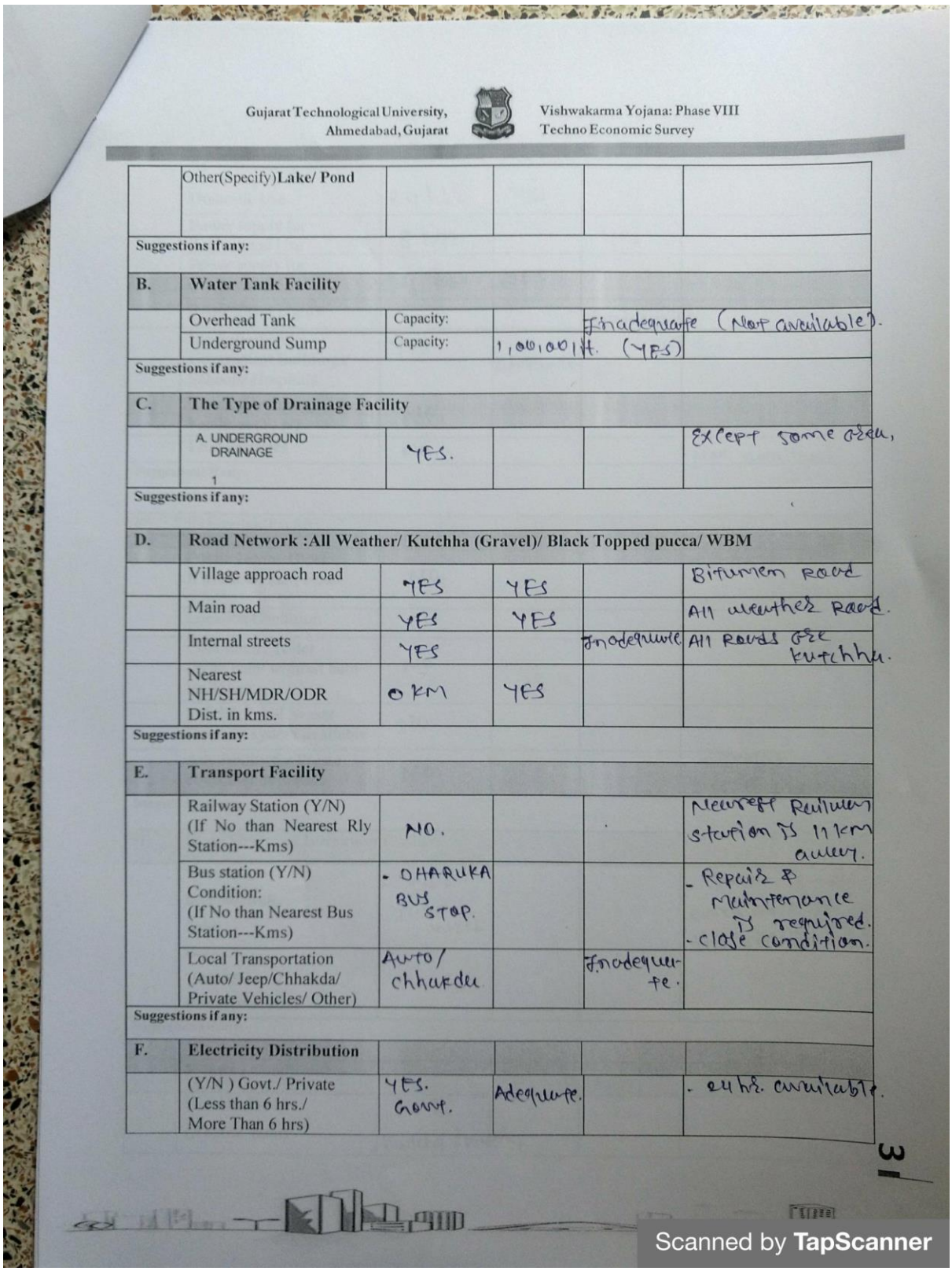
Name of Three Major Occupation groups in Village	1.	Dharuka Juva Sangathan
	2.	Jay Kallubapu Group
	3.	

Major crops grown in the village:	1.	Cotton.
	2.	wheat
	3.	Sesame

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

2



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Other(Specify)**Lake/ Pond**				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:		Inadequate	(Not available).
	Underground Sump	Capacity:	1,00,000 lit.	(YES)	
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	YES.			Except some area,
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	YES	YES		Bitumen Road
	Main road	YES	YES		All weather Road.
	Internal streets	YES		Inadequate	All Roads are kutchha.
	Nearest NH/SH/MDR/ODR Dist. in kms.	0 KM	YES		
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO.			Nearest Railway station is 11 km away.
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	- DHARUKA BUS STOP.			- Repair & Maintenance is required. - close condition.
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto/ chhakda		Inadequate.	
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	YES. Govt.	Adequate.		- 24 hr. available.

3

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	24 hr.	Yes		
	Power supply for Agricultural Use	8 hrs.		Yes	
	Power supply for Commercial Use	24 hrs.	Yes		
	Road/ Street Lights			Inadequate.	
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	Adequate.		
	Renewable Energy Source Facilities (Y/ N)	No.			
	LED Facilities	No.			- Not available.

Suggestions if any:

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

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	- WELL - TUBE WELL -			- Canal is not available in the village.

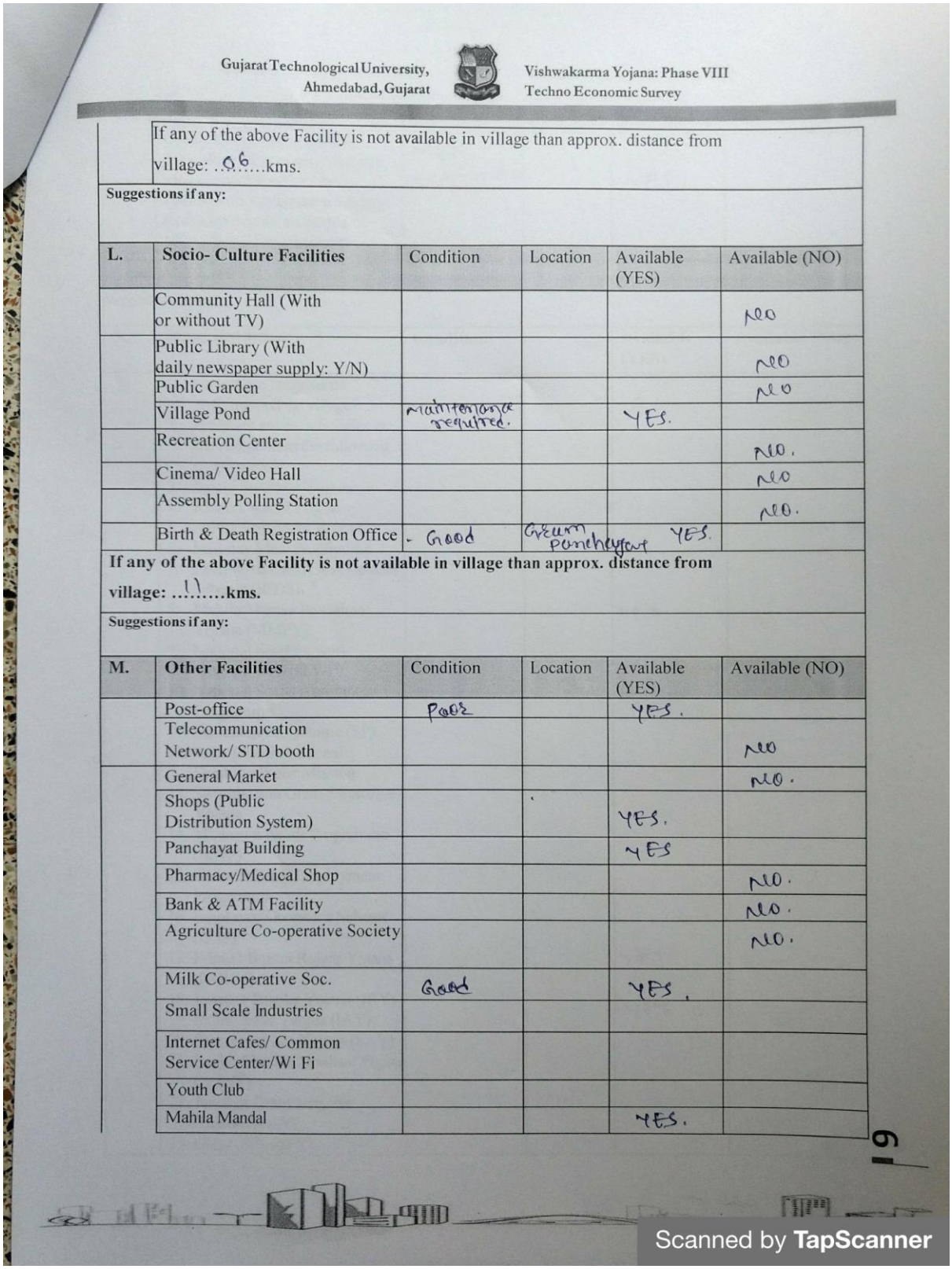
Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	1 : 2 Kutcha / pucca.			

4

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi) Sub-Centre PHC BLOCK PHC CHC/RH District/ Govt. Hospital Govt. Dispensary Private Clinic Private Hospital/ Nursing Home AYUSH Health Facility sonography /ultrasound facility	ICDS	YES		- 3 Anganwadi is available.
	If any of the above Facility is not available in village than approx. distance from village: 05.....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	3 Nos.	YES.		
	Primary School	1 (one)	YES.		
	Secondary school	NO.			
	Higher sec. School	NO.			
	ITI college/ vocational Training Center	NO.			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	If any of the above Facility is not available in village than approx. distance from village: ..06....kms.
Suggestions if any:	

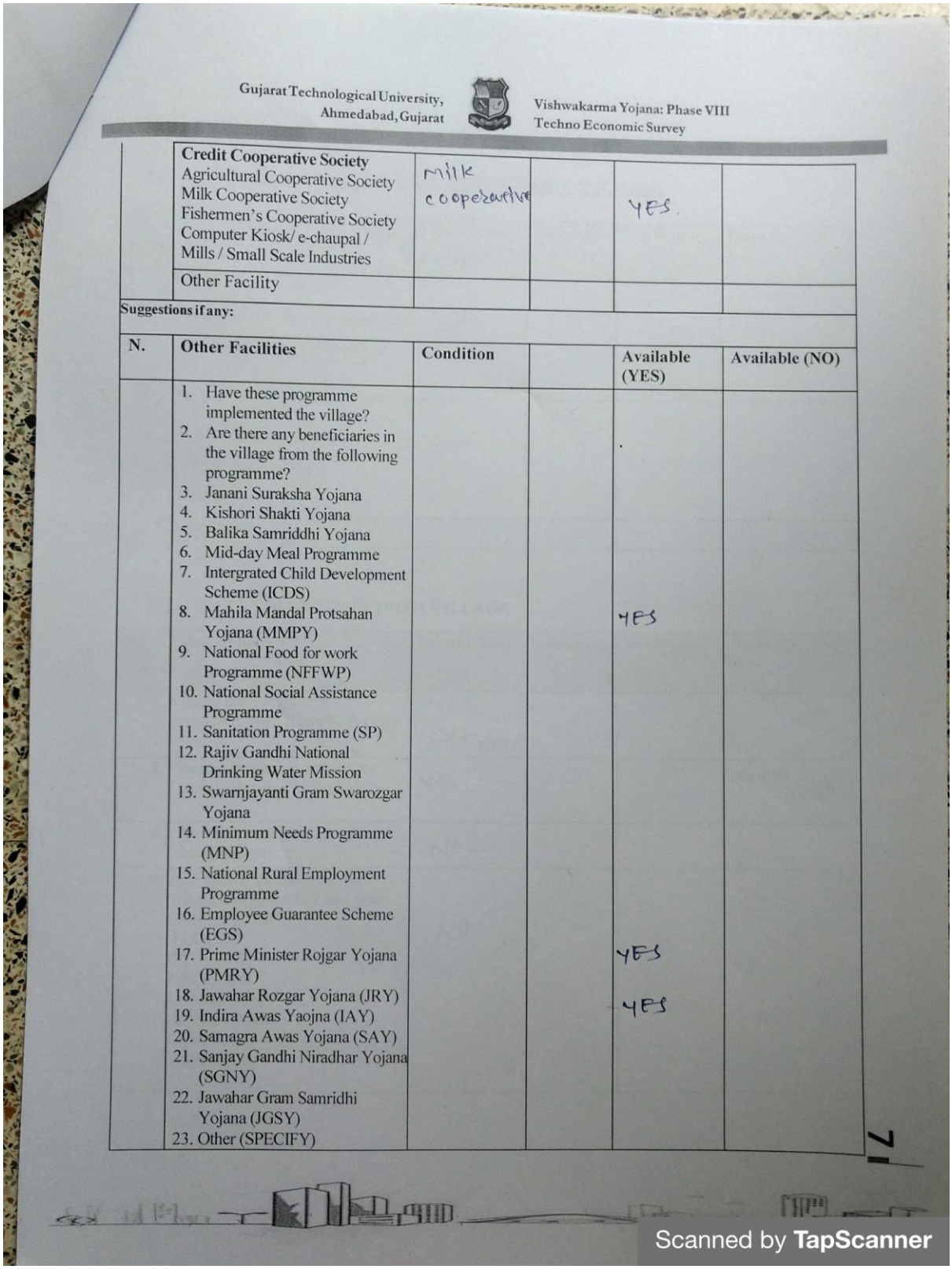
L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)				NO
	Public Library (With daily newspaper supply: Y/N)				NO
	Public Garden				NO
	Village Pond	maintenance required.		YES.	
	Recreation Center				NO.
	Cinema/ Video Hall				NO
	Assembly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

If any of the above Facility is not available in village than approx. distance from village: ..11....kms.

Suggestions if any:

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

9



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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	milk cooperative		YES.	
	Other Facility				

Suggestions if any:

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

17

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	YES. (All Govt. buildings required maintenance)	
2.	Additional Information/ Requirement	NO.	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	NO.	

IX. Smart Village / Heritage Details

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

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

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

તલાટી-કમ-મંત્રી
ધારૂકા ગ્રામ પંચાયત

સરપંચ
ધારૂકા ગ્રામ પંચાયત

16

12.4 Gap Analysis of the Allocated Village:-

VILLAGE GAP Analysis					
Village Facilities	**Planning Commission/UDPFI Norms**	**Village Name:**	Dharuka		
		Population:			
		Existing	**Required as per Norms**	**Smart Vilage / Cities / Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	3	2		1
Primary School	Each Per 2500 population	1	1		0
Secondary School	Per 7,500 population	0	0		0
Higher Secondary School	Per 15,000 Population	0	0	0	0
College	Per 125,000 Population	0	0		0
Tech. Training Institute	Per 100000 Population	0	0		0
Agriculture Research Centre	Per 100000 Population	0	0		0
Skill Development Center	Per 100000 Population	0	0		0
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1		0
Primary Health & Child Health Center	Per 20,000 population	0	0		0
Child Welfare and Maternity Home	Per 10,000 population	0	0		0
Multispeciality Hospital	Per 100000 Population	0	0		0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha	0	0		0

	house)				
Physical Infrastructure Facilities					
Transportation			Inadequate		
Pucca Village Approach Road	Each village	adequate			
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	adequate			
Drinking Water (Minimum 70 lpcd)		Inadequate			
Over Head Tank	1/3 of Total Demand	1	0		-1
U/G Sump	2/3 of Total Demand	0	0		0
Drainage Network – Open		**Inadequate**			
Drainage Network – Cover		inadequate			
Waste Management System		Inadequate			
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	0	0		0
community hall and Public Library	Per 15000 Population	0	0		0
Cremation Ground	Per 20,000 population	0	0		0
Post Office	Per 10,000 population	1	1		0
Gram Panchayat Building	Each individual/group panchayat	1	1		0
APMC	Per 100000 Population	0	0		0
Fire Station	Per 100000 Population	0	0		0
Public Garden	Per village	0	0		0
Police post	Per 40,000Population	0	0		0
Shopping Mall					
Electrical Design					
Electricity Network		**Adequate**			
Any Smart Village Facility					
Technology					
		ESR cap	0		
		Sump cap	0		

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

Sr. no.	Village Name	Discipline	Phase - I	Phase - II
1.	**Shampara**	Civil	Rain Water Harvesting System	Village Bank
			Septic tank	Washing Ghat with Circulatory tank
			Primary Health Centre	Agricultural Product Market Building
			Community hall	Library
			Vegetable Market	Skill Training Institute
			Recreational Centre	Lake front for tourism development point
2.	**Songadh**	Civil	College Building	Secondary School Building
			Design of Septic Tank	Recreation center
			Design of Sports Complex	Rainwater harvesting system
			Bus Stand	Public Toilets & Baths
			Design of Shelter Home	Defence training center
			Agriculture Market Building	Science center/Museum/Similar building
3.	**Valukad**	Civil	Public Library	Vegetable Market building
			Public Bath & Toilet	RCC road
			Public Bus-Stand	Street Light network expantion
			Public Storage Building	Sports complex
			Public Hostel	Community hall
			Public Shelter Home	Lake front for tourism development point
4.	**Kalatalav**	Civil	Public Toilets & Baths	Rain water harvesting system
			Anganwadi	Under ground water sump
			Primary & Secondary School	Elevated storage resorvoire

			Vegetable Market	Water supply distribution system
			Bank	Slill training institure
			Street Light	Zinga production and storage building
5.	**Dharuka**	Civil	Sustainable Design RCC Road	Post office
			Storage Building	Retaining & flood protection wall
			Rainwater Harvesting	Bituminous road
			Water Supply Storage and Distribution	Washing Ghat with Circulatory tank
			Sewerage System in Mafanagar of Dharuka	Primery health center
			Recreation Centre	Defence training center
6.	**Bambhaniya**	Civil	Public Health Center	Bus stop
			Community Hall	Village Bank
			Street Light	Secondary School Building
			Drainage system	Vegetable Market building
			Elevated Service Reservoir	Recreation center
			RCC Road	Post office
7.	**Morchand**	Civil	Anganwadi Building	Bus stop
			Agricultural Product Market Building	RCC road
			Secondary School Building	Street Light network expantion
			Hostel Building	Sports complex
			Bank Building	Public Toilets & Baths
			Library Building	Community hall

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

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

12.7 Summary of good photographs

Dharuka Aanganvadi

Timbi Hospital

Dharuka Primary School`

Timbi Elevated Water Tank

Timbi Sahkari Mandali

Timbi Village Road

Dhola Junction

Dhola Market

Dhola Vegetable Market

Dharuka Road

Dharuka Madhi

Dharuka Road

Timbi Temple

Timbi Sahkari Mandali

Timbi Temple

Timbi Primary School

Timbi Bus Station

Dhola Panchayat Kacheri

12.8 Village Interaction with sarpanch Report.

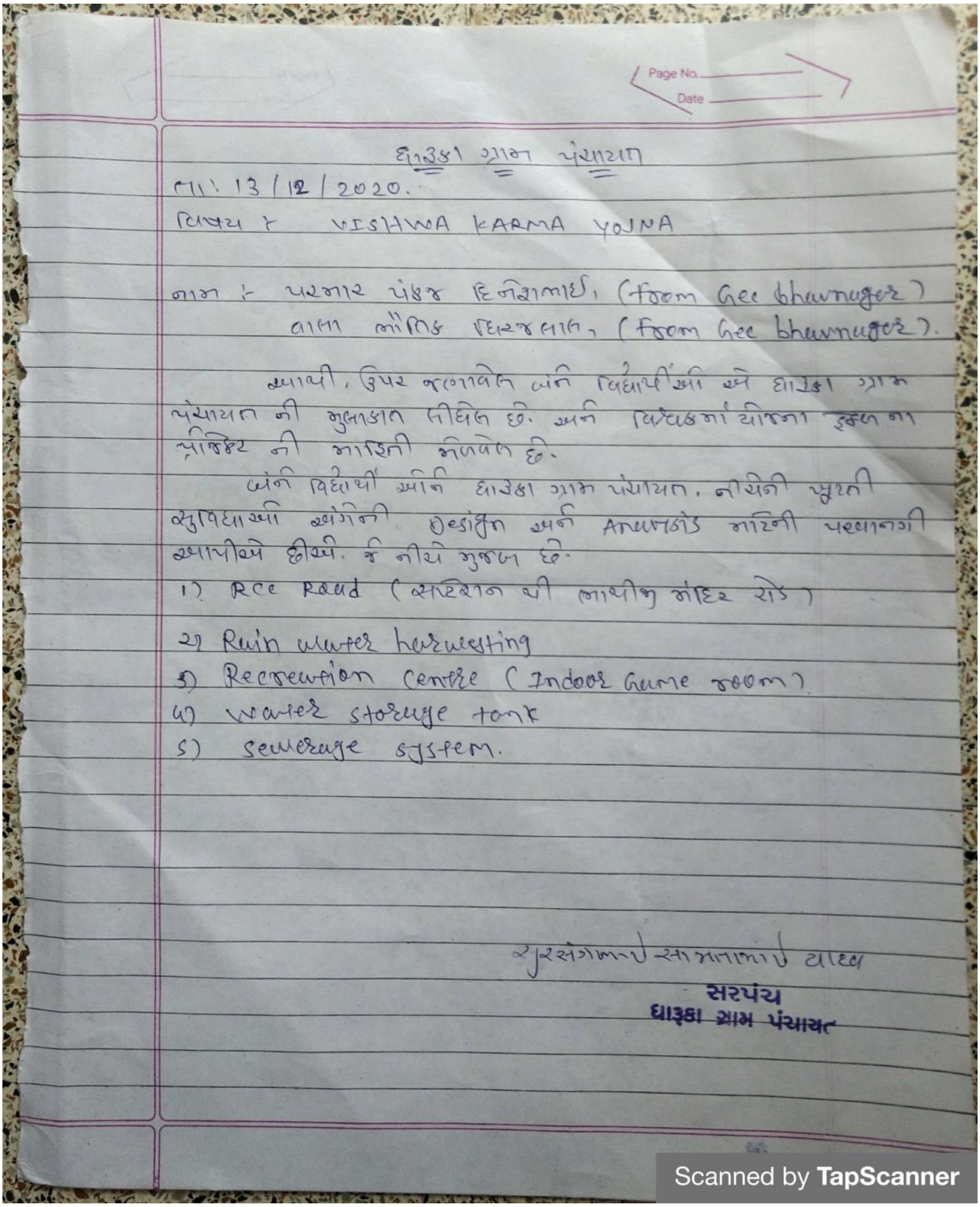
By following and respecting the Govt.'s COVID-19 Guidelines, On the date of 13th December 2020 at Dharuka Panchayat office we have carried out the Techno Economic Survey with Sarpanch Shri Shursangbhai Samatbhai Yadav sir and Other Panchayat Members, Village dwellershas remained present to give their feedback.

We explained how the development of Dharuka village is possible. We presented our Study work under this project. We explained theme of Vishwakarma Yojana, various benefits Of village development and issues prevailing in villages. We explained various designs under Physical infrastructure, Social infrastructure and Socio-Cultural facilities such as Internal Street, Water distribution system, Solid waste management, PHC center, post office & other.

Village dwellers shared diffrent problems faced by them before this project Implementation while designing such a facilities, we gave various methods and techniques of Such facilities with proposed design. The presentation was very helpful to understand what village dwellers actually needs in the village and what amenities to be designed at village level for the overall development of Dharuka village as Rurban town.

Our team thanked all the dwellers of the village for their support during this work period And made them understand that the implementation of this project can build a better village for Upcoming future.

12.9 Sarpanch Letter giving information about the village development



Page No.
Date

ધારુકા ગ્રામ પંચાયત

તા: 13/12/2020.

વિષય : VISHWA KARMA YOJNA

નામ :- પરમાર પંકજ દિનેશભાઈ, (from Gec bhavnagar)
વાળા કૌશિક ધીરજલાલ, (from Gec bhavnagar).

આથી, ઉપર જણાવેલ બંને વિદ્યાર્થીઓ એ ધારુકા ગ્રામ પંચાયત ની મુલાકાત લીધેલ છે. અને વિશ્વકર્મા યોજના ફેઝ ના પ્રોજેક્ટ ની માહિતી મેળવેલ છે.

બંને વિદ્યાર્થી ઓને ધારુકા ગ્રામ પંચાયત, નીચેની ખૂટતી સુવિધાઓ અંગેની Design અને Analysis માટેની પરવાનગી આપીએ છીએ. જે નીચે મુજબ છે.

1) RCC Road (સ્ટેશન થી ભાથીજી મંદિર રોડ)
2) Rain water harvesting
3) Recreation centre (Indoor Game room)
4) water storage tank
5) sewerage system.

ગુરસંગભાઈ સામતભાઈ ચાવડા
સરપંચ
ધારુકા ગ્રામ પંચાયત

Scanned by TapScanner

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 / planning with any software

13.1 Design Proposals

13.1.1 Civil Design 1 Primary health centre

: TITLE OF WORK :
DESIGN OF PRIMARY HEALTH CENTER

VISHVAKARMA YOJANA PHASE-VIII PART-II
DHARUKA VILLAGE

OPENING SCHEDULE	
D	3.00 X 2.10
D1	2.25 X 2.10
D2	1.00 X 2.10
D3	0.75 X 2.10
W	1.50 X 1.20
W1	1.50 X 0.90
V	0.60 X 0.60

SCALE	1:100
SHEET NO	01 OF 01

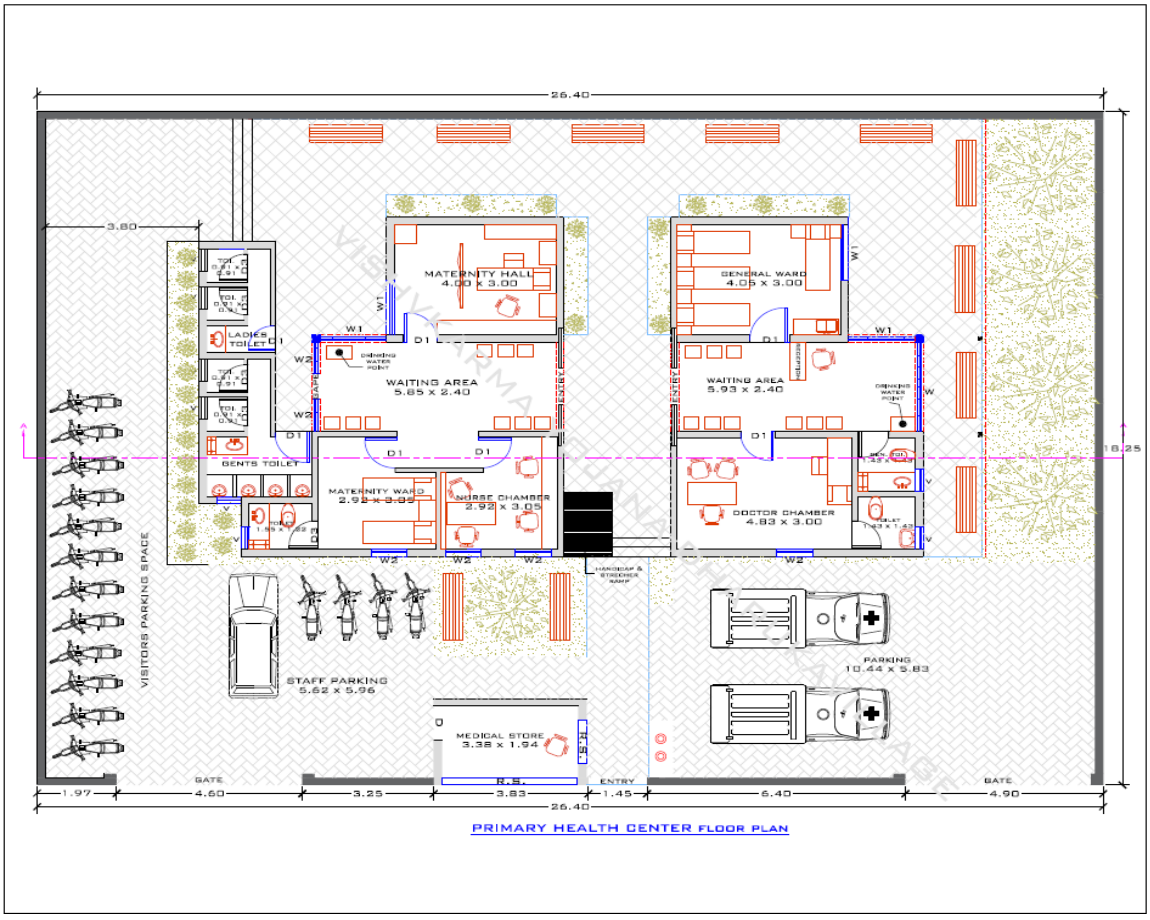
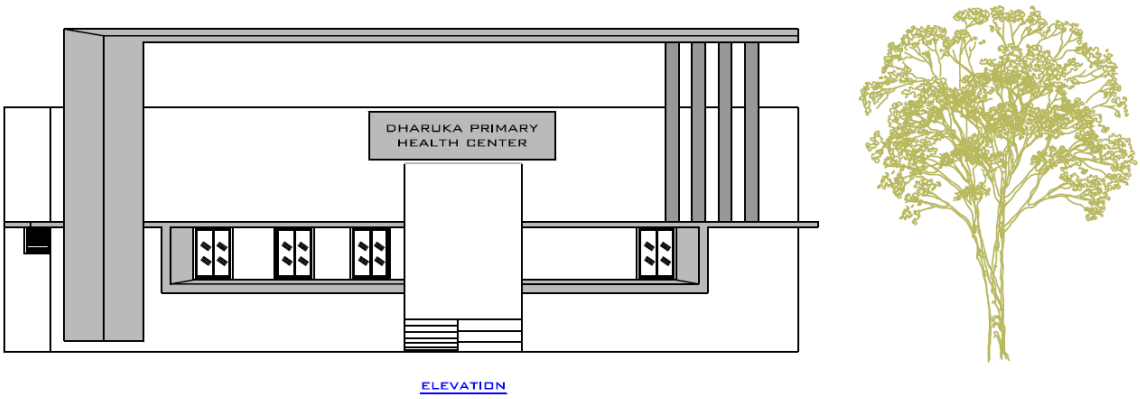


Fig. Design Primary Health center



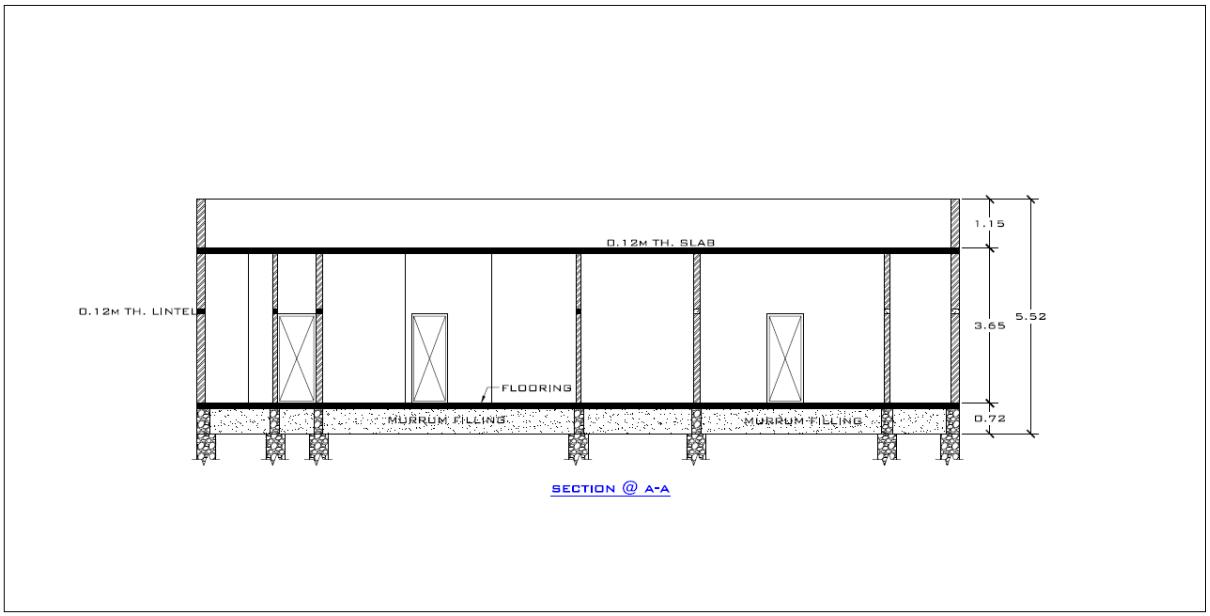


Fig. Section of Primary Health Centre

MEASUREMENT SHEET						
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY
	Centre line Length, A type wall= (4.83+1.43+.23+.15)x3 + (4.05x0.23)+ (3+2.40+3+.115+.23+.23+.115)x2 =39.0315m					

	B TYPE WALL= (1.43+0.07+0.115) + (3+0.23)= 4.845M					
1	**EXCAVATION IN ORDINARY SOIL**	1	37.2375	0.9	1.2	40.21
	230MM THICK WALL (=39.0315-(1/2*4*0.9))					
	=37.2315M					
	115MM THICK WALL	1	3.145	0.7	1.2	2.6418
	L= 4.845-(1/2*3*0.9)-(1/2*1*0.7)					
	3.145M					
					TOTAL QUANTITY= 42.8518 CUM	
2	**PCC FOR FOUNDATION (1:4:8)**					
	230MM THICK WALL	1	37.2315	0.9	0.3	10.05
	115MM THICK WALL	1	3.145	0.7	0.3	0.66
					TOTAL QUANTITY= 10.71 CUM	
3	**BRICK MASONARY UPTO PLINTH**					
	For PARTION WALL 115MM THICK WALL					
	(i) 400MM THICK FOOTING					
	L= (4.545-(1/2*0.6*3)-(1/2*1*0.4))					
	3.745M	1	3.745	0.4	0.2	0.3
	(ii) 300mm thick footing					
	L= (4.845-(0.5 x .3 x 1) - (0.5 x 0.5 x 3) = 3.945m	1	3.945	0.3	0.2	0.2367
	(iii) 115mm thick footing					
	L=(4.845 - (0.5 x 0.115 x 1) - (o.5 x 0.23 x 3)= 4.4425	1	4.145	0.115	0.2	0.095
	(iv) 115mm thick footing upto plinth					
	H= 0.6+0.5-0.2 = 0.9					
	L= 4.845-(0.5 x 0.115 x 1) - (0.5x 0.23 x 3)= 4.4425	1	4.4425	0.115	0.9	0.46
4	**FOR 230 MM THICK WALL**					

	(i) 600 thick footing					
	L= 39.0315- (0.5 X 4 X 0.6)= 37.8315	1	37.8315	0.6	0.2	4.54
	(ii) 500 THICK FOOTING					
	L= 39.0315 - (0.5 X 4 X 0.5)= 38.0315	1	38.0315	0.5	0.2	3.80315
	(iii) 400 THICK FOOTING					
	L= 39.0315 - (0.5 X 4 X 0.4)= 38.2315	1	38.2315	0.4	0.2	3.058
	(iv) 230 THICK FOOTING					
	L= 39.0315 - (0.5 X 4 X 0.23) = 38.5715	1	38.5715	0.23	0.9	7.9843
						=20.48 M^3
5	**BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6**					
	230 MM WALL					
	L= 39.0315 - (0.5 X 0.23 X 4) = 38.5715M	1	38.5715	0.23	3.525	31.271
	0.115 MM WALL					
	L= 4.845 - (0.5 X 3 X 0.23) - (0.5 X 1 X 0.115)= 4.4425M	1	4.4425	0.115	3.525	1.8
6	**PARAPET WALL:-**					
	LONG WALL = (3 + 2.40+ 3+ 0.23+ 0.23) X 2 = 17.72					
	SHORT WALL:-					
	4.05+ 5.93 = 9.98	1	27.7	0.23	1.15	5.733
					TOTAL=	7.326M^3
7	**CONCRETE QUANTITY**					
	CONCRETE FOR SLAB:-					
	WAITING AREA + CHAMBER					
	L= 5.93 + 0.23+ 0.23= 6.39	1	6.39	5.86	0.125	4.68

	B= 2.40 + 3 + 0.23+ 0.23 = 5.86					
	GENERAL WARD					
	L= 4.05 + 0.23 + 0.23 = 4.51					
	B= 3 + 0.23+ 0.23 = 3.46	1	4.51	3.46	0.125	1.95
					TOTAL =	6.63M^3
	DEDUCTION					
	IN THE BRICKMASONARY WORK UPTO SLAB LEVEL					
	ENTRY, L =1.52M	1	1.52	0.23	2.1	0.734
	D1= 1M	2	1	0.23	2.1	0.97
	D2= 0.76 M	2	0.76	0.115	2.1	0.361
	W = 2.4 M	1	2.4	0.23	1.2	0.66
	W1= 1.5 M	2	1.5	0.23	1.2	0.828
	W2 = 0.90 M	1	0.9	0.23	1.2	0.2484
	V = 0.6 M	2	0.6	0.23	0.3	0.08
				TOTAL DEDUCTION=		3.88 M3
	DEDUCTION					
	LINTEL BEARING					
	ENTRY	1	1.82	0.23	0.12	0.05
	D1	2	1.3	0.23	0.12	0.071
	D2	2	1.06	0.115	0.12	0.029
	W	1	2.7	23	0.12	0.074
	W1	2	1.8	0.23	0.12	0.099
	W2	1	1.2	0.23	0.12	0.03312
	V	2	0.9	0.23	0.12	0.05
					TOTAL DEDUCTION=	0.4076 M3
				NET BRICK WORK QUANTITY		28.7834 M3
8	**RCC WORK FOR CHAJJA**					
	ENTRY	1	1.82	0.6	0.1	0.11
	W	1	2.7	0.6	0.1	0.16
	W1	2	1.8	0.6	0.1	0.21
	W2	1	1.2	0.6	0.1	0.07

	D1	2	1.3	0.6	0.1	0.16
	D2	2	1.06	0.6	0.1	0.13
	V	2	0.9	0.6	0.1	0.11
				TOTAL QUANTITY=		0.9504 M3
9	**SMOOTH PLASTER INSIDE THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS**					
	GENERAL WARD	2	4.05	-	3.525	28.5525
		2	3	-	3.525	21.15
	WAITHING AREA	2	2.4	-	3.525	16.92
		2	5.93	-	3.525	41.8
	DOCTOER CHAMBER	2	4.83	-	3.525	34.0515
		2	3	-	3.525	21.15
	GENERAL TOILET	4	1.43	-	3.525	20.163
	TOILET	4	1.43	-	3.525	20.163
				TOTAL QUANTITY=		225.1065 M^2
	DEDUCTION FOR PLASTER WORK					
	ENTRY	1/2	1.52	-	2.1	1.596
	D1	4/2	1	-	2.1	4.2
	D2	4/2	0.76	-	2.1	3.192
	W	1/2	2.4	-	1.2	1.44
	W1	2/2	1.5	-	1.2	1.8
	W2	1/2	0.9	-	1.2	0.54
				TOTAL DEDUCTION=		12.768 M^2
				NET QUANTITY FOR PLASTER WORK=		212.3385 M^2
	CEILING PLASTER					
	GENERAL WARD 4.05 X 3	1	4.05	3		12.15
	WAITING AREA 5.93 X 2.40	1	5.93	2.4		14.23
	DOCTOR CHAMBER 4.83 X 3	1	4.83	3		14.49
	GEN. TOILET 1.43 X 1.43	1	1.43	1.43		2.0449
	TOILET 1.43 X 1.43	1	1.43	1.43		2.0449
						44.9598 M^2

				NET QUANTITY FOR PLASTER=		257.29 M^2
10	**EARTH FILLING IN PLINTH**					
	GENERAL WARD	1	4.05	3	0.6	7.29
	WAITING AREA	1	5.93	2.4	0.6	8.54
	GEN.TOILET	1	1.43	1.43	0.6	1.23
	TOILET	1	1.43	1.43	0.6	1.23
	DOCTOR CHAMBER	1	4.83	3	0.6	8.69
					TOTAL =	26.97 M^3

ABSTRACT SHEET

SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	40.21	M3	EXCAVATION IN ORDINARY SOIL	450	18094.5
2	10.71	M3	PCC FOR FOUNDATION (1:4:8)	1250	13387.5
3	20.48	M3	BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6	1700	34816
4	9.8	M3	BRICK MASONARY UPTO PLINTH	1500	14700
5	28.78	M3	CONCRETE FOR SLAB:	2000	57560
6	0.95	M3	RCC WORK FOR CHAJJA	2000	1900
7	212.33	M2	SMOOTH PLASTER INSIDE THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS	150	31849.5
8	26.97	M3	EARTH FILLING IN PLINTH	150	4045.5
9	4689	KG	STEEL WORK	56	262584
			TOTAL ESTIMATE=		438937
			CONTRACTOR PROFIT 10%=		43893.7
			OTHER MEDICAL EQUIPMENTS 50%		219468.5
			ELECTRIFICATION COST 8%		35114.96
			TOTAL ESTIMATED COST=		737414.2

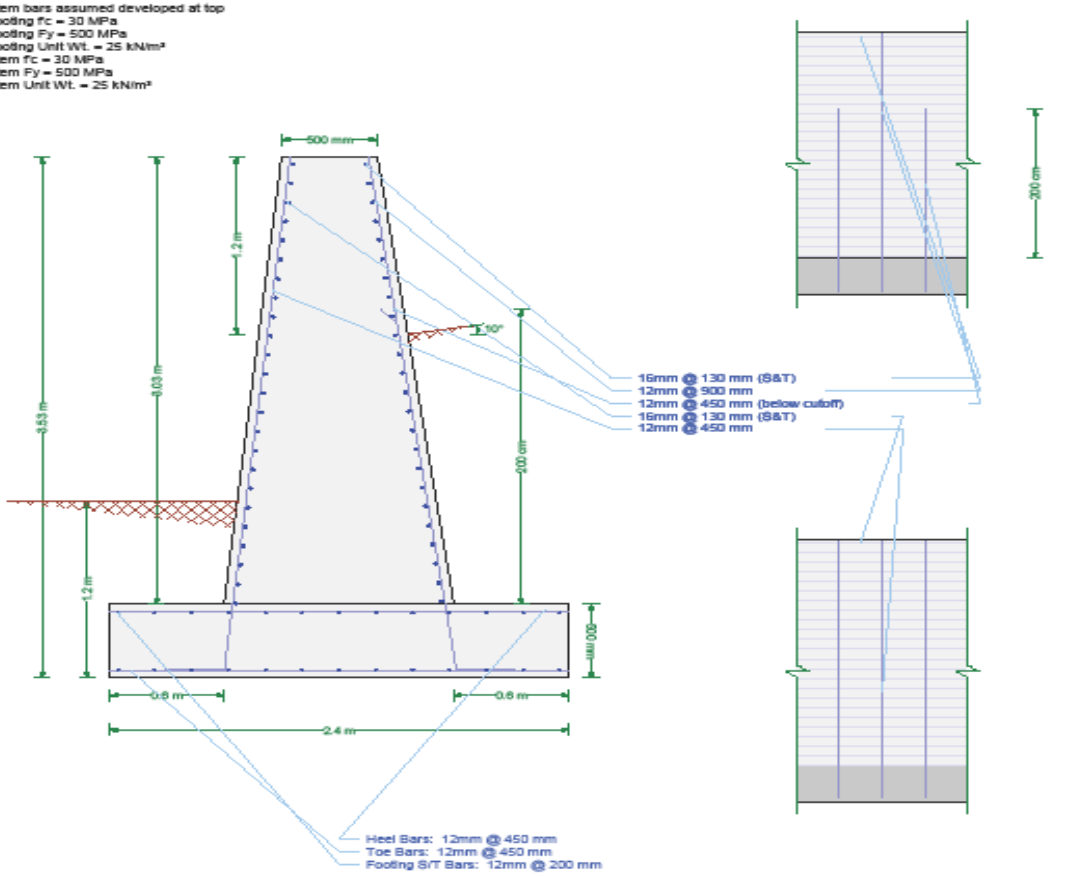
13.1.2 Civil Design 2 Flood Protection Wall (Gravity Retaining Wall)

FREE FOR ALL
Courtesy of LAVTEAM.ORG

Gravity Wall 1

Design Detail

Stem bars assumed developed at top
Footing f'c = 30 MPa
Footing Fy = 500 MPa
Footing Unit Wt. = 25 kN/m³
Stem f'c = 30 MPa
Stem Fy = 500 MPa
Stem Unit Wt. = 25 kN/m³

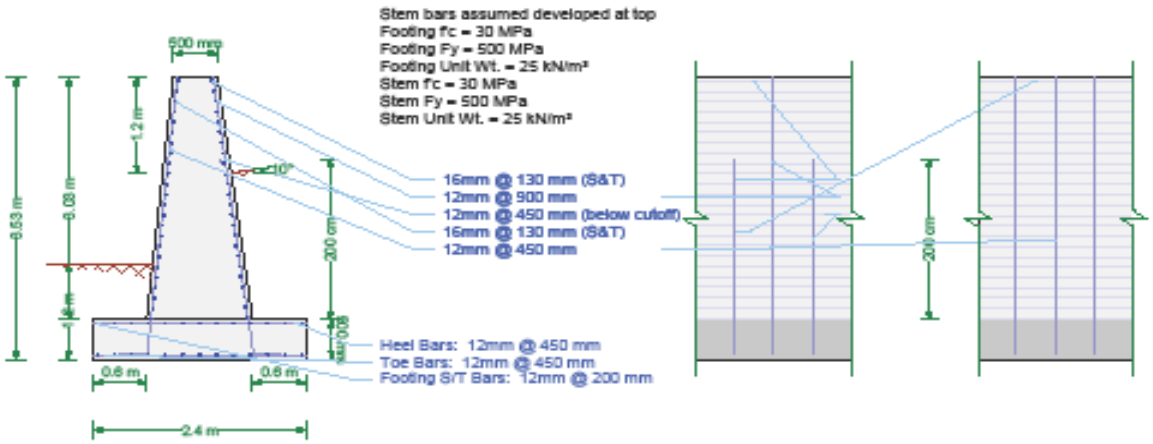


QuickRWall 4.0 (lesweb.com) D:\bhautik work\vishvkarma project\RETAINING ...\01.rwd Page 1 of 1 Sunday 04/18/21 12:40 PM

FREE FOR ALL
Courtesy of LAVTEAM.ORG

Gravity Wall 1

Design Detail



Check Summary

Ratio	Check	Provided	Required	Combination
----- Stability Checks -----				
✓ 0.212	Overturning	7.08	1.50	0.6D + 1.0H
✓ 0.441	Sliding	3.40	1.50	0.6D + 1.0H
✓ 0.388	Bearing Pressure	143.6 kPa	55.05 kPa	1.0D + 1.0H
✓ 0.010	Bearing Eccentricity	0 m	0.4 m	1.0D + 1.0H
----- Toe Checks -----				
✓ 0.018	Shear	309.7 kN/m	5.45 kN/m	1.4D
✓ 0.121	Moment	52.43 kN-m/m	6.35 kN-m/m	1.2D + 1.6H
✓ 0.018	Min Strain	0.2211	0.0040	1.2D + 1.6H
✓ 0.000	Min Steel	6.55 mm²	0 mm²	1.2D + 1.6H
✓ 0.173	Development	176 cm	30.48 cm	1.2D + 1.6H
✓ 0.437	S&T Max Spacing	200 mm	457.2 mm	1.2D + 1.6H
✓ 0.841	S&T Min Rho	0.0023	0.0015	1.2D + 1.6H
----- Heel Checks -----				
✓ 0.129	Shear	309.7 kN/m	40.02 kN/m	1.4D
✓ 0.188	Moment	52.43 kN-m/m	9.87 kN-m/m	1.2D + 1.6H
✓ 0.018	Min Strain	0.2211	0.0040	1.2D + 1.6H
✓ 0.000	Min Steel	6.55 mm²	0 mm²	1.2D + 1.6H
✓ 0.173	Development	176 cm	30.48 cm	1.2D + 1.6H
✓ 0.437	S&T Max Spacing	200 mm	457.2 mm	1.2D + 1.6H
✓ 0.841	S&T Min Rho	0.0023	0.0015	1.2D + 1.6H
----- Stem Checks -----				
✓ 0.074	Moment	133.7 kN-m/m	9.87 kN-m/m	1.2D + 1.6H
✓ 0.021	Shear	787.3 kN/m	16.19 kN/m	1.2D + 1.6H
✓ 0.008	Max Steel	0.6800	0.0040	1.2D + 1.6H
✓ 0.000	Min Steel	0 cm²/m	0 cm²/m	1.2D + 1.6H
✓ 0.331	Base Development	46 cm	15.24 cm	1.2D + 1.6H
✓ 0.000	Bar Cutoff Extension	200 cm	0 cm	1.2D + 1.6H
✓ 0.000	Bar Cutoff Shear	472.1 kN/m	0 kN/m	1.2D + 1.6H
✓ 0.975	Horz Bar Rho	0.0026	0.0025	1.2D + 1.6H
✓ 0.284	Horz Bar Spacing	190 mm	457.2 mm	1.2D + 1.6H

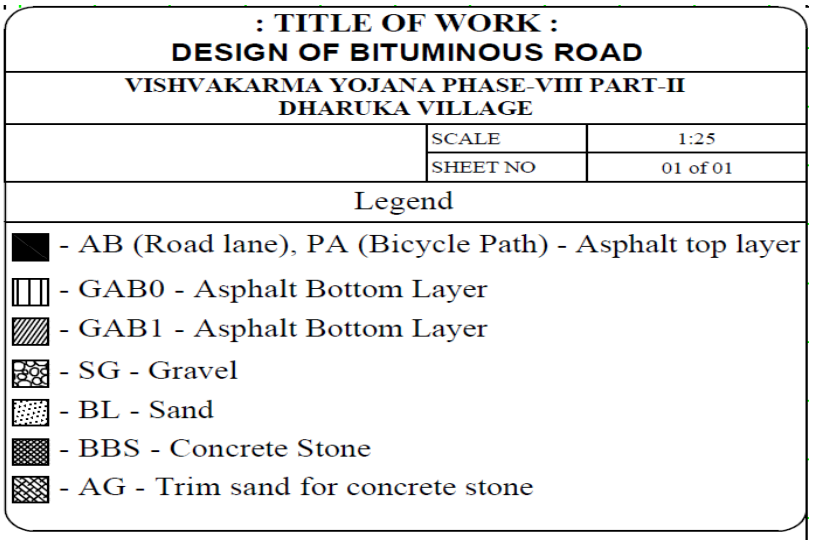
Criteria

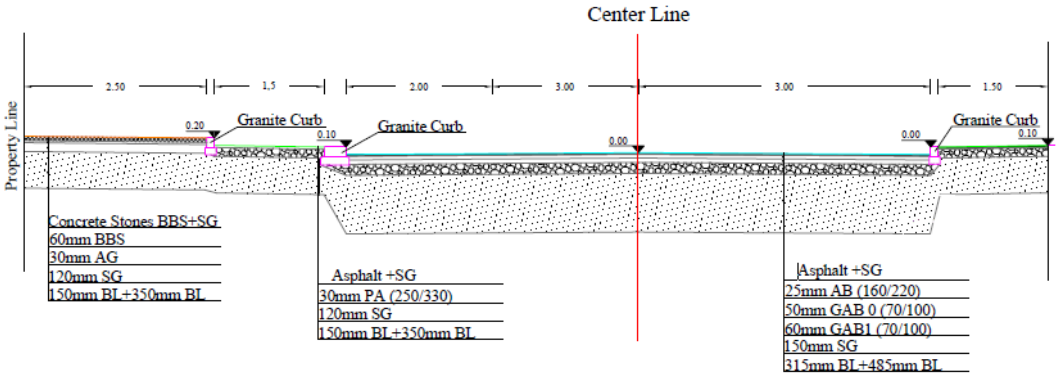
Building Code	IBC 2012
Concrete Load Combs	IBC 2012 (Strength)
Masonry Load Combs	ASCE 7-10 (ASD)
Stability Load Combs	ASCE 7-10 (ASD)
Restrained Against Sliding	No
Neglect Bearing At Heel	Yes
Use Vert. Comp. for OT	No
Use Vert. Comp. for Sliding	No
Use Vert. Comp. for Bearing	Yes
Use Surcharge for Sliding & OT	Yes
Use Surcharge for Bearing	Yes
Neglect Soil Over Toe	No
Neglect Backfill Wt. for Coulomb	No
Factor Soil Weight As Dead	Yes
Use Passive Force for OT	Yes
Assume Pressure To Top	Yes
Extend Backfill Pressure To Key Bottom	No
Use Toe Passive Pressure for Bearing	No
Required F.S. for OT	1.50
Required F.S. for Sliding	1.50
Has Different Safety Factors for Seismic	No
Allowable Bearing Pressure	143.6 kPa
Req'd Bearing Location	Middle third
Wall Friction Angle	25°
Friction Coefficient	0.35
Soil Reaction Modulus	27146 kN/m³

MEASUREMENT SHEET							
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY	UNIT
	TOTAL LENGTH, = 441.30M						
1	**EXCAVATION IN ORDINARY SOIL**	1	120.5	2.4	2.5	723	M3
	L=120.5 M						
2	**PCC FOR FOUNDATION (1:4:8)**						
	L=120.5 M	1	120.5	2.4	0.3	86.76	M3
3	**CONCRETE WORK**						
	L=120.5 M	1	120.5	-	-	441.1264	M3
	AREA= 3.6608						
4	**EARTH FILLING**						
	L=120.5 M	1	120.5			175.93	M3
	A=1.46 M2						
5	**STEEL WORK(12MM DIA.)**						
	L=120.5 M						
	NOS=30						
	LAPING LENGTH=30 CM						
	LENGTH OF 1 STEEL BAR=12M	STEEL WORK USED				568.88	KG

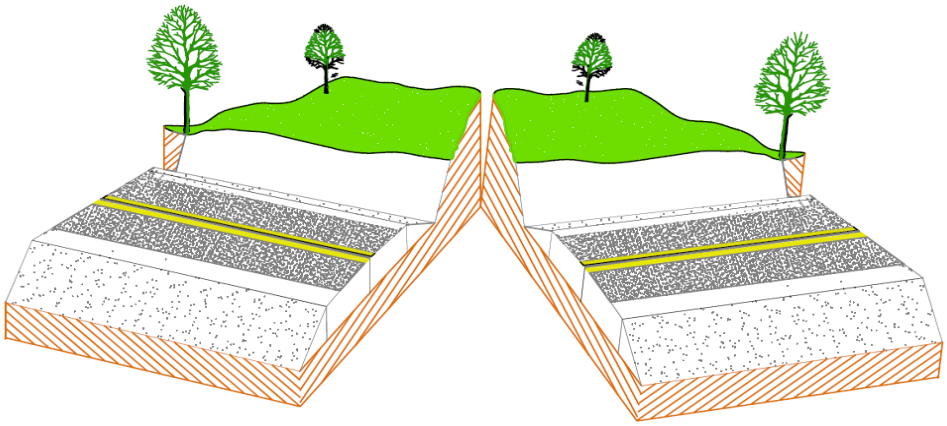
ABSTRACT SHEET					
SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	723	M3	EXCAVATION IN ORDINARY SOIL	450	325350
2	86.76	M3	PCC FOR FOUNDATION (1:4:8)	1250	108450
5	441.13	M3	CONCRETE WORK	2000	882260
6	1.2	M3	RCC WORK FOR CHAJJA	2000	2400
8	2435.24	M2	CEILING PLASTER	170	413990.8
8	2191.71	M3	EARTH FILLING	150	328756.5
9	8364.28	KG	STEEL WORK	56	468399.7
			TOTAL ESTIMATE=		2529607
			CONTRACTOR PROFIT 10%=		252960.7
			OTHER COST 15%		379441
TOTAL ESTIMATED COST=					**3162009**

13.1.3 Civil Design 3 BITUMINOUS ROAD





TYPICAL CROSS SECTION OF BITUMINOUS ROAD



3D VIEW OF FLEXIBLE PAVEMENT

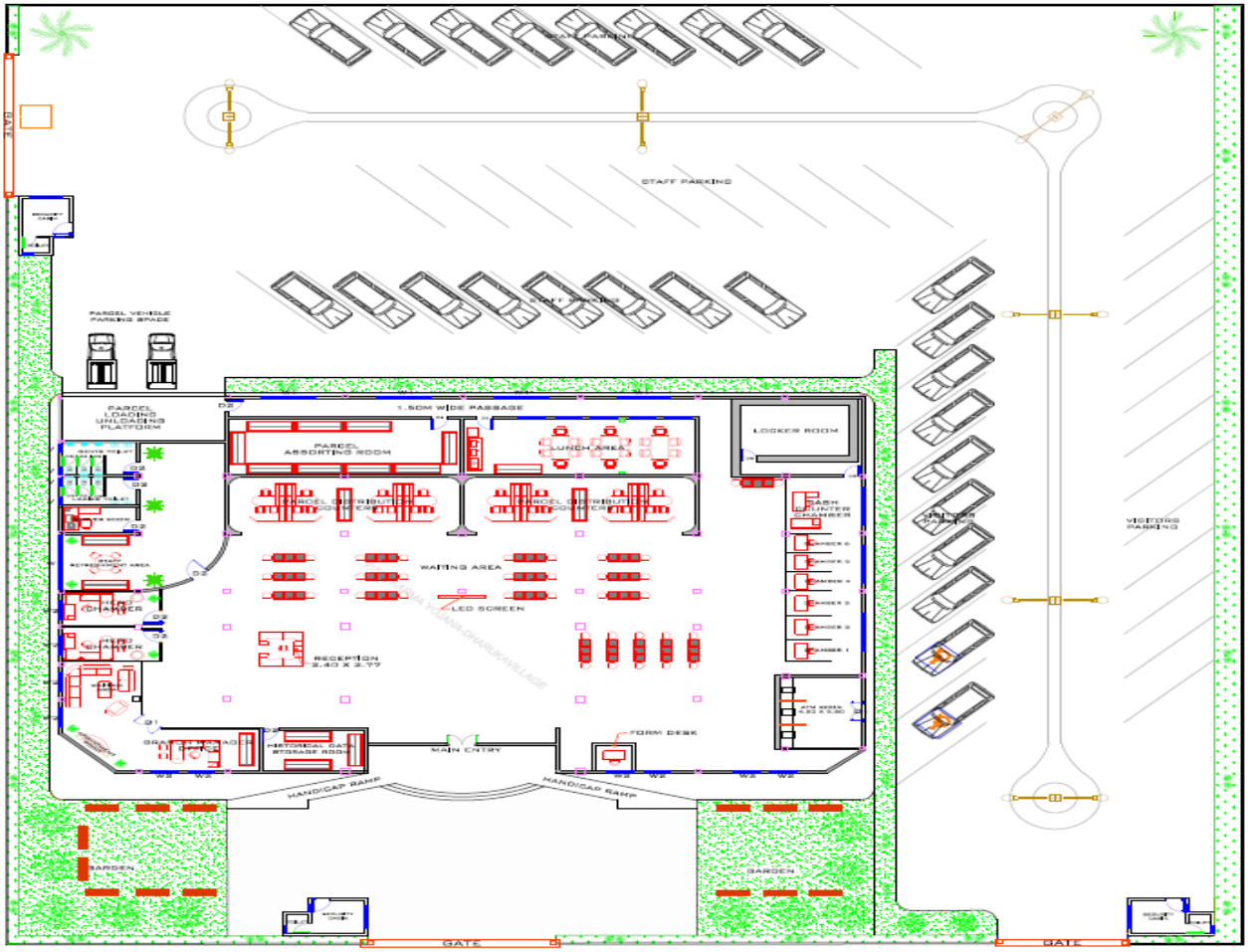
MEASUREMENT SHEET							
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY	UNIT
1	Scarifying gravelled macadam or bitumen macadam surface 6 cm to 10 cm.depth including stacking useful materials on road side and disposing off remaining stuff.	1	146	12	-	1752	M2
2	Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed upto 50Mt.lead.	1	146	12	0.15	262.8	M3
3	Laying built-up spray grout base course intwo layers with bitumen at rate of 15 kg./per 10 Sq.M. with 0.50 cu.m. stone aggregate for first layer and 15kg. of bitumen and 0.50 cu.m. of stone aggregate per 10 Sq.M. of roadsurface for second layer and using 0.13cu.m. of Key aggregate per 10 Sq.M. excluding rolling and consolidation complete. (stone aggregate and bitumen shall be paid separately) (more than 10 ton)	1	146	8	0.075	87.6	M3
4	Providing and laying ashphalt painting on BT surfaces with bitumen VG 30 @ rate 10kg/10sqmt by mechanical sprayer of rate 10 kg/10sqmt etc.complete	1	146	8	-	1168	M2

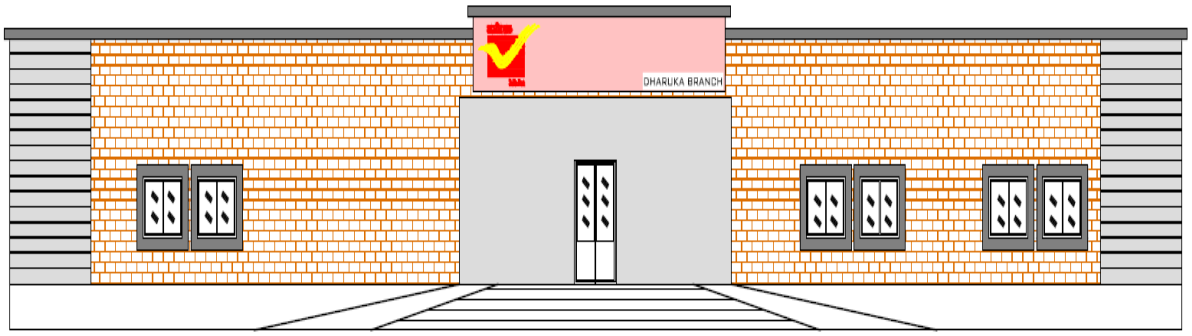
ABSTRACT SHEET

SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	1752	M2	Scarifying gravelled macadam or bitumen macadam surface 6 cm to 10 cm.depth including stacking useful materials on road side and disposing off remaining stuff.	24.9	43624.8
2	262.8	M3	Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed upto 50Mt.lead.	120	31536
3	87.6	M3	Laying built-up spray grout base course intwo layers with bitumen at rate of 15 kg./per 10 Sq.M. with 0.50 cu.m. stone aggregate for first layer and 15kg. of bitumen and 0.50 cu.m. of stone aggregate per 10 Sq.M. of roadsurface for second layer and using 0.13cu.m. of Key aggregate per 10 Sq.M. excluding rolling and consolidation complete. (stone aggregate and bitumen shall be paid separately) (more than 10 ton)	3079.4	269753.69
4	1168	M2	Providing and laying ashphalt painting on BT surfaces with bitumen VG 30 @ rate 10kg/10sqmt by mechanical sprayer of rate 10 kg/10sqmt etc.complete	43	50224
			TOTAL ESTIMATE=		395138.49
			CONTRACTOR PROFIT 10%=		39513.849
			OTHER COST 3%=		11854.155

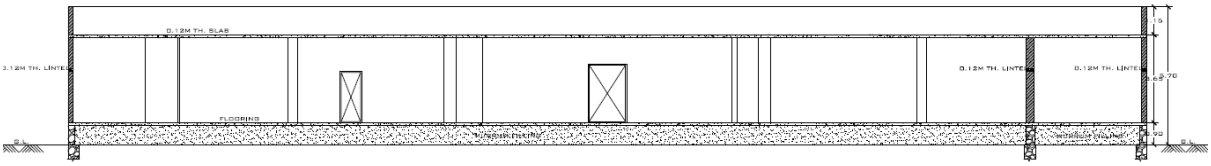
13.1.4 Civil Design 4 POST OFFICE:-

: TITLE OF WORK : DESIGN OF POST OFFICE BUILDING			
VISHVAKARMA YOJANA PHASE-VIII PART-II DHARUKA VILLAGE			
OPENING SCHEDULE		SCALE	1:100
D	3.00 X 2.10	SHEET NO	01 OF 01
D1	2.25 X 2.10		
D2	1.00 X 2.10		
D3	0.75 X 2.10		
W	1.50 X 1.20		
W1	1.50 X 0.90		
V	0.60 X 0.60		





ELEVATION



SECTION @ A-A

MEASUREMENT SHEET							
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY	UNIT
	Centre line Length, = 3539.53m						
1	**EXCAVATION IN ORDINARY SOIL**	1	3539.53	0.9	1.2	3822.692	M3
	230MM THICK WALL						
	=3539.53m						
	PCC FOR FOUNDATION (1:4:8)						
	230MM THICK WALL	1	3539.53	0.9	0.3	955.6731	M3
2	**BRICK MASONARY UPTO PLINTH**						
	FOR 230 MM THICK WALL						
	(i) 600 thick footing						
	L= 3539.53	1	3539.53	0.6	0.2	424.7436	

	(ii) 500 THICK FOOTING						
	L= 3539.53	1	3539.53	0.5	0.2	353.953	
	(iii) 400 THICK FOOTING					0	
	L= 3539.53	1	3539.53	0.4	0.2	283.1624	
	(iv) 230 THICK FOOTING						
	L= 3539.53	1	38.5715	0.23	0.9	7.984301	
				TOTAL=		1069.843	M3
	BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6						
	230 MM WALL						
	L= 3539.53M	1	3539.53	0.23	3.525	2869.674	
4	**PARAPET WALL:-**						
	L=3539.53						
		1	3539.53	0.23	1.15	936.2057	
				TOTAL=		3805.88	M3
5	**CONCRETE QUANTITY**						
	CONCRETE FOR SLAB:-						
	AREA= 1346.0343						
	1346.0343	1	1346.034		0.125	168.2543	M3
	SECURITY CABIN-2	2	45.56		0.125	11.39	M3
	AREA= 22.78+22.78						
			TOTAL=			179.6443	M3

6	DEDUCTION						
	IN THE BRICKMASONARY WORK UPTO SLAB LEVEL						
	D1	3	2.25	0.23	2.1	3.26025	
	D2	9	1	0.23	2.1	4.347	
	W	1	1.5	0.23	1.2	0.414	
	W1	4	1.5	0.23	0.9	1.242	
	V	4	0.6	0.23	0.6	0.3312	
				TOTAL DEDUCTION=		9.59445	M3
	DEDUCTION						
	LINTEL BEARING						
	D1		2.25	0.23	0.12	0.1863	
	D2		1	0.23	0.12	0.2484	
	W		1.5	0.23	0.12	0.0414	
	W1		1.5	0.23	0.12	0.1656	
	V		0.6	0.23	0.12	0.06624	
			TOTAL DEDUCTION			0.70794	M3
	RCC WORK FOR CHAJJA						
	W	3	2.7	0.23	0.1	0.1863	
	W1	9	1.8	0.23	0.1	0.3726	
	D1	1	1.3	0.23	0.1	0.0299	
	D2	4	1.06	0.23	0.1	0.09752	
	V	4	0.9	0.23	0.1	0.0828	
				TOTAL QUANTITY=		0.76912	M3
7	**SMOOTH PLASTER THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS**						

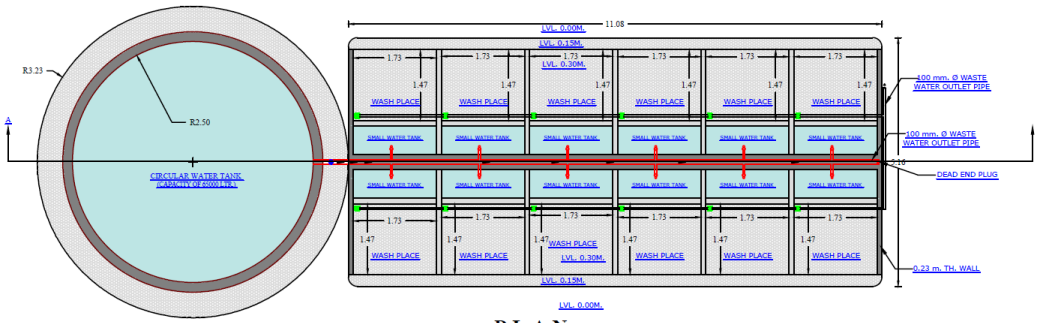
	LENGTH=162.5570	1	162.557		3.5	568.9495	M2
8	DEDUCTION FOR PLASTER WORK						
	D1	3	2.25	-	2.1	14.175	
	D2	9	1	-	2.1	18.9	
	W	1	1.5	-	1.2	1.8	
	W1	4	1.5	-	0.9	5.4	
			TOTAL DEDUCTION=			40.275	
							M2
	NET QUANTITY FOR PLASTER WORK=					528.6745	
9	CEILING PLASTER						M2
	AREA= 1346.0343					1346.035	
							M2
	NET QUANTITY FOR PLASTER=					1874.709	
10	**EARTH FILLING IN FOUNDATION**						M2
	TOTAL LENGTH= 3539.53 M	1	3539.53	0.6	1.2	2548.462	M3
11	EARTH FILLING IN PLINGTH	1					
	TOTAL AREA= 1346.0343	1	1346.034		0.9	1211.431	M3

ABSTRACT SHEET

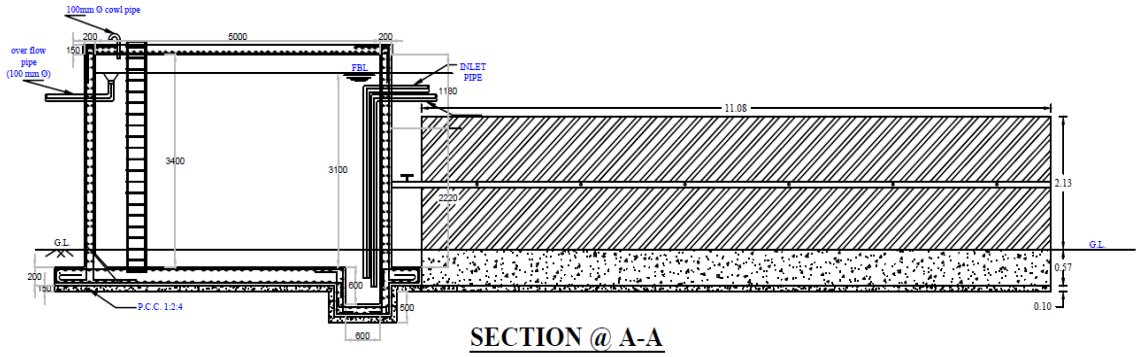
SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	3822.69	M3	EXCAVATION IN ORDINARY SOIL	450	1720211
2	955.67	M3	PCC FOR FOUNDATION (1:4:8)	1250	1194588
3	1069.46	M3	BRICK MASONARY UPTO PLINTH	1500	1604190

4	3805.88	M3	BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6	1700	6469996
5	168.25	M3	CONCRETE FOR SLAB:	2000	336500
6	0.7691	M3	RCC WORK FOR CHAJJA	2000	1538.2
7	528.67	M2	SMOOTH PLASTER INSIDE THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS	150	79300.5
8	1346.05	M2	CEILING PLASTER	170	228828.5
8	1211.046	M3	EARTH FILLING IN PLINTH	150	181656.9
9	7514	KG	STEEL WORK	56	420784
			TOTAL ESTIMATE=		5767596
			CONTRACTOR PROFIT 10%=		576759.6
			OTHER POST OFFICE EQUIPMENTS 50%		2883798
			ELECTRIFICATION COST 8%		461407.7
TOTAL ESTIMATED COST=					**9689561**

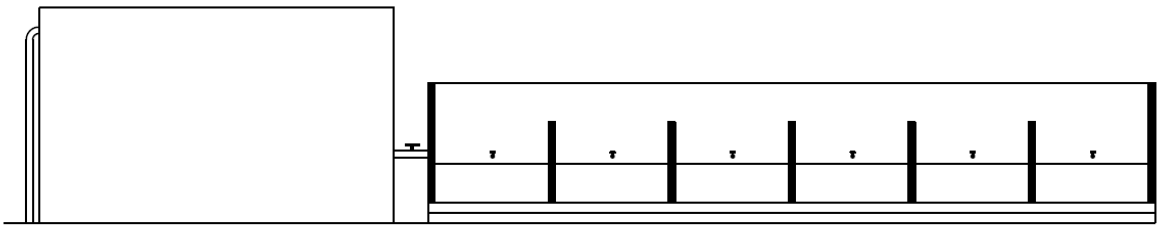
13.1.5 WASHING GHAT WITH CIRCULAR WASHING TANK



PLAN



SECTION @ A-A



ELEVATION

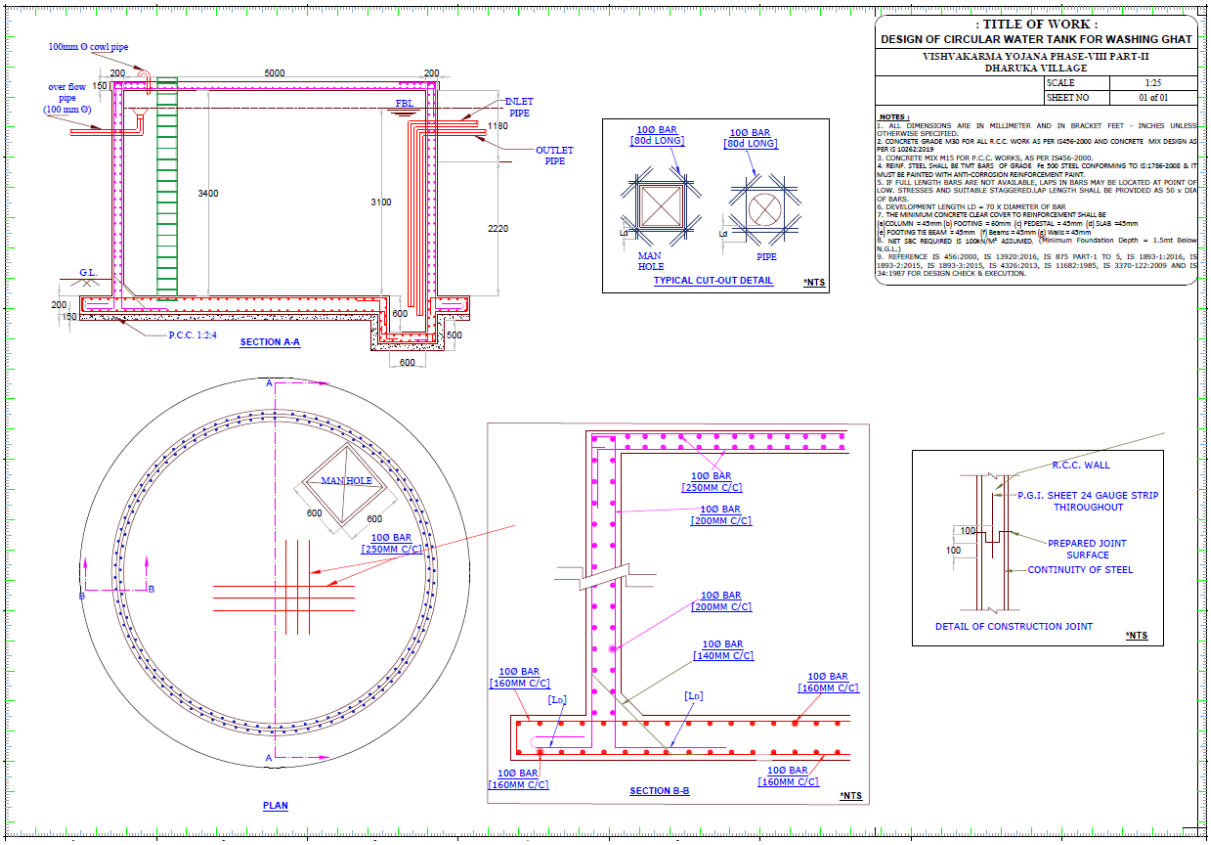
: TITLE OF WORK :
DESIGN OF CIRCULAR WATER TANK FOR WASHING GHAT

VISHVAKARMA YOJANA PHASE-VIII PART-II
DHARUKA VILLAGE

SCALE	1:25
SHEET NO	01 of 01

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETER AND IN BRACKET FEET - INCHES UNLESS OTHERWISE SPECIFIED.
2. CONCRETE GRADE M30 FOR ALL R.C.C. WORK AS PER IS456-2000 AND CONCRETE MIX DESIGN AS PER IS 10262:2019
3. CONCRETE MIX M15 FOR P.C.C. WORKS, AS PER IS456-2000.
4. REINF. STEEL SHALL BE TMT BARS OF GRADE Fe 500 STEEL CONFORMING TO IS:1786-2008 & IT MUST BE PAINTED WITH ANTI-CORROSION REINFORCEMENT PAINT.
5. IF FULL LENGTH BARS ARE NOT AVAILABLE, LAPS IN BARS MAY BE LOCATED AT POINT OF LOW. STRESSES AND SUITABLE STAGGERED.LAP LENGTH SHALL BE PROVIDED AS 50 x DIA OF BARS.
6. DEVELOPMENT LENGTH LD = 70 X DIAMETER OF BAR
7. THE MINIMUM CONCRETE CLEAR COVER TO REINFORCEMENT SHALL BE
(a)COLUMN = 45mm (b) FOOTING = 60mm (c) PEDESTAL = 45mm (d) SLAB =45mm
(e) FOOTING TIE BEAM = 45mm (f) Beams = 45mm (g) Walls = 45mm
8. NET SBC REQUIRED IS 100kN/M² ASSUMED. (Minimum Foundation Depth = 1.5mt Below N.G.L.)
9. REFERENCE IS 456:2000, IS 13920:2016, IS 875 PART-1 TO 5, IS 1893-1:2016, IS 1893-2:2015, IS 1893-3:2015, IS 4326:2013, IS 11682:1985, IS 3370-122:2009 AND IS 34:1987 FOR DESIGN CHECK & EXECUTION.



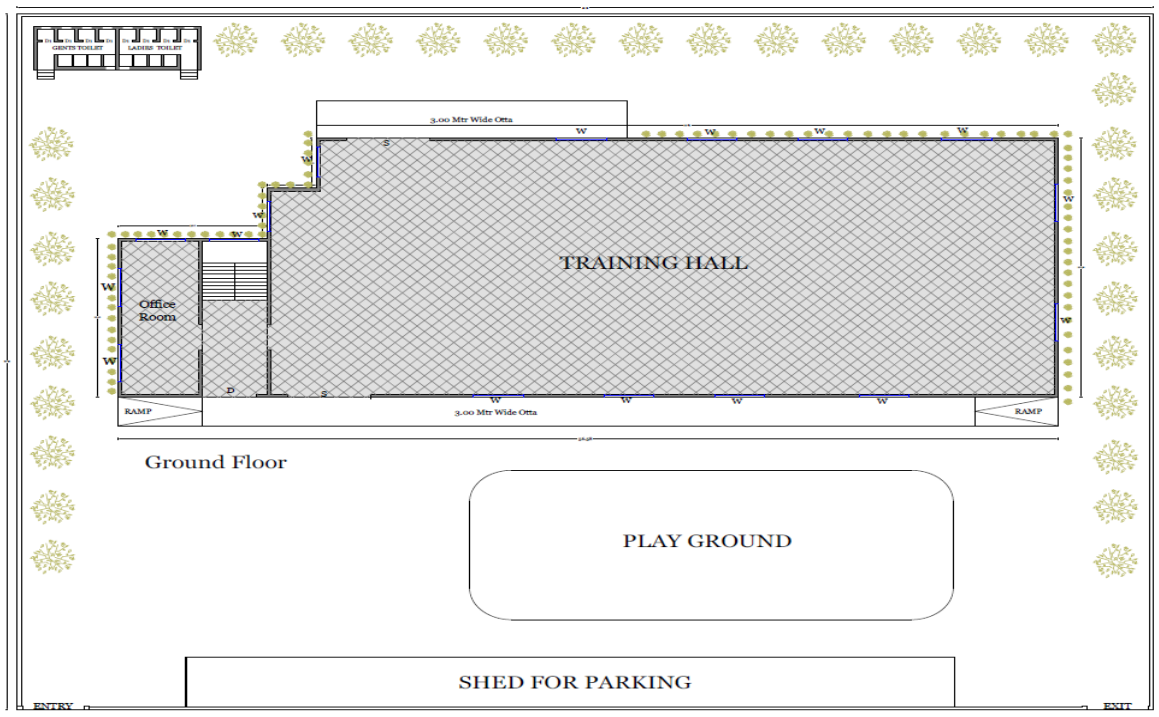
MEASUREMENT SHEET							
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY	UNIT
	Centre line Length, = 54.55m						
1	**EXCAVATION IN ORDINARY SOIL**	1	54.55	0.6	1	32.73	M3
	FOR WASHING PLACE-230MM THICK WALL						
	L=54.55M						
	FOR CIRCULAR WASHING TANK	1	32.776		0.57	18.68232	M3
	AREA= 32.776						
2	**PCC FOR FOUNDATION (1:4:8)**						
	FOR 230MM THICK WALL	1	54.55	0.6	0.57	18.6561	M3
	FOR CIRCULAR TANK	1	32.776		0.57	18.68232	M3
3	**BRICK MASONARY UPTO GROUND LEVEL**						
	FOR 230 MM THICK WALL						
	(i) 400 thick footing						
	L= 54.55 M	1	54.55	0.4	0.2	4.364	
	(ii) 300 THICK FOOTING						
	L= 54.55 M	1	54.55	0.3	0.2	3.273	
	(iv) 230 THICK FOOTING						
	L= 54.55 M	1	54.55	0.23	0.9	11.29185	
				TOTAL=		18.92885	M3
3	**FOR WASHING PLACE BRICK MASONARY ABOVE GROUNG LEVEL**						
	230 MM WALL						
	L= 54.55M	1	54.55	0.23	0.3	3.76395	
				TOTAL=		3.76395	M3
4	**SMOOTH PLASTER ABOVE THE GROUND LEVEL**						
	LENGTH=54.55M	1	54.55		0.3	16.365	M2
	NET QUANTITY FOR PLASTER WORK=					16.365	

5	CONCRETE WORK ON CIRCULAR TANK						
	SIDE AREA= 13.141	1	13.141		3.4	44.6794	M3
	SLAB AREA= 32.77	1	32.77		0.115	3.76855	M3
	BASE SLAB AREA= 2.078	1	2.078	7.5		15.585	M3
				TOTAL=		64.03295	M3
6	STEEL QUANTITY WORK						
	LENGTH OF BAR 12M						
	NO. OF BARS REQUIRED= 76 NOS.						
	DENSITY=7850 M3					1166.54	KG

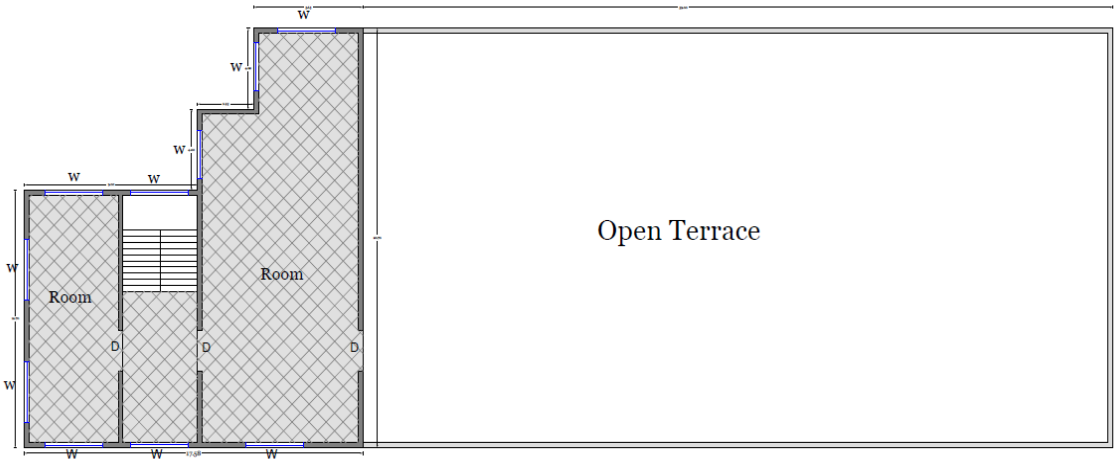
ABSTRACT SHEET

SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	51.48	M3	EXCAVATION IN ORDINARY SOIL	450	23166
2	37.33	M3	PCC FOR FOUNDATION (1:4:8)	1250	46662.5
3	18.92	M3	BRICK MASONARY UPTO GROUND LEVEL	1500	28380
4	3.7639	M3	FOR WASHING PLACE BRICK MASONARY ABOVE GROUNG LEVEL	1700	6398.63
5	64.0329	M3	CONCRETE FOR SLAB:	2000	128065.8
7	16.36	M2	SMOOTH PLASTER ABOVE THE GROUND LEVEL	150	2454
9	3584	KG	STEEL WORK	56	200704
			TOTAL ESTIMATE=		435830.9
			CONTRACTOR PROFIT 10%=		43583.09
			OTHER WATER SUPPLY EQUIPMENTS 50%		217915.5
TOTAL ESTIMATED COST=					**697329.5**

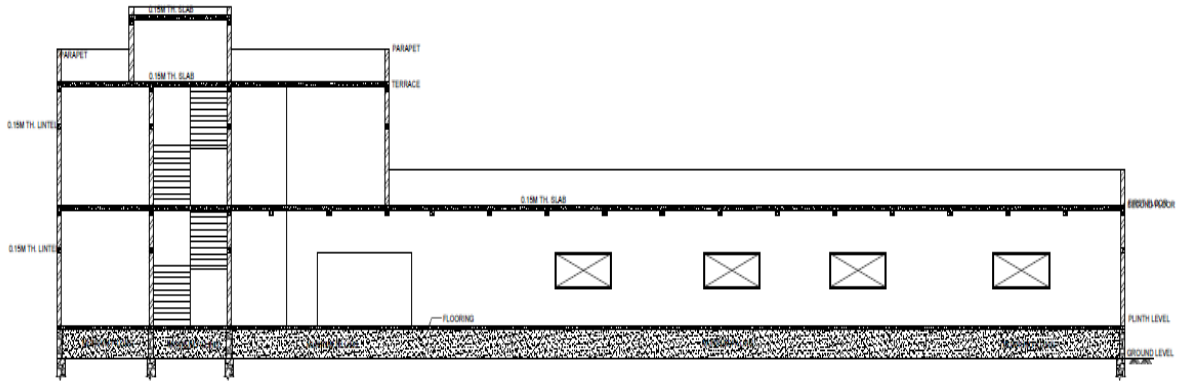
13.1.6 Civil Design 6 DEFENCE TRAINING CENTRE:-



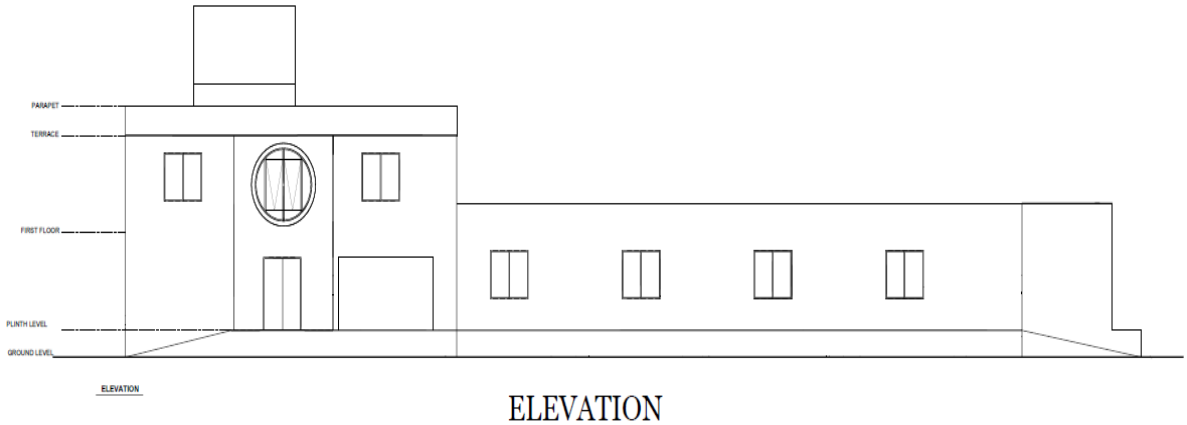
PLAN



Terrace Floor



SECTION @ A-A



ELEVATION

MEASUREMENT SHEET							
ITEM NO.	ITEM DESCRIPTION	NOS.	LENGTH (M)	WIDTH (M)	HEIGHT (M)	QUANTITY	UNIT
	Centre line Length, = 178.66m						
1	**EXCAVATION IN ORDINARY SOIL**	1	178.66	0.9	1.2	192.9528	M3
	230MM THICK WALL						
	=178.66M						
	PCC FOR FOUNDATION (1:4:8)						
	230MM THICK WALL	1	178.66	0.9	0.3	48.2382	M3
2	**BRICK MASONARY UPTO PLINTH**						

	FOR 230 MM THICK WALL						
	(i) 600 thick footing						
	L= 178.66	1	178.66	0.6	0.2	21.4392	
	(ii) 500 THICK FOOTING						
	L= 178.66	1	178.66	0.5	0.2	17.866	
	(iii) 400 THICK FOOTING						
	L= 178.66	1	178.66	0.4	0.2	14.2928	
	(iv) 230 THICK FOOTING						
	L= 178.66	1	178.66	0.23	0.9	36.98262	
				TOTAL=		90.58062	M3
	BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6						
	230 MM WALL						
	L= 178.66 M	1	178.66	0.23	3.525	144.8486	
4	**PARAPET WALL:-**						
	L=178.66						
		1	178.66	0.23	1.15	47.25557	
				TOTAL=		192.1042	M3
5	**CONCRETE QUANTITY**						
	CONCRETE FOR SLAB:-						
	AREA= 1217.62+1217.62						
		1	2435.24		0.125	304.405	M3
6	DEDUCTION						
	IN THE BRICKMASONARY WORK UPTO SLAB LEVEL						
	S	2	5	0.23	3	6.9	
	D	4	3	0.23	2.1	5.796	
	W	27	1.5	0.23	1.2	11.178	
				TOTAL=		23.874	M3
	DEDUCTION						
	LINTEL BEARING						
	S	2	5	0.23	3	6.9	
	D	4	2.25	0.23	0.12	0.2484	
	W	27	1.5	0.23	0.12	1.1178	
			TOTAL DEDUCTION			1.3662	M3

	RCC WORK FOR CHAJJA						
	W	27	1.5	0.23	0.1	0.9315	
	D	4	2.25	0.23	0.1	0.207	
	S	2	1.5	0.23	0.1	0.069	
				TOTAL QUANTITY=		1.2075	M3
	SMOOTH PLASTER THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS						
	LENGTH=159.16	1	159.16		3.5	557.06	M2
7	DEDUCTION FOR PLASTER WORK						
	D	4	2.25	-	2.1	18.9	
	W	27	1.5	-	2.1	85.05	
	S	2	1.5	-	1.2	3.6	
			TOTAL DEDUCTION=			107.55	
							M2
	NET QUANTITY FOR PLASTER WORK=					449.51	
8	CEILING PLASTER						M2
	AREA= 2435.24	1				2435.24	
							M2
	NET QUANTITY FOR PLASTER=					2884.75	
	EARTH FILLING IN FOUNDATION						M2
	TOTAL LENGTH= 178.66 M	1	178.66	0.6	1.2	128.6352	M3
10	EARTH FILLING IN PLINGTH	1					
	TOTAL AREA= 2435.24	1	2435.24		0.9	2191.716	M3

ABSTRACT SHEET

SR.NO	TOTAL QUANTITY	UNIT	DESCRIPTION	RATE	AMOUNT IN RS.
1	192.95	M3	EXCAVATION IN ORDINARY SOIL	450	86827.5
2	48.23	M3	PCC FOR FOUNDATION (1:4:8)	1250	60287.5
3	90.58	M3	BRICK MASONARY UPTO PLINTH	1500	135870

4	192.1	M3	BRICK MASONARY ABOVE PLINTH UP TO SLAB LEVEL IN C.M. 1:6	1700	326570
5	304.405	M3	CONCRETE FOR SLAB:	2000	608810
6	1.2	M3	RCC WORK FOR CHAJJA	2000	2400
7	449.51	M2	SMOOTH PLASTER INSIDE THE ROOMS AND CEILING IN C.M 1:3 PLASTER FOR WALLS	150	67426.5
8	2435.24	M2	CEILING PLASTER	170	413990.8
8	2191.71	M3	EARTH FILLING IN PLINTH	150	328756.5
9	6248	KG	STEEL WORK	56	349888
			TOTAL ESTIMATE=		2380827
			CONTRACTOR PROFIT 10%=		238082.7
			OTHER POST OFFICE EQUIPMENTS 50%		1190413
			ELECTRIFICATION COST 8%		190466.1
TOTAL ESTIMATED COST=					**3999789**

13.2 Reason for Students Recommending this Design:-

Sr.no	Design	Reason for Students Recommending this Design
1.	Bituminous Road	As existing road is kucha type makes it difficult for transportation in rainy season
2.	Washing Ghat with circular water tank	In relate to swachh bharat mission the panchayat has provide to washing ghat for wash cloths at one pic point for the collect the sewer water at the define location.
3.	Post office	In the village there is no any post office available
4.	Primary health centre	PHC Centre is not available in the village.
5.	Gravity retaining wall(flood protecting wall)	To divert the flood water and protect the road bank of the main road of village
6.	Defence training centre	In the village there is many student and people are interesting to join defence centre and other reason is for the maintain the healthy life by villagers

13.3 About designs Suggestions / Benefit of the villagers

Sr.no	Design	Benefit of the villagers
1.	Bituminous Road	• A smooth Ride Surface: • Gradual Failure: • Quick Repair: • Staged Construction • Life Cost is less: • Temperature Resistant:
2.	Washing Ghat with circular water tank	Given that the houses in the village are small and clustered close to each other, women normally washed their clothes either in the front or back of their homes or near the fields and the used water would run over the paths and stagnate at some point. Others carried their clothes to hand pumps or a common area and their used water would also flow unchecked. All that users must take with them to use the facility were soap and their soiled clothes. The initiative has made life easier for the families and stagnant puddles is not a common site any longer.
3.	Post office	• To provide mail parcel, money transfer, banking, insurance and retail services with speed and reliability. • To provide services to the customers on value-for-money basis. • To continue to deliver social security services and to enable last mile connectivity as a Government of India platform.
4.	Primary health centre	• Primary healthcare is the first contact a person has with the health system when they have a health problem. • Primary healthcare refers to a broad range of health services provided by medical professionals in the community. • Primary healthcare includes seeing health professionals to help you maintain good health, with regular health checks, health advice when you have concerns, and support for ongoing care.
5.	Gravity retaining wall(flood protecting wall)	The retaining wall prevents the soil or other material at places with sudden changes in elevation. Earth retaining structures are used to hold back the earth and maintain a difference in the height of the ground surface.
6.	Defence training centre	In the village there is many student and people are interesting to join defence centre and other reason is for the maintain the healthy life by villagers

Chapter 14:- Technical Options with Case Studies

14.1 Civil Engineering:-

14.1.1 Advanced Earthquake Resistant :-

Earthquake-resistant structures are structures designed to protect buildings from earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during seismic activity than their conventional counterparts. According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest.

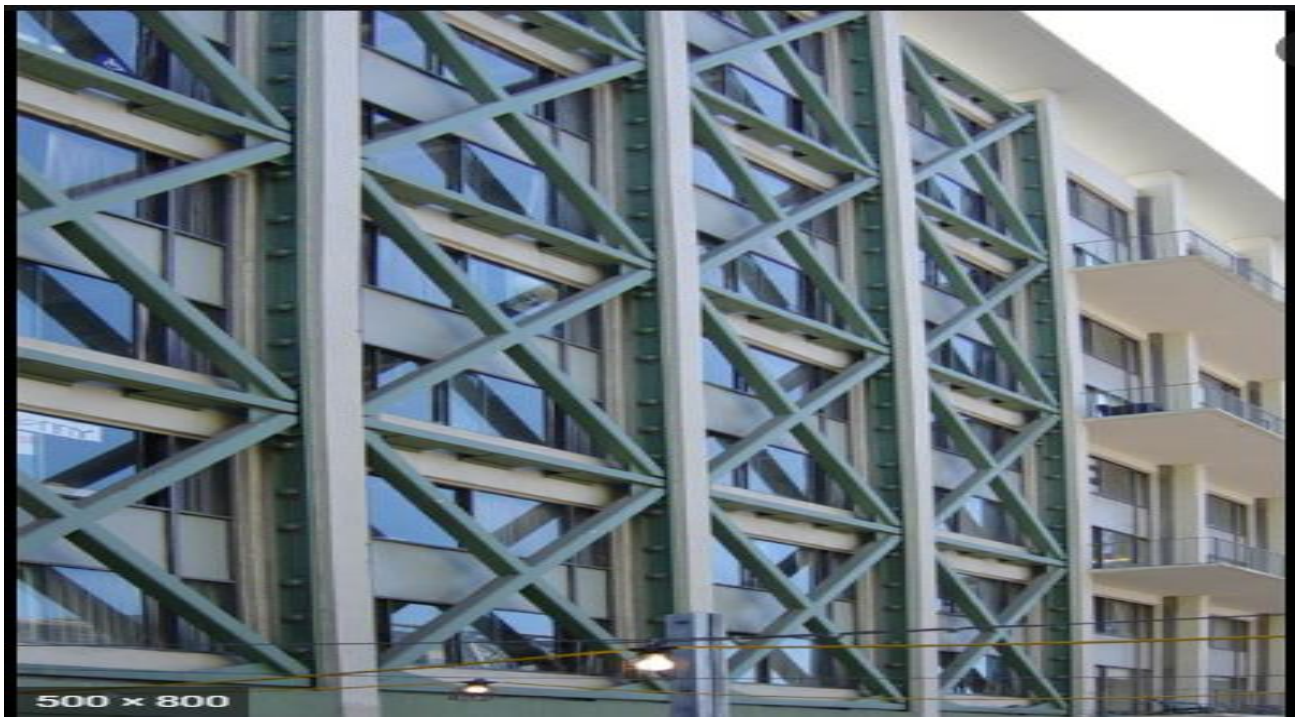


Fig14.1 Advance Earthquake Resistance Technique

14.1.2 Seismic Retrofitting of Buildings :-

The seismic retrofitting of reinforced concrete buildings not designed to withstand seismic action is considered. After briefly introducing how seismic action is described for design purposes, methods for assessing the seismic vulnerability of existing buildings are presented. The traditional methods of seismic retrofitting are reviewed and their weak points are identified. Modern methods and philosophies of seismic retrofitting, including base isolation and energy dissipation devices, are reviewed. The presentation is illustrated by case studies of actual buildings where traditional and innovative retrofitting methods have been applied.

SEISMIC ACTION Seismic vulnerability is not an absolute concept but is strongly related to the event being considered. The same construction may not be vulnerable to one class of earthquakes and yet be vulnerable to another. Therefore, before attempting a seismic vulnerability evaluation of a given construction, the seismic action that will affect that construction must be fully specified. All seismic codes specify the seismic action by means of one or more design spectra. These are a synthetic and quantitative representation of the seismic action which, besides depending on the characteristics of the ground motion, depends on some intrinsic characteristics of the structure such as the fundamental mode of vibration and its energy dissipation capacity.

The elastic design spectrum depends on the vibration periods of the structure and on the available damping. In Figure 1 the elastic spectrum of Eurocode 8 (CEN, 1998) is drawn for three different values of damping. A new draft of Eurocode 8 (CEN, 2003) became available in 2003, but is not being used here because some of the Eurocode 8 material relevant to the present work is still questionable and not generally accepted. The value of the spectral pseudo-acceleration, corresponding to a vanishing small period, corresponds to the peak ground acceleration (PGA). In fact, for T = 0 the structure is rigid and, therefore, subject to the same acceleration as the ground. This acceleration, called the maximum effective ground acceleration or PGA, depends directly on the seismic hazard at the construction site and acts as the anchoring acceleration of the spectrum. This value is generally prescribed by seismic codes as a function of the seismic hazard at the construction site. Furthermore, four regions may be identified for the elastic spectrum, each defined by a lower and upper period. In the first region, $(0) \leq \leq T\ TB$, the spectral ordinates increase linearly with the period; in the second $( ) T\ TT\ B\ C \leq \leq$, these are independent of the period; in the third $( ) T\ TT\ C\ D \leq \leq$, the spectral ordinates decrease rapidly with the period, that is with the reciprocal of the period T according to Eurocode 8; and finally in the fourth region $( ) T\ T \geq D$.

they decrease even more rapidly, with the reciprocal of the period squared according to Eurocode 8. More details on the elastic design spectrum may be found in the seismic codes (CEN, 1998), in specialized publications and in the treatises on dynamics of structures and seismic engineering (Chopra, 2001; Clough and Penzien, 1993).

The separation periods , , TTT BCD depend on seismological factors and on local site conditions. For instance Eurocode 8 specifies them as a function of three subsoil classes: A (firm soil), B (medium soil), C (soft soil).

Including the inelastic resources of a structure allows for a considerable reduction of the spectral ordinates in the design spectrum. This reduction generally depends on the available ductility and on the vibration period. Eurocode 8 considers that this reduction is mainly dependent on a factor related to ductility and it is described as structure behaviour factor or simply structure factor. Typical values of the structure factor q may fall in the range 1 to 5 for reinforced concrete structures (CEN, 1998). As may be seen from Figure 2, the use of the inelastic resources of a structure allows for a considerable reduction in the spectral ordinates and therefore in the design strength.

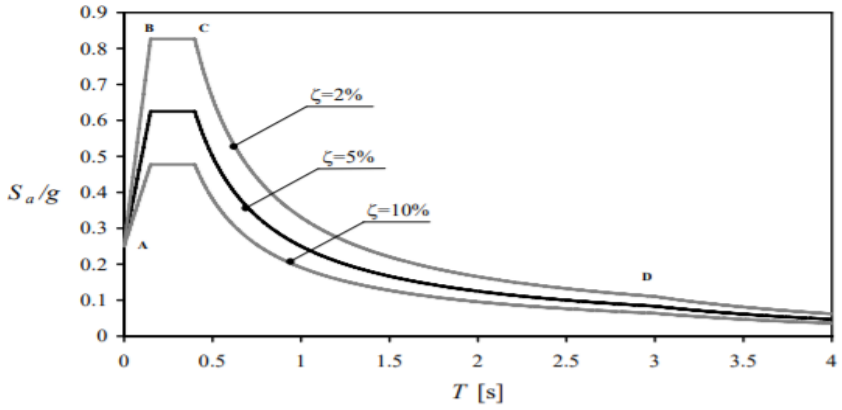


Fig. 1 Elastic design spectrum of Eurocode 8, soil type A

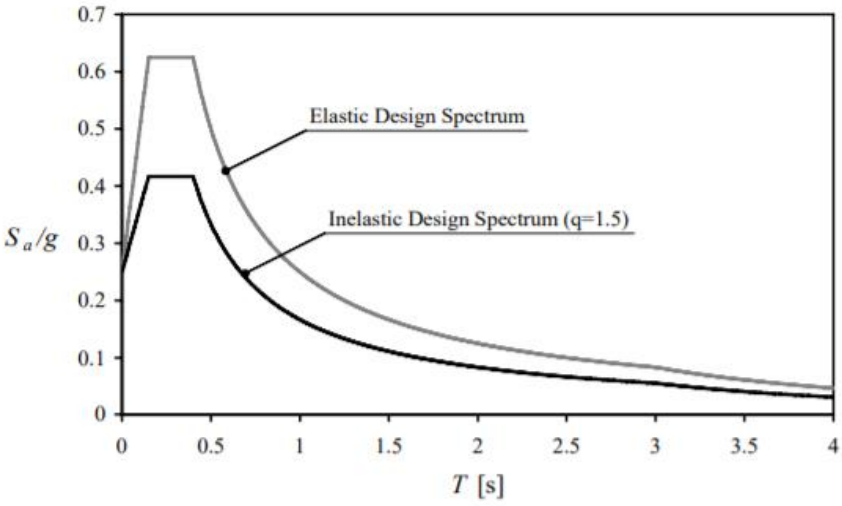


Fig. 2 Elastic and inelastic design spectra of Eurocode 8, soil type A

The process of retrofitting involves the careful balancing of different elements and their effects on the overall performance of a building. A change in one part of a building can affect another, and sometimes this is only apparent after irreversible defects have occurred. For example:

- Sealing buildings to improve their air-tightness can cause condensation problems.
- Insulating a roof without also ventilating it can cause decay of timber structure.
- Internal wall insulation will remove the benefits of thermal mass which may have a detrimental effect on fuel usage.
- External wall insulation will prevent the thermal store of heat from solar gain to be utilized within the building.
- Poorly installed cavity wall insulation can create cold spots that then have damp problems that are extremely difficult to rectify.
- Pre-existing problems can be covered up, and so more difficult to diagnose and rectify.

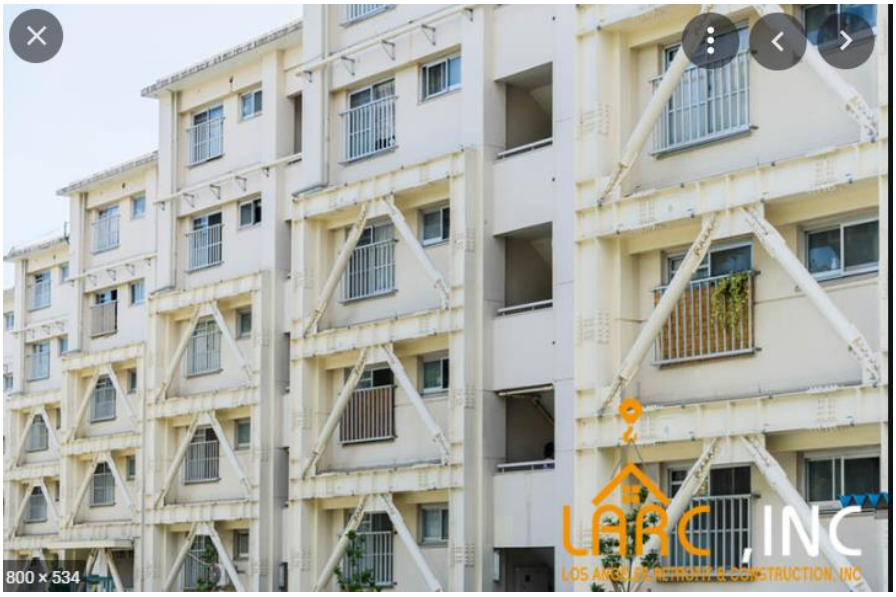


Fig14.2 Retrofitting of Structures

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

SR NO.	USE OF TECHNIQUE / EQUIPMENT	WORK ACTIVITY	ADVANTAGES
01	Precast lintel and chajja	Masonry work above lintel level	Saving the time.
02	Providing cavities in masonry during excavation	Concreting of hold fast for doors and windows	Breaking of concrete block/brick is avoided which saves labour time.
03	Wheel barrows, trolleys cranes, chains 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 erections, 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.
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 materials and refilling	Reduce the labour for loading of trucks. Speed increases.

Table 14.1 Various techniques, equipments and their advantages in building construction

14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment :-

Environmental Impact Assessment is a tool designed to identify and predict the impact of a project on the bio-geophysical environment and on man's health and well-being, to interpret and communicate information about the impact, to analyze site and process alternatives and provide solutions to sift out, or abate/mitigate the negative consequences on man and the environment.

EIA is always necessary for a pulp and paper project (whether it is a new mill or the expansion of an existing facility), as for any industrial project of importance. The EIA is a means of avoiding environmental disturbances that are always much more expensive to correct after their occurrence than before. It is also important to underline that very few projects have been deemed not viable merely because of the cost of pollution control and that modern environmental control, in a new plant, is less than 3% of the initial investment.

Today, there is world-wide evidence that man cannot ignore the quality of the environment. Thus environmental issues must be addressed as soon as possible during project planning. There should not be any hesitation in abandoning a project or a process at an early stage, or in proposing alternatives to any project which would have very detrimental impact on the environment, as is the case for projects which are not economically or financially viable. In the same way as economic, financial, institutional, or technical analyses, EIA is an integral part of the project.

Aware of this necessity, numerous countries have implemented EIA regulations. International agencies generally also lend their assistance to any industrial project of importance implementing an EIA, including pulp and paper industries.

There is historical precedent for the now mandatory Environmental Impact Assessments (EIA). Past efforts by governments have resulted in bans on activities that caused noxious odours, garbage dumps were positioned at places far away from habitation, and commercial activities were restricted to town centres.

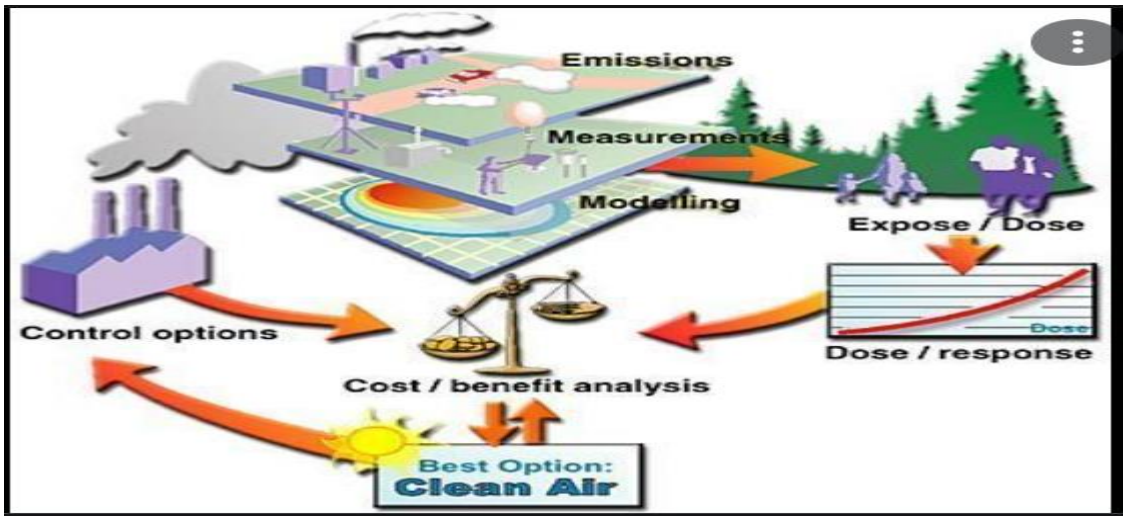


Fig14.3 Environmental impact of hydraulic fracturing

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

Sustainable sewerage infrastructure projects are essential in achieving sustainable development, as infrastructure directly affects all measures of such development. However, sewerage infrastructures face a variety of challenges and threats to their sustained performance throughout their life cycle, including effects of aging, aggressive environmental factors, inadequate design, underfunding, improper operation, and maintenance activities. These challenges lead to the enhancement of the risks of failure, for example, sewer leakage, overflow, and odor. These issues can have serious impacts on the environment, public health and safety, the economy, and the service lives of assets. Only a few research has focused on assessing sustainability at the project level, and to the best of researchers' knowledge, no study has assessed sewerage throughout its project life cycle. In response to this issue, this study proposes a sustainability assessment framework that focuses on all aspects of sustainability throughout the project life cycle. Furthermore, this framework supports the decision-making process throughout the life cycle of assets, ensuring the long-term sustainability of the projects and providing greater transparency for the stakeholders.

- **Water Supply :-** Meeting the present-day need for safe, reliable, and affordable water, which minimises adverse effects on the environment, whilst enabling future generations to meet their requirements.

  With growing numbers of people on our planet, it is essential that clean water is provided to people across the globe in a sustainable and fair manner. We need to use water efficiently and to achieve water sustainability we need to :-

- Make sure there is a balance between what is consumed and what is used.
- Ensure that water remains of a good quality and avoid pollution of our water sources.
- Allow for stores to be built up for drier periods in our changing climate.

- Manage the water that falls in places effectively.
  If we can do this we will have sustainable water supply which meets the present-day need for safe, reliable, and affordable water, which minimises adverse effects on the environment, whilst enabling future generations to meet their requirements.

Sustainable water supply means to find reliable and resilient approaches to various human needs for water for that does neither exhaust the water sources and the local economy nor have long term negative impact on the environment. Agriculture consume about 70% of the current world water supply, whereas domestic and industrial use is about 8% and 22% respectively (WBCSD 2009). Read more about the water cycle here. This course focuses on domestic water supply. Potable water for domestic use is normally derived from surface or groundwater sources or from rainwater harvesting (RWH). Other sources are harvesting of fog or air moisture, bottled water or even melting of snow or ice or sea water desalination. Methods for desalination of seawater have improved, but are still requiring substantial energy input and are thus not sustainable from an energy perspective. This module will mainly focus on ground- or surface-water sources and RWH and give the student knowledge that aids selection and design of sustainable water supply options in different parts of the world including crisis situations (disaster situations will be discussed in Module 6). Cases are used to illustrate different water supply and treatment options and to motivate the learning process.

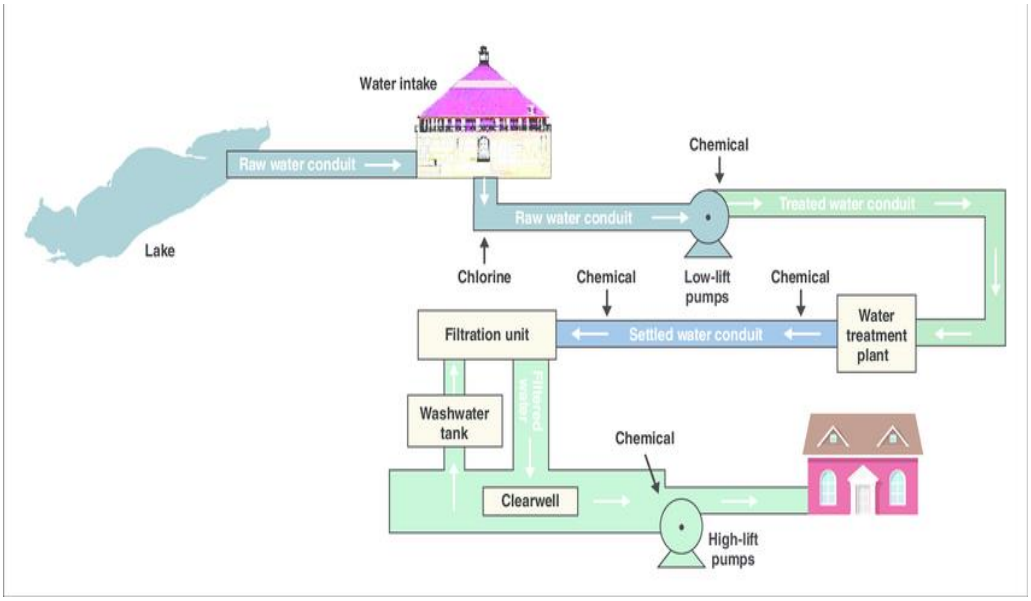


Fig14.4 Sustainable water supply technique

❖ Sewerage system & Waste Water :-

From a public health perspective, treatment of the wastewater produced by the population and industries in a given urban area is critical to ensure stable growth. Wastewater must also be treated to an extent that it does not affect the environment into which it is discharged, the goal being to ensure that urban growth is sustainable. In order for wastewater treatment to be sustainable, an innovation project must be

implemented to develop a new biological wastewater treatment process with low energy consumption and a low environmental impact. The project consists of determining whether the normal processes that take place in a wastewater treatment plant (WWTP)—i.e. elimination of all pollutants—can be carried out with very low levels of oxygen.

In a context in which the main energy consumption in WWTPs is related to the supply of oxygen for the biological process, achieving this goal would significantly increase the sustainability of water treatment processes by lowering fossil fuel consumption and significantly reducing greenhouse gas emissions. This would allow for the recovery of a vital natural resource, water, without affecting the availability of other resources, such as energy, and without polluting the environment directly, through contaminated water discharges, or indirectly, through greenhouse gas emissions.

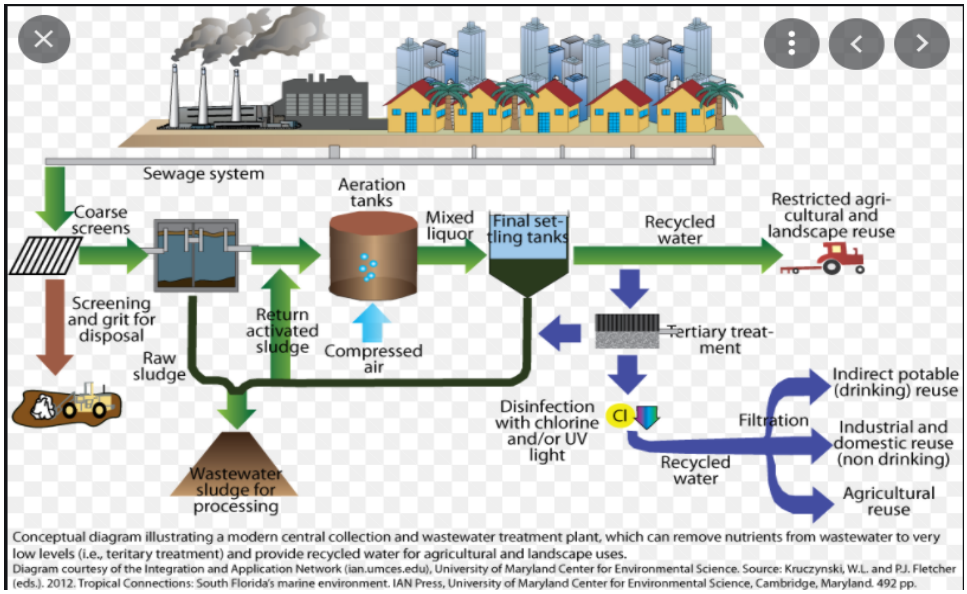


Fig14.5 Sustainable sewerage system & waste water development techniques

In an anthropomorphic sense, the solution was to select "sherpa" bacteria, which can survive in very low-oxygen environments, like the people who live high in the Himalayas. These bacteria are capable of capturing the little oxygen that is available by utilising specific molecules that are similar to the haemoglobin that humans and other animals have in their blood. As occurs in our bodies, this molecule captures oxygen and transports it to the areas of the cell where it is needed.

Preserving the environment involves developing processes for treating contaminated water to ensure sustainable growth of urban areas and protection of natural areas. But it's also important to bear in mind the issue of fossil fuel consumption and greenhouse gas emissions resulting from these processes: this innovation seeks to protect the environment at all levels by ensuring a sustainable future in water treatment and sanitation.

14.1.6 Sustainable Construction Using EPS Beads in Light Weight Blocks to form Innovative Foam Concrete as a Green Building Material.

1. Introduction

By and by Millions, Trillion of tons EPS squander is delivered which is destructive for condition hence to all the more likely use the EPS as a substitute of coarse totals. Most polystyrene items are presently not reused because of the absence of motivation to put resources into the compactors and calculated frameworks required for reusing. Because of low thickness of polystyrene froth or EPS dots, it isn't practical to gather. Generally, if a waste material experiences an underlying compaction

Measure. The material changes thickness from ordinarily 30 kg/m3 to 330 kg/m3 and it turns into a

Recyclable ware of high an incentive for creation of reused plastic pellets, protection sheets and different EPS materials for development applications; numerous makers can't deliver adequate piece due to assortment issues.

EPS dabs are utilized for bundling of products for simple taking care of and transportation. However,

the removal of EPS dabs is turning into an issue for the garbage removal division. Since, EPS is lightweight, non-biodegradable, hydrophobic and misleadingly inactive in nature, and furthermore have great warm and sound protection; it tends to be utilized as a minimal effort trade of the coarse totals for the light weight concrete. Since, it a by-product from the bundling business, using it in development of lightweight solid won't just lessen the cost however all decrease the weight on garbage removal divisions.

1.1 Definition: EPS or expanded polystyrene is a resolute cell plastic at first planned in Germany in

1950. It has been used in packaging courses of action since 1958. It is 98% air anyway the rest is delivered utilizing nearly nothing, round EPS spots - themselves made particularly of carbon and hydrogen. EPS dots can be used to make low thickness concretes required for building applications like cladding sheets, Partition dividers, composite ground surface structure and weight bearing strong squares. Decision of EPS touch all out was made prevalently in view of its low thickness, closed cell structure, hydrophobic and essentialness immersing characteristics. The EPS globules incorporated the mix contributes just to its low thickness.

2. History of Light Weight Concrete

Light weight cement concrete have been utilized in development since before the times of the Roman Empire. The most punctual sorts of lightweight cement were made by utilizing Grecian and Italians pumice as the lightweight total. Ordinary hydrated consumed lime was utilized as the cementations material in the blend. These early lightweight cements, by reason of the clearly frail materials, missed the mark in auxiliary execution of what we expect and accomplish today. They were, in any case, incredibly strong, and existing instances of these early lightweight cements are still to be found in different early structures of the Mediterranean region. The essential utilization of light weight concrete is to lessen the dead heap of the solid structure, which at that point permits the auxiliary architect to diminish the size of the section, balance and other burden bearing components.

2.1 Light Weight Concrete Using Eps Lightweight concretes (LWCs) can be used in various improvement fields. It will in general be used for fixing wooden floors of old structures, passing on dividers of low warm conduction, associate decks, floating quay, etc. For the essential applications, the lightest possible material is used, i.e., regularly it has a specific gravity of 0.5, the quality being of less noteworthiness. Nevertheless, for some assistant applications, a compressive quality higher than 40MPa is a portion of the time essential, which drives the organizer to improve a material with a specific gravity close to 1.8. In such a case, lightweight sums, for instance, expanded glass or soil, partake in the resistance of the composite. The potential results offered by new cement based materials prescribe that it is possible to improve the compressive quality versus the specific gravity, or to show up at equivalent quality for lower express gravity. The purpose of this report is to achieve a mix plan for Lightweight EPS Concrete with thickness lesser than 1800kg/m³ and enough high compressive quality so it will in general be used being developed explanation.

3. Literature Review

R. Gawale et al. 2016[5] performed explores and considered that thickness, compressive quality of the examples with EPS dots and the examples without EPS dots in the blend plan. Admixture Polycarboxyl ate ether (PCE) is included blend configuration to build the functionality of the solid. The ends were discovered to be that quality of light weight solid utilizing EPS globules is low for lower thickness blend. This brought about augmentation of voids all through the example brought about by the Air entraining admixture. Along these lines the decline in compressive quality of the solid. A Tayale et al. 2018[6] performed tests thought about the properties, for example, compressive quality and warmth protection, of EPS cement to the standard solid 3D square. The solid shapes comprises of 5%, 10%, 15%, 20%, 25%, and 30% EPS in blend plan M25. The blocks were tried 7 days, 14 days and 28 days of restoring. Creator presumed that the heaviness of the 3D shape was diminished by 63% when the EPS globules are included by 25%. During warming cycle, the EPS globules that came in direct contact with the warmed surface shrinked prompting arrangement of voids in the solid. J Singh et al. 2017[7] performed attempts various things with M20 mix structure of coarse and fine absolute in degrees of 0%, 10%, 20%, 30%, 40% and half in the water solid extent of 0.50 was concentrated with silica rage as a midway replacement of cement. Maker reasons that the usefulness of mixes was seen to increase with increase in rate replacing of sums with polystyrene. S M Abd et al. 2016 [8] examined the convenience and the relationship of the compressive quality, thickness assortment in the models for the 7 days and 28 days. The development in the EPS content in solid mixes reduces the compressive nature of concrete. Augmentation in the EPS content in solid mixes diminishes the thickness of concrete. Value increases with increase in EPS globules content M D Karthick et al. [9] played out the trials on the solid blocks for usefulness and compressive quality, creator additionally played out the split tractable test. Creator infers that expansion in polystyrene volume, expands the voids when contrasted with the control blend. There is volume rot in the connection of compressive quality and volume portion of the EPS dabs. Creator additionally saw that decrease of the viable cross-area flexural tallness influenced by the EPS size part. A Mandlik et al. 2013[10] played out the examinations solid blending in with and without the EPS dabs the cost viability is likewise

concentrated by the creator , Author additionally infers that EPS concrete with no extraordinary holding specialist show great functionality and could undoubtedly be compacted and wrapped up. EPS can be utilized as a substitute for the coarse total and positive application is performed by the creator .EPS dabs can be an utilized as substitute in a non basic part. Wenboshi et Al. 2015[11] performed tries and presumed that strength of the EPS concrete was acquired by making correlation between example when applying cyclic heap of 40KN, 50KN, and 60KN for 50000 or multiple times. Creator reasoned that hydroxyl-propyl cellulose is blended in the

EPS concrete for improving the functionality of the grout and the impact of its blending proportion on the solid compressive quality is considered. To build the compressive quality the polymer emulsion is blending in the solid grout which bond different blends and connection between blending proportion and compressive quality is examined by creator.

4. Scope of The Study An undertaking is made to take a gander at the it is lighter than the standard concrete with a dry thickness of 300 kg/m3 up to1840 kg/m3.The rule specialties of lightweight concrete are its low thickness and warm conductivity. The preliminary assessment mechanical properties of concrete made with broadened polystyrene spots (EPB) as a fragmentary replacement of coarse and fine all out in degrees of 0%, 10%, 20%, 30%, 40% and half in the water solid extent of 0.50 was concentrated with silica fume as a deficient replacement of cement.

4.1 Puzzle Statement Right now a huge number of huge amounts of waste polystyrene is delivered on the planet. This will at last reason contamination and is unsafe to the biological system. Public and worldwide natural guidelines have become more firm progressively which have made it costly to arrange. Thusly utilizing waste polystyrene in concrete production not just takes care of the issue of arranging this super light strong waste yet additionally helps safeguard common assets.

4.2 Purpose With the snappy unforeseen development and inventive augmentation, the need of substitutes for absolute in concrete has extended. Bit by bit new materials are being used as replacement of sums in strong turn of events, for instance, expanded glass, broadened polystyrene spots, etc. A result must be dictated by taking EPS touches and various tests have coordinated on it following 7 and 28 days independently to evaluate the properties of light weight strong squares. Lightweight concretes (LWCs) can be used in various advancement fields. EPS specks can be used to make low thickness concretes required for building applications like cladding sheets, Partition dividers, composite ground surface structure and weight bearing strong squares.

4.3 Objectives: This task targets accomplishing the accompanying:

• To use and supplant the assets to spare assets and condition.

• To research the physical properties of various materials to be utilized in work.

• Provide shield to the earth by using waste appropriately.

• Use of mechanical waste in a valuable way and give practical development material.

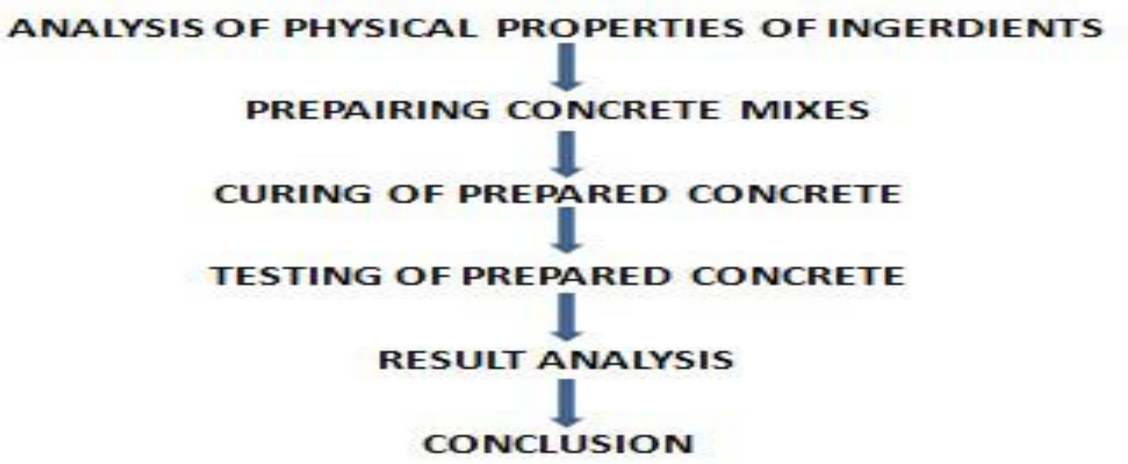
5. Methodology To accomplish the goal of present examination, broad and thorough test program has been arranged. The whole examination has been ordered into different unmistakable periods of work for through and methodical methodology. The materials utilized for planning concrete are chosen from those by the regular solid industry. Materials used for LWC using EPS spots are Crush sand stone, solid, Fly trash, EPS dabs and engineered admixtures. LWC can be planned and built utilizing an expansive scope of cementing materials, and this is basic for LWC to pick up prevalence. Cement: The term concrete is commonly used to imply powdered materials which make strong concrete qualities when gotten together with water. These materials are all the more appropriately known as pressure driven concretes, Portland concrete being the most significant in development Cement is a fine grayish powder which, when blended in with water, frames a thick glue. 53 evaluation Ordinary Portland concrete adjusting to BIS 12269-1987 is utilized. Fly ash: Fly debris or Pulverized fly debris is a development from the consuming of walloped coal accumulated by mechanical separators, from the fuel gases of warm plants. The synthesis changes with kind of fuel expended, load on the warmer and sort of separation. The fly flotsam and jetsam contain round shiny particles reaching out from 1 to 150 micron in estimation and besides experiences a 45-micron sifter. The mixture properties of fly flotsam and jetsam are referred to underneath satisfactory strong quality, sums should be hard and strong, freed from disastrous contaminating impacts, and falsely consistent. Sensitive and porous stone can confine quality and wear resistance, and a portion of the time it may moreover isolate during mixing and unfairly impact usefulness by growing the proportion of fines.

Crushed Sand Stone: Cementing sands reasonable for LWC are squashed sand, adjusted sands and Siliceous sand and calcareous sands can be utilized. The amount of fines under 0.125 mm is to be considered as powder. A base measure of fines (emerging from the fasteners and the sand) must be accomplished to dodge isolation.

Chemical admixture: Polycarboxylate ether (PCE) type is extremely effective dispersants for

Calcium Aluminate concrete. They give glorious convenience to the material in the new state, and phenomenal physical properties in the cemented state.

Water: Water is utilized for blending and restoring according to IS 456:2000. From sturdiness thought water concrete proportion ought to be confined as in the event of typical cement and it ought to ideally be under 0.4 are tried for their significant properties before using them for making concrete.



Path of Work

6. Procedure of EPS Light weight blocks

A. Materials and mix proportions The materials utilized in this investigation were conventional Portland concrete adjusting to BS12: 1991, waterway sand with a fineness modulus of 2.85, squashed rock with a greatest size of 10 mm, accessible round EPS dots. The M20 evaluation of solid blend was utilized in this examination.

B. Properties of EPS Light weight blocks

Table 1: Properties of EPS Light weight blocks

Property Average value Density 13kg/m3
Compressive strength 0.09MPa
Flexural strength 0.21MPa
Water absorption 4%by volume
Specific gravity of cement 3.15
Specific Gravity of fine aggregate 2.40
Specific Gravity of EPS beads 0.011
Fineness modulus of fine aggregate 3.00
Bulk Density of Fine Aggregate 1643 kg/m3

C. Mixibility: A strategy like „sand-wrapping“ was applied on the EPS specks. EPS spots were wetted from the outset with 30% of the mixing water and a short time later the remainder of the materials is incorporated. Mixing was continued until a uniform and streaming mix was gotten. The Cement to EPS extent was kept 1:1 by volume, the thickness of hardened concrete lessened 76, 57, 47, and 39%, separately, when diverged from control

test, 1:1 extent of cement to EPS was picked and since EPS is hydrophobic, it has been represented that water maintenance is zero regardless, when the globules are immersed in water reliably for one month.

D. Casting and Curing: Various test examples EPS concrete was set up at various level of EPS dots (by vol. of coarse totals). The solid was intended for M25 blend plan according to the IS 10262: 1982. The 3D shape example of size 15x15x15 cm were set up at 5%, 10%, 15%, 20%, 25% and 30% of EPS (by vol. of coarse totals). Following 7, 14 and 28 days of restoring, they were tried for compressive quality.

7. Comparision Between Common Brick and Eps Concrete Blocks

1) The compressive quality of Light weight EPS solid squares is more than of mud block.
2) The water safe property of Light weight EPS solid squares is acceptable and it is valuable in development work.
3) The usefulness of Light weight EPS solid squares is acceptable as contrast with traditional blocks.
4) Rapid and moderately basic development is conceivable with the Light weight EPS blocks.
5) Economical as far as transportation as well as decrease in labor utilizing EPS blocks.
6) Significant decrease of in general weight results in sparing auxiliary edges, footing or heaps utilizing EPS blocks.

8. Applications of Eps Concrete Blocks

1) It is generally utilized as free fill protection in workmanship development where it improves Imperviousness to fire, decreases clamor transmission, don't spoil and termite obstruction.
2) It is utilized underway of warmth protected light divider board.
3) Used in the scaffold to forestall freezing.
4) Environmentally nurseries are the structures which are less unsafe to condition. Green house are comprised of the materials which produces less CO2 and are reusable. To lessen the measure of plastic on the earth utilization of plastic as EPS dots is a smart thought for ecologically green tasks. It gives warm protection to building which forestalls the vitality misfortune in structures so it is valuable in earth green tasks.

Figure 3: EPS blocks in walls

Figure 4: EPS blocks in step

5) Light weight concrete utilized in development of steps, windows, garden dividers, and so forth.

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

(For Allocated village development, villager's happiness, comfortable and for enhancementof the village) (With the Smart village development Concept as per Your Idea and Village Visit, modern technology with innovation).

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

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

If possible, List the sources of the funding available with the Village gram panchayat.

1. According to chapter 8 design the sustainable features of the designs are as under:-

1. Sustainable features of rcc road:-

Highway construction requires a lot of energy at different levels: for the production of asphalt and cement destined to pavements and excavating materials, for road maintenance, and by vehicles stuck in congestion due to poorly designed highways. To reduce the level of energy consumption, warm-mix asphalt (WMA) can be used to replace hot-mix asphalt (HMA). Besides the fact that WMA is produced at a lower temperature, it also induces great benefits such as an improvement of working conditions (less exposure to heat and fumes) and asphalt compaction, reduction of paving cost and longer hauling.

One of the options which would also allow to generate savings in energy and production costs is the use of "Bio-binders" as materials for sustainable asphalt pavements. Bio-binders – also known as biopolymer- come from natural resources and are fully bio degradable.

Sustainability can also be reached through the use of recycled materials (like crushed concrete for instance), which entails a reduction in the consumption of energy needed to import new materials besides the obvious benefits of using recycled materials.

2. rain water harvesting

Rainwater harvesting is one of the best methods of water management as it helps store and reuse rainwater instead of letting it run off. In the recent years, factors like rapid urbanization and an increase in population has resulted in acute water shortage and a receding water table. Therefore it has become essential to adopt rainwater harvesting methods at not just an individual level but even within a building or society complex.

Advantages of Rainwater Harvesting

One of the biggest advantages is that it helps in increasing the level of the water table. It also reduces the chances of flooding around buildings and the load on the existing drainage system

of the city. Since rainwater is a free source, it not only reduces the water bills of the home but also reduces the carbon footprint and makes the home more sustainable.

Rainwater harvesting is a simple and primary technique of collecting water from natural rainfall. At the time of a water crisis, it would be the most easily adaptable method of mitigating water scarcity.

The system is applicable for both critical and normal situations. It is an environmentally friendly technique that includes efficient collection and storage that greatly helps local people.

The associated advantages of rainwater harvesting are that

(i) it can curtail the burden on the public water supply, which is the main source of city water

(ii) it can be used in case of an emergency (i.e., fire);

(iii) it is solely cost effective as installation cost is low, and it can reduce expense that one has to pay for water bills;

(iv) It extends soil moisture levels for development of vegetation;

(v) Groundwater level is highly recharged during rainfall.

3. Storage building
Storage Building means, any building or part thereof used primarily for the storage or sheltering of goods, wares or merchandise as in warehouses; such building shall include cold

Goods. Seller warrants that it has good and transferable title to the Goods and that all Goods provided will be new and will not be used or refurbished.

Merchandise. For purposes hereof, "Merchandise" shall mean all goods, saleable in the ordinary course, located in the Stores on the Sale Commencement Date (defined below) or delivered thereto within twenty- eight (28) days after the Sale Commencement Date.

4. Rectangular water tank:-
A water tank is a container for storing water.

Water tanks are used to provide storage of water for use in many applications, drinking water, irrigation agriculture, fire suppression, agricultural farming, both for plants and livestock, chemical manufacturing, food preparation as well as many other uses. Water tank parameters include the general design of the tank, and choice of construction materials, linings. Various materials are used for making a water tank: plastics (polyethylene, polypropylene), fiberglass, concrete, stone, steel (welded or bolted, carbon, or stainless). Earthen pots, such as matki used in South Asia, can also be used for water storage. Water tanks are an efficient way to help developing countries to store clean water.

By design a water tank or container should do no harm to the water. Water is susceptible to a number of ambient negative influences, including bacteria, viruses, algae, changes in pH, accumulation of minerals, and accumulated gas. The contamination can come from a variety of origins including piping, tank construction materials, animal and bird feces, mineral and gas

intrusion. A correctly designed water tank works to address and mitigate these negative effects. It is desirable that water tanks be cleaned annually to reduce delivery of algae, bacteria and viruses to people or animals.

5. Recreational centre:-A parks and recreation facility's main purpose should be to provide opportunities for physical activity and recreation in a safe, inclusive environment. By creating a positive atmosphere, these local facilities become essential to personal health and wellness, thereby reducing reliance on healthcare and other costly social services. In turn, parks and recreation boosts the local economy and can also help contribute to overall economic development.

Healthy communities aren't just built on physical or mental health; they're also built on social health. The social bonds that people create at community recreation centres have strong benefits—they improve lives and help build strong, safe and inclusive communities; social interaction, volunteerism, civic pride and aesthetics all play a role. After-school recreation programs can help deter at-risk youth from criminal activities and can provide a constructive environment. Plus, they help younger people build self esteem as part of their critical development.

These spaces are meant for all ages, ethnicities, physical health backgrounds, activity and skills levels; they should promote cultural diversity and inclusion. Connecting your parks and recreation community with the right marketing channels can help you bring in more people.

Creating a Culture Focused On Wellness

Any parks and recreation facility should provide a convenient and fun opportunity for the community to stay fit and in great physical health. Physical activity has shown to have various benefits, including decreased risk of disease, improved physical and mental health, lower risk of injuries, lower risk of premature death, and more. It's no wonder a healthy, active community that enjoys recreation and physical activity is a happy one.

For example, Vancouver has a well-known culture revolving around health, fitness and nutrition. While the city's natural beauty gives them a huge advantage into drawing people out into natural spaces, their fit recreation culture still wasn't built in one day. The City of Vancouver is known for leading the way in environmental sustainability and providing their citizens with 240 parks, destination gardens, and 24 recreation centres with swimming pools, arenas, and playing fields. With intelligent programming and community outreach, parks and recreation organizations can cultivate a healthy culture of wellness to better their own local communities. Needless to say, the City of Vancouver has seen great benefits from investing in their recreation's culture of well-being.

Promoting Social Responsibility

Parks and recreation facilities do wonders for environmental sustainability. By acquiring, protecting and managing natural spaces, these organizations boost the health of our ecology. A recreation facility can be a socially responsible leader in the community, in a number of ways. Host local volunteer recreation events where you make a difference in the environment. Whether that's creating a pollution reduction campaign or advocating for the protection of an

at-risk natural habitat in your city, there are many things you can do to establish a culture of responsibility.

As a parks and recreation team member, to effectively boost health benefits and wellness in your community, your communication with recreation members needs to be at a high level. Here are some effective outreach strategies for your community, to get more people moving.

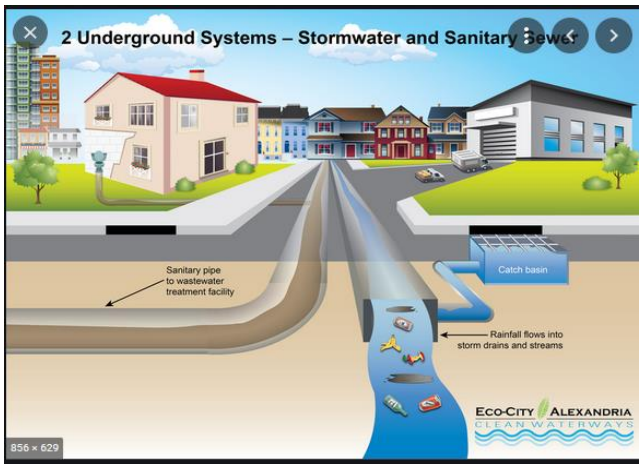
6. Sewerage water supply system:-

The sewerage project in respect of which considerable public and social resources are being used, form a basic infrastructure for the country and an indisputable indicator of civilisation and development. The works cover a number of substantial social needs and aim to improve the quality of life and to protect public health and the environment. Some of the benefits and advantages of the sewerage system are as follows:

(a) Upgrading the quality of life

The quality of life and the hygienic conditions in the areas where the system operates have already improved. The operation of the sewerage system has relieved these areas to a great extent from previous problems that were caused by the continuous emptying of cesspools. In the past, hotels and blocks of apartments were required to empty and maintain septic tanks and soak ways. The sewerage system provides a healthier and more appropriate way to manage liquid wastes.

(b) Preserving the natural environment



Previously, all sewage waste was discharged in septic tanks and cesspits, resulting in the pollution of the ground water of the areas where such waste was discharged. Polluted waters then ended in the sea and caused various risks and other environmental problems. With the operation of the sewerage system no more pollution of ground water is effected and the discharge of sewage waste in the area of "Vati" outside Lemesos has significantly been reduced. In the past, all sewage waste was discharged at "Vati" creating thus a serious environmental problem in the area and in the Polemidia Dam. Sewage waste discharged at Vati has been reduced by approximately 60%. Moreover, the wastewater treatment plant produces by-products such as treated biosolids and methane. Treated sludge is used as a soil-improving substance mainly for tree cultivations whilst methane is being used for electricity generation, covering part of the power, required to operate the plan

(c) Saving and processing waters

Water is a substantial natural resource for our country and it should be managed in the best possible manner. The tertiary treated effluent at the wastewater treatment plant is reused for agricultural and other purposes. On completion of the project, the amount of water to be saved is expected to exceed 10 million cubic metres per year, which equals approximately the amount of water reserved in the Germasogia Dam. Today around 4 million cubic metres of water are reused per annum.

(d) Saving of money

It is estimated that the operation of Phase A of the system helps to save over an approximate of 3.5 million Euro per year otherwise spent on the discharge of Greater Limassol waste water at "Vati" area. In the long term, the central sewerage system will cause big savings to be made regarding the construction and maintenance of private smaller cesspools.

(e) Economic development and tourism

The most significant advantage of the system is maintaining sustainable development, the protection of the environment and improvement of the quality of life in our town, with a further impact on the development of tourism and the economy in general.

(f) Flooding incidences

The construction of main stormwater drainage systems reduces the social and financial consequences resulting from the direct damage on properties caused by flooding, or even destruction of basic infrastructure such as roads, pavements and underground cables. It also reduces any indirect damage caused by traffic congestion and minimises pedestrian difficulties.

Moreover, uncontrolled flooding and the flow of surface water causes nuisance and public health problems, development of mosquitoes, accumulation of litter, grease and other pollutants.

(g) Standard of living

As a result of the above, the sewerage system contributes to further development and increase of the standard of living of the town of Limassol inhabitants. Considering all the above advantages, there is no doubt that if we all cooperate, ourselves and our children will enjoy a better quality of life in the years to come and that we will secure a better environment to the forthcoming generations.

2. According to designs of chapter 13 the sustainable feature designs are as under:-

1. Washing ghat with circular water tank:-

Dhobi Ghat: Given that the houses in the village are small and clustered close to each other, women normally washed their clothes either in the front or back of their homes or near the fields and the used

water would run over the paths and stagnate at some point. Others carried their clothes to hand pumps or a common area and their used water would also flow unchecked. All that users must take with them to use the facility were soap and their soiled clothes. The initiative has made life easier for the families and stagnant puddles is not a common site any longer.

Fig. washing ghat

2. Bituminous road:-

Advantages of Bitumen Road:

There are the following advantages of bitumen road as given below;

- A smooth Ride Surface:

It provides a smooth surface to ride because it does not make use of any joints and as compared with concrete pavements, it also gives less sound emission. It maintains the smoothness because the wear and tear are less in the bitumen road.

- Gradual Failure:

The concrete pavement shows brittle failures and the deformation and the failure is a gradual process in bitumen road.

- Quick Repair:

The repairing of bitumen road is a quick process and they set fast so they don't consume time in reverting the path for traffic.

- Staged Construction:

In a situation when problems of fund constraint or traffic estimation problems are faced, this helps in carrying out staged construction.

- Life Cost is less:

As compared to concrete pavement, the initial cost and overall maintenance cost of bituminous pavement are less.

- Temperature Resistant:

They are not affected by de-icing materials and act resistant against high temperatures from melting.

3. Post office:-

Vision

India Post's products and services will be the customer's first choice.

Mission

- To sustain its position as the largest postal network in the world touching the lives of every citizen in the country.
- To provide mail parcel, money transfer, banking, insurance and retail services with speed and reliability.
- To provide services to the customers on value-for-money basis.
- To ensure that the employees are proud to be its main strength and serve its customers with a human touch.
- To continue to deliver social security services and to enable last mile connectivity as a Government of India platform.

Core Values

We will maintain our iconic status as a unique and trusted national institution by:

- Always providing the human touch in all our interactions with society
- Being responsive and reliable
- Demonstrating the highest order of integrity, honesty, transparency and professionalism
- Discharging our responsibilities towards the society in an environment of deep trust, mutual respect and a culture of service before self

Strategic Goals

- Achieve the long term goal of financial self-sufficiency by generating surpluses from services (existing & new) outside our universal service obligation
- Develop, implement and operate a system of standards with accountability for performance
- Develop a scalable and flexible technology infrastructure to support our operations
- Be the preferred, trusted and reliable service partner for all customers
- Ensure that India Post acquires all required people capabilities to deliver its chosen services portfolio
- Be the interface between citizens and the government

4. Primary health centre :-

- Primary healthcare is the first contact a person has with the health system when they have a health problem.
- Primary healthcare refers to a broad range of health services provided by medical professionals in the community.
- Your general practitioner (GP) is a primary healthcare provider, and so are nurses, pharmacists and allied health providers like dentists.

- Primary healthcare is the provision of health services, including diagnosis and treatment of a health condition, and support in managing long-term healthcare, including chronic conditions like diabetes.
- Primary healthcare includes seeing health professionals to help you maintain good health, with regular health checks, health advice when you have concerns, and support for ongoing care.

Having a good relationship with your primary healthcare provider is important. You will often be able to establish an ongoing relationship with these providers, so that you can feel confident you have a medically trained professional to contact when you have a health issue. To maintain a good relationship with your primary healthcare provider:
Keep medical history information and make it available to your primary healthcare provider.

Feel confident sharing sensitive information with your primary healthcare provider, as they are not allowed to share it without your permission.

Prepare for visits by writing down your symptoms, medication and any other healthcare providers you may be seeing, so you can discuss this with your primary healthcare provider.

5. Rcc Gravity retaining wall (Flood Protection wall):-

Function of retaining wall:-
The retaining wall prevents the soil or other material at places with sudden changes in elevation. Earth retaining structures are used to hold back the earth and maintain a difference in the height of the ground surface.

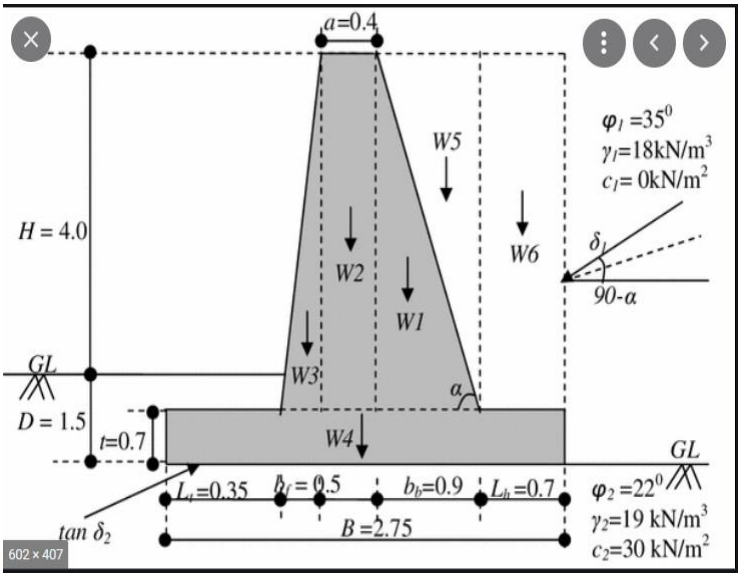


Fig. Rcc gravity retaining wall

B. List the sources of the funding available with the Village gram panchayat

Presently, one of the most significant sources of funds for Gram panchayats are grants from the Central Finance Commission. ... Beyond this, there are grants from state finance commissions. Own sources of revenue (taxes, tariffs and fee) are largely untapped in most Gram Panchayats.

- Sample of grant declared in the allocated village:-

Approved Action Plan Report

Plan Year	State	District panchayat & equivalent	Block Panchayat & equivalent	Village Panchayat & equivalent
2020-2021	GUJARAT	BHAVNAGAR	UMRALA	DHARUKA

Plan Summary

Total Amount Alloted(in Rs.)								Total Planned Outlay(in Rs.)							
Tied				Untied				Tied				Untied			
SC	ST	General	Total	SC	ST	General	Total	SC	ST	General	Total	SC	ST	General	Total
0	0	585687	585687	0	0	617367	617367	0	0	694267	694267	0	0	694267	694267

Sectoral View

		Planned Outlay							
		Scheme							
	Sector	Tied				Untied			
		SC	ST	General	Total	SC	ST	General	Total
	Drinking water	0	0	294267	294267	0	0	0	0
	Roads	0	0	0	0	0	0	694267	694267
	Sanitation	0	0	300000	300000	0	0	0	0
	Total	0	0	594267	594267	0	0	694267	694267

Scheme View

	Scheme Name	Component Name	Amount Alloted	Planned Outlay	

http://egramswaraj.gov.in

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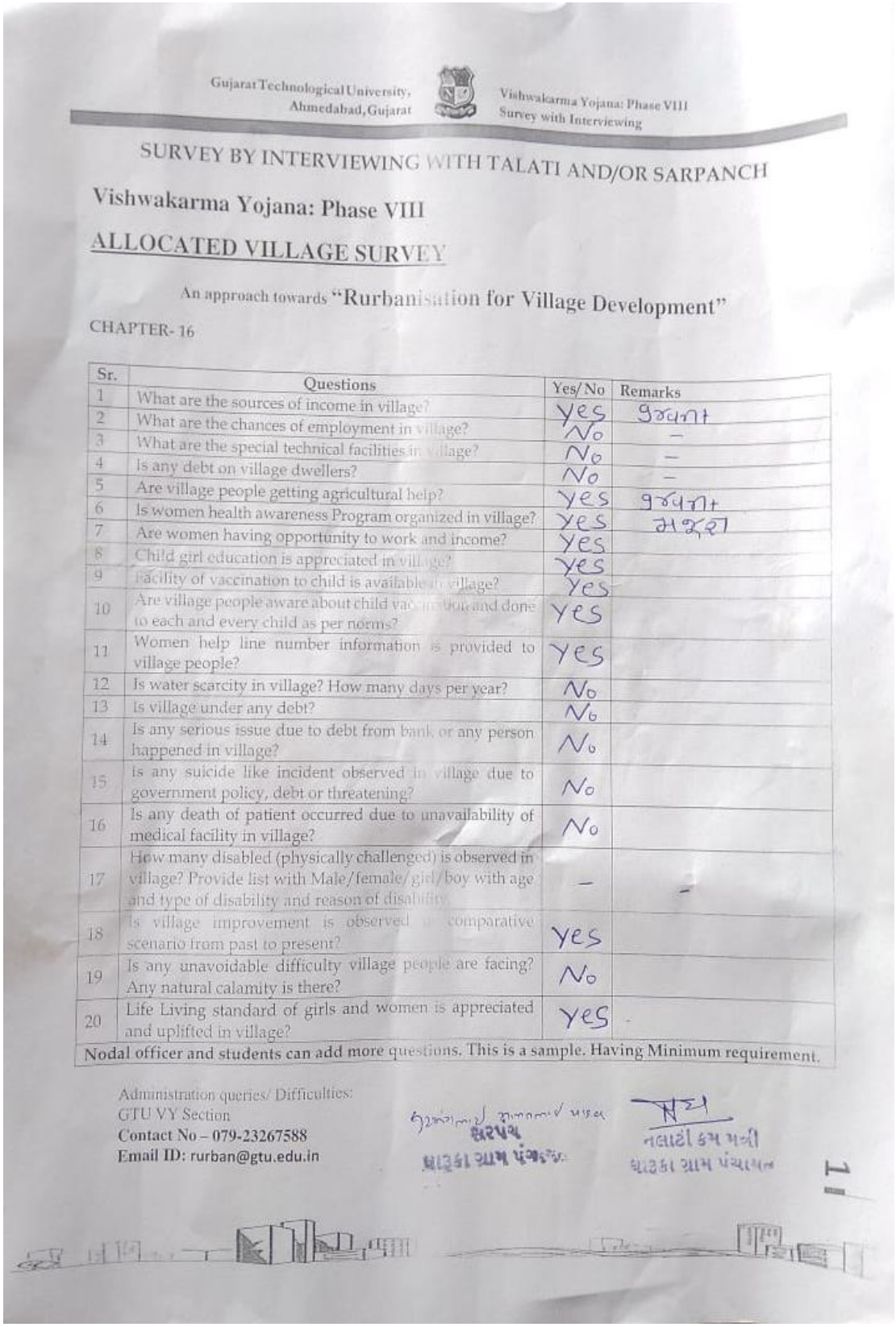
16. Survey By Interviewing With Talati And/or Sarpanch:-



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	ગ્રામજનો
2	What are the chances of employment in village?	No	–
3	What are the special technical facilities in village?	No	–
4	Is any debt on village dwellers?	No	–
5	Are village people getting agricultural help?	Yes	ગ્રામજનો
6	Is women health awareness Program organized in village?	Yes	આંગણવાડી
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	–	–
18	Is village improvement is observed in comparative scenario from past to present?	Yes	
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	

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

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

સરપંચ
ધારૂકા ગ્રામ પંચાયત

તલાટી કમ મંત્રી
ધારૂકા ગ્રામ પંચાયત

17. **Irrigation / Agriculture Activates and Agro Industry, Alternate Technics and Solution**

Irrigation is the artificial process of applying controlled amounts of water to land to assist in production of crops. Irrigation helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall. Irrigation also has other uses in crop production, including frost protection, suppressing weed growth in grain fields and preventing soil consolidation. In contrast, agriculture that relies only on direct rainfall is referred to as rain-fed.

Irrigation systems are also used for cooling livestock, dust suppression, disposal of sewage, and in mining. Irrigation is often studied together with drainage, which is the removal of surface and sub-surface water from a given location.

Fig. irrigation in agricultural land

Irrigation has been a central feature of agriculture for over 5,000 years and is the product of many cultures. Historically, it was the basis for economies and societies across the globe, from Asia to the Americas.

Agro-industries are the enterprises, active- ties. And institutions that deliver material inputs to the farming sector and transform, distribute and otherwise add value to agricultural and food products targeting an identified market demand. Benefits of agro-industries include pro-viding.

Evolution of Alternative Farming Strategies

The interest in the sustainability of agricultural and food systems can be traced to environmental concerns that began to appear in the 1950s–1960s. However, ideas about sustainability date back at least to the oldest surviving writings from India, China, Greece and Rome.

Today there is an urgent need of sustainable agricultural technologies and practices that

(1) Do not have adverse effects on the environment i.e. partly because the environment is an important asset for farming

(2) are accessible to and effective for farmers

(3) Lead to both improvements in food productivity and have positive side effects on environmental goods and services. Sustainability in agricultural systems incorporates concepts of both resilience i.e. the capacity of systems to buffer shocks and stresses, and persistence i.e. the capacity of systems to continue over long periods. This culminates in many wider economic, social and environmental outcomes

Types of Alternative Farming Techniques

Environmental sustainability is a major driving force for the development and adop- tion of sustainable farming practices where monoculture production of agriculture and forestry commodities has led to reduced biodiversity and loss of wildlife habitat, increased non-point source pollution of ground and surface water, and deterioration of family farms.

The different forms of integrated land-use systems that embrace the concepts of

Sustainable agriculture include.

• Organic farming

• Bio-dynamic farming

• No tillage farming

• Urban and Peri-urban Farming

• Natural farming

• Eco-farming

• Permaculture

• Polyculture

• Integrated farming system

• Floating Farming

These are the predominant potential sustainable farming techniques practiced in various parts of the world. This article reviews the potentials, constraints, strategies and case studies for these ten alternative farming techniques. Based on an extensive critical review of literature, it may be concluded that these farming techniques have demonstrated their ecological, economic, social and cultural sustainability he last section for the review comprises of some innovative endogenous farming techniques practices in India, as there is a rapid revival of alternative farming in

Recent decades.

This part include,

• Nammazhvar's Organic farming techniques from Tamilnadu

• Subhash Palekar's Zero Budget Natural farming from Maharashtra

• HOMA – Agnihotra – Vedic science of bio-energy denoting the process healing

and purifying the atmosphere by removing the toxins through the agency of fire

• LEISA- Low Energy Input Sustainable Agriculture

Organic Farming

The principles of organic farming is the maintenance of soil fertility by bio-intensive nutrient management, recycling of agricultural wastes, vermicomposting, avoidance or reduction of external inputs, use of natural forms of pest management and weed control (Goldsmith and Hildeyard 1996;Hansen et al. 2006). The organic movement Alternative Farming Techniques for Sustainable Food Production 383 began in the 1930s and 1940s as a reaction to the growing reliance of agriculture on synthetic fertilizers. Organic farming is a form of agriculture which excludes the use of synthetic fertilizers and pesticides; plant growth regulators, livestock feed additives, and genetically modified organisms. Organic agriculture can be considered a subset of sustainable agriculture, the difference being that organic

Implies certification in accordance with legal standards.

Green Manuring

A green manure is a type of cover crop grown primarily to add nutrients and organic matter to the soil for soil improvement and soil protection. Typically a green manure crop is grown for a specific period, plowed and incorporated into the soil.

• Leguminous green manures contain nitrogen-fixing symbiotic bacteria in root nodules that fix atmospheric nitrogen in a form that plants can use.

• Green manures increase the percentage of organic matter (biomass) in the soil, thereby improving water retention, aeration, and other soil characteristics.

• The root systems of some varieties of green manure grow deep in the soil and bring up nutrient resources unavailable to shallower-rooted crops.

• Common cover crop functions of weed suppression and prevention of soil erosion and compaction are often also taken into account when selecting and using green manures.

• Some green manure crops, when allowed to flower, provide forage for pollinating insects

Bio-Dynamic Farming

Biodynamic agriculture was the first ecological farming systems arise in response to commercial fertilizers and specialized agriculture after the turn of the century yet it remains largely unknown to the modern farmer. Biodynamic farming places great importance on the rhythmic positions of moon, sun and planets when sowing seeds, transplanting, applying liquid manures or spraying fruit trees and crops.

Biodynamic (BD) agriculture is an advanced organic farming system which gains increased attention of farmers and consumers for its emphasis on food quality and soil health. There are about 4,200 Biodynamic certified farms in 43 countries over 128,000ha, according to Demeter standards (Demeter 2008; Turinek et al. 2009). Biodynamic agriculture developed out of eight lectures on agriculture given in 1924 by Rudolf Steiner (1861–1925) an Austrian scientist and philosopher to a group of farmers near Breslau (which was then in the eastern part of Germany and is now Wroclaw in Poland). Biodynamic farming is a combination of biological and dynamic practices; it also involves animal manures, crop rotations, and care for animal welfare, looking at the farm entity and local distribution systems. BD farming practices are also gaining importance in the face of increasing climate change, energy scarcity and population growth, where they indicate a more resilient, diverse and efficient system (Turinek et al. 2009).

Cover Cropping

Cover cropping is an ideal cropping pattern adopted specifically for soil im- provement purposes. Both annual and perennial cover crops used to harnessing natural resources effectively in above-and below-ground biodiversity (Burgos and Talbert 1996;Anonymous 2001). Cover crops may provide a physical temporary habitat for many different species of ground-nesting birds, small mammals as well as nectar and pollen sources for many species of insects. The habitat value of cover crops varies by species and variety therefore cover crops must be carefully selected to meet specific management objectives. Cover crops root system improves water penetration and prevents soil erosion (Roberson et al. 1991;Tyler et al. 1994;Sainju and Singh 1997).

Cereal cover prevents, excessive water consumption, nutrient leaching into sensitive water ways and can be an important source of organic matter when incorporated into the soil (Holderbaum et al. 1990;Sullivan et al. 1991). The use of perennial cover crops in farms is an effective means of enhancing the biodiversity and productive capacity of cropping systems by minimizing the environmental risks associated with chemical use (Creamer and Bennett 1997;Costello 1999)

18. Social Activities – Any Activates Planned By Students

E.G Teaching Learning Activities, Awareness Camp, Business Idea For Self Help Group Or Any Other

The best social activities:-

- Going out to eat. We all have to eat, and enjoying a meal with friends can be one of life's greatest pleasures. ...
- Board **games**. Grab your friends and host a board game night. ...
- Meeting up for coffee. ...
- Movie nights. ...
- Pick-up sports. ...
- Volunteering together as a group. ...
- Video **games**. ...
- Hiking.

Teaching Learning activities and general awareness about corona virus are both social activities done by students:-

1. Think-pair-repair

In this twist on think-pair-share, pose an open-ended question to your class and ask students to come up with their best answer. Next, pair learners up and get them to agree on a response. Get two pairs together, and the foursome needs to do the same thing. Continue until half the group goes head to head with the other half.

2. Brainwriting

You've probably tried brainstorming, but have you tried brainwriting? In this approach, students are given time to come up with their own ideas individually before sharing them out loud or posting them to an online whiteboard or other shared platform. Building in space for individual reflection leads to better ideas and less groupthink.

The evidence just keeps growing – postsecondary students engage more, learn more and accomplish more with active learning. In yet another proof point, a meta-analysis from the *Proceedings of the National Academy of Sciences* found that student exam scores improved 6% when active learning approaches were used. And students in traditional classes were 1.5 times more likely to fail than those being taught with interactive methods.

During uncertain times like these, it might feel simpler to stick with what's familiar. But even if your classes have moved partially or fully online, that doesn't mean you're limited to lecturing. Even taking 5 or 10 minutes to shift from knowledge intake to interaction can make a difference.

Are you ready to move to a different way of teaching but need some ideas to get you started? Or maybe you've been running your courses this way for years but want ideas that work for the new reality. Whether your classes are in person, online or somewhere in between, here are 15 active learning activities to try with your students this semester.

4. Jigsaw

Help students build accountability by teaching each other. Start by dividing them into "home groups" (4 or 5 people works well). Again, breakout rooms in Zoom or Google Meet make this simple even if everyone is remote. Assign each person in the group a different topic to explore – they'll regroup to work with all the students from the other groups who are exploring the same idea. Once they've mastered the concept, students return to their home group and everyone shares newfound expertise.

5. Concept mapping

Collaborative concept mapping is a great way for students to step away from their individual perspectives. Groups can do this to review previous work, or it can help them map ideas for projects and assignments. In pre-COVID times, you may have covered classroom walls with sticky notes and chart paper – now there are many online tools that make it simple to map out connections between ideas.

6. The one-minute paper

How much could you explain in one minute? At the end of class, set a timer and ask students to record their most eye-opening revelation or biggest question. This activity lets students reflect on learning and build writing skills – plus you'll get a window into their understandings and misunderstandings. Here are more prompts you can use to get students writing.

7. Real-time reactions

When students are watching a video, a mini lecture or another student's presentation, have them share their real-time reactions. This helps students spot trends and consider new points of view. You can set up a hashtag to allow for live tweeting, or use the chat function in your conferencing software.

8. Idea line up

Choose a question that has a range of responses, and then ask students where they stand – literally. If you're not social distancing, have them come to the front of the classroom and organize themselves in a line, based on where on the spectrum of answers they find themselves. In a blended classroom or a physically distanced one, get them to place themselves on a virtual number line instead.

9. Mystery quotation

Test how well students can apply their understanding of an issue or theoretical position. After they've explored a topic, show them a quotation about it they've never seen before. Their task

is to figure out the point of view of the person behind the quotation – and justify it to the class. Students can debate this issue in small breakout groups before beginning a whole-class discussion.

10. Idea speed dating

Have students cycle through your space, or through breakout rooms in Zoom or Google Meet, sharing insights about a topic or their elevator pitch for an upcoming project. As they present their learnings multiple times on several "speed dates," students' presentation skills and perspectives will grow.

11. Empathy mapping

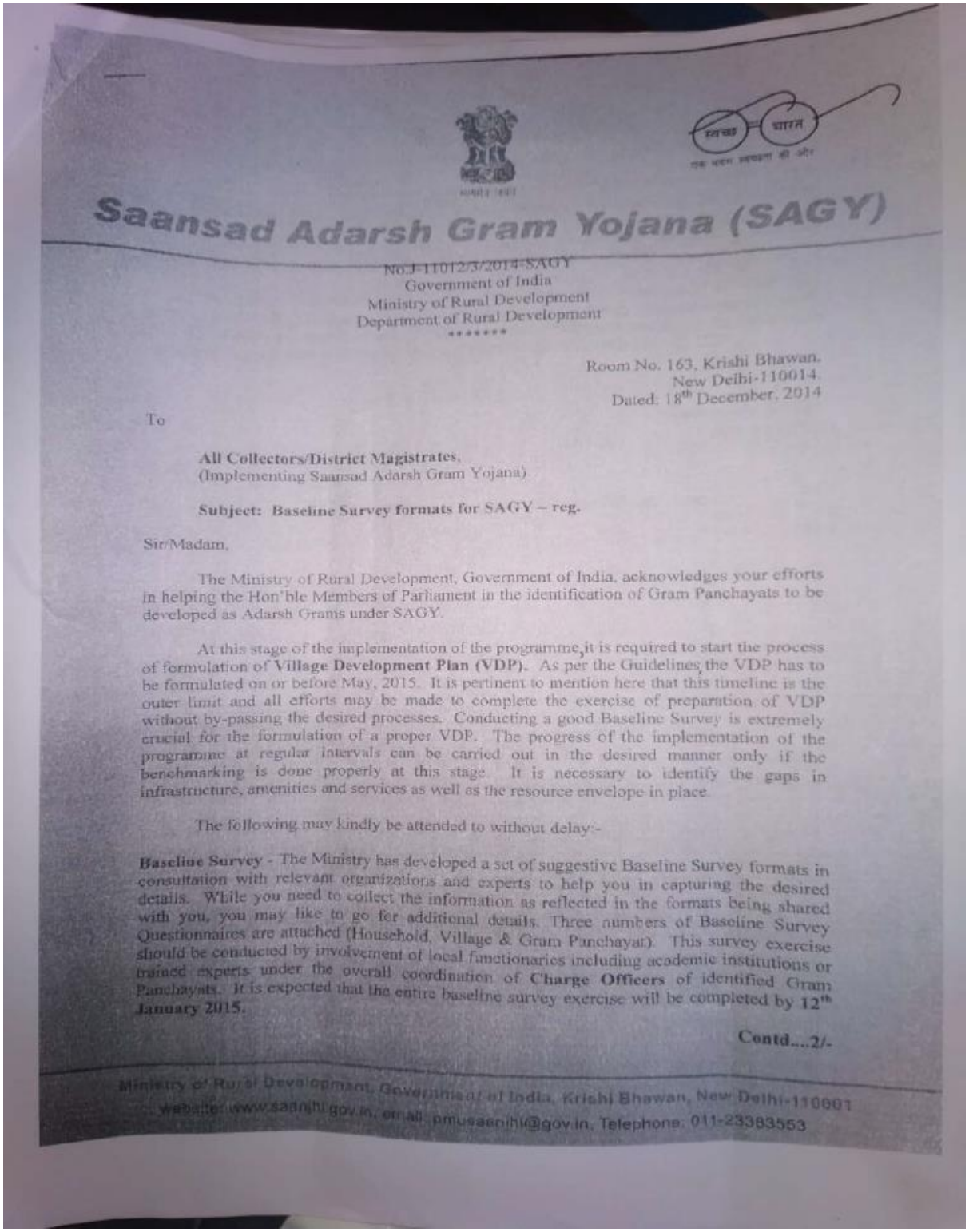
Take a page from the designers' handbook and get students to explore deeper by embracing a perspective. It's deceptively simple – write down what a person says, thinks, does and feels. The ability to slow down and immerse yourself in another point of view is valuable. In design thinking, empathy maps help designers create better products for users.

Activities planned by our group for general awareness about corona virus:-

- ✓ Making the villagers aware about initial preparedness through following common and specific guidelines levied by Central and State Governments time by time.
- ✓ Identifying the possibilities of development of screening facilities either at village entrance or common entrance point of either Taluka or nearby region.
- ✓ Tracing the contacts or migrants in the village.
- ✓ Testing to treatment facilities and centers in the village.
- ✓ Identifying manpower augmentation and training
- ✓ Suggesting various locations for temporary shelter homes either for isolation or for quarantine.
- ✓ Analysing post COVID-19 effects on agriculture, industry, employment and per capita income at village level.
- ✓ Simplifying administration, health-care and other local mercantile / industrial processes and strategies.
- ✓ Continuous contact between Gram Panchayat and District Level Control Room or Task Force for getting latest guidelines, practices and steps taken for fighting against COVID-19 Pandemic situations.
- ✓ Continuing the practice of social distancing, wearing masks and consulting health care units without shying.
- ✓ Distribution of food, fruit, dairy products, grain, vegetables, oils, petroleum products, etc. should be observed so that neither scarcity nor rush can be observed.
- ✓ Inter-village and intra-village active cases movements as well as rural to urban to and fro migration should be observed and recorded so that contact tracing can be practiced effectively.
- ✓ Awareness to governance through social media and digital platform should be practiced, which may lead less movement for various purposes.

Making villagers aware and educated have become must, even if they are vaccinated in nearby future

19. <<ALLOCATED VILLAGE>> SAGY Questionnaire Survey form with the Sarpanch Signature (Scanned copy attachment in the soft copy report and Original copy in hardbound report)



Saansad Adarsh Gram Yojana (SAGY)

No.J-11012/3/2014-SAGY
Government of India
Ministry of Rural Development
Department of Rural Development
****

Room No. 163, Krishi Bhawan,
New Delhi-110014.
Dated: 18th December, 2014

To

All Collectors/District Magistrates,
(Implementing Saansad Adarsh Gram Yojana)

Subject: Baseline Survey formats for SAGY – reg.

Sir/Madam,

The Ministry of Rural Development, Government of India, acknowledges your efforts in helping the Hon'ble Members of Parliament in the identification of Gram Panchayats to be developed as Adarsh Grams under SAGY.

At this stage of the implementation of the programme, it is required to start the process of formulation of **Village Development Plan (VDP).** As per the Guidelines, the VDP has to be formulated on or before May, 2015. It is pertinent to mention here that this timeline is the outer limit and all efforts may be made to complete the exercise of preparation of VDP without by-passing the desired processes. Conducting a good Baseline Survey is extremely crucial for the formulation of a proper VDP. The progress of the implementation of the programme at regular intervals can be carried out in the desired manner only if the benchmarking is done properly at this stage. It is necessary to identify the gaps in infrastructure, amenities and services as well as the resource envelope in place.

The following may kindly be attended to without delay:-

Baseline Survey - The Ministry has developed a set of suggestive Baseline Survey formats in consultation with relevant organizations and experts to help you in capturing the desired details. While you need to collect the information as reflected in the formats being shared with you, you may like to go for additional details. Three numbers of Baseline Survey Questionnaires are attached (Household, Village & Gram Panchayat). This survey exercise should be conducted by involvement of local functionaries including academic institutions or trained experts under the overall coordination of **Charge Officers** of identified Gram Panchayats. It is expected that the entire baseline survey exercise will be completed by **12th January 2015.**

Contd....2/-

Ministry of Rural Development, Government of India, Krishi Bhawan, New Delhi-110001
website: www.saanshi.gov.in, email: pmusaanshi@gov.in, Telephone: 011-23383553

-2-

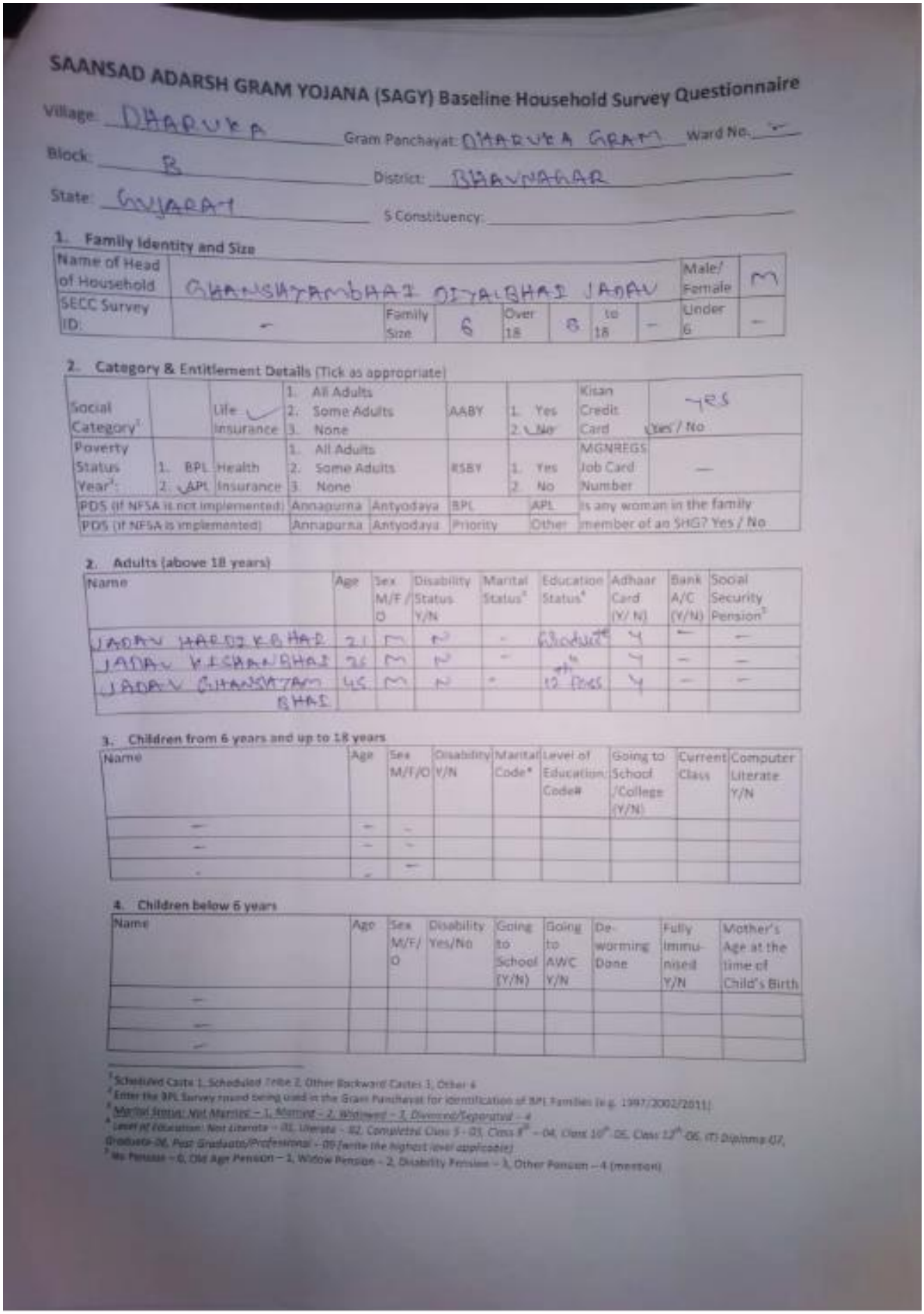
Uploading of the data collected through Baseline Survey- After the collection of data, the same should be entered into the online portal at http://www.saanjhi.gov.in . You (District Collector/DM) being the Nodal Officer will ensure that the data is correctly compiled and uploaded on to the website latest by **20th January, 2015.**

The Ministry will be sharing with you the **structural framework of VDP** very shortly, which will give you an idea as regards the desired processes and structure of a VDP. We will be holding a dialogue with you through video conferencing facility in the near future for assessing the progress of baseline survey exercise and formulation of the VDP.

(Aparajita Sarangi)
Joint Secretary
19/12/14

Copy to:

Principal Secretaries/Secretaries (RD Department)/State Nodal Officers (SAGY)



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: DHARUKA Gram Panchayat: DHARUKA GRAM Ward No.: –

Block: B District: BHAVNAGAR

State: GUJARAT 5 Constituency: _____

1. Family Identity and Size

Name of Head of Household	GHANSHYAMBHAI DIYALBHAI JADAV						Male/ Female	M
SECC Survey ID:	–	Family Size	6	Over 18	6	to 18	–	Under 6	–

2. Category & Entitlement Details (Tick as appropriate)

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

2. Adults (above 18 years)

Name	Age	Sex M/F/O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
JADAV HARDIKBHAI	21	M	N	–	Graduate	Y	–	–
JADAV VISHANBHAI	26	M	N	–	8th	Y	–	–
JADAV GHANSHYAM BHAI	45	M	N	–	12 Pass	Y	–	–

3. Children from 6 years and up to 18 years

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

4. Children below 6 years

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

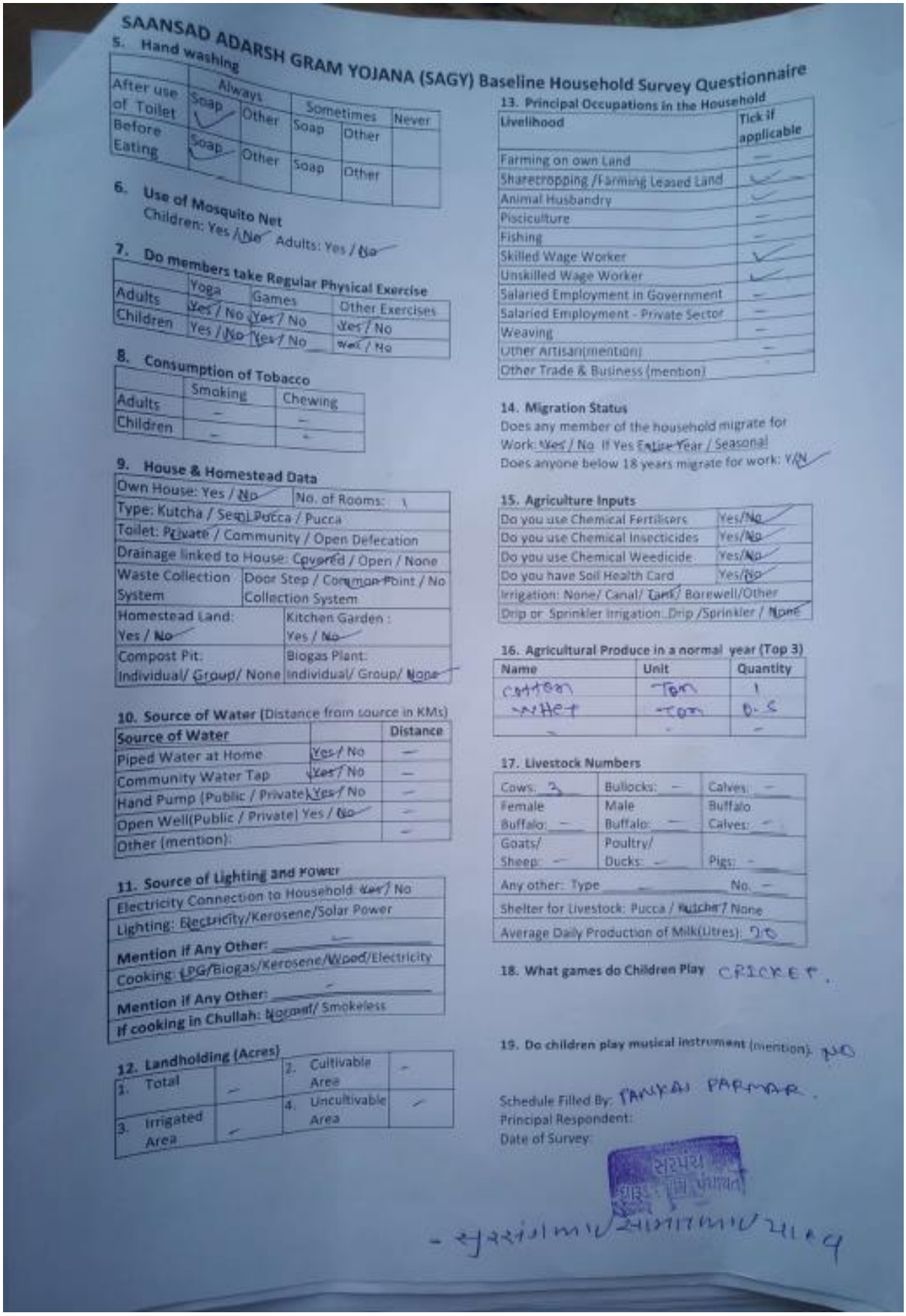
[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4

[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 ✓

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	–	–
Children	–	–

9. House & Homestead Data

Own House: Yes / No ✓	No. of Rooms: 1
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No ✓	Kitchen Garden : Yes / No ✓
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None ✓

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

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

11. Source of Lighting and Power

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

12. Landholding (Acres)

1. Total	–	2. 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/No ✓
Do you use Chemical Insecticides	Yes/No ✓
Do you use Chemical Weedicide	Yes/No ✓
Do you have Soil Health Card	Yes/No ✓
Irrigation: None/ Canal/ Tank/ Borewell/Other	
Drip or Sprinkler Irrigation: Drip /Sprinkler / None ✓	

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

Name	Unit	Quantity
cotton	Ton	1
wheat	Ton	0.5
–	–	–

17. Livestock Numbers

Cows: 2	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): 20		

18. What games do Children Play CRICKET.

19. Do children play musical instrument (mention): NO

Schedule Filled By: RANJAN PARMAR.
Principal Respondent:
Date of Survey:

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: DHARUKA

b. Ward Number: -

c. Gram Panchayat: DHARUKA GRAM PANCHAYAT

d. Block: -

e. District: BHAVNAGAR

f. State: GUJARAT

g. Lok Sabha Constituency: -

h. Number of Habitations / Hamlets in the Gram Panchayat: 7

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 1469 Total Population 2106 Male 1051 Female 1055

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	YES	
b.	Nearest Middle School	NO	15KM
c.	Nearest Secondary School	NO	15 KM
d.	Kisan Sevn Kendra	NO	15 KM
e.	Milk Cooperative /Collection Centre	YES	
g.	Health Sub Centre	-	15KM
h.	Bank	-	15KM
i.	ATM	-	15 KM
j.	Bus Stop	YES	
k.	Railway Station	-	15 KM.

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
l	Library	NO	15 KM
m	Common Service Centre	NO	15 KM
n	Veterinary Care Centre	NO	15 KM

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: All

iii. Drinking Water Facilities

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

If 3 mention the name of the habitations not covered:

b.Hand Pump Coverage in Habitations: NO *(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: YES *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:

b. Coverage under Open Drains: NO *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered:

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

If 3 mention the name of the habitations not covered: None.

v. Coverage of Habitations under Electrification

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

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

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

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

vi. Sports Facilities in the Village

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

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 4

c. Schools (Number)

Primary Private: — Primary Govt.: 1

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	hec 175.86	d.	Pasture / Grazing Land	-	g.	Check Dam	3
b.	Irrigated Land	175.65	e.	Forests/ Plnatations	hec 0.23	h.	Wells/Bore Wells	2
c.	Un-irrigated Land	hec 0.32	f.	Other Common Land	he 14.32	I	Tanks /Ponds	2

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	38
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	60
5	Number of landless households	74
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'

PARMAR 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

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: DHARUKA GRAM PANCHAYAT

b. Block: -

c. District: BHAVNAGAR

d. State: GUJARAT

e. Lok Sabha Constituency: -

f. Number of Wards in the Gram Panchayat: -

g. Number of Villages in the Gram Panchayat: ONE

h. Names of Villages: DHARUKA

Demographic Information

Number of Households 449 Total Population 2106 Male 1051 Female 1055

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	N	15 KM
b.	Nearest Primary Health Centre (PHC)	N	15 KM
c	Nearest Community Health Centre (CHC)	N	15 KM
d.	Nearest Post Office	Y	-
e.	Nearest Bank Branch (Any)	N	15KM
f.	Nearest Bank with CBS Facility	N	15 KM
g.	Nearest ATM	N	15 KM
h.	Nearest Primary School	Y	-
i.	Nearest Middle School	-	15 KM
j.	Nearest Secondary School	-	15 KM
k.	Nearest Higher Secondary School / +2 College	-	48 KM.
l.	Nearest Graduate College	-	48 KM
m	Nearest ITI / Polytechnic Centre	-	15 KM
n	Kisan Seva Kendra	-	15 KM.

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	N	15 km.
p	Nearest Agro Service Centre	N	15 km.
p	MSP based Government Procurement Centre	N	40 km.
q	Milk Cooperative /Collection Centre	Y	
r	Veterinary Care Centre	N	15 km.
s	Ayurveda Centre	N	15 km.
t	E – Seva Kendra	N	15 km
u	Bus Stop	Y	
v	Railway Station	N	6 km.
w	Library	N	15 km.
x	Common Service Centre	Y	15 km.

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 4

b. Number of villages without Angan Wadi Centres –

Names of such villages: –

c. Schools (Number)

Primary Private: – Primary Govt.: YES

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)
a.	Cereal (Rice/ Wheat/ Millets)	–	–	YES	–	–	GP	–
b.	Kerosene	–	–	✓	–	–	GP	–
c.	Other (mention)	–	–	–	–	–	–	–

2

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered covered Not Covered –	DHARUKA TIMBA KERIYA BAJUD	
b.	Hand Pump Coverage in Villages:	Covered covered Not Covered –	DHARUKA	
c.	Coverage under Covered Drains:	Covered ✓ Not Covered	DHARUKA TIMBA KERIYA BAJUD	
d.	Coverage under Open Drains:	Covered Not Covered ✓		DHARUKA TIMBA KERIYA BAJUD
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ Not Connected	DHARUKA BAJUD KOLARAMA TIMBA KERIYA	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	hel 775.86	d.	Pasture / Grazing Land	–	g.	Check Dam	3
b.	Irrigated Land	hel 775.86	e.	Forests/ Plantations	hel 0.23	h.	Wells/Bore Wells	2
c.	Un-irrigated Land	hel 11.32	f.	Other Common Land	hel 11.32	i	Tanks /Ponds	2

[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	300+
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	60+
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	75+
l)	Number of landless households	80+
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	20
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'

PANKAJ PARMAR Surveyor	સરપંચ 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

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

VISHWAKARMA YOJANA PROJECT PHASE VIII 2020-2021

Bhautik Vala <valabhautik1@gmail.com> 3:04 PM (3 minutes ago)

to ddo-bav, collector-bav

DT.08-09-2021

NAME: (1) BHAUTIK D. VALA

ENROLLMENT NO. 180213106017

(2) PANKAJ D. PARMAR

ENROLLMENT NO. 180213106011

SEMESTER 8TH, CIVIL ENGINEERING BRANCH

GOVERNMENT ENGINEERING COLLEGE BHAVNAGAR.

SUBJECT: VISHWAKARMA YOJANA PROJECT PHASE VIII 2020-2021 REPORT SUBMISSION

RESPECTED SIR, / MADAM,

AS PER ABOVE SUBJECT WE ARE HAPPY TO SUBMIT OUR FINAL PROJECT REPORT OF VISHWAKARMA YOJANA PROJECT PHASE VIII 2020-2021. IT IS OUR GRATE EXPERIENCE REGARDING THIS PROJECT WE HAVE LEARNED A LOT FROM THIS PROJECT ABOUT HOW TO DEVELOP ANY VILLAGE IN CONTEXT OF RURBUN TO URBAN AND TO REDUCE THE MIGRATION OF LOCAL VILLAGE DWELLERS BY PROVIDING SUSTAINABLE SAFE AND GOOD INFRASTRUCTURE FACILITIES LIE ANY SMART VILLAGE. AT LAST, WE WOULD LIKE TO THANKS OUR VISHWAKARMA YOJANA PROJECT PHASE VIII 2020-2021 HEAD MISS.DARSANA MA'AM, OUR NODAL OFFICER AND OUR COLLAGE FOR PROVIDING SUCH HUGE SUPPORT REGARDING THIS PROJECT TERM. WE HOPE THIS PROJECT WILL HELPFUL TO OUR GUJARAT GOVERNMENT IN UPCOMING GOVT.PROJECTS RELATED TO VILLAGE DEVELOPMENTS.

THANK YOU!

YOUR FAITHFULLY,

1) BHAUTIK D. VALA

(2) PANKAJ D. PARMAR

Dharuaka Village V...

21. Comprehensive report for the entire village

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

The project work started with the basic data collection, survey work and it progressed through meeting with headman, Talati-cum-Mantri shri and the gap analysis was later framed and 12 various design problems were identified. The proposed solutions are framed in such a way that the village can enhance the overall physical, social and educational conditions of villagers and can promise the sustainable growth of the village in context to the Bhavnagar City, in which the village falls. Vishwakarma Yojana is an approach towards rurbanisation and Vishwakarma Yojana would provide “Design to Delivery” solution for development of villages in ‘Rurban’ areas. The team has conducted Vishwakarma Yojana Project for dharuka Village with the vision of the developmental work in villages that could be undertaken as per the need of the village, in particular includes Physical, Social and Sustainable infrastructure facilities.So we tried to give some ideas of development for our allocated village DHARUKA, in this process were thankful to many people who helped us.