DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
Subir Village
Dang District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
GAYAKWAD SURAJBHAI PRAKASHBHAI	ELECTRICAL	170910109008
GANGODA VISHALBHAI SHIVRAMBHAI	CIVIL	170910106012
THORAT RINABEN ISHWARBHAI	CIVIL	170910106024

COLLEGE NAME :
SRI SATSANGI SAKETDHAM RAMAHSRAM GROUP OF INSTITUTION VADASMA

NODAL OFFICERS NAME
Prof. DEVANG GAJJAR
Prof. ANAD KUMAR ACHARYA

COLLEGE LOGO

YEAR:2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda,Ahmedabad– 382424 Gujarat

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Gujarat Technological University,
Chandkheda,Ahmedabad– 382424 Gujarat

CERTIFICATE

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

Detail Project Reportfor,
VILLAGE : SUBIR

DISTRICT: DANG

Under

VishwakarmaYojana: Phase-VIII

In partial fulfillmentof the project offed by

GUJARATTECHNOLOGICALUNIVERSITY,CHANDKHEDA

During the academic year 2020 -21

This project work has been carried out by the munder our super visionana guidance.

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Date of Report Submission:	
Principal Name and Signature:	
VY-Nodal Officer Name and Signature:	
Internal(Evaluator) Guide Name and Signature:	Prof. DEVANG GAJJAR Prof. Anand kumar Acharya
College Name:	Sri satsangi saketdham ramahsram group of institution
College Stamp:	

ABSTRACT

Vishwakarma Yojana is one such initiative towards Rurbanization of villages by Government of Gujarat that hinders such migrations. This Yojana aims at developing the village by providing all the urban facilities that a city may have, yet maintaining the Rural soul. This can be achieved by considering various aspects such as Physical, Social, and Renewable infrastructural facilities. The concept of Rurbanization at regeneration and revitalization of both the physical as well as social environment in villages through a judicious and economic consumption of resources is the thought for betterment or the villages. It is designed to reduce and remove the rural-urban divide and to lead to process of rural transformation that is not exploitative. Vishwakarma Yojana is an approach towards Rurbanization, it has been proposed to provide the benefit of real world experience to engineering students and apply their technical knowledge in the planning, development and management of rural infrastructure facilities. Rurbanization means urban facilities and amenities in rural area, developing village with help of rural soul and urban amenities. In this village on one hand some essential infrastructural facilities like Water Supply, Road Network and electricity, primary school, secondary and higher secondary school etc. have been good and sufficient on the other hand lacking of infrastructural facilities like drainage, public toilet, and public garden. Under this scheme the villages of Rurban areas will be adopted by various engineering colleges under the Gujarat technological University. The engineering colleges would study the identified villages and make recommendations to achieve integrated and comprehensive development through technology application and project preparation and management.

The name of the allocated village is Subir located in Subir taluka of Dang district. This village has comprises of 300 houses. It has a total population of 3188 with 1508 female population against 1608 males according census 2011 data. The main aspects for development of this village are sewage, public toilets, community hall, etc. Some of the physical infrastructure like dairy, panchayat building, primary school, and well exist in the village and are properly maintained and utilized. More over Water tank is present but in bad condition.

On the basis of survey data we have observed that there are some physical infrastructures like water tank, dairy, primary school, etc. but among them some are not in usable condition which creates problems for villagers. The work of Sarpanch and Talati is good as per the feedback given by villagers. Clinic facility is also not available. Construction of roads are in better condition and usable. More such problems are identified and are to be designed and renovated in the project phases.

In part 1 on the basis of survey data, which we have collected from Subir village and interaction with villagers, Sarpanch and Talati, we have finalized some designs for the further development of the village as, Community hall, Pharmacy Store, ATM, Village entrance gate, Supermarket and Cybercafe.
By introducing above mentioned amenities all the facilities can be made available to villagers which may reduce the migration. This will sustain the culture of cooperative living. Socioeconomic development will occur giving a sense of livelihood to the dwellers yet maintaining the essence of a village.

ACKNOWLEDGEMENT

We are highly indented to **Gujarat Technological University**, Ahmedabad for providing us such opportunity to work under Vishwakarma Yojana to get real work experience and applying our technical knowledge in the development of Villages.

We wish to express our deep sense of gratitude to **Prof.(Dr.)NavinSheth**, **Hon'ble Vice Chancellor, Gujarat Technological University-Ahmedabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N.Kher**, **Registrar, Gujarat Technological University-Ahmedabad** for giving us complete support.

We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

We express our sincere thanks to **DDO, TDO, Sarpanch, Talatiand staff members of Ahmadabad** District for providing us with requisite data whenever we approached them. Especially our thanks are to all villagers and stake holders for their support during Survey.

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

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,
Mr. Aanand Acharya and Mr. Devang Gajjar from college Shri satsangi saketdham Ram ashram group of institute for their invaluable guidance, constant inspiration and active involvement in our project
work.

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

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma yojana
PHC	Primary health center
CHC	Community health center
RCC	Reinforced concrete structure
BM	Brick Masonry
D	Door
V	Ventilator
W	Window
WC	Water Closet
O	Opening
GDP	Gross Domestic Product
NH	National Highway
SH	State Highway
ODR	Other district roads
MDR	Major district Road
SBA	Swachh Bharat Abhiyan
SC	Schedule Cast
ST	Schedule tribe
NGO	Non-Governmental Organization
SWOT	Strength, Weakness, Opportunity, Threats

Summary of Project Villages

Village features	Allocated Village	Ideal Village	Smart Village
Village	**SUBIR**	**UNAI**	**PUNSARI**
Taluka	Subir	Vansda	Punsari
District	Dang	Dang	Sabharkantha
Sarpanch	Pawar Tukarambhai	Bipin bhai	Himanshu patel
Distance (km)	10	45	230
Population(As per Census 2011)	3188	6104	5500
Pin code	394716	396580	383307
Surveys	Techno-economic Survey	Techno-economic Survey	Smart Village Survey
Facilities/ Key Features	Gram Panchayat, Road Network, Primary education, Anganwadi, O/H watertank, RO Waterplant, Post office, Sump, etc.	Gram Panchayat, Road Network, Outpost, Bus station, primary, sec. and hig. sec. education, primary to multispec. hospital, O/H Watertank, sump, Post office, etc.	Gram Panchayat, Road Network, Bus station, primary and secondary education, PHC, Entrance gate, O/H Watertank, sump, Post office, Village Pond, Recreational area, etc.
Technology	Mobile and Internet connectivity, WiFi connection in Panchayat, etc.	Solar system, Mobile and Internet connectivity, WiFi, Multispec. hospitals, Online education, etc.	Solar system, Mobile and Internet connectivity, WiFi, CCTVs, etc.
Drawbacks	Poor Maintenance	More people, traffic, etc.	Lack of services

Chepter:1 ideal village visit from district of gujrat state

1.1 Background & Study Area Location Unai Village :

An allocated Indian village will be so constructed as to lend itself to perfect sanitation. It will have cottages with sufficient light and ventilation built of a material obtainable within a radius of five miles of it. The cottages will have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all avoidable dust. It will have wells according to its needs and accessible to all. It will have houses of worship for all, also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have Panchayats for settling disputes. It will produce its own grains, vegetables and fruit, and its own Khadi. This is roughly my idea of a model village. In the present circumstances its cottages will remain what they are with slight improvements. Given a good zamindar, where there is one, or co-operation among the people, almost the whole of the program other than model cottages can be worked out at expenditure within means of the villagers including the zamindar or zamindars, without Government assistance. With that assistance there is no limit to the possibility of village reconstruction. But my task just now is to discover what the villagers can do to help themselves if they have mutual co-operation and contribute voluntary labour for the common good. I am convinced that they can, under intelligent guidance, double the village income as distinguished from individual income. There are in our villages inexhaustible resources not for commercial purposes in every case but certainly for local purposes in almost every case. The greatest tragedy is the hopeless unwillingness of the villagers to better their lot.

We visited Unai village, Navsari, Gujarat to understand how the village has been transformed in all these years. The main aim behind the visit was also to get an insightof how the Gram Sarpanch, Bipinbhai has transformed and revamped it since 2016 and what are the next developments he is looking for his village in near future. Unai is a village in the Navsari district in the Indian State of Gujarat, India. Unai isconnected with Subir, Chikhli, Saputara,Nasik, Vapi, Dharampur, Shamlaji by statehighway. This village situated onBillimora–Subir narrow gauge railway route. The nearest railway station forbroad gauge trains is Bilimora Junction.Unai is famous for Unai Mata Temple. UnaiMata is Hindu a devi Ushna Amba matatemple with hot water springs kund.Visitors can bathe in the hot springattached to this famous temple of considerable historical significance.Bartad, Chadhav, Khambhaliya, Palgabhan,Sindhai, Bhinar, Kelkutch, Dharampuri,Kureliya, Nani Valzar, Pathakvadi are villages nearby Unai. There are total 1,187families living in the Unai village. The Gram Panchayat also introduces a new scheme every year to motivate the villagers to pay advance tax by providing a gift/kit i.e. this year they have given a dustbin. The Kit also bears a particular number/identity to a particular family, so that the panchayat have a record as to which kit is allocated to which family. Around 30-35 families reside in hut rest all are having their house with all modern amenities.

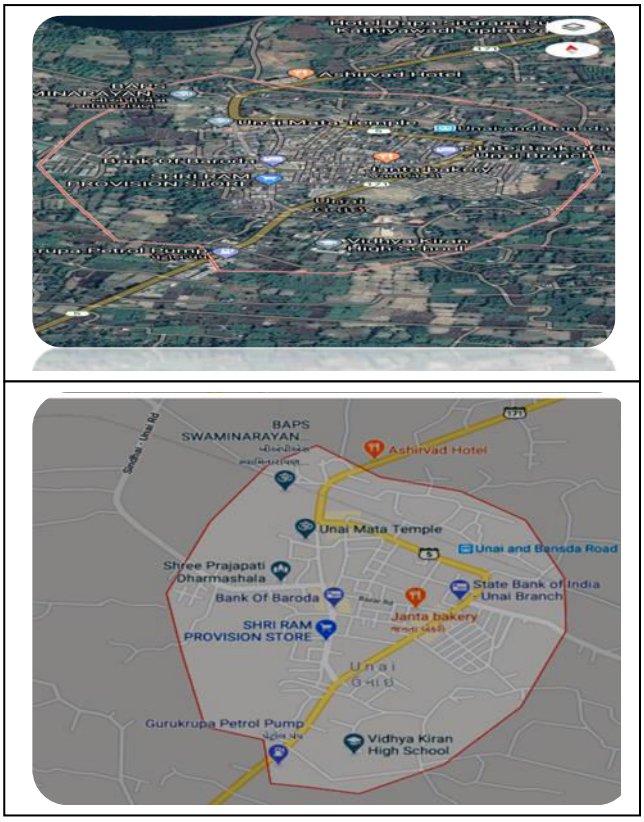
Unai village population fact:

Number of Households	**1187**
Population	6104
Male Population	3069(51.3%)
Female Population	3035 (49.7%)
Children Population	587
Sex-ratio	989
Literacy	85.3%
Male Literacy	91.31%
Female Literacy	79.2%
Scheduled Tribes (ST) %	14.33%
Scheduled Caste (SC) %	5.67%

(T-1.1A Unai population data)

Unai village

Coordinate	**20.76°N 73.36°E**
Country	**India**
State	**Gujrat**
District	**Navsari**
Taluka	**unai**
Language	**Gujarati, hindi**
Time zone	**IST (UTC+5:30)**
Elevation / Altitud	**97 meter**
Pincode	**394710**



(T-1.1B Unai data) **(F-1.1A- Unai village map)**

1.2 Concept of Ideal village and Normal village

An allocated Indian village will be constructed in such a manner that it will be able to lend itself perfect sanitation. It shall have cottages with sufficient light and ventilation built of material that can be obtained within a radius of five miles of it. The cottages shall have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all kind of avoidable dust. It shall have wells as per the need and demand.

1.2.1 Objectives :

To prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living.To make the model village a "hub" that could attract resources for the development of other villages in its vicinity.

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

To contribute towards social empowerment by engaging all sections of the community in the task of village development.

To create and sustain a culture of cooperative living for inclusive and rapid development.

To creating models of local development which can be replicated in other villages.

1.2.2 Example / Live Case studies of allocated village of India/Gujarat :

There are total 1,187families living in the Unai village. The Gram Panchayat also¬ introduces a new scheme every year to motivate the villagers to pay advance tax by providing a gift/kit i.e. this year they have given a dustbin. The Kit also bears a particular number/identity to a particular family, so that the panchayat have a record as to which kit is allocated to which family.

1.2.2.1 Case Study of Model Village from the state of Gujarat- Punsari :

Swarajya (self-governance) to Surajya (good governance)" has been hailed as the mantra for rural development in the state of Gujarat. The good governance model of this prosperous state from western part of India has been a matter of study for quite some time now. A number of schemes have been launched in the past decade, such as Adarsh Gram, Smaras Gram, Tirth Gram, Sardar Awas, and Paawan Gram, to develop rural areas in Gujarat. The present paper adopts a constructive approach and aims to explore and understand the successful experiment of Punsari Village. (Sengupta, 2014). These guidelines aim to offer a design of rural development that focuses not only on improving economic indicators of development but also on bettering the social indicators of development such as health, sanitation, education, women's empowerment, inclusiveness, etc. In this process, the Gram Panchayat has to play a pivotal role. The present programme was inspired by the success of a small village from the District of Sabarkantha in Gujarat called Punsari.

Model Village: Punsari

Punsari is located approximately 80 kilometers away from the state capital of Gandhinagar in Gujarat. It has had phenomenal success in the past decade under the leadership of a visionary and missionary Sarpanch (village headman) Mr. Himanshu Patel (who served as the Sarpanch from 2006 to 2016).

Punsari is a Model Village and Yet Struggles to be an Allocated Village :

Punsari model village definitely has an excellent record in terms of fewer people living below poverty line, availability of schools, water facilities, free Wi-Fi facility, roads, proper solid waste management etc. The village has proved itself on important development indicators like health, education, social services, women empowerment, which have already been discussed in the previous section. However, during the field wok the author observed that mere physical indicators of development are at times misleading. A model village is not necessarily an allocated village. men. It also exposes theway rural democratic institutions are actually working in India (cf. Kumar, 2006).

Conclusion :

The paper has attempted to explore the development journey of a smart and model village called Punsari. The author argues that grass-roots leadership, community participation, decentralization of powers to local bodies in rural areas, and financial support in the form of various government schemes can bring far-reaching changes in the rural landscape of India. Punsari represents a classic example as well as an exemplar of concerted efforts of elected leaders, community people, and government support to bring transformation and make villages smart and sustainable. The paper has highlighted the role played by a local leader whose vision and mission can achieve the impossible. However there still exists a gap between a model village and an allocated village. The gap can only be filled with the persistent efforts for rural revitalization not only by the government but also with effective involvement of the local leaders and village folks. 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

(F-1.2A Punsari gram panchayat)

(F-1.2B- State bank of india)

1.2.3The Idea of a model/Smart Village:

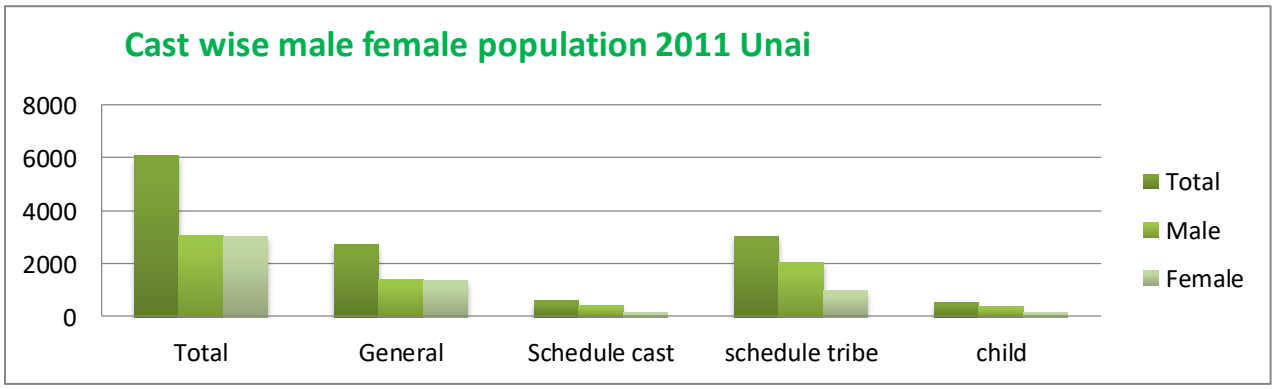
Smart Village is a concept adopted by national, state and local governments of India, as an initiative focused on holistic rural development, derived from Mahatma Gandhi's vision of Adarsh Gram and Swaraj .Prime Minister Narendra Modi launched Sansad Adarsh Gram Yojana (SAGY) or SAANJHI) on 2 October 2014, Gandhi's birthday, in 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.

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

Physical, Socio economic and Demographical Details:

Unai is a Census Town city in district of dang, Gujarat. The Unai Census Town has a total population of 6104 of which 3,069 are males while,3045 are females as per the report released by Census India 2011.

Population of Children with age of 0-6 is 587 which is 12.03 % of total population of Unai (CT). In Unai Census Town, Female Sex Ratio is of 989gainst state average of 919. And Moreover Child Sex Ratio in Unai is around 835 compared to Gujarat state average of 890. Literacy rate of Unai city is 91.31 % higher than state average of 78.03 %. In Unai, Male literacy is around 91.52 % while female literacy rate is 79.85 %.



(F-1.3A Cast wise population Unai)

Unai Religion Data 2011:

Town	Population	Hindu	Muslim	Christian	Sikh	Buddhist	Jain	Others	Not Stated
Ahwa	6104	92.03%	7.82%	0.06%	0.00%	0.01%	0.01%	0.00%	0.07%

(T-1.3A-Unai religion data)

Unai Infrastructures facilities (All Types):

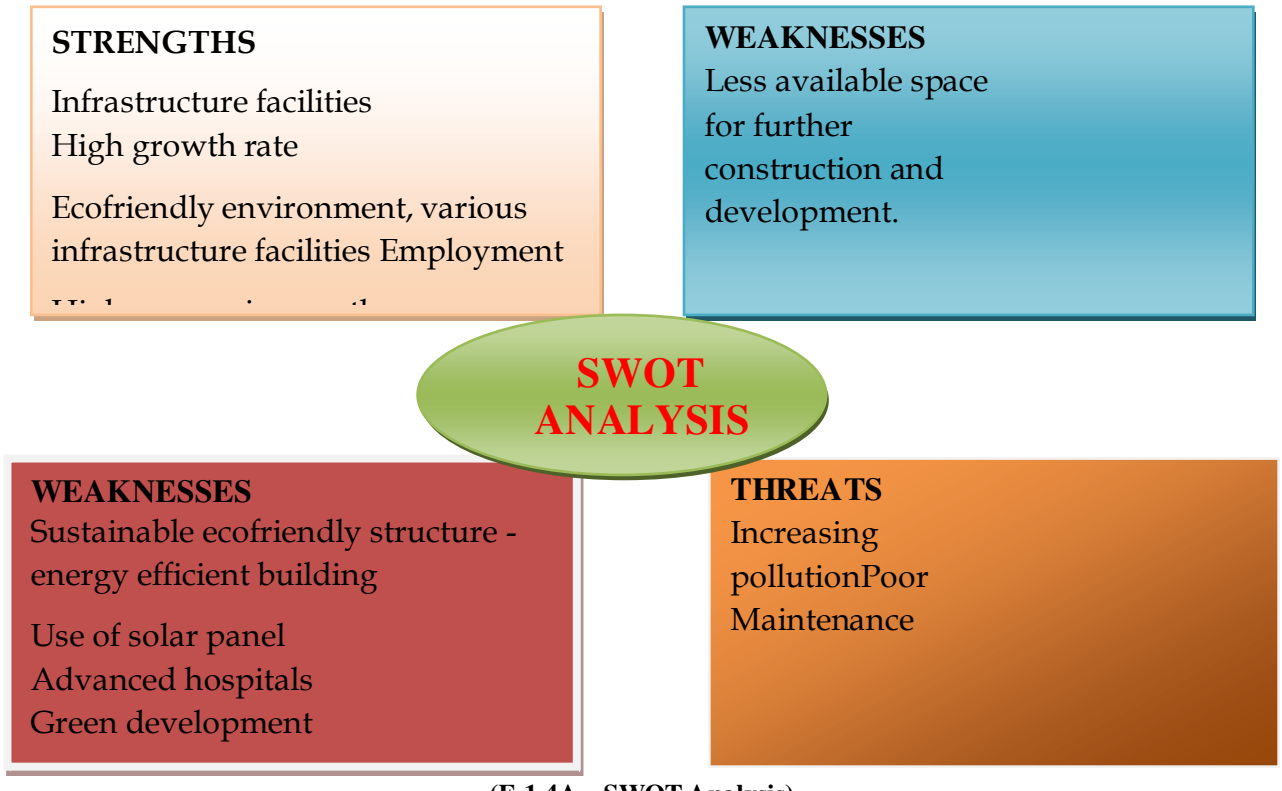
Infrastructure and facilities	Details
1. PHC	1
2. Government Hospital	1
3. Private Hospital/ clinic	7
4. CHC	1
5. Government dispensary	2
6. Anganwadi	3
7. Primary school (Eng. & Guj.)	6
8. Sec and high. Sec. school	3
9. ITI college	1
10. Private Tuitions	Available
11. Community hall	1
12. Library	1
13. Public garden	Closed Condition
14. Village pond	2
15. Handpump	Closed condition
16. Overhead tank	6
17. Assembly polling station	12
18. Post office	1
19. Panchayat building	2
20. U/G Sump	4
21. Polling Stations	4
22. Mahila mandal	8
23. Dairy	1
24. Nursing Home	1
25. Police station and jail	1
26. veterinary hospital	1
Small scale industries	Near By 22
28. Recreational Centre	Chowk, temples and Play ground
29. Bus station	2
30. Telephone exchange office	No
31. Electricity	24/7
32. Road network	CC,RCC and Paver Blocks
33. waste collection	Daily
34. Shops Approximately	200
35. Bank	Co. Op. 1 and Gov. 2
36. ATM	3
37. Local Transportation	Available
38. Gov. grocery shop	5
39. Multispec. hospitals	2 1
40. U/G Drainage	Available

(T-1.3B-Unai infrastructure facilities)

		
(F-1.3B-Bank of Baroda)	**(F-1.3C-PHC)**	**(F-1.3DWater Tank)**

1.4 SWOT analysis of Ideal village

A SWOT analysis focuses on the four elements of the acronym, allowing companies to identify the forces influencing a strategy, action or initiative.



(F-1.4A – SWOT Analysis)

1.5 Future prospects of Development of the Ideal village :

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

- Gas Pipelines
- Biogas Plant
- Cold Storage Area
- Rain Water Harvesting
- Solar Street Lights
- Working NGOs
- Public WiFi Facility
- Fire Station , etc.

1.6 Benefits of the visit of ideal village

Almost all the civil benefits such as, Water supply network, Pucca roads, LED Street lights, Drainage network, Waste disposal, Water storage tanks, waste collection system were observed in the village.Apart from this, infrastructure facilities such as, schools, colleges, roads, post-office, banks, clinics, Public health center, bus stop, Public toilets, anganwadi, police station, community hall, places of recreational interest etc. are also present.

By visiting the village we got an insight about:

- The culture of a village.
- Lifestyle of village
- Socioeconomic cnditions of village
- Working of village governing bodies
- Importance of infrastructure facilities
- functioning of a village
- amenities that are need by the village

1.7 Civil aspects required in Ideal village :

We have observed the balance of commercial, residential and recreational land use in the Ahwa village but as per the feedback which were given by villagers some facilities are lacking in the village from civil aspects and these are, Gas Pipelines, Biogas Plant, Cold Storage Area, Rain Water Harvesting, Solar Street Lights, Public WiFi Connection, Fire Station , etc.

Chepter-2 Subir village Literature Review- Civil & Electrical Concept

2.1 Introduction: Urban and Rural village

2.1.1 Urban village concept:

Urban is the opposite of Rural. An Urban area‖ is an area where many people live and work close together. A place having minimum population of 5000.Population density of 400 persons per sq kilometer or higher.75% plus of the male working population involved in non -agricultural employment activity**.**

2.1.2Rural village concept:

Rural areas are also known as the 'countryside' or a 'village' in India. It has a very low population densityAn area with a population density of up to 400 per square kilometer,Villages with clear surveyed boundaries but no municipal board,A minimum of 75% of male working population involved in agriculture and alliedactivities.

2.2 Importance of the Rural development:

2.2.1 Rural development introduction:

Rural development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areasRural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry.

2.2.2 Need for Rural Development in India:

The rural economy is an example of an agrarian economy. Although farming and agriculture are one of the most important primary activities, the problem lies in the fact that they share in the GDP of the agriculture sector is on a constant decline.

2.3 Ancient Villages / Different Definition of Rural Urban Villages:

A rural area is a land outside the densely populated urban areas in a city or town. They have low population density, large open areas, lower standard of facilities etc. The primary industry in such areais agriculture

Characteristics of rural area are:Lower literacy rate.

- Lack of educational facilities.
- Lack of good health infrastructure.
- Less population density.
- Agriculture as prime employment (more than 75% male).

Village definition:

- Village is a clustered human settlement or a community, larger than a hamlet but smaller than a town, with a population ranging from a few hundred to a few thousand.
- Villages are normally permanent with fixed dwellings.

Characteristics of a village:

- Village have population between 500 and 10000.
- The villagers managed their own affairs through the traditional institution of Panchayat. The central government had neither inclination nor the means for interfering with the self- government of villages.
- Village has the atmosphere of simplicity, calmness and peace. There is no noise and little sophistication.
- The poverty and illiteracy of the village people.

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

Census 2021 preparations are underway for more than a year now. One of the first tasks the Office of the Registrar General and Census Commissioner, India was to identify the country's urban and rural areas. For this, officials created a base map by applying the census criteria.

Officials involved in this process say it is surprising how quickly urbanisation is spreading, and that rural India will be history sooner than we think. Many of the urban areas identified in Census 2011 have expanded while thousands of villages have turned into towns, as per the census definition, the officials say.

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

(T-2.4A India census 2011Data)

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

Gujarat Population 2020

As per projection, population of Gujarat in 2020 is 7.04 Crore…

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

(T-2.5A Gujrat population)

Gujarat Urban Population 2011 :

Out of total population of Gujarat, 42.60% people live in urban regions. The total figure of population living in urban areas is 25,745,083 of which 13,692,101 are males and while remaining 12,052,982 are females. The urban population in the last 10 years has increased by 42.60percent. Sex Ratio in urban regions of Gujarat was 880 females per 1000 males. For child

2.6 Rural Development Issues - Concerns – Measures:

We visited Subir village, Dang, Subir is now Taluka. Population more than 3k and it's cover more than 100 villages. Gujarat to understand how the village has been transformed in all these years. The main aim behind the visit was also to get an insight of how the Gram Sarpanch, Mr.Yogeshbhai jivabhai chaudhari has transformed and revamped it since 2016 and what are the next developments he is looking for his village in near future.Subir is located at Dang , Gujarat.

Perticuler	Total	Male	Female
Total no.houses	517	-	-
Population	3188	1608	1580
Child(0-6)	578	277	301
Scheule tribe	3038	1531	1507
Literacy	74.83%	83.70%	65.60%
Total worker	1394	690	704
Marginl worker	84	34	50

(T-2.6- Subir village population data)

2.6.1 Crime Free / Dispute Free

The types of crime that commonly occur in Indian villages include dacoity, robbery, agricultural feuds , disputes over : land , irrigation , cattle, election rivalries. Further crimes such as un-touch ability offences, insurgency, domestic violence etc. also prevail in the villages.Therefore it may be suggested that to tackle the problem of village crimes and disputes, a separate rural wing of police can be established. The rural police should be provided training which is needed for welfare activities.

2.6.2 Resources

Various natural resources like wind, water from lakes, ponds and rivers are available in Subir village

2.6.3 Health/ Hygiene

Poor sanitation and hygiene are a major health concern in all villages. Poor personal and household hygiene can lead to increased rate of infections and other

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

The importance of infrastructure for economic growth and development in rural area can hardly be overemphasized in a developing economy like India. With poor rural infrastructure, even a marginal improvement in its quantity and quality could significantly improve economic development and human well-being. Improving basic infrastructure, such as roads, transport, electricity, telecommunications, housing, health, water and sanitation, is essential for development and well-being of the rural population.

Rural Infrastructure in India: Scope and Importance:

Infrastructure is the backbone of any country. It plays a very important role in supporting nation's economic growth and the same is the case with India. If we talk about rural infrastructure in the country,then it is crucial for agriculture, agro-industries and poverty alleviation in the rural areas. Typically, rural infrastructure in the country encompasses rural roads, major dams and canal works for irrigationand drainage, rural housing, rural water supply, rural electrification and rural telecommunication connectivity

Importance of rural infrastructure in India:

Basically, rural infrastructure has the potential to provide basic amenities to people that can improve their quality of life. To give an example, development of rural infrastructure can lead to

2.8 Other Projects / Schemes of Gujarat / Indian Government :

Rural development is a process of improving quality of life and economic status of people living in villages. Education, entrepreneurship, physical infrastructure and social infrastructure also play a role in developing the rural regions. Rural development is characterized by its emphasis on locally produced economic development strategies. The main objective of the rural development is to remove poverty of the people and fill the widening gaps between rich and poor. Various policies and scheme by Government of India are:

- Pradhan Mantri Gram Sadak Yojana.
- Swarnjayanti Gram Swarozgar Yojana (SGSY)
- Prime Minister Rural Development Fellows Scheme.
- National Rural Employment Guarantee Act (NREGA).
- Sampoorna Grameen Rozgar Yojana (SGRY).
- Sarv Siksha Abhiyan.

towards the Pradhan Mantri Gram Sadak Yojana (PMGSY) to connect far-flung habitats. The rural housing scheme has received more than Rs 9,000 crore and the allocation for rural electrification scheme has been increased by Rs 4,814 crore in the Union Budget 2017-2018. Under the Swachh Bharat Program, the government has taken up the task of construction of individual, cluster and community toilets. All these initiatives are good but still there is huge scope further in rural infrastructure development.

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

3.1 Introduction: Concepts, Definitions and Practices :

We have selected the smart village as Punsari. It is located in sabarkhanthaWe have visited the Punsari Village.

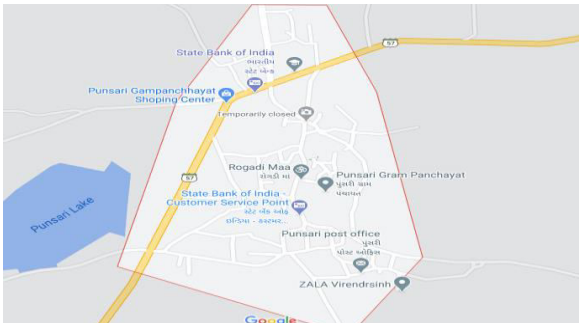
Brief about Punsari:

Punsari is a village located in Sabarkantha district in the state of Gujarat, India.Punsari is considered as India's smartest village. The village is located at about 80km from the state capital, Gandhinagar. Punsari is 20km from Parvati Hills. Parvati Hills is the largest table top land of India. The village follows the Panchayati raj system. The village extent about 65 km . The land in use of agriculture is 6 hectares . The main non farming activity is dairy in this village . The village has undergone a transformation under the panchayat.There has been use of new and advanced technology in education. This village has wi-fi connection for all people. Efforts have been made for the empowerment of women and increasing security in the village. Some of the facilities provided by the panchayat include local mineral water supply, sewer & drainage project, a healthcare centre, banking facilities and toll-free complaint reception service. Consequently, Punsari received theaward of being the best Gram Panchayat in Gujarat.The village's model has been appreciated by delegates from Nairobi and they are keen to replicate this 4 in Kenyan villages.

Sr. No.	**Census**	**Population**	**Male**	**Female**	**Total Households**
i)	2001	4076	2064	2012	
ii)	2011	5500	2945	2555	689
Village			**Punsari**		
District			Dang		
State			Gujarat		
Country			India		
Time Zone			IST (UTC + 05:30)		
Currency			Indian Rupee (INR)		
Dialing Code			+91		
Date format			dd/mm/yyyy		
Driving side			Left		
Internet cTLD			In		
Language			Gujarati		
Time difference			37 minutes		
Latitude			23.2082106		
Longitude			73.1305348999999		

(T-3.1A Punsari Data)

(F-3.1A Punsari satellite view)



(F-3.1B punsari location map)

(F-3.1C – Entrance gate)

(F-3.1D-Solar Panel)

(F-3.1E –Ghrampanchayat))

(F-3.1F-power station)

Smart Village Concept:

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 and Swaraj .Prime Minister Narendra Modi launched Sansad Adarsh Gram Yojana (SAGY) or SAANJHI) on 2 October 2014, Gandhi's birthday, in 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.

Smart Village Definitions

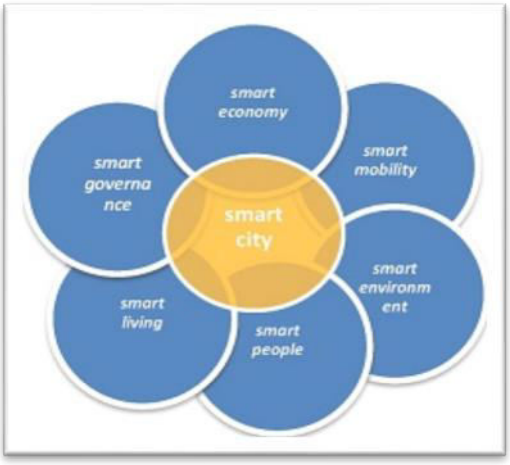
A smart city is an urban area that uses different types of electronic methods and sensors to collect data. Insights gained from that data are used to manage assets, resources and services efficiently; in return, that data is used to improve the operations across the city. This includes data collected from citizens, devices, buildings and assets that is then processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection,information systems, schools, libraries, hospitals, and other community services.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

India is a rural dominated country and villages are said to be the heart of this nation. According to 2011 Census, the population of rural areas comprised of 68.84 per cent. Migration of the people from rural areas to urban areas causes some burden on the urban areas. If the vision of the founders of this nation is to be respected and implemented, then we all need to have the responsibility to make our villages smart, which means self-sufficient, efficient, healthy and educated villagers.

Smart city development vision- Goals - activities :

- Idetify the transportation challenges and needs of the citizen and business community and demonstrate how advanced technologies can be used to address issues in safety, mobility, and climate change, now and into the future.
- Determine which technologies, strategies, applications, and institutional arrangements demonstrate the most potential to address and mitigate, if not solve, transportation challenges identified within a city.



(F-3.2A- smart village development)

(F-3.2B- smart village management)

3.3 Technological Options

Human society is developing with rapid momentum and achieved various successes for making its livelihood better. The civilization is witness for various changes related to its development through different catalysts like industrial development, green revaluation, science and technology, etc. India has more than 72% of its population living in villages. Near about seven decade had been passed since India got freedom, but the scenario in villages in our country is still unchanged. On one side India has recently selected 100 cities for Smart City project and ready to adapt all the advanced technologies for these smart cities and on other hand villages in our country are still struggling for getting basic amenities like 24 x 7 electricity. On one hand 4G internet technology is being utilized all over the urban areas but on other hand villages in our country are still searching for genuine mobile networks. Our Governments are joining hands with developed countries like America, China, Japan to run bullet trains to connect big cities in India whereas villages in our country are still disconnected and are lacking with basic facilities like drinking water, healthy food, sanitization, toilets, transportation, education, etc. The technology that we use here can be availed to the people living in rural areas to help in improving their lifestyle. This paper summarizes such efforts which can definitely help us to introduce various technologies in these neglected parts of our country fulfilling our responsively to build up our nation. Thus new concept of smart villages can be introduced to make heaven in the heart of our India, because real Bharat is recognized by the villages in our country.

3.4 Road Map and Safe Guards

Mahatma Gandhi said, “the future of India lies in its villages”. Despite government’s focus on villages for many decades, villages remain poorly serviced and governed. India has been an agricultural economy yet the sector is still not a well-paying livelihood option. Generating new avenues of employment in villages, reviving agriculture and improving services in rural areas are some of the components that need to be included right away in rural development policies. The visual perception of Indian villages has not changed much though certain corrective policy measures and infrastructural reforms have taken place.

3.5 Issues & Challenges :

1. Misuse of resources - We have been misusing resources because we do not know why it matters and what it does in the long run. It does not even comes to mind as we have been doing all our lives. This includes money.

2. Technological evolution - It has taken a dangerous turn and will come to bite us in the ass. The process has already started, things we used to see in movies are becoming bitter truth of the society. We want comfort, ease and we are getting it at the cost of our civilization. Simple examples - Social Media and Mobile Phones.

3.5.2 Education / Job opportunities development

1. Lack of funds: The lack of sufficient funds is the main problem in the development of education. Outlay for education in Five Year Plans has been decreasing. Due to insufficient funds most educational institutions lack infrastructure, science equipment and libraries etc. Due to this reason, desired results cannot be achieved.

2. Expensive higher education: University, professional and technical education has become costly in India. Fee structure of technical and professional institutes like IIM's is quite high IIM's charge Rs. 2 lakh per semester for MBA classes. It is beyond the reach of common man. Privatization of higher education has led to the growth of profit hungry entrepreneurs. Now a day's higher education is much costly affair.

3. Neglect of Indian languages: The medium of instruction particularly in science subjects is English. So rural students who are not well versed in English, cannot study science properly in English. They suffer a lot; Indian languages are still under developed. Standard publications are not available in Indian language.

4. Problem of Brain drain: When intelligent, talented and deserving candidates do not get suitable jobs in the country, they prefer to go abroad for seeking jobs. So our country is deprived of good talent. This phenomenon is called 'Brain drain'.

3.5.3 Urban water and sanitation challenges

For urban India, the situation is critical. In 2015, about 377 million Indians lived in urban areas and by 2030, the urban population is expected to rise to 590 million. Already, according to the National Sample Survey, only 47% of urban households have individual water connections and about 40% to 50% of water is reportedly lost in distribution system due to various reasons. Further, as per the 2011 census, only 32.7% of urban Indian households are connected to a piped sewerage system.

3.6 Smart Infrastructure - Intelligent Traffic Management :

Traffic congestion is a major problem in many cities of India along with other countries. Failure of signals, poor law enforcement and bad traffic management has lead to traffic congestion. One of the major problems with Indian cities is that the existing infrastructure cannot be expanded more, and thus the only option available is better management of the traffic. Traffic congestion has a negative impact on economy, the environment and the overall quality of life. Hence it is high time to effectively manage the traffic congestion problem. There are various methods available for traffic management such as video data analysis, infrared sensors, inductive loop detection, wireless sensor network, etc. All these methods are effective methods of smart traffic management

Social Health Indices:

The number of businesses per ten lakh population can form a city's level of economic activity and economic performance. It provides a single indication of the business climate in a jurisdiction, and attitudes towards entrepreneurship. The unemployment rate is measured by taking the unutilized labor supply and then tracks business cycles. It is measured in terms of working-age city residents who during the survey period were not considered in paid

Electricity: All the electrical lines will be present underground by not disturbing aesthetics of a place or making any kind of nuisance. The power generated will be available from renewable sources like wind energy farm, hydroelectric plant or natural gases will also be used for not exhausting natural resources.

Transportation: An entire intermodal transport available to all at affordable rate with minimum time delay and maximum possible comfort. It has an elaborated recommendation to keep track of transport facilities such as high capacity public transport and light passenger transport The results will be expressed in annual number of public transport trips per capita and ridership of public transport.

3.7 Cyber Security :

Future cyber security problems of smart cities through collaboration between companies, government, media outlets and individuals across the world.Over the past few years, Technology has begun to play an important role in our daily lives. Internet enabled gadgets have changed the way in which we work or do our daily chores. Digitization has an impact on personal lives, education, health, government and national security. Due to increase in complexity of smart city systems and globally connected social, economic, political systems, etc. has increased vulnerability of security of a city.

3.8 Initiatives in village development by local self-government :

The institutions of Local Government have flourished in India since time immemorial. The Panchayats or Village Governments, as they were called, were ancient institutions and were themselves small republics. They exercised power in various spheres such as industrial, commercial, administrative, and social including civic education and religious functions. The development of Urban Local Self-Government, as compared to that of Rural Local Self Government, has been very slow after independence.

3.9 Smart Initiatives by District Municipal Corporation :

Talking about the smart city initiative by Dang district the goal of the initiative is " Smart utilization of Dang city's potential for enhancing quality of life for the citizens of providing equal access to best quality physical infrastructure , social infrastructure and mobility through leveraging state of the art and technology : thus making Dang a futuristic Global city with focus on enhancing economy , protecting the ecology and preserving the identity and culture of the city".

The initiatives taken by Dang Municipal Corporation are :

- Solar roof Panels
- Green Dang campaign
- Integrated command and control center.
- Installation of CCTV Cameras

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

Digital India Initiative : The initiative comprises of several projects which will focus on better governance, knowledge and universal phone connectivity across the country.

1.Digi Locker 2.MyGov.in 3.eSign Framework 4.Swachh Bharat Mission mobile app 5. National Scholarship Portal 6. eHospital 7.Digitize India Platform 8.Bharat Net

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

Smart Environment Smart villages can be stewards of the environment aided by technologies to monitor key environmental indicators such as forest health, water quality, soil conditions and changes to the landscape. They can also reduce pressure on deforestation using efficient cook stoves to decrease the need for traditional biomass energy sources such as charcoal and wood a key driver of unsustainable forest use. Smart villages can host community-run recycling facilities ranging from those equipped to recycle wastewater and organic waste from agro -processing, to next-generation facilities for the recycling of e-waste, including energy-storage and generation technologies such as batteries and solar panels. Depending on geographical endowments, some smart villages will be able to operate as regional ecotourism hubs, an activity that can improve the welfare and connectivity of rural and urban communities.

Smart cities revolution to boost employment in India

Government of India's 'smart cities mission', a flagship initiative, is aimed at developing 100 sustainable and citizen friendly cities across the country.

CHEPTER-4 ABOUT SUBIR VILLAGE :

4.1 Introduction

4.1.1 Introduction About Subir Village details :

We visited Subir village, Dang, Subir is now Taluka. Population more than 3k and it's cover more than 100 villages. Gujarat to understand how the village has been transformed in all these years. The main aim behind the visit was also to get an insight of how the Gram Sarpanch, Mr.Yogeshbhai jivabhai chaudhari has transformed and revamped it since 2016 and what are the next developments he is looking for his village in near future.Subir is located at Dang , Gujarat.

SUBIR- Village Overview	
Gram Panchayat :	Subir
Block / Tehsil :	subir
District :	Dang
State :	Gujarat
Pincode :	394710
Area :	781.03 hectares
Population :	3188
Households :	517
Nearest Town :	Ahwa

(T-4.1A-Subir data)

Working Population as per Census 2011:

In subir village out of total population, 1394 were engaged in work activities. 93.97

Perticuler	Total	Male	Female
Total no.houses	517	-	-
Population	3188	1608	1580
Child(0-6)	578	277	301
Scheule tribe	3038	1531	1507
Literacy	74.83%	83.70%	65.60%
Total worker	1394	690	704
Main worker	1310	-	-
Marginl worker	84	34	50

(T-4.1B-Subir detail)

4.1.2 Justification/ need of the study :

Indian population is growing very fast so need of development like education facilities, employments, increasing living standards are providing only in cities or in urban area. Hence, people of village must have to migrate to the cities due to lack of all amenities. This cause population density in cities are increase, so we have to think about to provide the all-infrastructural facilities required in Rural area.

4.1.3 Study Area (Broadly define) :

By doing this project we can study the broad area about village amenities and need of all primary facilities like Education, Health, Transportation, Sanitation, and other physical infrastructure facilities. In Subir village we have notice that many lack of facilites by doing Gap analysis and Techno-economic survey and as per our primary and secondary survey we have concluded some positive .

4.1.4 Objectives of the study :

- ✓ Infrastructure development in rural area and connect all with social and civil facilities.
- ✓ Reduce migration from rural to urban area due to sufficient facilities are notavailable
- ✓ Provide better transportation & inter connectivity and employment scope invillage
- ✓ Provide better sanitation and improve of need of facilities like solidwaste
- ✓ Electricity connections like street lighting that is energy efficientandeco-friendly.

4.1.5 Scope of the Study :

In Subir by taking detail of village scope of study In VY project the main scope is in two

fields are as under...

Scope of Civil

- Planning andDesign
- Techno-EconomicSurvey
- Preparation of mapforVillage RedesigningandReimagination
- Quantity, estimationandSurveying
- Rurbanization
- Sanitationimproving Economical solutionforproblems

Scope of Electrical

- Design, develop and provide more efficient and sustainableelectricity
- inruralarea Providing better connection of electricity in ruralareasTelecommunicatio

4.1.6 Methodology/ Study FrameWork

- Allocated village survey at unai village near Dang.
- Datacollection
- Gap analysis for facilities available as per allocated village norms &requirement
- Techno-economic survey of unai village nearDang.
- SWOT analysis of Anandpura village nearMehsana
- Techno-economic survey of allotted village Subir neardang
- Meeting with Villagers, Sarpanch, Talati, TOO&DDO
- Consulting with all related to village and analyze problem faced by Subir village
- Gap analysis of Subirvillage
- SWOT analysis of Subirvillage
- Finding best, economical & sustainable solution for problems as per
- UDPFIGuidelines Best Proposanal Design forsolvingproblem
- Detail progress report and detail design done in final projectreport

4.2 Subir village stydy area profile

4.2.1 Study Area Location with brief History land use details :

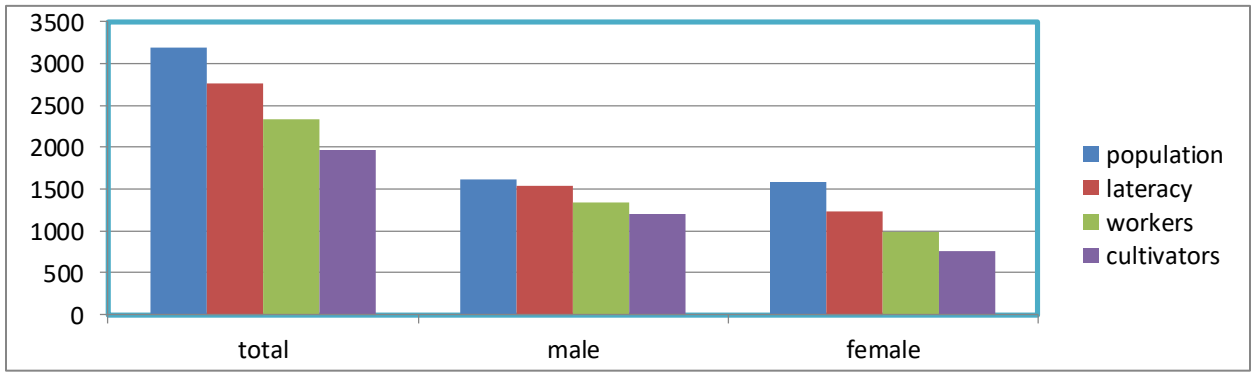
According to Census 2011 information the location code or village code of Subir village is 522577. Subir village is located in The Dangs Tehsil of The Dangs district in Gujarat, India. It is situated 31km away from Ahwa, which is both district & sub-district headquarter of Subir village. As per 2009 stats, Subir village is also a gram panchayat.

(F-4.2A- Subir map)

(F-4.2B- subir satellite map)

4.2.2 Physical & Demographical Growth

The population of subir village about 10000 peoples. The subir Census town haspopulation of 3,188 of which 1608 are males while 1580 are females as for reportreleased by census india 2011.population of children with age of 0-6is578.Subir is a large village located in The Dangs Taluka of The Dangs district, Gujarat with total 517 families residing. The Subir village has population of 3188 of which 1608 are males while 1580 are females as per Population Census2011 In Subir village population of children withage0-6is578whichmakesup18.13% of total population of village. Average Sex Ratio of Subir village is 983 which is higher than Gujarat state average of 919. Child Sex Ratio for the Subir as per census is 1087, higher than Gujarat average of 890.Subir village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Subir village was 74.83 % compared to 78.03 % of Gujarat. In Subir Male literacy stands at 83.70 % while female literacy rate was65.60%.As per constitution of India and Panchyati Raaj Act, Subir village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website, don't have information about schools and hospital inSubirvillage.In Subir village out of total population, 1394 were engaged inworkactivities.93.97 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 6.03 % were involved in Marginal activity providing livelihood for less than 6 months.



(F-4.2C-Population chart Subir)

Country	India
State	Gujarat
District	Dang
Location	Subir,
Population(2019/2020) est.	3188-3200
Population(2011)	3188
Males	1608
Females	1580
Households	517
Latitude	**71.2824331**
Longitude	**23.4192638**

(F-4.2D Subir data)

4.2.3 Economic generation profile / Banks:

The major sources of income are:

- Farming
- Animal Husbandry
- As Shopkeepers
- As workers in mills and factories.

4.2.4 Actual Problem faced by Villagers and smart solution:

During an interaction with people of Subir village we understood their problems and issues like:

- is a waterlogging problem during rainy season,
- There is no community hall available in the village,
- There is no bank existing in the village,
- There is no ATM in the village

Smart solutions:

- Community Hall
- Pharmacy Store
- ATM
- Cybercafe
- Supermarket
- Entrance Gate
- Rain water harvesting
- Bank
- Public garden
- Solid waste management
- development center
- Solar street lights and dustbins

4.2.5 Social scenario -Preservation of traditions, Festivals, Cuisine:

CULTURE : The Gujarati's are known for their diverse cultural heritage and rich traditions. It is a vibrant mix of Hinduism, Islam, Jainism and Buddhism and also a blend of different cultures of the Gujarat's like arts, beliefs, customs, traditions, institutions, inventions, language, technology and values. The culture of the people does not stop with one particular generation but instead the elders of the community see to that the future generations also practice it which automatically leads to the wisdom and appreciation of cultural traditions and lifestyles.

CUSTOMS AND TRADITIONS : Though modern and sophisticated houses have come in Gujarat, still there are places which have their traditional homes and wooden houses. Most of these traditionally built houses have beautiful and intricately designed interiors but as a customary practice each house has a special "Chabutara" built for bird feeding.

4.2.6 Migration Reasons / Trend:

- Subir village Migration Reasons as per the data available in Village Profile & Taluka Planning are
- Number of families who have migrated from village to village/city to get higher education are around 108.

4.3. Data Collection Subir village (Photograph/Graphs/Charts/Table) :

4.3.1 Describe Methods for data collection :

The main methods for data collection are :

1) Individual interviews.

- Interviews can be done formally or informally.
- Questions should be focused , clear , and encourage open ended responses.
- They should be qualitative in nature.

2) Focus groups

- A facilitated group interview with individual that has something in common.
- Gathers information about combined opinions.
- Responses are often coded in categories and analyzed .

3) Observations - Field trips

- Allows for the study of the dynamics of a situation , frequency counts of target behavior.
- Good source for providing extra information about a certain group , can use videography.

4.3.2 Primary details of survey:

It is located 3KM towards north from Distric the adquarters Ahwa. 324KM from state capital Gandhinagar .Subirissurrounded by Ahwa taluka towards west ,surgana Taluka towards south,Kalwan taluka towards south,vansda taluka towards west.The total geographical area of village is 782.03 hecteres .Subir village have religiousplaces“sabaridham”and“Pampasarovar”.In the subir village the nature is very beautyfull

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

In Subirl : Average size of the house in the village is 5 X 10m

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

4.3.4 No of Human being in One House :

Total number of population in Subir is 3188 as per 2011 census. There are different number of people in each house as there are nuclear families as well as joint families, but the average no of human beingsin one house is 5.

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

The materials like milk, other grocery materials, wheat, dangar , cotton and other agricultural cereals are used locally as they are locally easily available.

4.3.6 Geographical Detail:

The total geographical area of village is 782.03 hectares, total residential area is 200 hectares andtotal irrigated land area is582.03 hectares.

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

Total No. of houses : 517

Population : 3188 (Male : 1608 ; Female : 1580)

SC & ST : 50 & 876
Literacy : 74.83%

4.3.8 Occupational Detail :

Insubir village out of total population, 1394 were engaged in work activities. 93.97% of workers describe their work as main work while 6.03%

4.3.9 Agricultural Details / Organic Farming / Fishery :

Majority of the population of Subir village are occupied in farming. The main crops grown in the village are: wheat, cotton, rice, etc. There are no any farmer or villager using organic farming or fishery.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses :

Transportation facilities are Government bus service is available from main highway road.. Local transportations are autorickshaw, chagdaa, private vehicles are available in Subir village.

4.3.11 development available in the village for attracting the tourist :

In Subir village there are two tourism activities available for attracting the tourist. Tourism Development can be implemented in Subir as ,
1.Sabaridham
2.Pampa sarovar

4.4 Infrastructure Details (With Exiting Village Photograph) :

4.4.1 Drinking water

Drinking water is sourced from open wells and borewells and is electrically pumped through pipes to an elevated storage tank or an open well, treated with chlorine for disinfection and then distributed to households through taps around the village undergravitationalpressure.The gram panchayat and the sarpanch are responsible for the management of water supply, treatment and day-to-day maintenance. The actual implementation is done by the “waterman”, who is from the same village and is paid by the gram panchayat. The waterman has received training to do his

duties, including chlorination practices, from the health department at the block level. The health department is in charge of taking monthly water samples and monitoring the waterquality.

Description	Detail	Remark/suggesion
Tape water (treated/untreated)	Yes (untreated)	Water distribuution
well water (coverd/uncoverd)	Yes (coverd)	Far away from village
Hand pump	Yes	-
Tube well/borehole	yes	-
River/lake /spring/canal/pond	River, lake	-

(T-4.4A-Resources of drinking water)

(F-4.4A –Head pump)

(F-4.4B-Water tank)

4.4.2 Drainage Network / Sanitation Facilities

This work had as main purpose the design of a separative drainage network of wastewaters in the Subir village. For this project topographic data of this region were provided a priori. However a collection of updated information about the population was needed.A number of INE publications were consulted and a recognition of the city and surroundingregion was made. This research allowed us to design a possible solution, using the skills development in Civil Engineering.In the solution presented, all the requirements in the current regulations were taken into account, both within the drainage system and the structure of the pumping station, making this project a viable solution.

4.4.3 Transportation and Road Network

Road network is vital to the economic development, trade and social integration of the country. It facilitates smooth conveyance of both people and goods. Size of the road net work, its quality and access has a bearing on various parameters of the economy like travel time, transport costs,

cost of input, cost of finished products etc. Besides, road network promotes wide market of various products/ services and thereby extend markets as a consequence enable exploitation of the economiesofscale..

Typeofroad	availabities	Remarks
Village Approch road	yes	**Black tapped pucca road good condition**
Main road	Yes GJSH 216	**Black tapped pucca road medium condition**
Internal streets	yes	**Kutta road poor condition**
NearestNH/SH/MDR/OD R dist.in km	**GJ SH 216**	**Black type pucca road good condition**

(T-4.4B- Road Network)

(F-4.4C-Main road)

(F-4.4D-Road of village)

4.4.4 Housing condition:

The poor housing conditions in the Subir village of Dang have been identified as one of the greatest problems faced by the village residents. Fifty-five per cent of the village population is dalits (untouchables) and these and other poor households live in small thatched huts made of wooden sticks, mud and palm leaves, with inadequate lighting and ventilation. The smoke produced by cooking creates a health hazard and high winds or fires frequently destroy the huts. Social inequality within the villages is increased by the stigma associated with living in huts.

Type of House	Availability	Remark
Kutchha/pucca(approx.ratio)	Both kutchha/ Pucca70%are kutchhaand 30%pucca	Are not in good condition
Hunts	Few 0.10 % in village	Not in good condtion

(T-4.4B- housing condition)

(F-4.4E-kutchha house)

(F-4.4F- house)

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

Social Infrastructures:

In subir village there are 2 anganwadi , 1 primary school , 1 temples , 1 Post office , 1 Panchayat building but one in working condition and other in closed condition. There are no secondary and higher secondary schools. Village does not have any health care center, public latrine and recreational area or public garden.

Health Facilities:

In the village no PHC, CHC, dispensary or any kind of private clinics are available in the village. The villagers go to UNAI village for any kind of health facility.

Education Facilities:

Subir village has 2 Anganwadi and 1 primary school and one high secondary school. Primary School is managed by the Local body. The school consists of Grades from 1 to 8. The school is Co-educational and the school have an attached playground section. Gujarati is the medium of instructions in this school. This school is approachable by all-weather roads. The school is Government building. It has got 8-10 classrooms for instructional purposes. As per the observation classrooms are in good condition.Addressing the issue of vacant and abandoned land and structures, state governments play an important role as well. In many cases, the ability to overcome the problems associated with vacant properties and convert them to productive use requires legislative powers that are found only atthe state level. Even when demand for new or restored land uses is sufficient for redevelopment to occur, the path to success is troubled by the displacement of previous residents and the elimination of their neighborhoods. Displacement can occur directly through property clearance and conversion to new uses, or indirectly through gentrification when land prices and rents are bid-up to a level unaffordable to the neighborhood's long-term residents. The redevelopment process can create winners and losers, with the losers too often racial and ethnic minorities and the economically disadvantaged. Physical and economic redevelopment are virtual imperatives for cities, but paths to redevelopment that minimize displacement and offset its negative consequences are unsure. Redevelopment has created new, vibrant central city areas. Historic buildings have been restored to physical and economic vitality. At the same time, affordable housing has filtered upward in price and economic class. Historic buildings have been lost. Residences and neighborhoods have been destroyed.

(F-4.4G- Navjoyt High School)

(F-4.4H- Primary School)

(F-4.4I –Anganvadi)

(F-4.4J Taluka katcheri)

(F-4.4K-Ghrampanchayat)

(F-4.4L-Temple)

(F-4.4M-Hospital)

(F-4.4N- PHC)

(F-4.4P- Electical power Station)

(F-4.4Q-BGGB Bank)

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

In the Subir village as per the interaction with the villagers the maintenance is required in the village pond. Water tank is present but is not in good condition and village officials have said that new water tank will be constructed in place of current water tank with higher capacity. Panchayat building, Anganwadi, Public library and primary school are also in good working condition. So the estimate of proper maintenance of village pond is required. Dairy is operated under a good pukka condition building.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details :

Almost in all the households the villagers are using mobile phone and they are also using the internet facility for personal usage. There are no private WIFI users in the village as per the data collected. But in the panchayat building there is a WIFI connection available.

4.4.8 Sports Activity as Gram Panchayat :

There are no any sports activities are being done by gram panchayat. The primary school has some sports equipment and tools & also children and students are using these facilities.

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

The Subir village has panchayat building and it is in good condition. The separate Post office building is there in village. Public Library is available in the village. Dairy building is available in the village. A small playground outside the primary school is present. The village has no public garden, separate play ground or any other recreational facilities. There is one village pond but it is not in good condition and its water is also not drinkable.

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

There are no any kind of facilities like smart toilet-coin operated entry, footpath development, self- cleansing, waterless public building, etc. in the Subir village. There are some houses in which solar system is there like solar panel, solar water heater and solar cooker. And according to current population the village has a smart thing which is RO water plant.

4.4.11 Any other details :

There are agriculture co-operative office building, 4 wells, 7-8 tube wells in farms or agriculture areasand 1 pump. The farmers have the farming equipment like tractor, etc. in the subir village.

4.5 Electrical facilities

4.5.1 Renewable energy source planning particularly for villages

India is one of the largest countries in the world, where the people's occupation is predominantly agriculture and most of the population lives in villages. Many of these villages are remotely located and their connectivity with the grid is very difficult resulting in their being not electrified at all or lack of continuous supply. For the development of the region, there is every need to utilize energy efficient techniques and potential of available renewable energy resources. An economic solution can be achieved by proper energy management making the village self sustained in its energy requirement. By employing existing but well proven energy conversion techniques, these resources can be used for various energy requirements for basic needs like electricity, cooking, water heating etc. The aim is to generate electric power, produce cooking gas and other forms of energy locally and distribute them within the village effectively.

4.5.2 Irrigation Facilities

Agriculture is the backbone of the majority of developing and emerging countries. Therefore, access to reliable and affordable irrigation water for agriculture is a crucial factor for the economic development of the country.

Around 93% of human water consumption is utilized for irrigation. Most of this water needs to be moved, often from below the ground. Yet, water distribution is often inefficient and requires significant amounts of energy, mostly supplied through diesel generators.

The ability to move water is critical for irrigated agriculture in most areas of the world. Both surface and underground water resources are commonly tapped for irrigation. Around 57% of current irrigation water demand is covered by the former, the remaining 43% by the latter source of water (World Bank, 2010).

irrigated, and remaining 2/3rd cultivated land in waghai is dependent on monsoons. 65% of the irrigation in village is from groundwater.Currently about 51% of the agricultural area cultivating food grains is covered by irrigation. The rest of the area is dependent on rainfall which is most of the times unreliable and unpredictable.

4.5.3 Electricity Facilities with Area

In waghai village the electicity supply is managed by DGVCL department. In waghai village by dgvcl department electricity supplied for 24 hours and there is also one electrical station located near the dgvcl which provide electricity in waghai village.

4.6 Existing Institution like - Village Administration – Detail Profile

4.6.1 Bachat Mandali :

In the Subir village there is no any Bachat Mandali existing

4.6.2 Dudh Mandali :

There is one Dudh Mandali existing in the Subir village in Dairy

4.6.3 Mahila forum :

A mahila forum is active in the village anganwadi. There is no any mahila mandal existing in the Subir village. As per the interaction with villagers there is a system of asking before any kind of decision implementation in the village and that is a good thing in Subir village so that mahilas have the decision making authority.

4.6.4 Plantation for the Air Pollution :

There is no such activity done of tree plantation for the air pollution in the Subir village. But thatkind of activities are done in the primary school by the students of the Subir village.

4.6.5 Rain Water Harvesting - Waste Water Recycling :

In the Subir village no one is using thesystem of rain water harvesting and there is no any kind of waste water recycling process done.According to Talati there is rain water harvesting in the village primary school.

4.6.6 Agricultural Development :

There is one agricultural co-operative office building in the Subirvillage so all the village agriculture related decisions are being operated from this office. The farmers have agricultural tools and equipment. All the agri-materials are available from Unai village which is 3 km away from the Subir village.

4.6.7 Any Other :

There are no any other kind of institutions existing in the Subir village apart from panchayat building,dharmshala, dairy, primary school, public library, government grocery shop, temples, agricultural cooperative office building, anganwadi, etc.

Chapter 5.Technical Options with Case Studies : (FOR ANY ONE TOPIC, Take a new concept design , prototype model with actual costing)

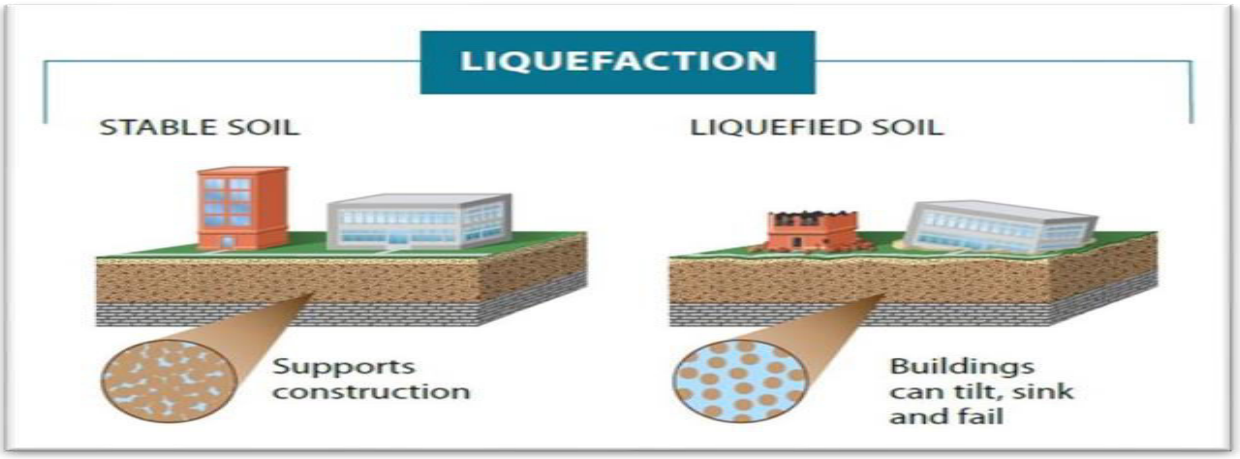
5.1 Concept (Civil) :

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying:

India's construction sector is assessed at Rs.4000 billion or $100 billion. As a result of government spending, private investments as well as foreign direct investment, has made India number one of the top ten spending nations on construction in the world. We manufacture more than 250 million tons of cement and are second only to China. A recent report "Global Construction 2020", estimates that India will be the third largest global construction market after China and USA. In order to improve the standard of living of her population, one of the key hurdles that faces today's India is to overcome the challenge of infrastructure bottlenecks. Consequently the federal government has announced our 11th five years plan which allocates 9% of the GDP to infrastructure projects.

5.1.2 Soil liquefaction

Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid.In soil mechanics, the term "liquefied" was first used by Allen Hazen in reference to the 1918 failure of the Calaveras Dam in California. He described the mechanism of flow liquefaction of the embankment dam as: If the pressure of the water in the pores is great enough to carry all the load, it will have the effect of holding the particles apart and of producing a condition that is practically equivalent to that of quicksand… the initial movement of some part of the material might result in accumulating pressure, first on one point, and then on another, successively, as the early points of concentration were liquefied.Type of soil causes liquefaction Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

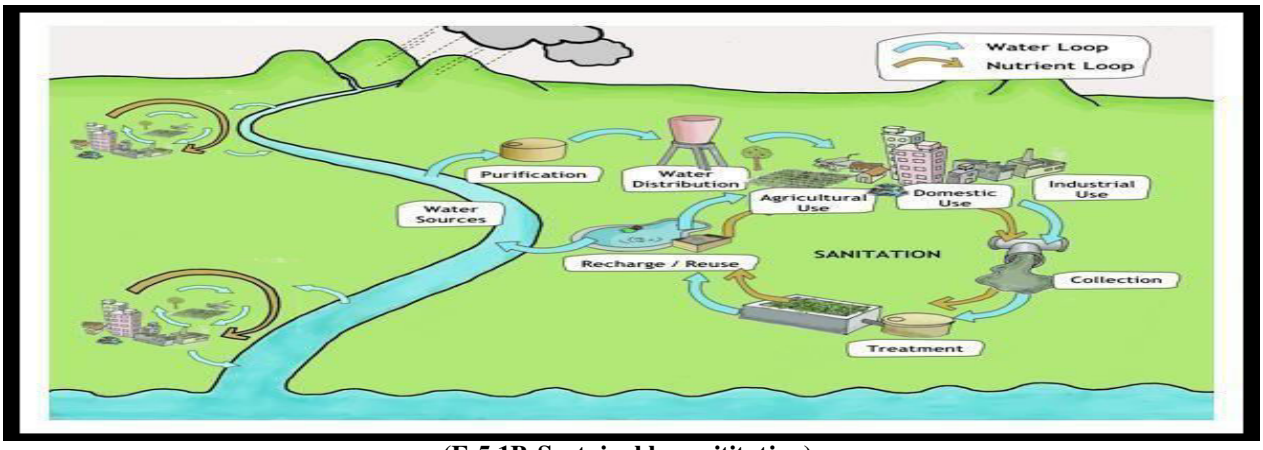


(F-5.1A-soil liquefaction)

5.1.3Sustainable Sanitation

Sustainable sanitation:

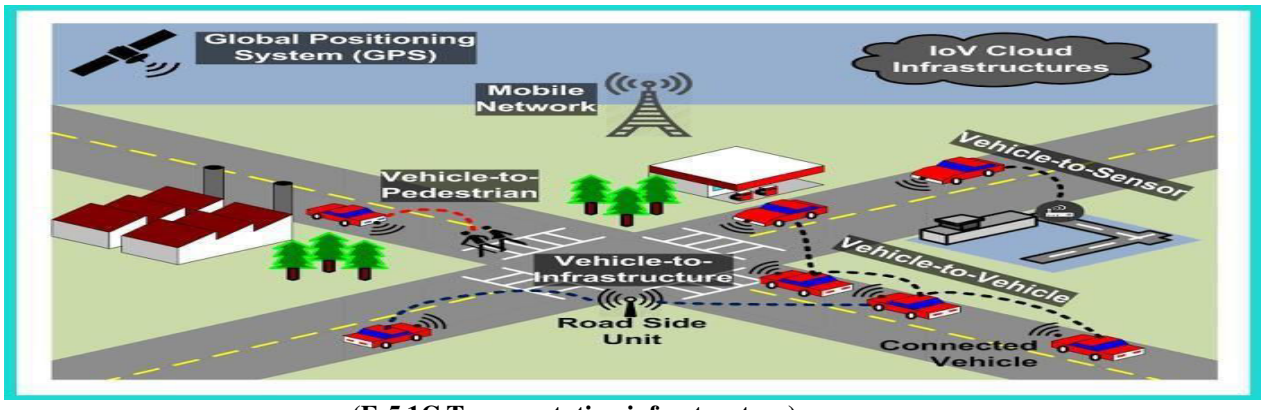
Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal.The Sustainable Sanitation Alliance (SuSanA) includes five features (or criteria) in systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and naturalresources.



(F-5.1B-Sustainable sanititation)

5.1.4 Transportation/infrastructure

Sustainable transportation concerns systems, policies, and technologies. It aims for the efficient transit of goods and services, and sustainable freight and delivery systems. The design of vehicle-free city planning, along with pedestrian and bicycle friendly design of neighbourhoods is a critical aspect for grassroots activities, as are telework and teleconferencing.Sustainable transportation would therefore manifest in the form of more pedestrianization (with active walking and cycling cultures), public transit systems than are operated on clean and renewable energy sources, bicycle station and car share options



(F-5.1C Transportation infrastructure)

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

Mechanism :

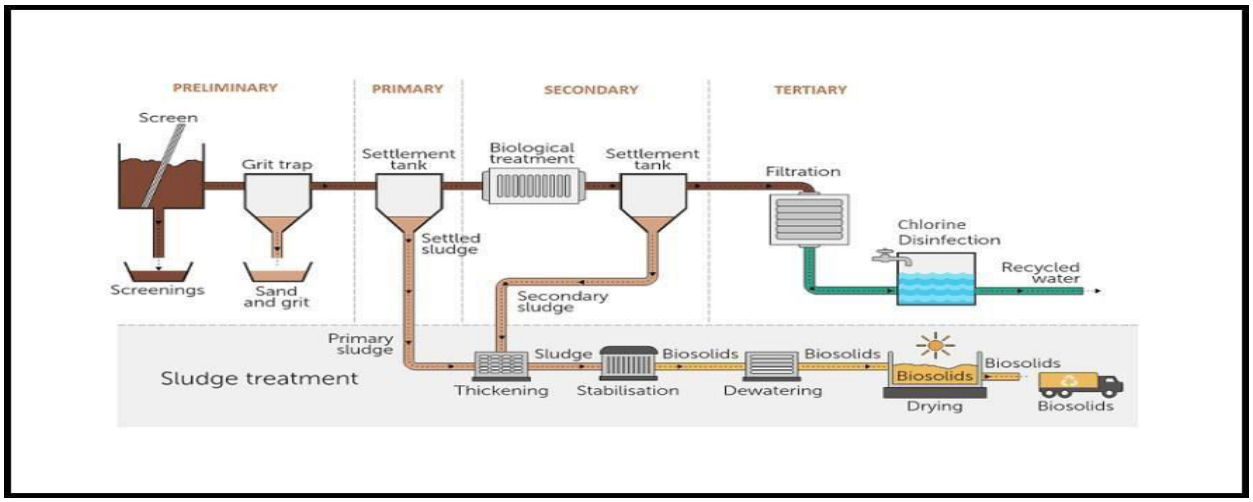
In the case of Reinforced concrete structure the ingress of moisture or air may lead to corrosion of steel, cracking and spalling of the concrete cover thereby reducing durability of the concrete structure . Repair has been suggested as the protective solution for damaged structure due to corrosion. Corrosion of reinforcing steel is a significant economic and safety problem, preventing many buildings from attaining their design life. It is now a must look into field as corrosion of reinforcing steel is seen almost in every 10 out of 100 constructions within a life of 10 years. Nowadays the increase content of pollutants in the city atmosphere has very much affected the lifespan of RCC structures.

Prevention :

Corrosion of steel in reinforced concrete structures can be divided into four different categories, based on how they provide protecti Alternative reinforcement and slab design method includes materials that electrically isolate the steel from the concrete and create a barrier for chloride ions, materials that protect steel galvanic-ally, and materials that have significantly higher corrosion thresholds than conventional reinforcing steel. Concrete slabs have been designed without any internal reinforcement.

5.1.6 Sewage treatmentplant

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.



(F-5.1D-Treatment plan)

5.1.6 Vertical Farming

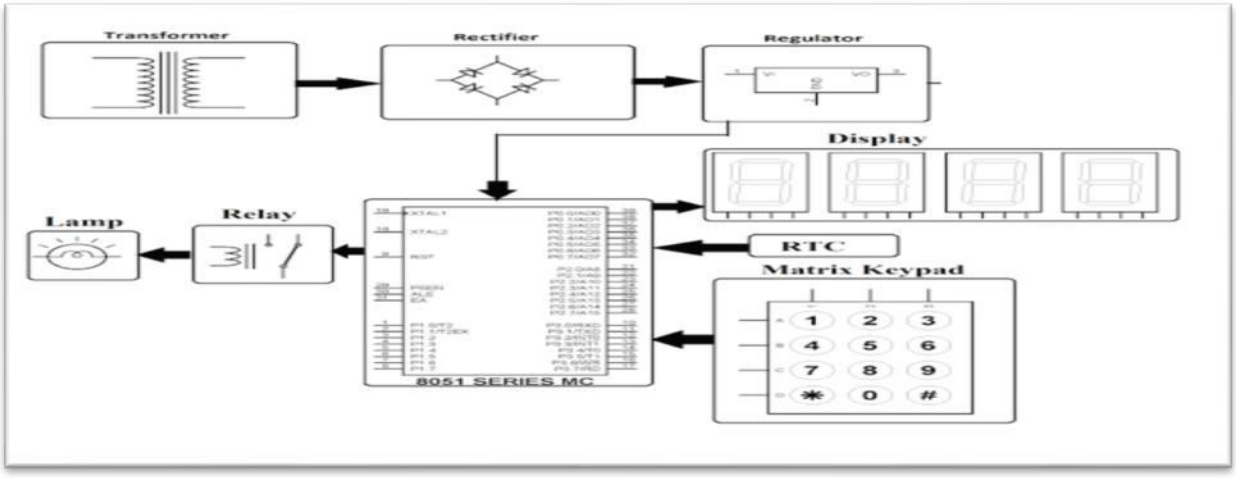
Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. Some common choices of structures to house vertical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

(F-5.1E-Vertical farming)

5.2 Electrical concept

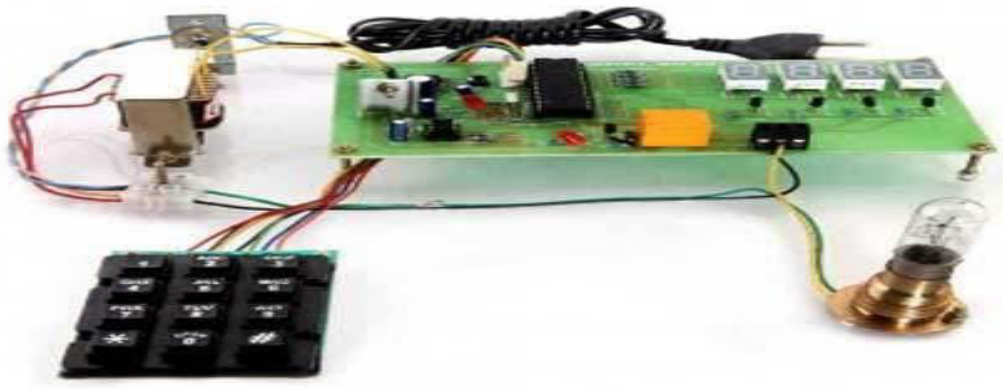
5.2.1 programmable load shedding

In today's world, there is a continuous need for automatic appliances with the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life. The project is designed to operate an electrical load multiple number of times as per the program. It overcomes the difficulties of switching the load ON/OFF manually. This proposed has an inbuilt real time clock (RTC) to keep tracking the time and thus to switch ON/OFF the load accordingly. Load shedding is what electric utilities do when there is a huge demand for electricity that exceeds the supply. Thus in a distribution system it needs to be precisely controlled for specific period of time. Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family. While the set time equals to the real time, then microcontroller gives command to _ the corresponding relay to turn ON the load and then another command to switch OFF as per the program. Multiple ON/OFF time entry is the biggest advantage with this project. A matrix keypad helps to enter the time.



(F-5.2A-Block diagram of load shedding)

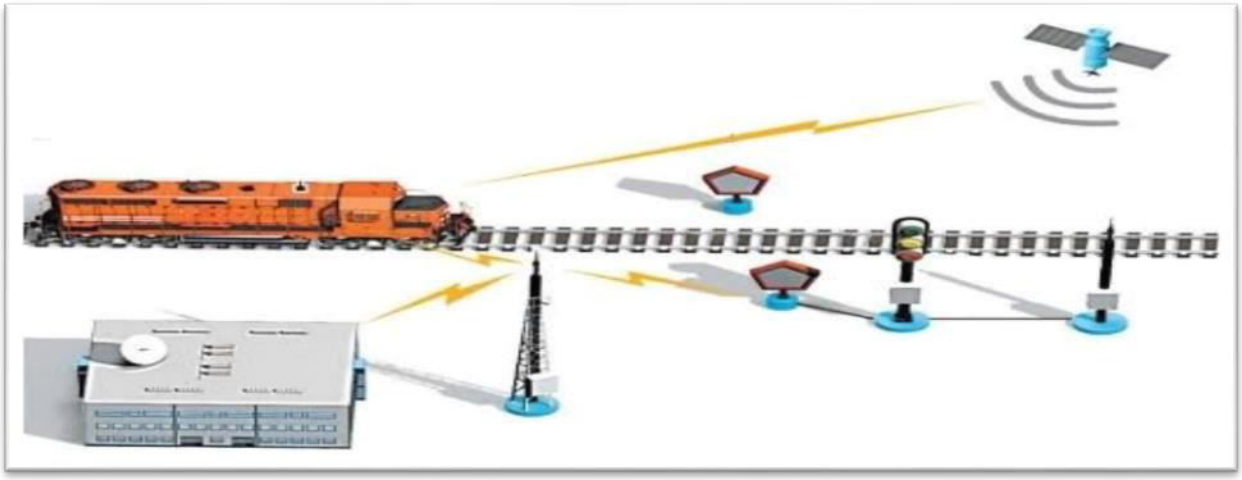
The demand for electrical energy is increasing. Today over 21% of the total electrical energy generated in Nigeria is lost in transmission (4-6%) and distribution (1518%). The electrical power deficit is currently about 18% in the country. Clearly, reduction in distribution losses can reduce this deficit by significantly. Its possibility to bring down the distribution losses to a 6-8 % level in India with the help of newer technological option (including information technology) in the electrical power distribution sector which will enable better monitoring and control. The project "Electricity and load shedding monitoring" are designed such that distribution point or grids monitored and load shedding from one central location.



(F-5.2B-model of load shedding)

5.2.2 Railway security system using IoT

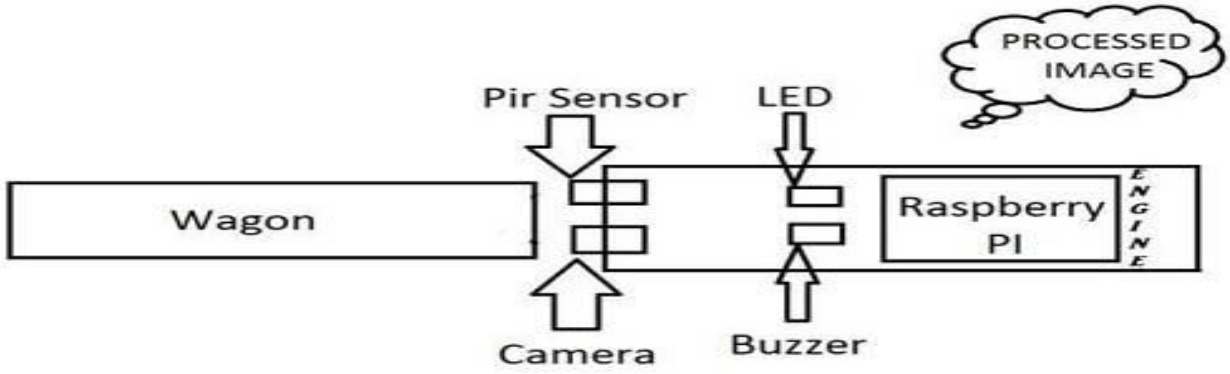
There are many cases reported for coalmines thief near the rural areas when the train halts for sometime.This has affecte dalotin the Indian railways economy.The objective of this project is to create a Security System for the goods that are carried in open top freight trains. The most efficient way to secure anything from thieves is to have a continuous observation. So for continuous observation of the open top freight train, Camera module2 has been used. Passive Infrared Sensor (PIR) 1 has been used to detect the motion or to sense movement of people, animals, or any object. So whenever a motion is detected by the PIR sensor, the Camera takes a picture of that particular instance.



(F-5.2C-Railway security system using IOT)

Relatedworks

Design and development of an integrated and heterogeneous network was proposed by SandroChiocchio et al [1] and which concentrates on board communication through an 868 MHz WirelessSensor Network component, data communications across a mobile network through M2M (Machine-to-Machine) communication, data collection on the Cloud for processing and detection of anomalies.



(F-5.2D-block diagram of security system)

5.2.3 Management through Energy harvesting concept:

Energy harvesting is commonly defined as the conversion of ambient energy into electrical energy1. This definition is too narrow. We define energy harvesting as "the collection and storage of ambient energy for on-demand, off-grid use".

The first definition considers only the transducer technology for energy conversion, and assumes that the energy must be converted to electricity. Our definition takes a broader, application centric view, where the transducer is one component of a complete system that provides power for those niche applications where other sources of energy are unavailable orunsuitable.

Ambient energy

Energy is all around us, in many different forms – thermal, chemical, electrical, mechanical and more. To make use of energy harvesting one or more of these energy fields must be present in the environment of interest, and there must be a suitable transducer to convert the energy.

Off-grid energy

Energy harvesting is used where another supply of energy is not available. Harvesters cost money, so it only makes sense to use them when it is too expensive or physically impossible to use other energy sources such as grid electricity or batteries.

On-demand energy

An energy harvester has to supply power when it is needed, not simply when it is available, and some form of energy storage is generally required to match the demand

Green energy

A myth that keeps cropping up is that energy harvesting is a small scale demonstration of how we can collect freely available energy in the environment, and that in the future these same technologies will be scaled up and used to power our homes and businesses. This is false. With the exception of photovoltaic cells for collecting sunlight, the technologies are completely different.

Collecting wasted energy

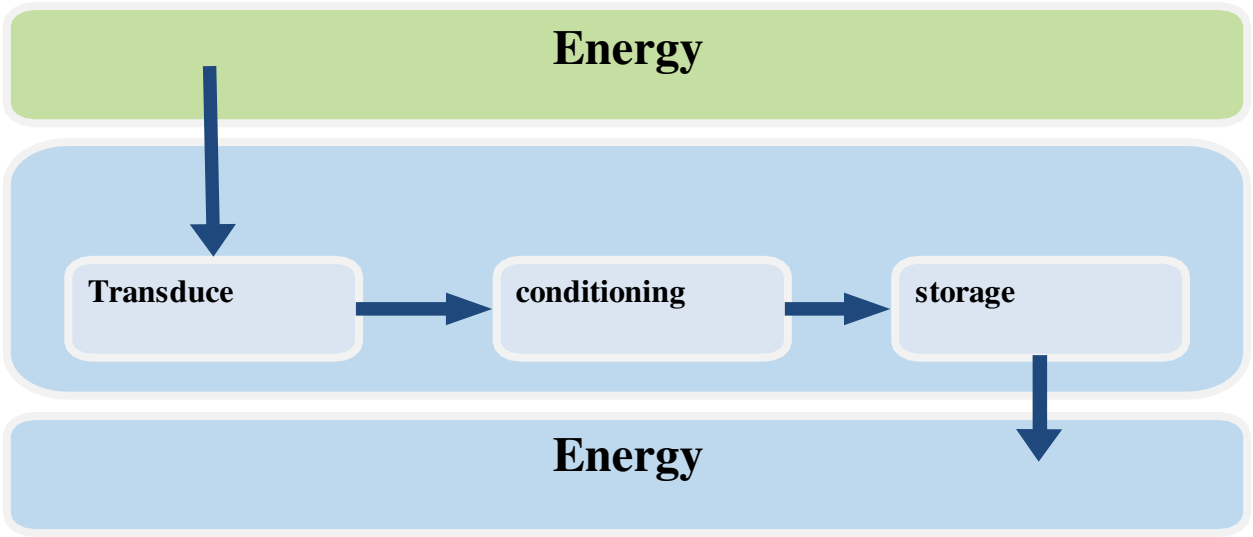
It's easy to do calculations showing how much energy is 'wasted' by the footsteps of a thousand people, but there's no business sense in powering ticket machines from the footsteps of commuters at underground stations. The harvesters will be expensive, and the amount of energy that can be collected is trivial in comparison to the energy used in lighting, heating, and ventilation. If cost savings are the goal, then optimising the operation of the existing building infrastructure and replacing old plant will pay back much sooner.

Vibration energy

harvesters that exploit energy from walking can provide enough power for charging, but only while walking, and are not small enough to be integrated within the phone.

Extending device operating time

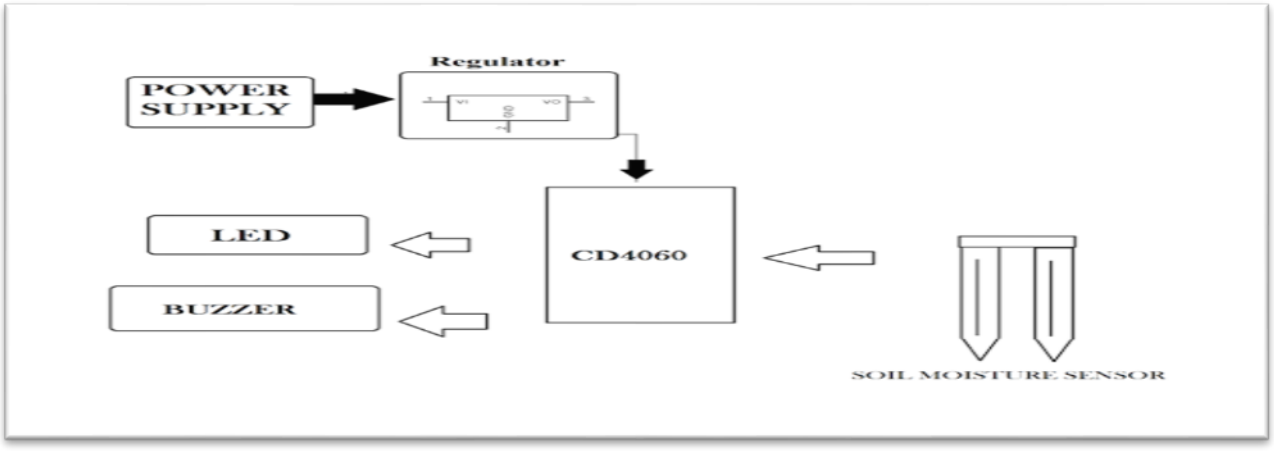
Our batteries don't last long enough. How about using energy harvesting to keep them topped up when the power runs out? In our experience this rarely works out. For an application where you can harvest energy faster than you use it, you don't need the battery in the first place and can rely entirely on energy harvesting. For an application where you use energy faster than you can harvest it, adding a harvester will only increase the lifetime of your device by a small fraction, e.g. 10% rather than the factor of two or more that you're looking for.



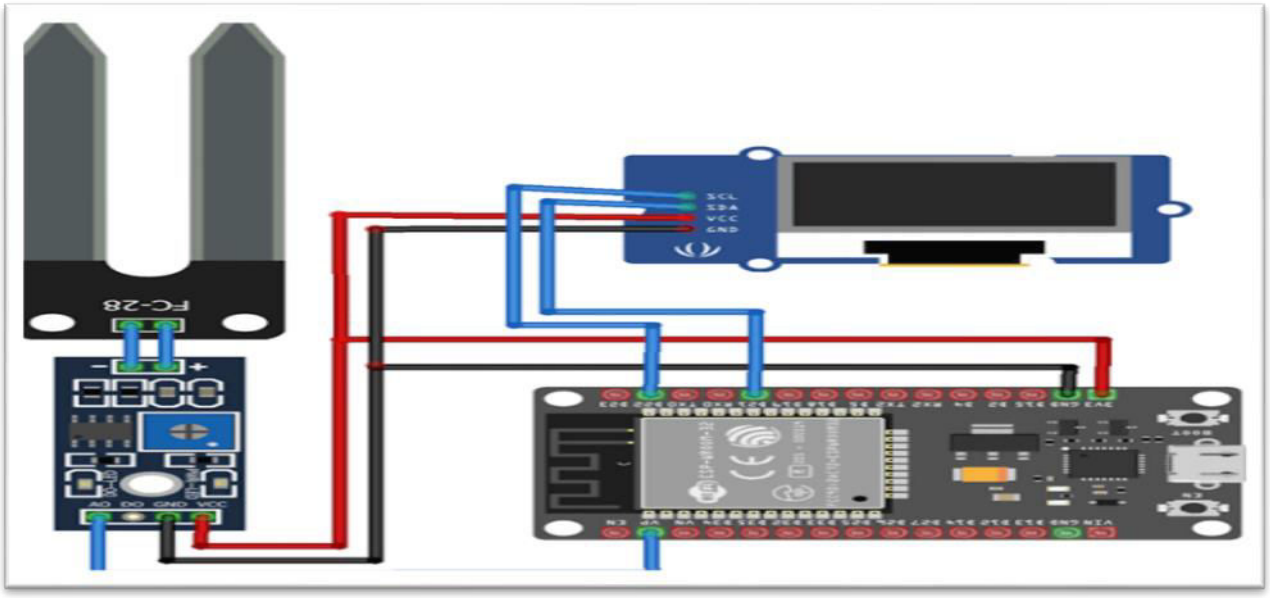
(F-5.2E-Block diagram of Energy harvesting)

5.2.4 Plant Moisture Monitoring System

Planting a tree in an environment where the seed or the plant would not get water adequately through natural sources like rain or ground water in its initial phases has been always a matter of concern for tree planters. This is where an autonomous moisture monitor for plants system can help.The system timely monitors the moisture level of the soil. If at the time of monitoring it comes to know that the moisture level of the soil is lower than recommended then it will raise an audio visual alert.



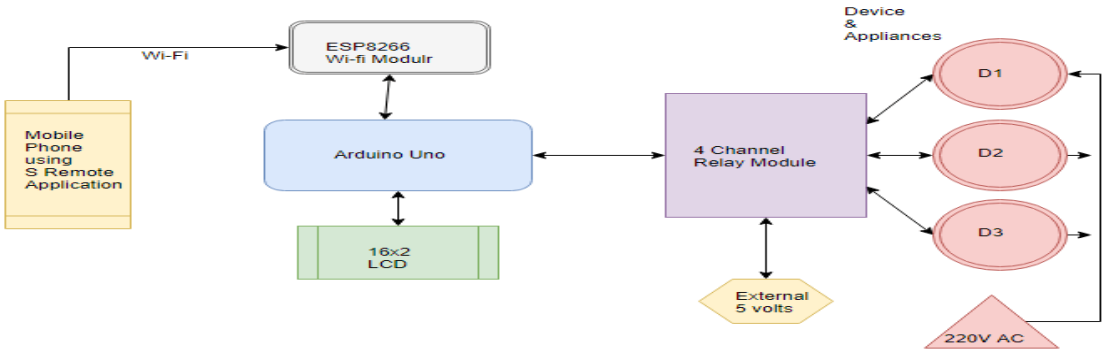
(F-5.2F-Block diagram of plant moisture monitoring system)



(F-5.2G circuit of plant moisture monitoring system)

5.2.5 Home Automation System using IOT :

To develop a home automation system, the developer has to look at the necessary components and software involved from the lock to the users smartphone.the structure of the planned product where everything is controlled wirelessly. The product aims at being able to work with many house appliances such as door lock and lights for example, though the lights are a secondary objectiveThe first component would be the door lock itself.

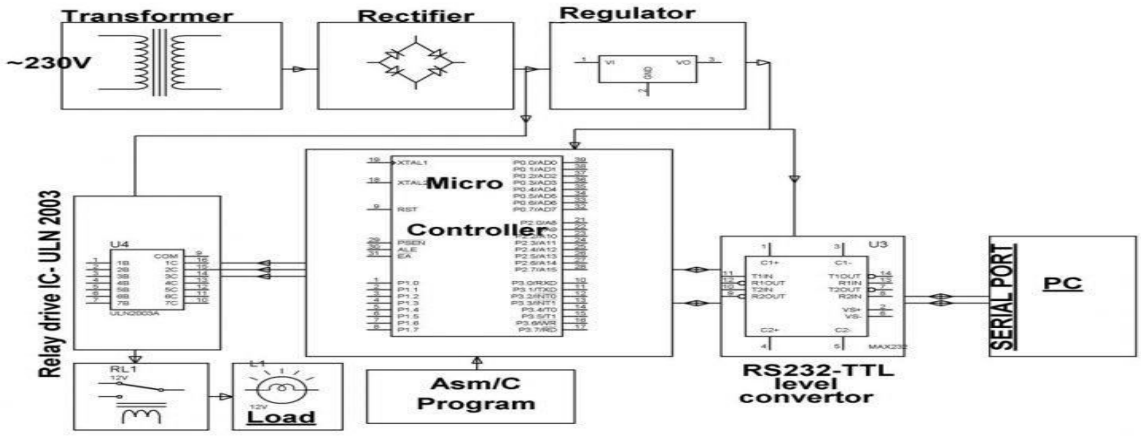


(F-5.2H- home automation system)

5.2.6 Pc based electrical load control:

Automation system is mostly depending upon the power systems in industrial, residential or commercial, which needs remote controlling and monitoring. By employing wireless technologies, it is more competent to execute a suitable technology depending upon the requirements of the proposed system like speed, cost, and distance.For distant controlling and

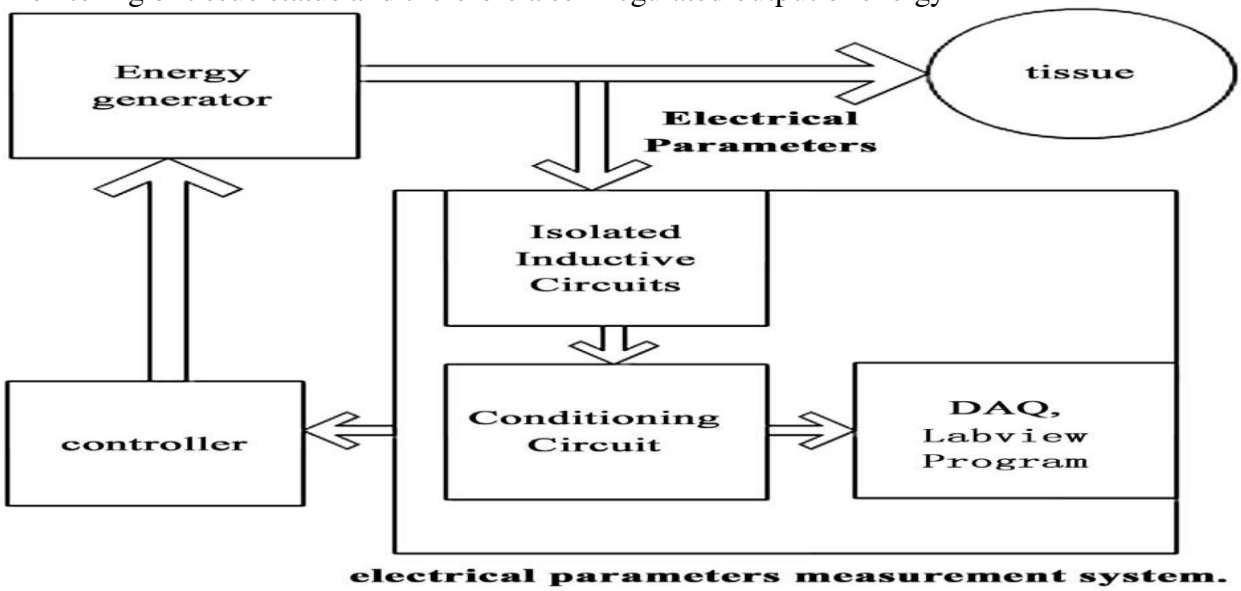
monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based graphical user interface application. The progress of technology equipments is becoming simpler and easier for us. Automated systems have more benefits over manual system. PC based electrical load controlled systems are highly reliable, precise and time conserving systems.



(F-5.2I-PC base electrical load control system)

5.2 7 Electrical parameter measurement:

Energy are generally subject to the subjective judgment of doctors according to their own experience, it also brings along some side effects, such as causing thermal damage for an over releasing of energy or the failure of sealing due to the inadequacy of energy. To reduce this kind of unwanted effects caused by human factors, the development of the instrument from a single combination of cutting and sealing to intellectualization is just in flight, promising a real-time monitoring of tissue status and therefore a self-regulated output of energy



(F-5.2J-electrical parameter measurement system)

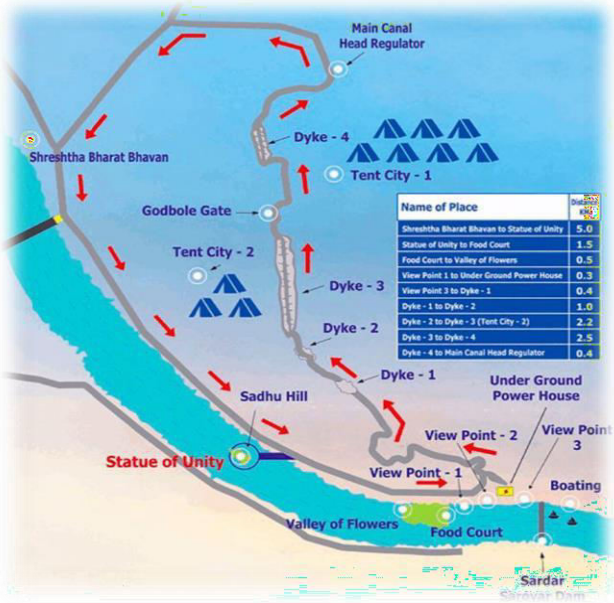
5.3 Technical Case Study On "The Statue Of Unity" :

We have selected an already constructed structure site named The Statue Of Unity as a technical case study. It is located on the Narmada River in the Kevadiya colony, facing the Sardar Sarovar Dam 100 kilometers (62 mi) southeast of the city of Vadodara and 150 kilo meters (93 mi) from Surat.

The SOU is a colossal statue of Indian statesman and independence activist Vallabhbhai Patel (1875– 1950), who was the first Deputy Prime Minister and Home minister of independent India and adherent of Mahatma Gandhi during the non-violent Indian Independence movement. Patel was highly respected for his leadership in uniting 562 princely states of India with a major part of the former British Raj to form the single Union of India. The statue is located in the state of Gujarat, India.

The Statue of Unity is the world's tallest statue with a height of 182 meters (597 feet). It is located on the Narmada River in the Kevadiya colony, facing the Sardar Sarovar Dam 100 kilometers (62 mi) southeast of the city of Vadodara and 150 kilometers (93 mi) from Surat. The project was first announced in 2010 and the construction of the statue started in October 2013 by Larsen & Toubro, with a total construction cost of ₹2,989 crore (₹29.89 billion; US$437 million) It was designed by Indian sculptor Ram V. Sutar, and was inaugurated by Indian Prime Minister Narendra Modi on 31 October 2018, the 143rd anniversary of Sardar Patel's birth.

Location :



History

Narendra Modi first announced the project to commemorate Vallabhbhai Patel on 7 October 2013 at a press conference to mark the beginning of his 10th year as The Chief Minister of Gujarat. At the time, the project was dubbed, "Gujarat's tribute to the nation". A separate Society named Sardar Vallabhbhai Patel Rashtriya Ekta Trust (SVPRET) was formed under the chairmanship of the Chief minister, Government of Gujarat, to execute the project. An outreach drive named the Statue of Unity Movement was started to support the construction of the statue. It helped collect the iron needed for the statue by asking farmers to donate their used farming instruments. By 2016, a total of 135 metric tonnes of scrap iron had been collected and about 109 tonnes of it was used to make the foundation of the statue after processing. A marathon titled Run For Unity was held on 15 December 2013 in Surat and Vadodara in support of the project.

Design

The statue depicts Vallabhbhai Patel, one of the most prominent leaders of the Indianindependence movement, the first home minister as well as the first Deputy Prime Minister of independent India, and responsible for the integration of hundreds of princely states into the modern Republic of India. The Statue of Unity is an enlarged version of this statue in the Ahmedabad International Airport. After studying statues of Patel across the country, a team of historians, artists, and academics chose a design submitted by the Indian sculptor Ram V. Sutar. The Statue of Unity is a much larger replica of a statue of the leader installed at Ahmedabad International Airport. Commenting on the design, Ram Sutar's son, Anil Sutar explains that, "the expression, posture and pose justify the dignity, confidence, iron will as well as kindness that his personality exudes. The head is up, a shawl flung from shoulders and hands are on the side as if he is set to walk". Three models of the design measuring 3 feet (0.91 m), 18 feet (5.5 m), and 30 feet (9.1 m) were initially created. Once the design of the largest model was approved, a detailed 3D-scan was produced which formed the basis for the bronze cladding cast in a foundry in China.

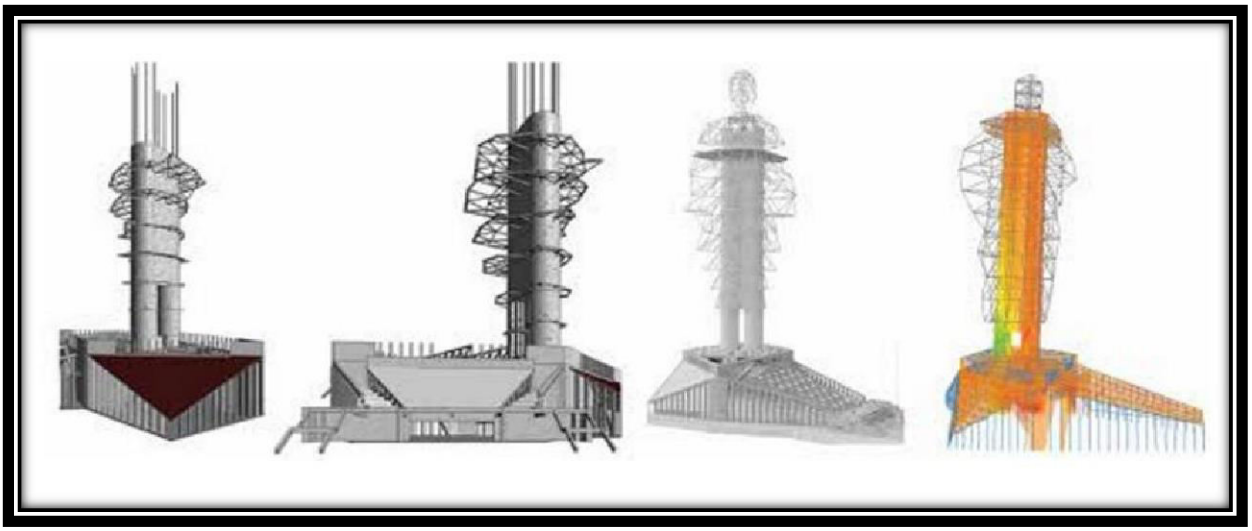
Funding:

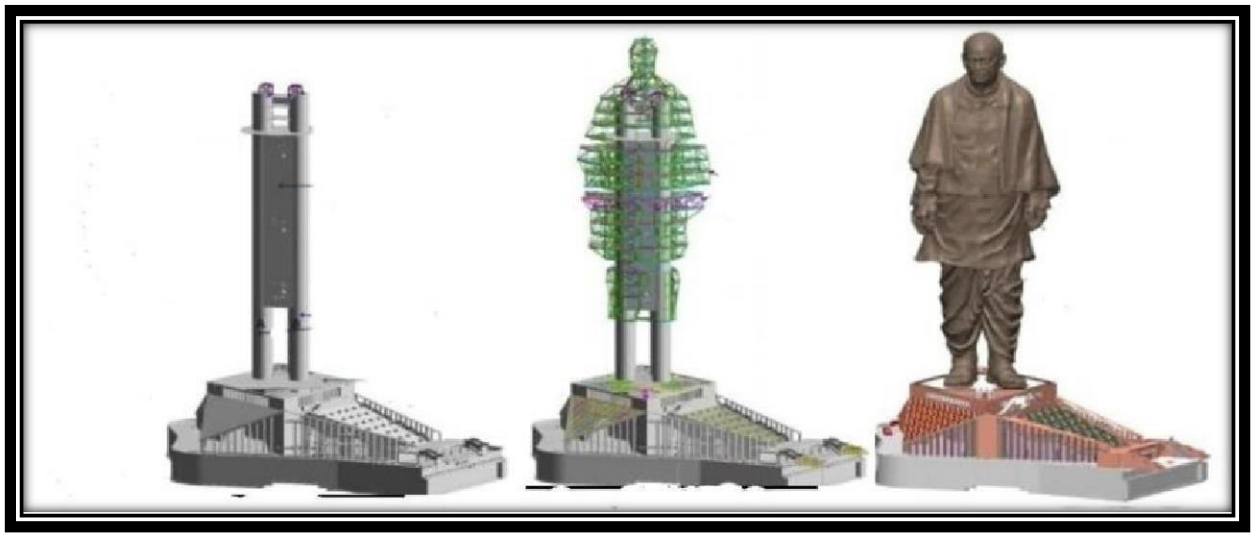
The Statue of Unity was built by a Public Private Partnership model, with most of the money raised by the Government of Gujarat. The Gujarat state government had allotted ₹500 crore (equivalentto ₹607 crore or US$85 million in 2019) for the project in its budget from 2012 to 2015. In the 2014–15 Union Budget, ₹200 crore (equivalent to ₹257 crore or US$36 million in 2019) was allocated for the construction of the statue. Funds were also contributed by Public Sector Undertakings underthe Corporate Social Responsibility scheme.

Contruction:

Statue of Unity

Height Standing at 597 feet or 182 meters above ground level, the Statue of Unity is twice the size of the Statue of Liberty in the United States, and 40% taller than China’s Spring Temple Buddha. The statue also hosts a viewing gallery at a height of 193 meters from sea level, which can accommodate 200 visitors at a time, offering a spectacular view of the Sardar Sarovar Dam, its reservoir, and the Satpura and Vindhya mountain ranges.



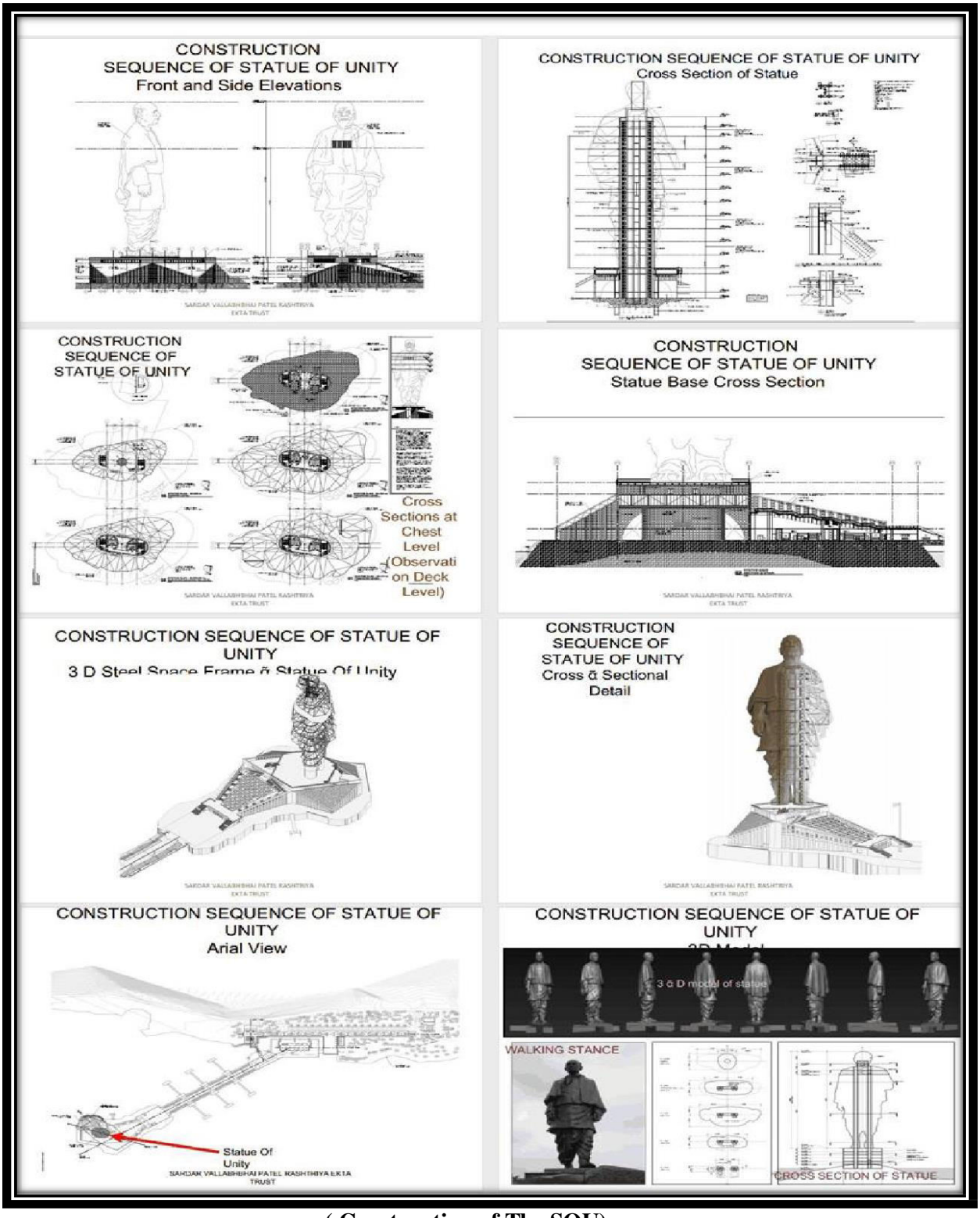


Statue of Unity Cost

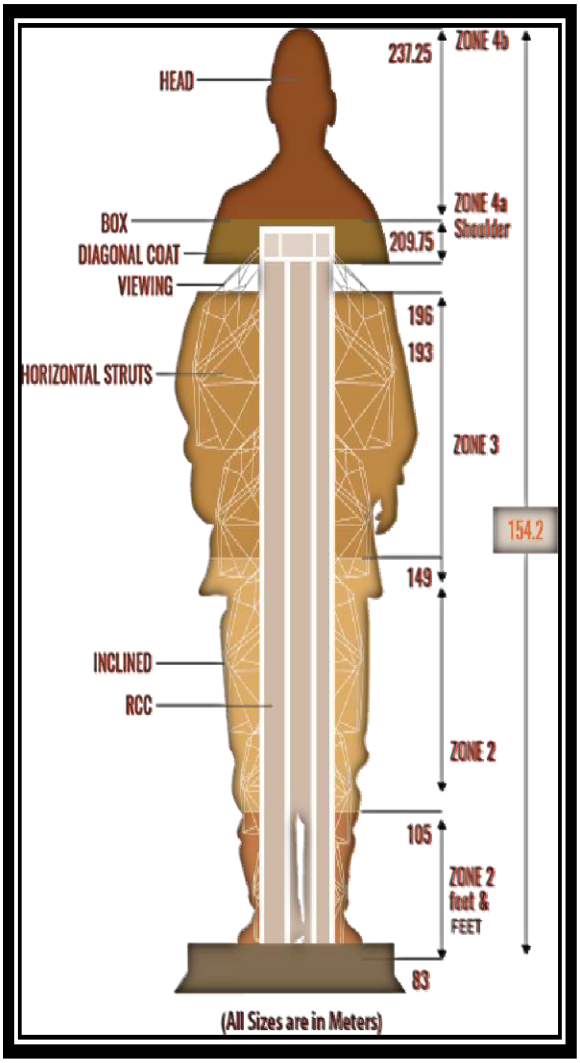
Costing nearly ₹3,000 crores / USD $40-45 Million / Euro €35-40 Million – work on the 182-meter tall Statue of Unity began in 2013 and completed in 2018.

Statue of Unity Construction

Built by over 250 engineers and 3,400 workers using 70,000 tonnes of cement, 18,500 tonnes of reinforcement steel bars, 6,000 tonnes of structural steel, and 1,700 metric tonnes of bronze – the Statue of Unity in Gujarat stands twice as tall as the Statue of Liberty in the United States.Larsen and Toubro and state-run Sardar Sarovar Narmada Nigam Ltd built the statue, with intricate bronze cladding work done by a Chinese foundry, the Jiangxi Toqine Company.The height of the statue was fixed as '182' meters to match the total democratic assembly constituencies in the state of Gujarat.The base of the statue is constructed with over 129 tonnes of scrap iron, donated by nearly 100 million farmers from across India. The statue is built to withstand wind velocity up to 60 meters per second and earthquakes measuring below 6.5 on the Richter scale.



(Construction of The SOU)



Coordinates	21.8380°N 73.7191°ECoordinates: 21.8380°N 73.7191°E
Location	Narmada Valley Kevadiya colony, Narmada district, Gujarat, India
Designer	Ram V. Sutar
Type	Statue
Material	Steel framing, reinforced by concrete and brass coating, bronze cladding[1]
Height	182 meters (597 ft)
Visitors	2.8 million[2] (in 2018-19)
Beginning date	31 October 2013
Completion date	30 October 2018
Opening date	31 October 2018
Dedicated to	Vallabhbhai Patel
Website	statueofunity.in

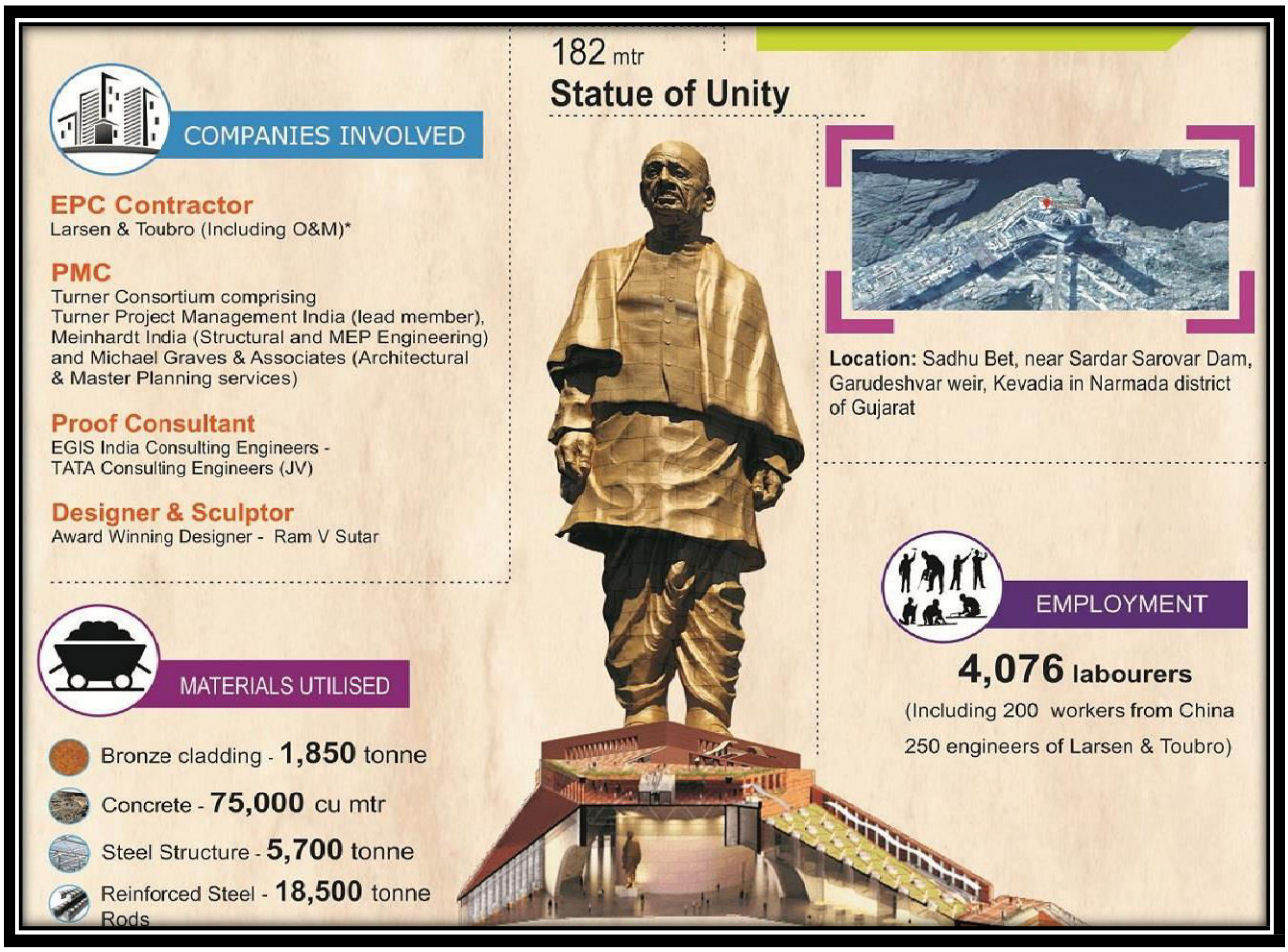
(The SOU Archite.)L&T employed over 3000 workers and 250 engineers in the statue's construction. The core ofthe statue used 210,000 cubic meters (7,400,000 cu ft) of cement and concrete, 6,500 tonnes of structural steel, and 18,500 tonnes of reinforced steel. The outer façade is made up of 1,700 tonnes,of bronze plates and 1,850 tonnes of bronze cladding which in turn consists of 565 macro and 6000 micro panels. The bronze panels were cast in Jiangxi Tongqing Metal Handicrafts Co. Ltd (the TQ Art foundry) in China as facilities large enough for such casting were unavailable in India. The bronze panels were transported over sea and then by road to a workshop near the construction site where they were assembled Local tribal belonging to the Tadvi tribe opposed the land acquisition for the development of tourism infrastructure around the statue. They have been offered cash and land compensation, and have been provided jobs. People of Kevadia, Kothi, Waghodia, Limbdi, Navagam, and Gora villages opposed the construction of the statue and demanded the restitution of the land rights over 375 hectares (927 acres) of land acquired earlier for the dam as well as for the formation of a new Garudeshwar subdistrict..

Construction of the monument was completed in mid-October 2018; and the inaugural ceremony was held on 31 October 2018 (143rd birth anniversary of Vallabhbhai Patel), and was presided over by Prime Minister Narendra Modi. The statue has been described as a tribute to Indian engineering skills.

(-Surveys and other treatments in site)

Prime Minister Narendra Modi in the museum within the complex. The Statue of Unity is the world's tallest statue at 182 meters (597 ft). It rises 54 meters (177 ft) higher than the previous record holder, the Spring Temple Buddha in China's Henan province. The previous tallest statue in India was the 41 m (135 ft) tall statue of Lord Hanuman at the Paritala Anjaneya Temple near Vijayawada in the state of Andhra Pradesh. The statue can be seen within a 7 km (4.3 mi) radius. The monument is constructed on a river island named Sadhu Bet, 3.2 km (2.0 mi) away from and facing the Narmada Dam downstream. The statue and its surroundings occupy more than 2 hectares (4.9 acres), and are surrounded by a 12 km (7.5 mi) long artificial lake formed by the Garudeshwar weir downstream on the Narmada river

The statue is divided into five zones of which only three are accessible to the public. From its base to the level of Patel's shins is the first zone which has three levels and includes the exhibition area, mezzanine and roof. The first zone also contains a memorial garden and a museum. The second zone reaches up to Patel's thighs, while the third extends up to the viewing gallery at a height of 153 meters. The fourth zone is the maintenance area while the final zone comprises the head and shoulders of the statue. The museum in the first zone catalogues the life of Sardar Patel and his contributions.

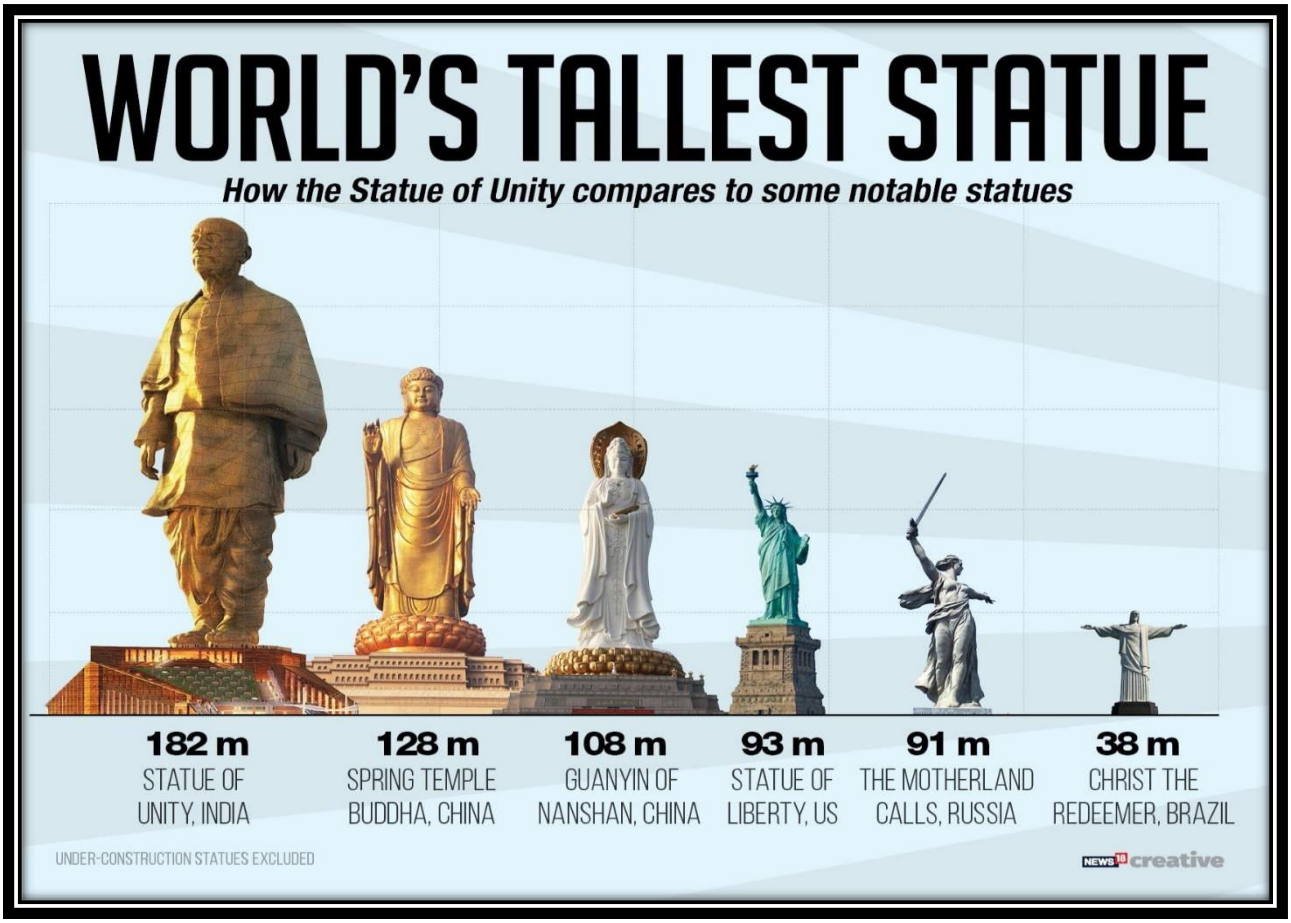


Issues faced during the construction:

Local tribal belonging to the Tadvi caste against land acquisition for the construction oftourism infrastructure nearby the statue. Although, they have been offered cash, land compensation, and provided jobs.People of nearby villages such as Kevadia, Kothi, Waghodia, Limbdi, Navagam, and Gora against the construction of the statue and claimed the refund of the land rights over375 hectares (927 acres) of land obtained earlier for the construction of the dam as well as the constitution of new Garudeshwar subdistrict.They also disagree with the development of the Kevadia Area Development Authority (KADA) and the construction of the Garudeshwar weir-cum-causeway project. At last, the government of Gujarat has to accept their demands.

Proposed and Planned Infra:

As of now, there are several projects on the card to assure that this place turns out to be a popular tourist point.A world-class zoo will be developed across 1,300 acres over seven levels by the name Sardar Patel Zoological Park near the statue.



(SOU Height Comparison)

Over 128,000 tourists visited the statue in the 11 days after its opening to the public on 1 November 2018. The daily average tourist footfall at Statue of Unity during November 2019 reached 15,036, outpacing the Statue of Liberty (which attracts around 10,000 daily visitors on average). It has been included in the Shanghai Cooperation Organization's '8 Wonders of SCO' list.

##Information and details in brief in below videos##

"How L&T built the Statue of Unity" : https://youtu.be/oqtBtXs0mPw

"Statue of Unity: What will happen to 182 meters tall Sardar Patel when earthquake comes? (BBC Hindi)" : https://youtu.be/zgMwfCGDBOQ

Modern Marvel: Statue of Unity Hindi Episode : https://youtu.be/5noLkp0KzCI

More references :

#I. https://statueofunity.in/

#II. http://www.larsentoubro.com/corporate/products-and-services/sardar-patel/the-statue-of-unity/

Chapter 6. Swachh Bharat Abhiyan (Clean India) :

Swachh Bharat Mission (SBM), Swachh Bharat Abhiyan (SBA), or Clean India Mission

It is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management (SWM). Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.Initiated by the Government of India, the mission aimed to achieve an "open-defecation free" (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi. The objectives of the first phase of the mission also included eradication of nmaual scavenging, generating awareness and bringing about a behavior change regarding sanitation practices, and augmentation of capacity at the local level. The second phase of the mission aims to sustain the open defecation free status and improve the management of solid and liquid waste. The mission is aimed at progressing towards target6.2 of the Sustainable Development Goals Number 6 established by the United Nations in 2015.The campaign's official name is in Hindi. In English, it translates to "Clean India Mission". The campaign was officially launched on 2 October 2014 at Rajghat, New Delhi by Prime Minister Narendra Modi.

6.1 Swachhta needed Subir village -Existing Situation :

We have done one survey on existing condition of village regarding swachhta. The people are maintaining cleanliness of the village but in some streets there is no swachhata because there are animal and their waste , mud, etc. The village pond has to need a proper maintenance. Other than these there are clean streets, main road and approach road

.

6.2 Guidelines - Implementation in Subir village :

According to Talati, Sarpansh and villagers, the people are cleaning their nearby area regularly and collect that waste and dispose it to out of the village and burn it. No daily basis waste collection is there in the Subir village

6.3 Activities Done by Students for Subir village

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

(F-6.3A- Clean india)

Chapter 7. Village condition due to Covid-19 :

With respect to COVID 19 pandemic, Ministry of Panchayati Raj, Government of India in close collaboration with State Governments has taken various initiatives. Close consultation and guidance of the State as well as District authorities is being maintained to ensure that lock down conditions are not violated and norms of social distancing are scrupulously followed to contain the spread of the disease. India has overtaken Brazil and become the second-worst affected country in the world by the coronavirus pandemic, with more than 4 million cases. COVID-19 had mostly remained in India's cities, but the disease is now spreading to rural India – an area with over 850 million people and far worse healthcare. The reason for this shift appears to be migrant workers who have been returning to their villages since lockdown was eased at the end of June. The medical response to stop the spread and treat those infected has been inadequate, according to media reports. With one trained doctor for every 1,497 people, against the World Health Organization recommended one per 1,000, and public health expenditure for 2018 at just 1.3% of GDP, India faces an uphill struggle in dealing with the pandemic. While two-thirds of India's population lives in rural areas, there are almost four times as many health workers per person in cities. Most rural communities rely on untrained health workers. Over two-thirds of these rural health providers have no formal medical training, but remain the only option of medical support for most of the rural population.

7.1 Taken steps in Subir village related to existing situation :

During interaction with the Talati, he told us that quarantine place and home quarantine facility were implemented during the lockdown. According to Talati, Sarpanch and villagers ; in the Subir village the sanitization process was done during the lockdown period when first case of covid 19 came in the village.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.Most rural communities rely on untrained health workers. Over two-thirds of these rural health providers have no formal medical training, but remain the only option of medical support for most of the rural population.This situation is worsened by the stigma and misinformation that surrounds COVID-19 in India. Fear of the virus has led to widespread mistrust of trained healthcare professionals. Indian doctors have reported being evicted from rented accommodation and others have been violently targeted in some slum communities. The misconception is that health professionals are sources of infection and that they will force people to be removed from their families into quarantine centres.

7.2 Activities Done by Students for Subir village :

We have taken a permission from Talati and Sarpanch for doing one awareness regarding covid 19 in the subir village and then we did awareness camp regarding covid 19. In that awareness camp we have distributed some face masks to the villagers for the protection against covid 19 and aware them about covid 19 situation in India and told them to take precautionary measures like wear a mask perfectly, wash hands regularly, maintain social distancing in public and avoid crowdy area & firstly make yourself home quarantined if you fill any COVID-19 symptom in your body

(F-7.2A- Activity done by students for subir village)

7.3 Any other steps taken by the students / villagers :

During interaction with the Talati, he told us that quarantine place and home quarantine facility were implemented during the lockdown. In the COVID-19 situation cleaning, fogging and sanitization were done in the village. The reason for this shift appears to be migrant workers who have been returning to their villages since lockdown was eased at the end of June. The medical response to stop the spread and treat those infected has been inadequate, according to media reports. With one trained doctor for every 1,497 people, against the World Health Organization recommended one per 1,000, and public health expenditure for 2018 at just 1.3% of GDP, India faces an uphill struggle in dealing with the pandemic.

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

8.1 Design Proposals : Observation and brief write up about each design from 8.1.1 to 8.1.9

Sustainable Design : ATM

Here we have designed the ATM for our Subir village. The population of Subir village is 3188 as per 2011 census. So it is required to have one ATM in the village. The villagers have to go in Ahwa village for cash requirement so that we have decided and finalized the design of ATM.

Physical design : Pharmacy Store

In the Subir village there is no any PHC or dispensary or private clinic or pharmacy store. So according to the feedback given by the villagers, one dispensary or pharmacy store should be there in the village. The villagers have to go in Unai for any kind of health or medical facility. So that we have designed one Pharmacy store for the urgent requirement of medicines for the villagers.

Social Design : Community Hall

Community hall is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole community or for a specialized group example Mahila mandal hall. A community hall of village generally consists of a hall , storage or kitchen area and washroom.

Socio-Cultural Design : Supermarket

Supermarket is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores.

Heritage Village Design : Entrance Gate

The Subir village has no main entrance gate at the village approach road. So that we have designed the village entrance gate as heritage village design

8.1.1 Sustainable Design (Civil) : ATM

Scenario :

The residents of far-flung or rural areas are unable to pay visit to branches located at distant places on account of resource constraints viz., time, cost and opportunity. Thus, it has become imperative for banks to reach out customers through a variety of technology driven delivery channels such as Micro ATMs, Bio-metric ATMs, Mobile ATMs, and Smart Cards etc., which are most cost effective compared to Brick and Mortar model. ATM has brought sea change in Indian Banking space with significant qualitative improvement in delivery of banking services and within short span the presence of ATMs are outnumbered the physical branch network. The higher growth percentage of white-label ATM (WLA) operators is an indication of rural growth but its not limited to that. Banks have also been expanding in rural regions. However, the ATM industry numbers (3% growth) do not reflect that as the expansion was offset by the 10-PSU-bank merger plan, which led to closure of ATMs in urban areas.

Existing Situation in SUBIR :

Here we have designed the ATM for our SUBIR village. The population of SUBIR village is 3188 as per 2011 census. So it is required to have one ATM in the village. The villagers have to go in ahwa village for cash requirement so that we have decided and finalized the design of ATM.

Sustainability of the design :
ATM as an important tool :
Design Utilized by

Illiterate/ Semi-literate users ; Under served ; Unbanked ; People living in remote area; etc.

Needs :
Basic banking facilities ; Security ; Ease of use ; A suitable and simple product ; etc.
Design brief :
Atm design to assist illiterate, semi-literate with banking; Providing services through familiar devices; Net reduction in transaction processes; Aim to help in financial inclusion policies; etc.
ATM Design :
Sustainable Design : ATM
Location of ATM
ATMs must be located where potential consumers live, work, or shop. Since ATMs are many people's only point of contact with their Financial Institution, machines should also be located in safe, secure and typically well-light or highly-trafficked locations.In addition to traffic, be sure to account for power supply, connectivity, and parking.Once an ATM is placed, continue to monitor its performance over time. As establishments in the area change, foot and/or traffic patterns may change also. In the subir village ATM is constructed at middle of village near the road so that every one use easily very well.

ATM Design :

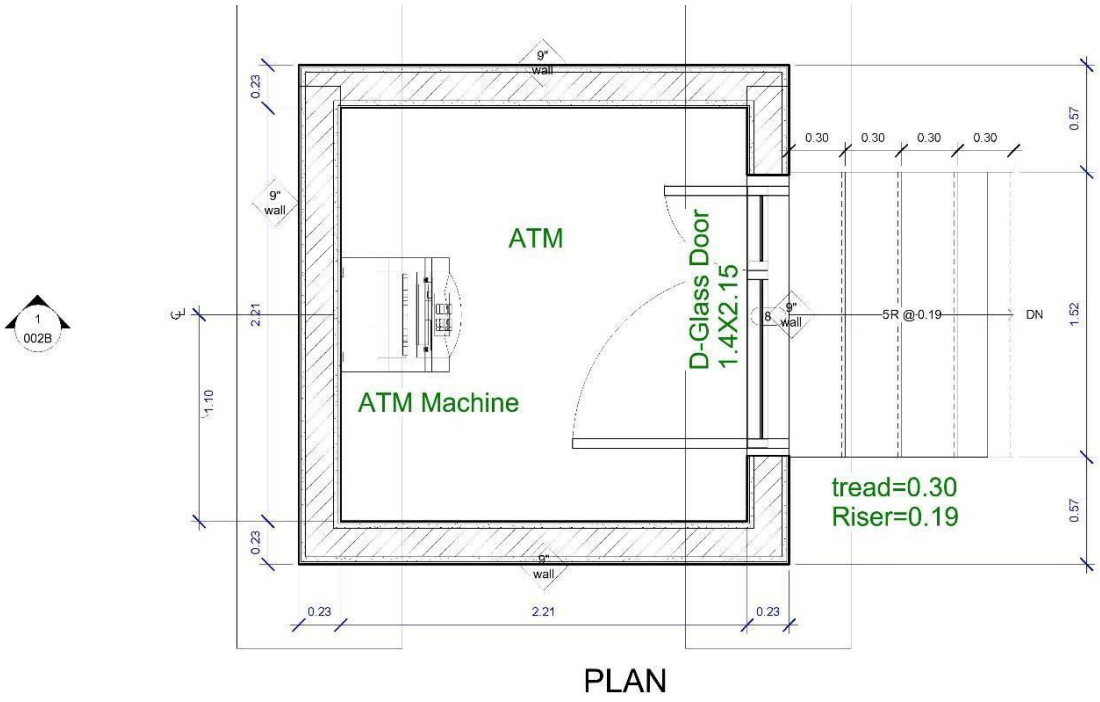
Length : 2.67m ; Width : 2.67m :

Height : 3.35mCarpet area : 4.88 m2

Common repair and maintenance of the structure :

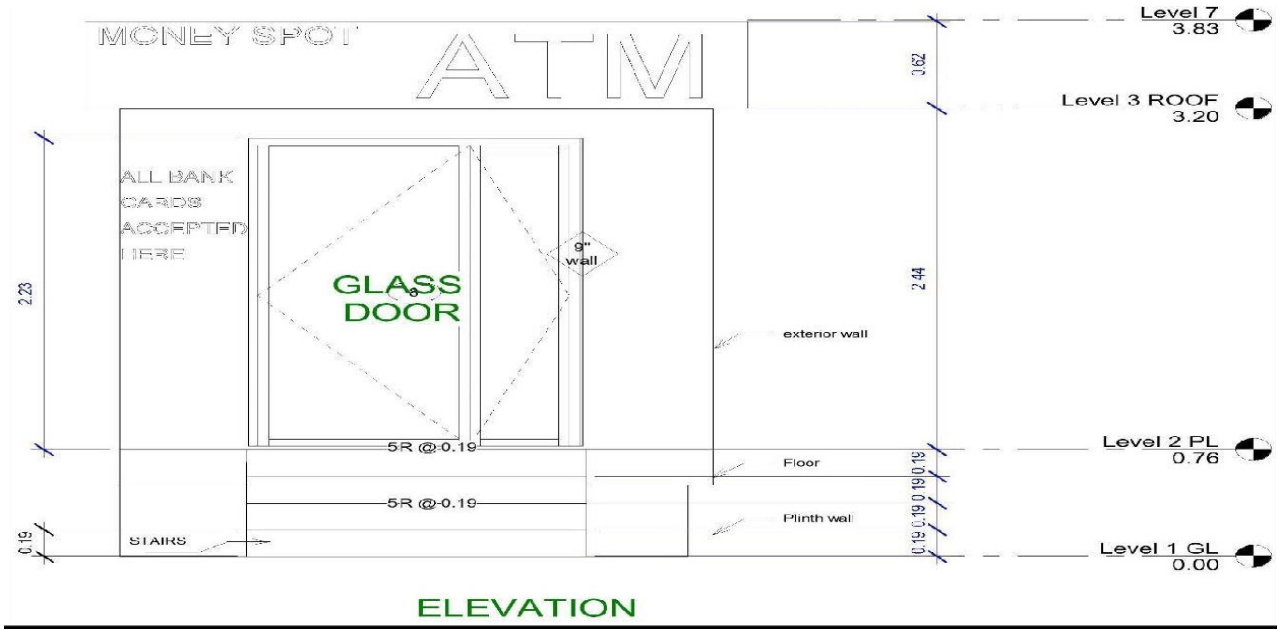
For maintenance to be most effective, it should be organized through a programme of cyclical maintenance. At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi- annual, annual, quinquennial and so on routines. Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs;etc

Proposed Design in Auto cad; Revit and Skechup :

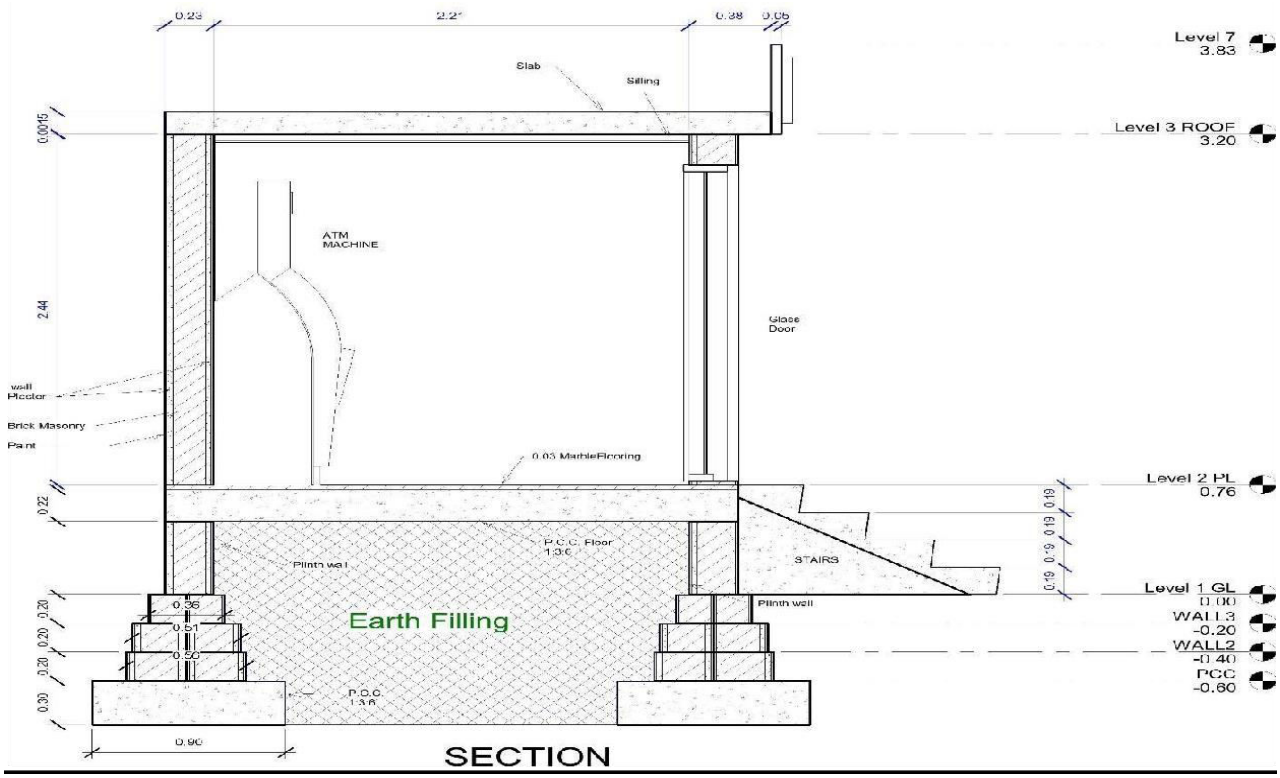


PLAN

(F-8.1.1 ATM plan)



(F-8.1.1B-ATM Elevation)



(F-8.1.1C-ATM Section)

(F-8.1.1D ATM 3D Model)

ATM : Measurement Sheet (T-8.1.1A- ATM measurement sheet)

SR.N O	Description	Length(m)	Width(m)	Height(m)	Count(Nos.)	TotalQuantity(m^3)
1	GLASSDOORWITHALUMINUMFRAME	1.397	0.02	2.2098	1	1
2	BASICROOF:GENERIC	2.667	2.667	0.152	1	1.15
3	FLOOR:10"	2.667	2.667	0.254	1	1.81
4	BASICWALL:9"EXTERIOR	2.4384	0.2286	3		4.68
5	BASICWALL:9"EXTERIOR	1.6002	0.2286	3	1	3.47
6	CAST-IN-PLACESTAIR:	0.1778	1.524	0.1778	4	0.75
7	PCC INFOOTING	10.22	0.90	0.4	1	2.80
8	BASICWALL:0.40	10.22	1.6	0.4	1	1.64
9	BASICWALL:00.30	10.22	1.2	0.4	1	1.22
10	BASICWALL:GENERIC –0.50	10.22	2	0.4	1	2.04
11	EXCAVATION	10.22	1.2	1.5	1	18.40

ATM : Abstract Sheet (T-8.1.1B- ATM abstract sheet)

SRNO.	Description	Quantity(m^3)	Rate	Per	Amount
1	BASICWALL:9" EXTERIOR1	220.48	130	FT^2	28662
2	BASICWALL:9" EXTERIOR2	25.84	90	FT^2	2325.6
3	GLASS DOORWITH ALUMINUMFRAME:	-	3000	-	3000
4	BASICROOF: GENERIC-12"	1.15	3500	M^3	4025
5	FLOOR:10"	1.81	4100	M^3	7421
6	CAST-IN-PLACESTAIR:	-	3000		3000
7	EXCAVATION	1.215*4	350	M^3	1701
8	PCC	9.32	3500	M^3	32620
9	BASICWALL:00.30	4.08	90	FT^2	13140
10	BASICWALL:0.40	5.44	90	FT^2	13140
11	BASIC WALL:GENERIC-0.50	6.78	90	FT^2	13140
				GRANDTOTAL	104752

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor'sprofit, contingencies, utilities and laborcharges.

Total cost =Rs.104752/-

8.1.2 Physical design (Civil) : Pharmacy store

Scenario :

A pharmacy is a shop where therapeutic drugs are sold. Sometimes a pharmacy is also called a drug store. A pharmacy is the place where most pharmacists practice the profession of pharmacy. Pharmacists play a major role in providing healthcare services by means of community pharmacy services in rural areas where physicians are not available or where physician services are too costly for meeting the healthcare necessities.

Sustainability of the design :

Loacation of pharmacy store

All the people living in the village of even outsiders from nearby villages can use or utilize a pharmacy store for their medical uses. The pharmacy store located at road side which is easly accesiable by any mode of transportation.

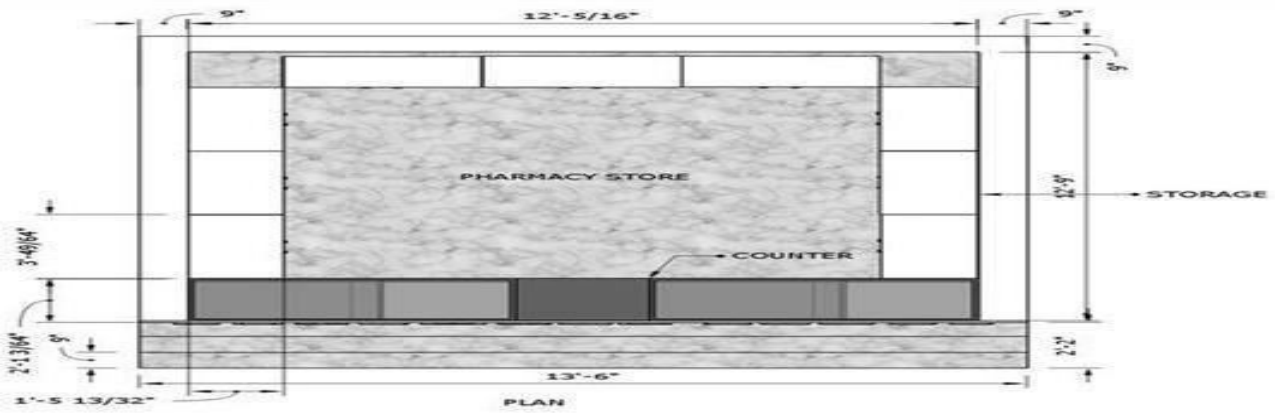
Pharmacy Store Design :

Length : 4.16m ; Width : 4.11m : Height : 3.96m
Carpet area : 14.162

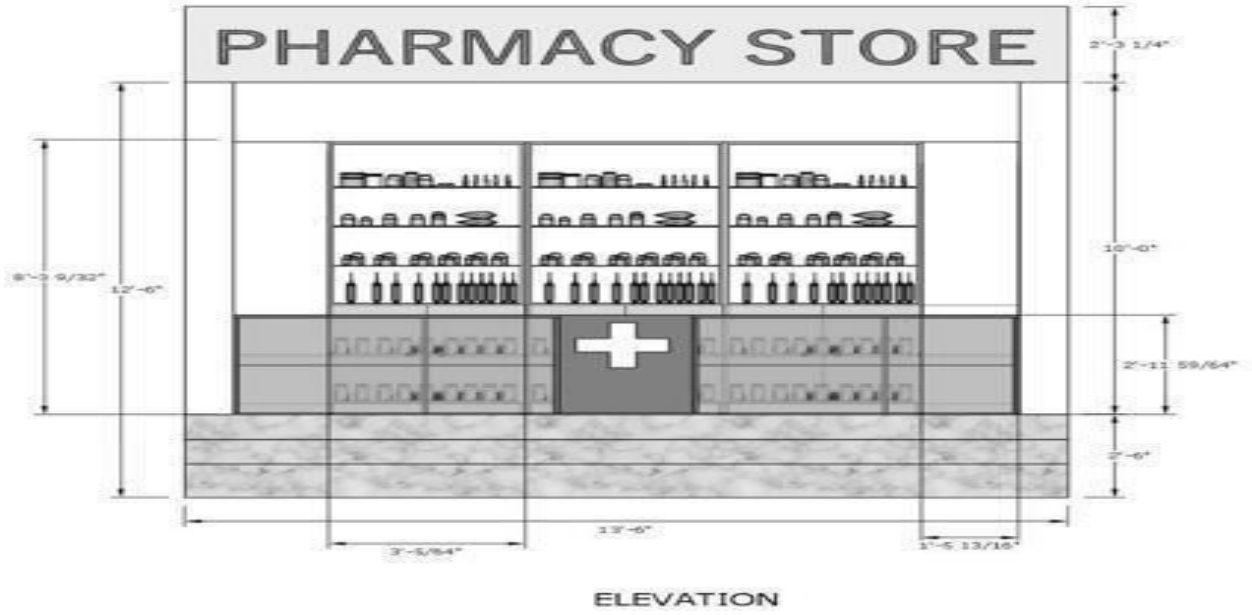
Common repair and maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc. For most effective maintenance , it should be organized through a programme of cyclical maintenance.

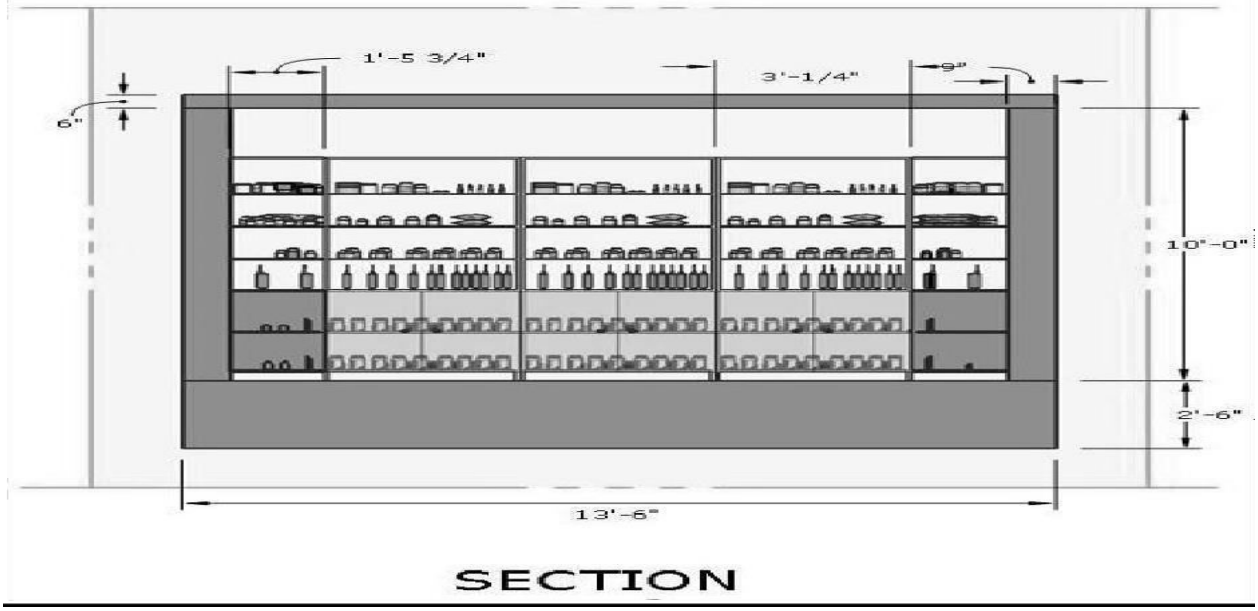
Proposed Design in Auto cad; Revit and Skechup:



(F-8.1.2A Pharmacy plan)



(F-8.1.2B Pharmacy store elevation)



(F-8.1.2C Pharmacy store section)

(F-8.1.2D -Pharmacy Store 3D model)

Pharmacy Store : Measurement Sheet (T-8.1.2A- PS measurement sheet)

SR.N O	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	TotalQuantity(m^3)
1	TOPROOF	4.1148	4.1148	0.1524	1	**2.580231**
2	WALL9"	4.1148	0.2286	3	4	**8.282**
3	PLINTHWALL WITHST AIRS	4.1148	0.2286	0.762	4	**3.575**
4	FLOOR	4.1148	4.1148	0.1524	1	**2.58**
5	PCC	4.1148	0.90	0.4	1	**5.02**
6	BASIC WALL:00.30	18.3	1.2	0.4	1	**2.2**
7	BASICWALL: 0.40	18.3	1.6	0.4	1	**2.94**
8	BASICWALLGENE RIC-0.50	18.3	2	0.4	1	**3.66**
9	EXCAVATIN	22	1.2	1.5	1	**3.6**

Pharmacy Store : Abstract Sheet (T-8.1.2B- PS abstract sheet)

SR NO.	Description	Quantity (m^3)	Rate	per	Amount
1	BASICWALL:9" EXTERIOR1	8.282678	130	Ft^2	**50700**
2	TOPROOF	2.580231	3500	m^3	**9030.81**
3	FLOOR	2.580231	3500	m^3	**9030.81**
4	PLINTH WALLWITHSTAIRS	3.575851	90	Ft^2	**8757**
5	EXCAVATION	1.215*4	350	m^3	**1701**
6	PCC	5.02	3500	m^3	**17570**
7	BASIC WALL:00.30	2.94	90	Ft^2	**7200**
8	BASIC WALL:0.40	2.2	90	Ft^2	**7200**
9	BASIC WALL:GENERIC-0.50	3.66	90	Ft^2	**7200**
				GRAND TOTAL	**118388**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges

Total cost =Rs.118388/-

8.1.3 Socio-Cultural design (Civil) : Supermarket

Supermarket is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores

Location of the super market

The super market located at the middle of the village near sabaridham which is tourism place.

Supermarket Design :

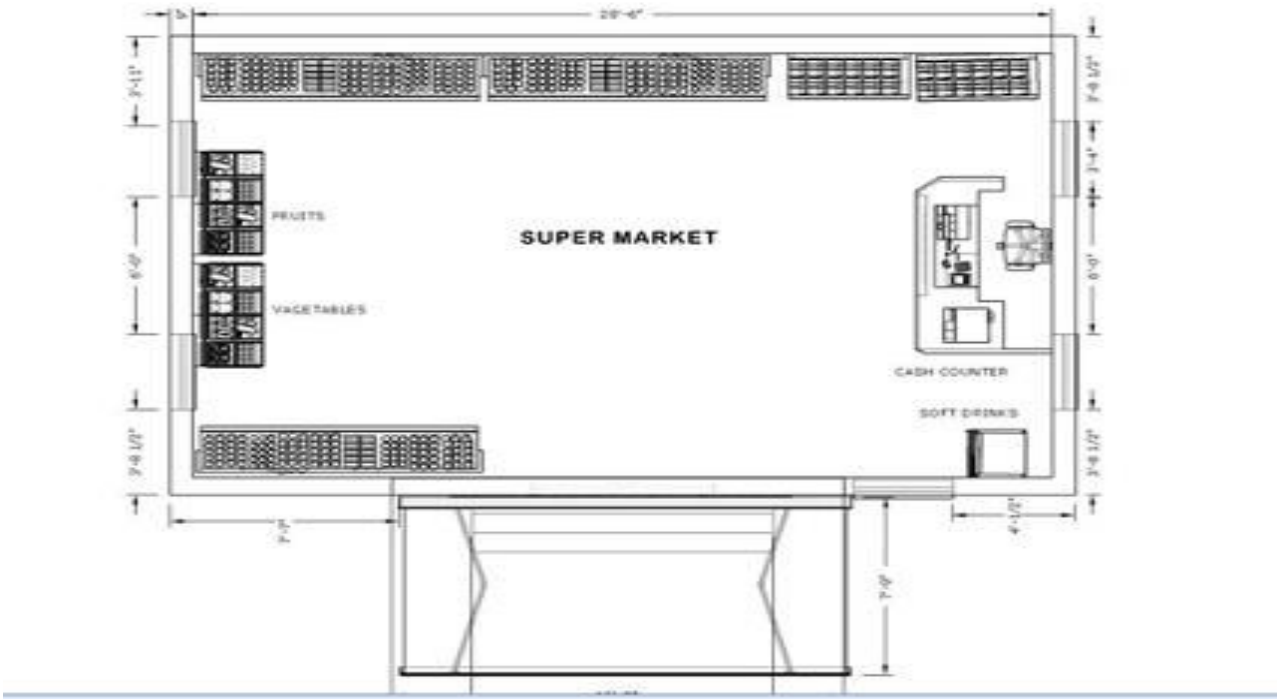
Length : 9.14m ; Width : 6.1m : Height: 4.36m

Carpet area : 51.29 m2

Common repair and maintenance of the structure :

For most effective maintenance , it should be organized through a programme of cyclical maintenance. At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines. Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaningwallset

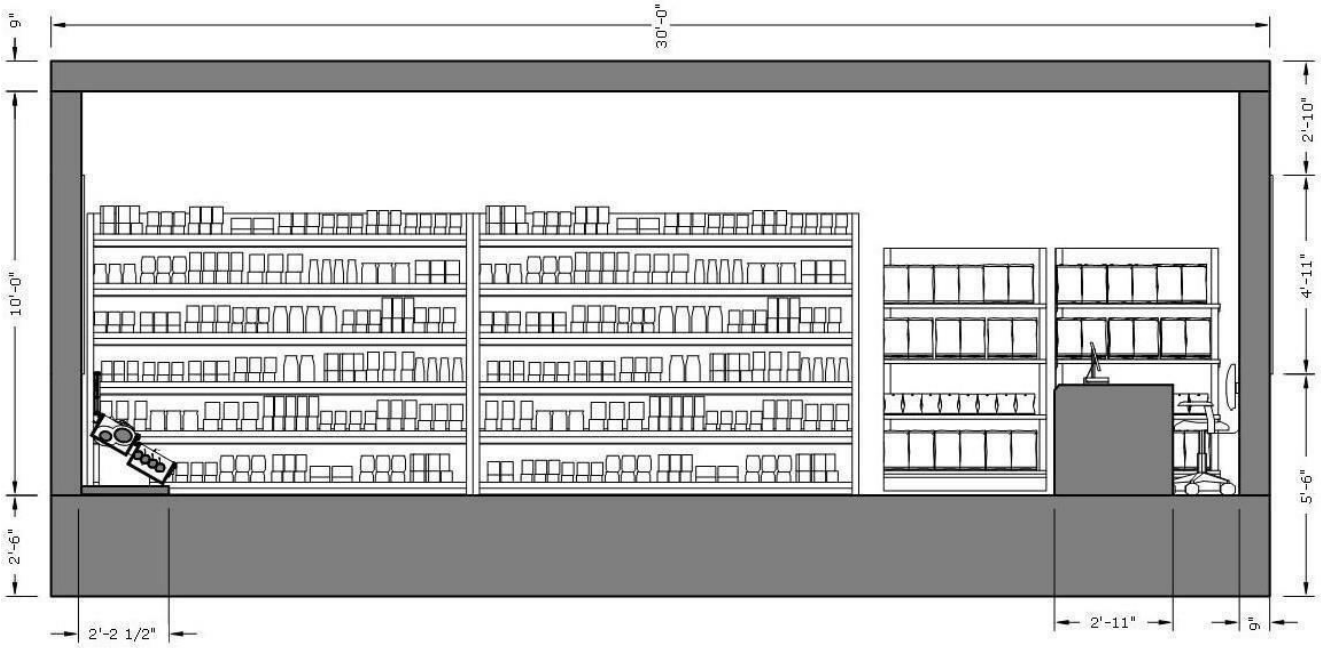
Proposed Design in Auto cad; Revit and Skechup:



(F-8.1.3A Super market Plan)

ELEVATION

(F-8.1.3B Super market Elevation)



SECTION

(F-8.1.3C -Super market Section)

(F-8.1.3D Super market 3D model)

(F-8.1.3E- Super market interior 3D model)

Supermarket : Measurement Sheet (T-8.1.4A- SM measurement sheet)

SR . NO	Description	Length(m)	Width (m)	Height(m)	Count (Nos.)	Total Quantity(m^3)
1	ROOF	9.144	6	0.15	1	**12.74**
2	WALL 9"	21.336	0.2286	3	1	**18**
3	PLINTH WITH STAIRS	21.336	0.2286	0.762	4	**5.89**
4	FLOOR	9.144	6	0.15	1	**8.5**
5	DOOR	1.8796	-	2.1336	1	**-**
6	WINDOW	1	-	1.524	4	**-**
7	PCC	29.98	1.2	0.4	1	**8.22**
8	BASIC WALL: 00.30	29.98	1.2	0.4	1	**3.6**
9	BASIC WALL: 0.40	29.98	1.6	0.4	1	**4.8**
10	BASIC WALL: GENERIC - 0.50	29.98	2	0.4	1	**6**
11	EXCAVATION	33.58	1.2	1.5	4	**60.44**

Supermarket : Abstract Sheet (T-8.1.3B- SM abstract sheet):

SR NO.	Description	Quantity(m^3)	rate	per	Amount
1	WALL	18	4590	Ft^2	**82636.32**
2	DOOR		6000	-	**6000**
3	WINDOW		4*2400	-	**9600**
4	ROOF	12.74	3500	m^3	**44590**
5	FLOOR	8.5	3500	m^3	**29750**
6	PLINTH WALL STAIRS	5.89	90	Ft2	**18720.31**
7	EXCAVATION	1.215*4	350	m^3	**1701**
8	PCC	8.22	3500	m^3	**28770**
9	BASIC WALL: 00.30	3.6	90	Ft2	**11520**
10	BASIC WALL: 0.40	5.44	90	Ft2	**11520**
11	BASIC WALL: GENERIC - 0.50	6	90	Ft2	**11520**
				TOTAL	**256327**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive ofwater charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = Rs.256327/-

8.1.4 Heritage Village Design (Civil) : Entrance gate:

Heritage Village Design : EntranceGate

The Subir village has no main entrance gate at the village approach road. So that we have designed the village entrance gate as heritage village design

Location of Entrance gate:

The Entrancce Gate located at the begning of the village where the different aproches of roads are meets and entrance village.

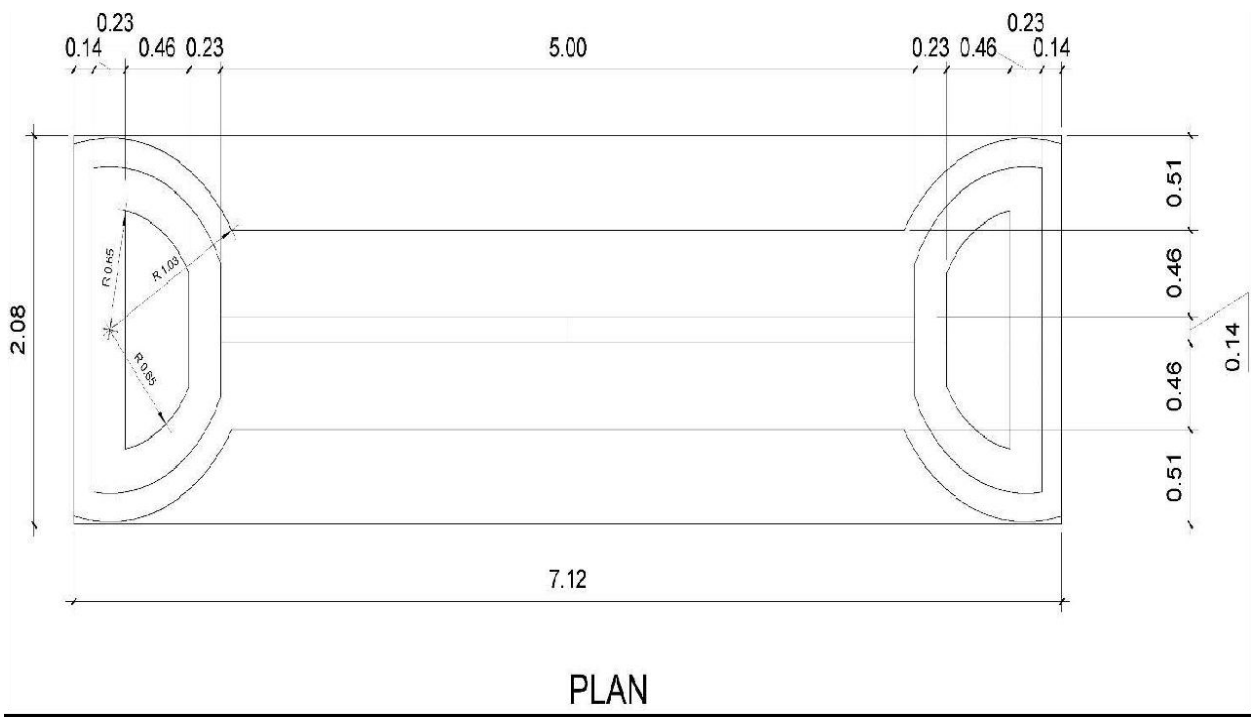
Entrance Gate Design :

Length : 7.12m ; Width : 2m : Height : 4.88m

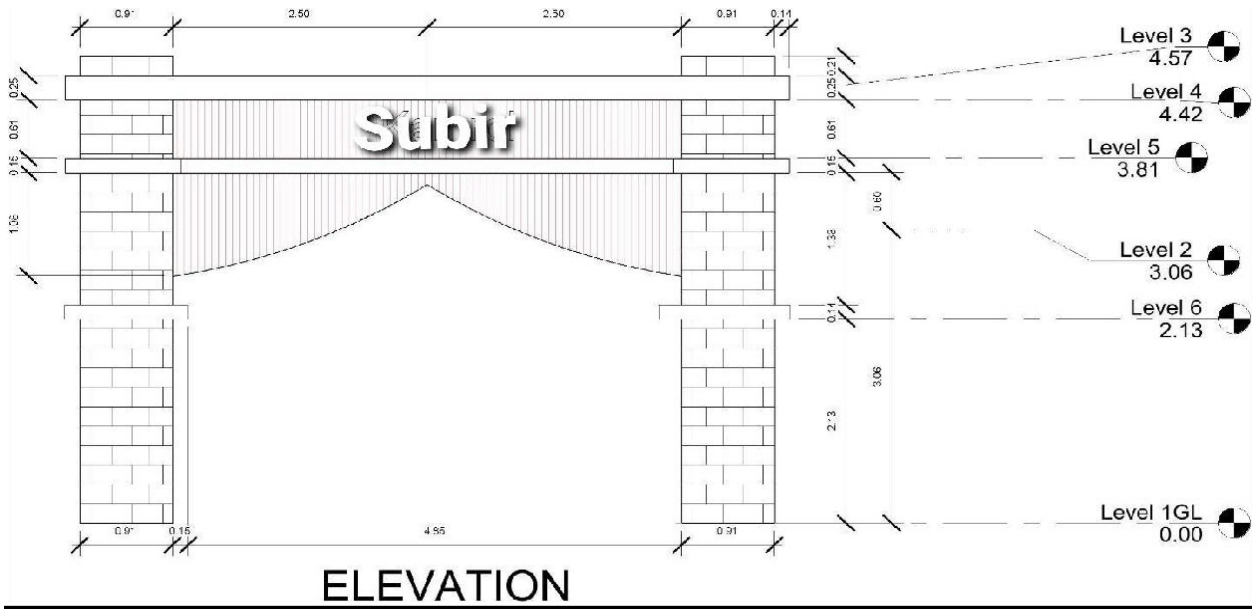
Common repair and maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring;Plumbing;Repairing cracking or leaning walls etc.

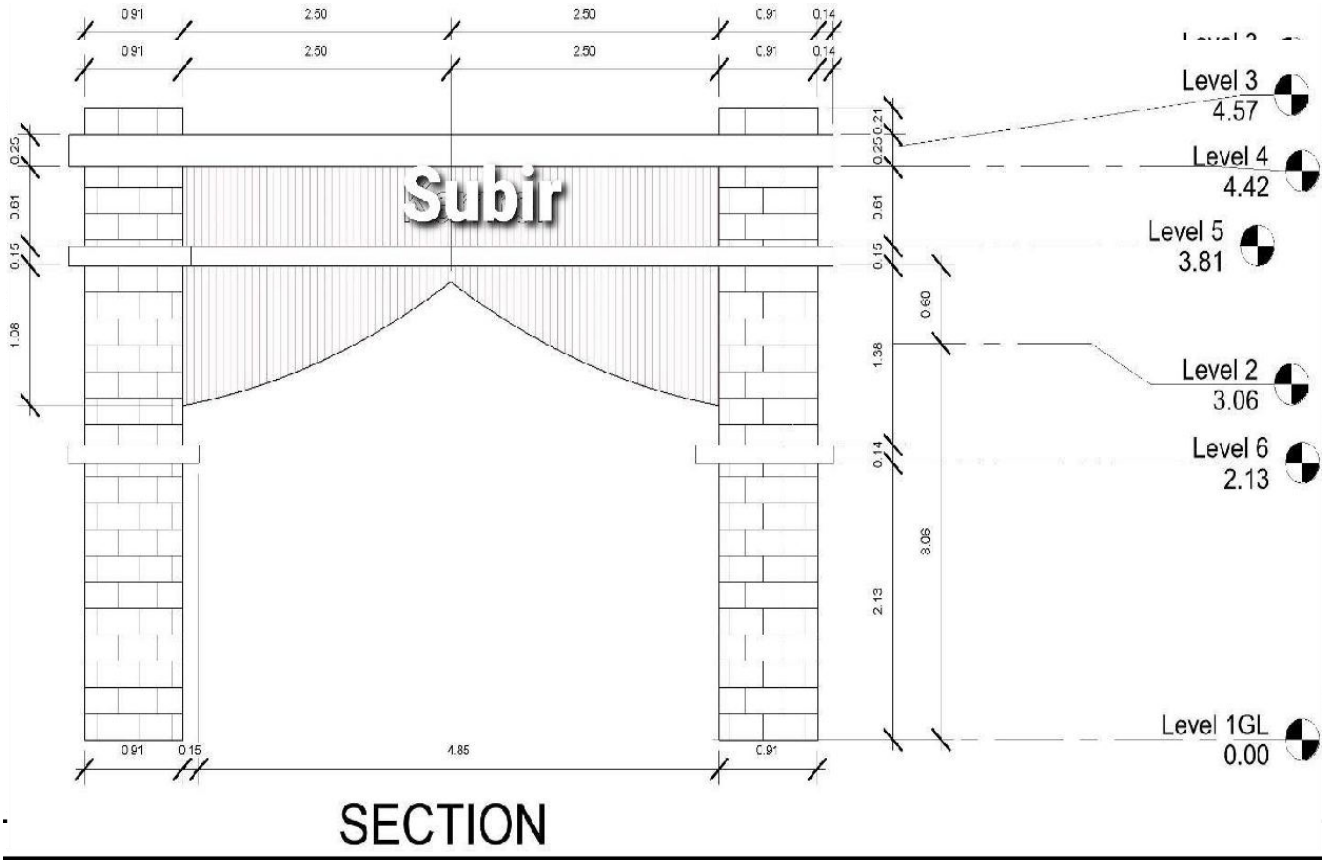
Proposed Design in Auto cad; Revit and Skechup:



(F-8.1.4 A Entrance Gate plan)



(F-8.1.4B Entrance Gate Elevation)



(F-8.1.4C Entrance Gate Section)

(F-8.1.4D-Entrance Gate)

Entrance Gate : Measurement Sheet (T-8.1.4A- EG measurement sheet):

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m^3)
1	BASIC WALL: 9"	7.12	2.083	4.877	2	**8.66**
2	BASIC WALL: GENERIC - 6" MASONRY	1.524	0.1524	1.83	1	**1.04**
3	ROOFS 1	7.2	2.08	0.1524	1	**3.7**
4	ROOFS 2	7.2	2.08	0.1524	1	**1.42**
5	EXCAVATION	2	2	1.5m	2	**13.5**

Entrance Gate : Abstract Sheet (T-8.1.4B- EG abstract sheet):

SR NO.	Description	Quantity(m^3)	rate	per	Amount
1	BASIC WALL: 9"	8.66	3500	Ft^2	**30310**
2	BASIC WALL: GENERIC - 6" MASONRY	1.04	130	Ft^2	**10231**
3	ROOFS 1: ROOFS 1	3.7	3500	m^3	**12950**
4	FLOOR: GENERIC - 6"	1.42	3500	m^3	**4970**
5	EXCAVATION	13.5*2	350	m^3	**9450**
6	PCC	1.85	3500	m^3	**12950**
7	BASIC WALL: 00.30	1.8	90	Ft^2	**9360**
8	BASIC WALL 00.40	2.8	90	Ft^2	**9360**
9	BASIC WALL GENERIC-0.50	2.8	90	Ft^2	**9330**
				GRAND TOTAL	**108941**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges

Total cost = Rs. 108941/-

8.1.5 Social design (Civil) : Community Hall

Community hall is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole community or for a specialized group example Mahila mandal hall. A community hall of village generally consists of a hall , storage or kitchen area and washroom.

Existing Situation in SUBIR :

In the SUBIR village there is no any community hall so that according to the village population there should be one community hall in village. It is a public location where members of a community gather for group activities, events, festivals and social purpose. A community hall of village generally consists of a hall , storage or kitchen area and washroom. During the interaction with villagers they have also suggested that there should be a community hall in SUBIR village.

Sustainability of the design :

Community hall as an important tool :

Design Utilized by,

All the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a community hall for their different uses with the permission of Sarpanch, Talati and some authorized people of the village.

Needs :

where members of a community gather for group activities, events, festivals and social purpose ; for mahila mandal in the village ;etc.

Design brief :

The Community Hall is an important public building in a prominent location. Village and community halls are the smallest buildings that can accommodate a sports programme alongside the customary social and arts pursuits. There are a wide variety of types and sizes, all with the following in common. A main activity and assembly space together with ancillary accommodation that might include additional small halls. The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

Community Hall Design :

Length : 10.67m ; Width : 6.32m : Height : 5.03m Carpet area : 59.93 m^2

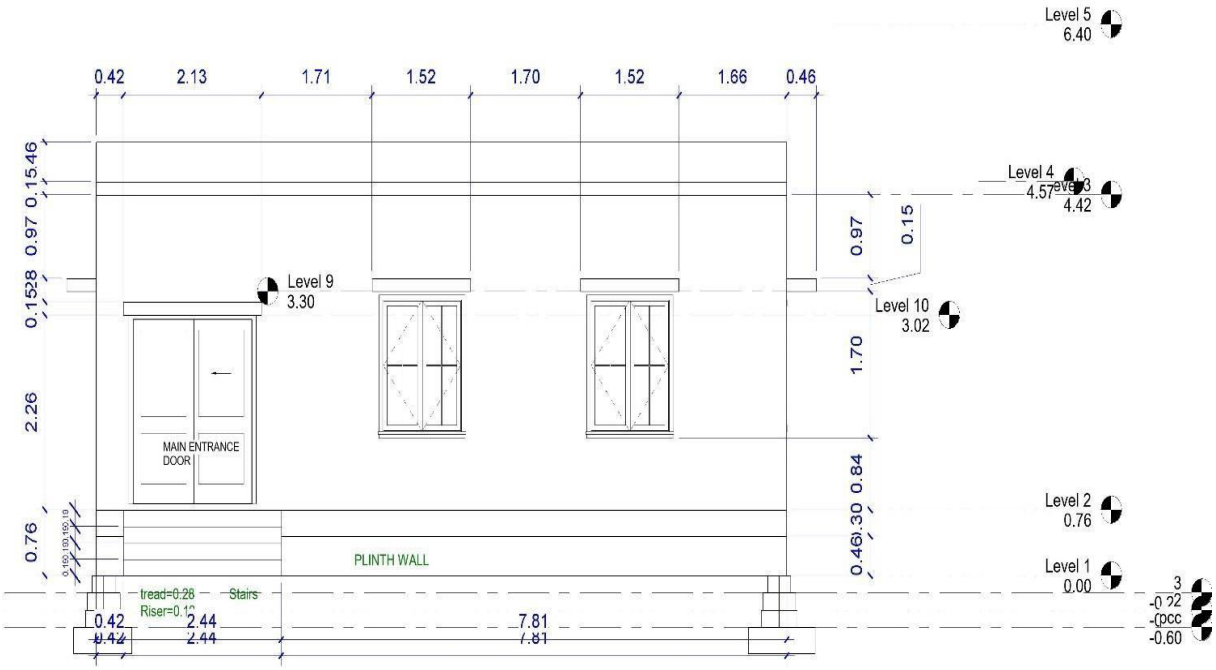
Common repair and maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.** For most effective maintenance , it should be organized through a programme of cyclical maintenance. At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines

Proposed Design in Auto cad; Revit and Skechup :

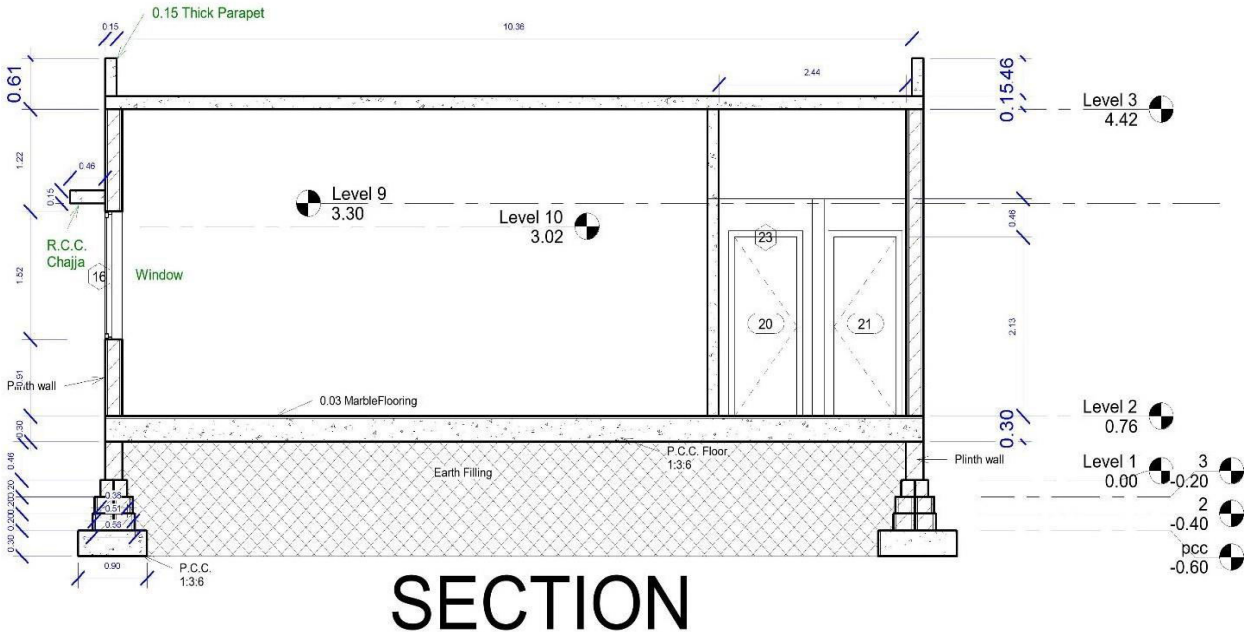
PLAN

(F-8.1.5A-Plan of community hall)



ELEVATION

(F-8.1.5B-Elevation of Community hall)



SECTION

(F-8.1.5 C- CH section)

(F-8.1.5D- CH 3D model)

Community Hall : Measurement Sheet (T-8.1.5A- CH measurement sheet)

SR. NO.	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m^3)
1	BASIC WALL: 9": 4	33.0708	0.2286	3	1	**24.06**
2	BASIC WALL: 9" PL: 4	33.0708	0.2286	3	1	**3.46**
3	BASIC WALL: GENERIC - 6": 5	10.8966	0.1524	0.76	1	**3.62**
4	BASIC WALL: GENERIC - 6" 2: 4	33.0708	0.1524	0.76	1	**2.32**
5	WINDOW-CASEMENT-DOUBLE: 48" X 60"	1.2192		1.524	4	**-**
6	WINDOW-LOUVERS: 16" X 24": 2	0.4064		0.60	2	**-**
7	BASIC ROOF: GENERIC -6"			0.152	1	
8	FLOOR: GENERIC - 10"			1' - 0"	1	**20.57**
9	DOOR-INTERIOR-DOUBLE-SLIDING-2_PANEL-WOOD: 72" X 84"		1.8288	2.1336	1	**-**
10	SINGLE-FLUSH: 30" X 80" 2	0.762		2.032	2	**-**
11	PCC	33.968	1.2	0.4	1	**9.32**
12	BASIC WALL: 00.30	33.968	1.2	0.4	1	**4.08**
13	BASIC WALL: 0.40	33.968	1.56	0.4	1	**5.44**
14	BASIC WALL: GENERIC -0.50	33.968	1.56	0.4	1	**6.78**
15	EXCAVATION	37.58	1.2	1.5	4	**67.64**

Community Hall : Abstract Sheet (T-8.1.5B- CH abstract sheet)

SR NO.	Description	Quantity (m^3)	rate	per	Amount
1	BASIC WALL: 9": 4	24.06	130	Ft^2	**147289**
2	BASIC WALL: 9" PL: 4	3.46	90	Ft^2	**14647.5**
3	BASIC WALL: GENERIC - 6": 5	3.62	90	Ft^2	**23010.3**
4	BASIC WALL: GENERIC - 6" 2: 4	2.32	90	Ft^2	**14782.5**
5	WINDOW-CASEMENT-DOUBLE: 48" X 60": 6	16ft2	220	-	**26400**
6	WINDOW-LOUVERS: 16" X 24": 2	384 inch2	75	-	**2600**
7	BASIC ROOF: GENERIC -6"	11.09	3500	m^3	**38815**
8	FLOOR: GENERIC - 10"	20.57	3500	m^3	**71995**
9	DOOR-INTERIOR-DOUBLE-SLIDING-2_PANEL-WOOD: 72" X 84"	-	-	-	**6000**
10	SINGLE-FLUSH: 30" X 80" 2	-	-	-	**4200**
11	EXCAVATION	1.215*4	350	m^3	**1701**
12	PCC	9.32	3500	m^3	**32620**
13	BASIC WALL: 00.30	4.08	90	Ft^2	**13140**
14	BASIC WALL: 0.40	5.44	90	Ft^2	**13140**
15	BASIC WALL: GENERIC - 0.50	6.78	90	Ft^2	**13140**
				GRAND TOTAL	**423480**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.
Total cost = ₹ 423480/-

8.1.6 Smart Village Design (Civil) : Cybercafe

A cybercafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer-related tasks. In most cases, access to the computer and internet is charged based on time.

Existing Situation in SUBIR :

In the SUBIR village there is no any cybercafe existing in the village. From the feedbacks which were given by the villagers we have decided to design a cybercafe as a smart village design for the main purpose of internet availability at any time for any person in the village.

Sustainability of the design :

Cybercafe as an important tool :

Design Utilized by,

People living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a cybercafe for their different uses.

Needs :

Ease of use; Availability internet and for the people who can know about the internet ;etc.

Design brief :

A cybercafe alternatively referred to as an Internet cafe, PC bangs, or Net cafe. Cybercafe is a place to use computers to access the Internet, play games, create documents, chat with friends using voice and video, and other computer-related tasks. At most Internet cafes the computer and Internet access is provided for an hourly or daily fee.The cybercafe first came into existence in July 1991 in San Francisco, when Wayne Gregori started up the SFnet Coffeehouse Network. He built and set up 25 coin operated computer stations in multiple coffeehouses in San Francisco.

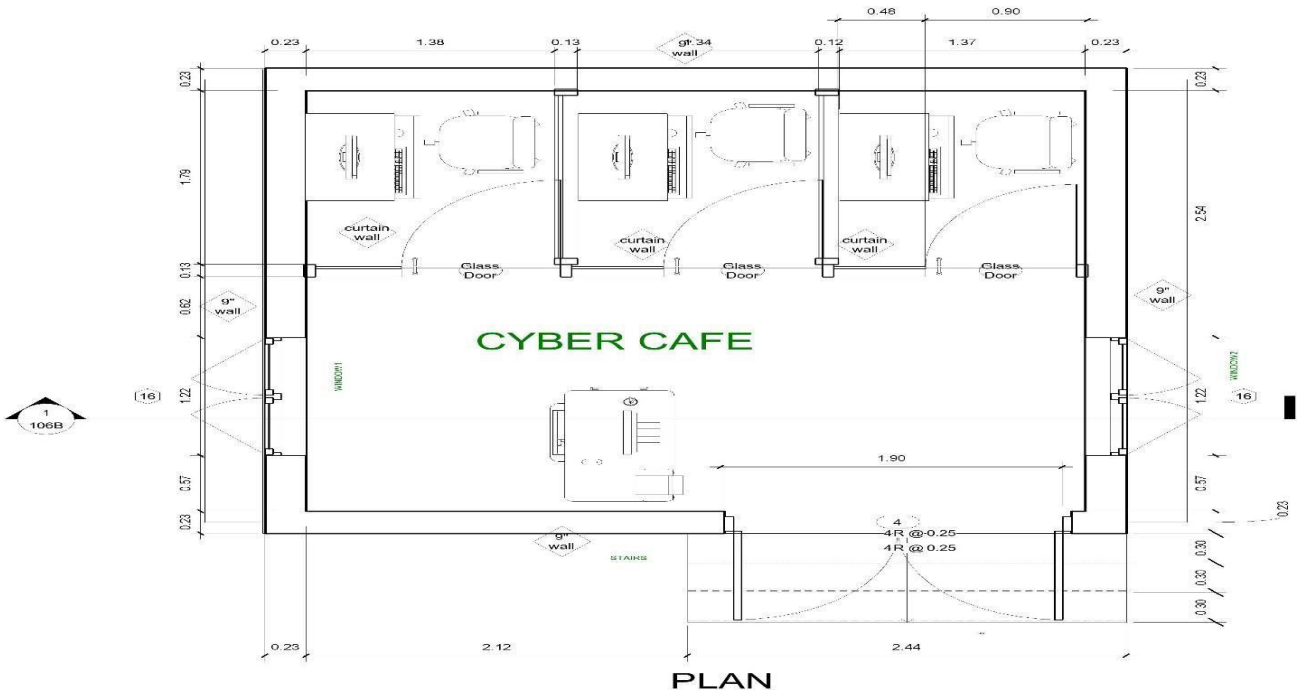
Cybercafe Design :

Length : 4.79m ; Width : 4.79m : Height : 4.11m Carpet area : 18.74 m^2

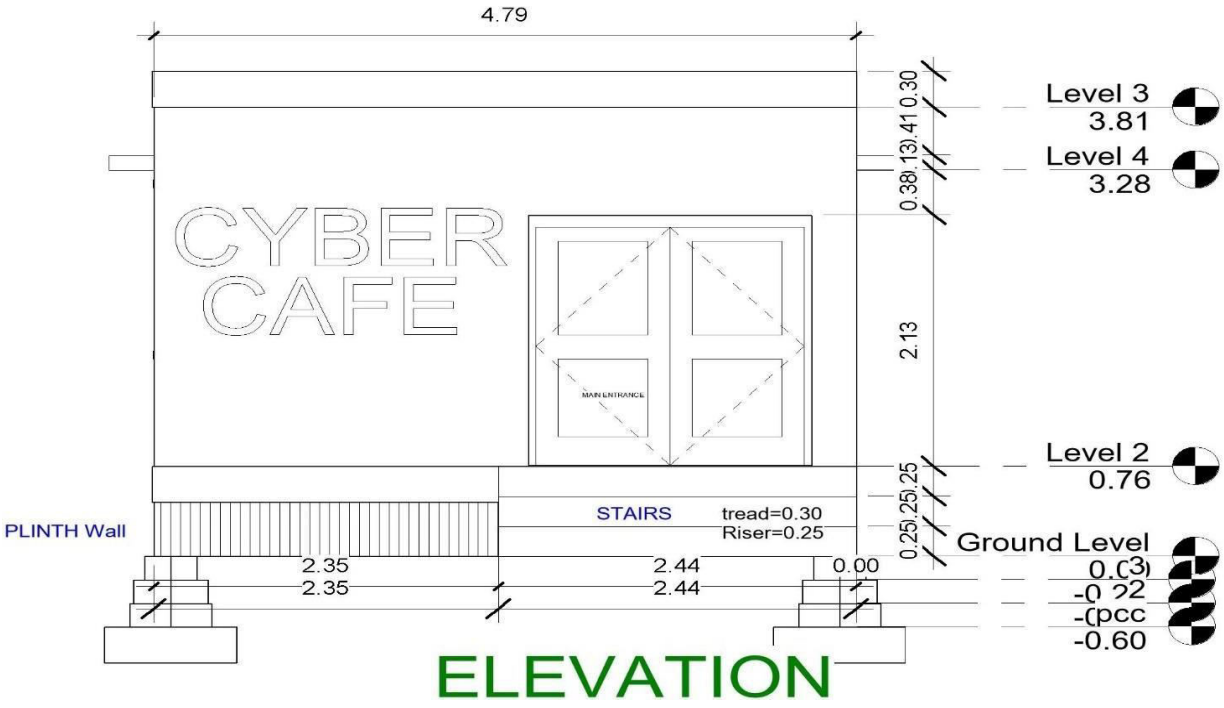
Common repair and maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.** For most effective maintenance , it should be organized through a programme of cyclical maintenance.

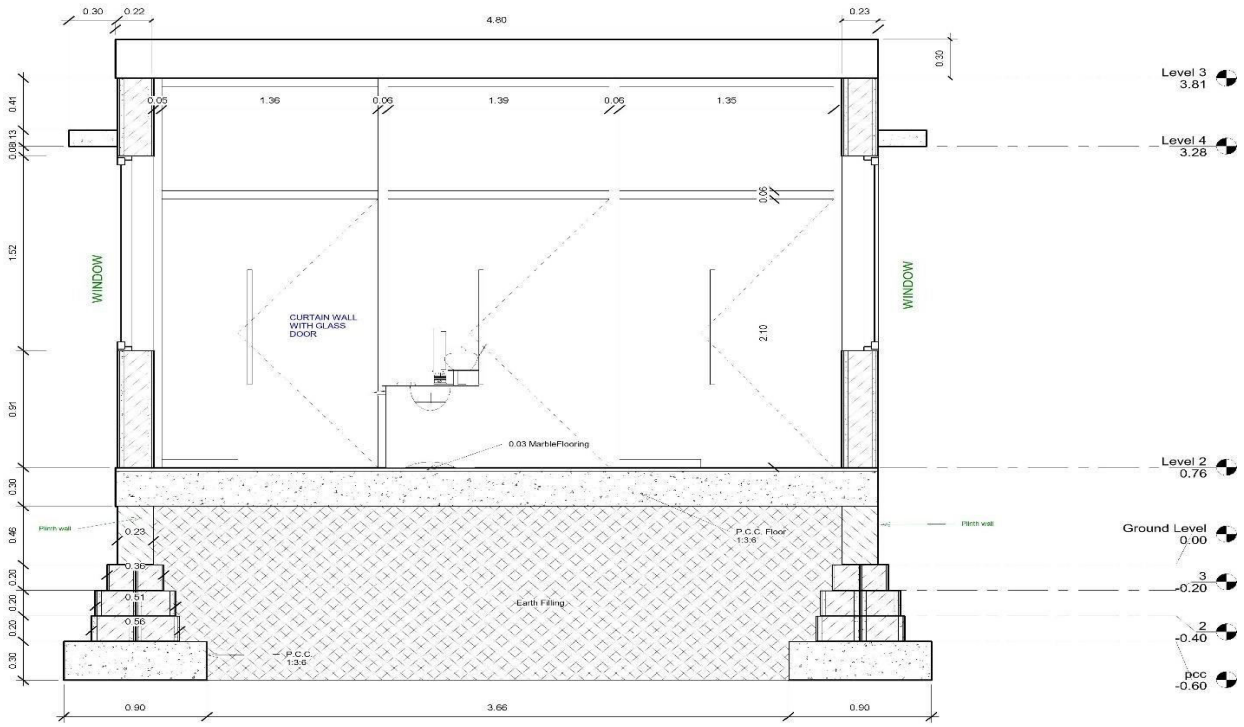
Proposed Design in Auto cad; Revit and Skechup :



(F-8.1.6A- Cybercafe plan)



(F-8.1.6B- Cybercafe elevation)



(F-8.1.6C- Cybercafe section)

(F-8.1.6D- Cybercafe 3D model)

Cybercafe : Measurement Sheet (T-8.1.6A- Cybercafe measurement sheet):

SR.NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m3)
1	BASIC WALL: GENERIC - 9" 2	4.572	0.2286	3.0	1	12.82
2	BASIC WALL: GENERIC - 9" 2	4.572	0.2286	0.762	1	12.82
3	CURTAIN WALL: CURTAIN WALL 1	1.905	0.0254	3.048	1	-
4	DOOR-EXTERIOR-DOUBLE-TWO LITE: 72" X 80"	1.8288	0.0508	2.0574	1	-
5	1452181752750-CURTAIN WALL DOOR: AUS SGL GLASS FRAMED W D-PULL	0.8382	0.0127	2.1082	3	-
6	WINDOW-CASEMENT-DOUBLE: 49" X 60"	1.2192	0.101	1.524	3	-
7	BASIC ROOF: GENERIC - 1	4.572	0.2286	0.1524	1	7.45
8	FLOOR: GENERIC - 1	4.572	0.2286	0.1524	1	6.99
9	PCC	4.1148	0.90	0.4	1	5.02
10	BASIC WALL: 00.30	18.3	1.2	0.4	1	2.2
11	BASIC WALL: 0.40	18.3	1.6	0.4	1	2.94
12	BASIC WALL: GENERIC0.50	18.3	2	0.4	1	3.66
13	EXCAVATION	22	1.2	1.5	4	3.6

Cybercafe : Abstract Sheet (T-8.1.6 B- Cybercafe abstract sheet)

SR NO.	Description	Quantity (m^3)	rate	per	Amount
1	BASIC WALL: GENERIC - 9" 2	10.92	130	Ft^2	**66818.7**
2	BASIC WALL: GENERIC - 9" 2	1.91	90	Ft^2	**8077.5**
3	DOOR-EXTERIOR-DOUBLE-TWO LITE: 72" X 80"	-	-	-	**4000**
4	1452181752750-CURTAIN WALL DOOR: AUS GLASS FRAMED W D-PULL	-	-	-	**5400**
5	WINDOW-CASEMENT-DOUBLE: 49" X 60"	-	-	-	**4800**
6	CAST-IN-PLACE STAIR: MONOLITHIC STAIR	-	-	-	**6000**
7	BASIC ROOF: GENERIC - 12" 2	3.73	3500	m^3	**13055**
8	FLOOR: GENERIC - 12"	3.5	3500	m^3	**12250**
9	EXCAVATION	1.215*4	350	m^3	**1701**
10	PCC	9.32	3500	m^3	**32620**
11	BASIC WALL: 00.30	4.08	90	Ft^2	**13140**

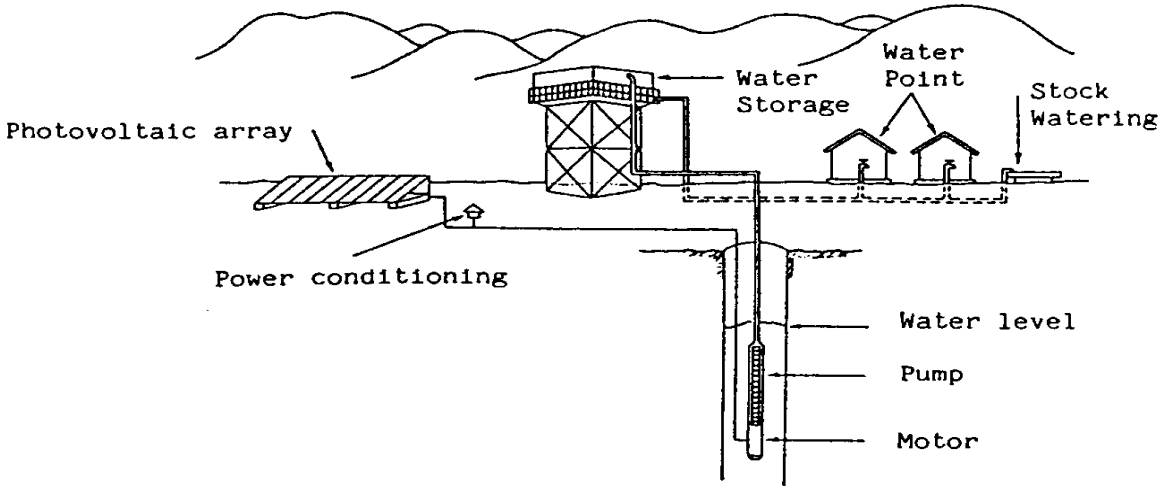
The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 194142/-

8.1.7 Solar pumping system (electrical)

CONCEPT OF SOLAR SYSTEM IN AGRICULTURE:-

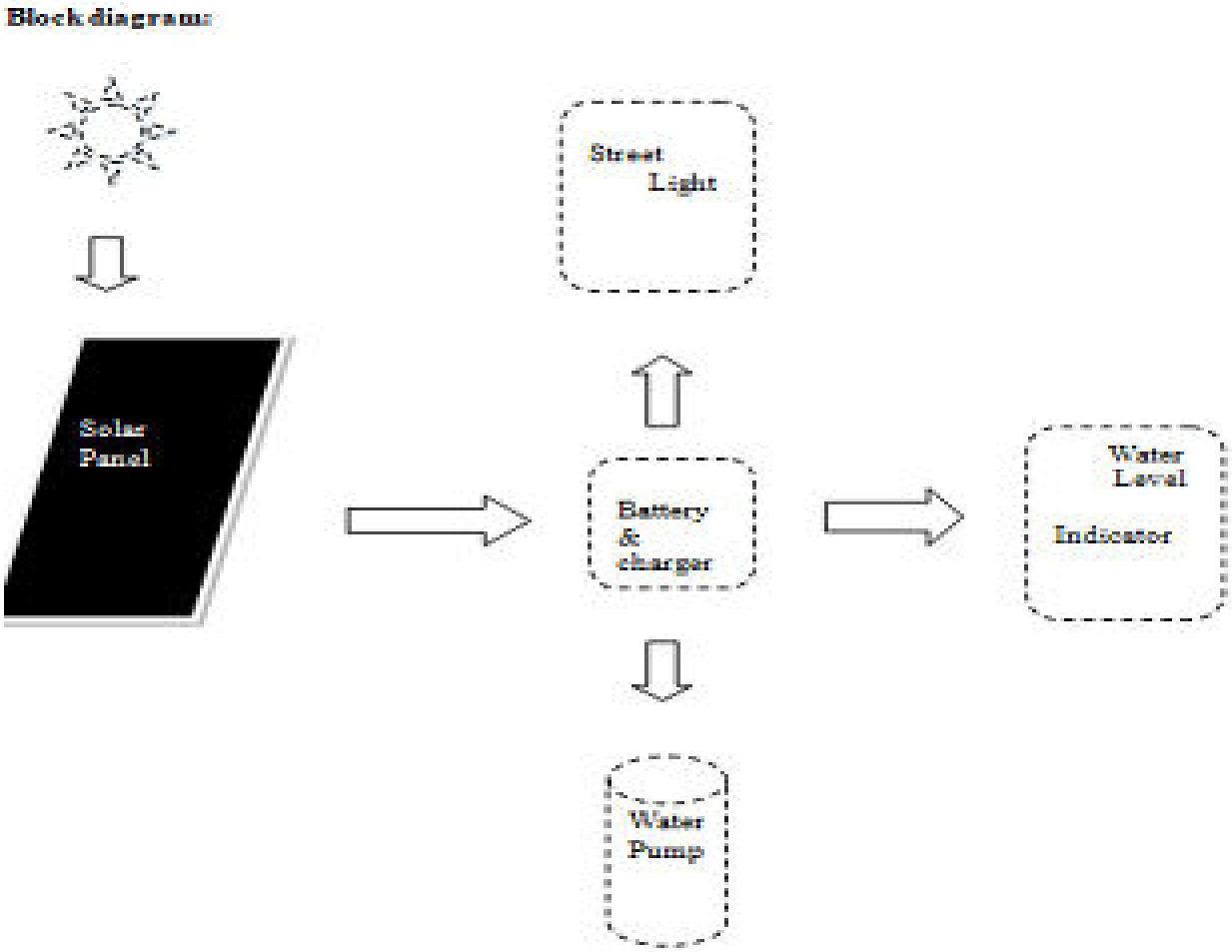
Energy is a key ingredient for the overall development of an economy. India has been endowed with abundant renewable solar energy resource. India is large country and the rate of electrification has not kept pace with the expanding population, urbanization and industrialization and has resulted in the increasing deficit between demand and supply of electricity. This has not only resulted in under electrification but also put heavy pressure on the governments to keep pace with demand for electricity. People not served by the power grid have to rely on fossil fuels like kerosene and diesel for the poor people in rural areas.



(F-8.1.7A-: solar Water pumping system)

Wherever the rural areas have been brought under power grid the erratic and unreliable power Supply has not helped the farmers and the need for an uninterrupted power supply especially during the critical farming period has been a major area of concern. India receives a solar energy equivalent of 5,000 trillion KWh/year with a daily average solar energy incidence of 4-7 KWh/m2. This is considerably more than the total energy consumption of the country. Further, most parts of the country experience 250-300 sunny days in a year, which makes solar energy a viable option in these areas. Decentralized renewable energy system, which relies on locally available resources, could provide the

BASIC BLOCK DIAGRAM OF SOLAR SYSTEM IN AGRICULTURE

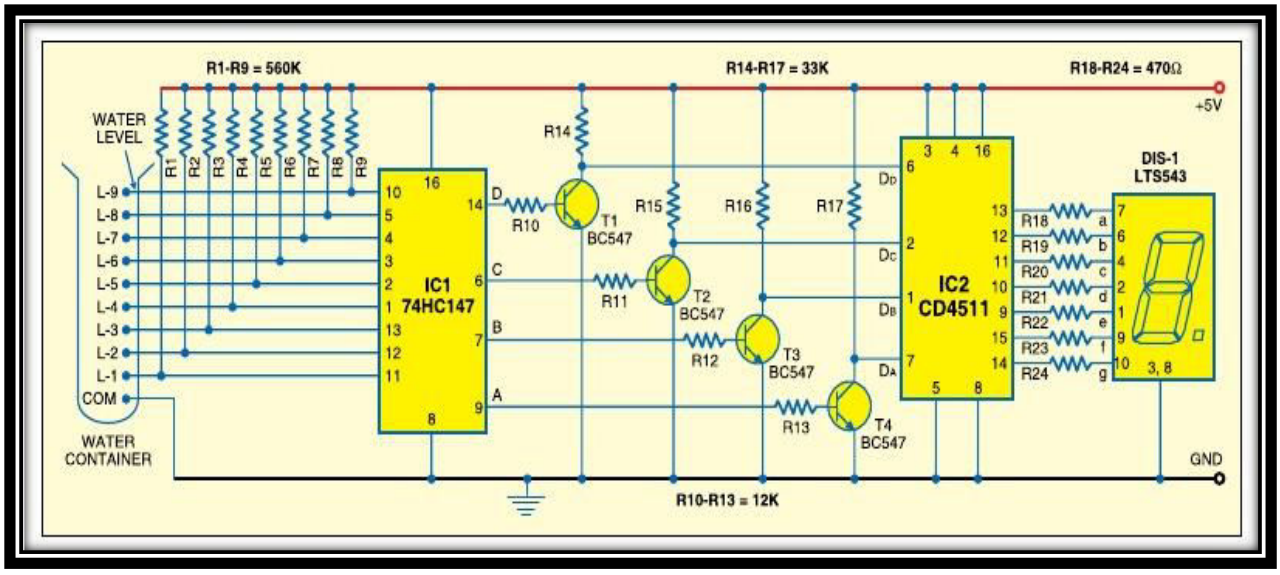


(F-8.1.7B- block diagram of solar system in agriculture)

Working of block diagram:-

The solar system in agriculture very useful for our country. Now see the fig1.2 of block diagram of solar system in agriculture.Now see the working of in block diagram.When sun light falls on panel in solar panel made by silicon and germanium. It is convert photon energy to electric energy. So the solar cell converts in electrical energy in dc system. And also USB battery in hole day battery charge use dc supply in street light and water level indicator and water pump in agriculture system**.**

WATER LEVEL INDICATOR CIRCUIT:-



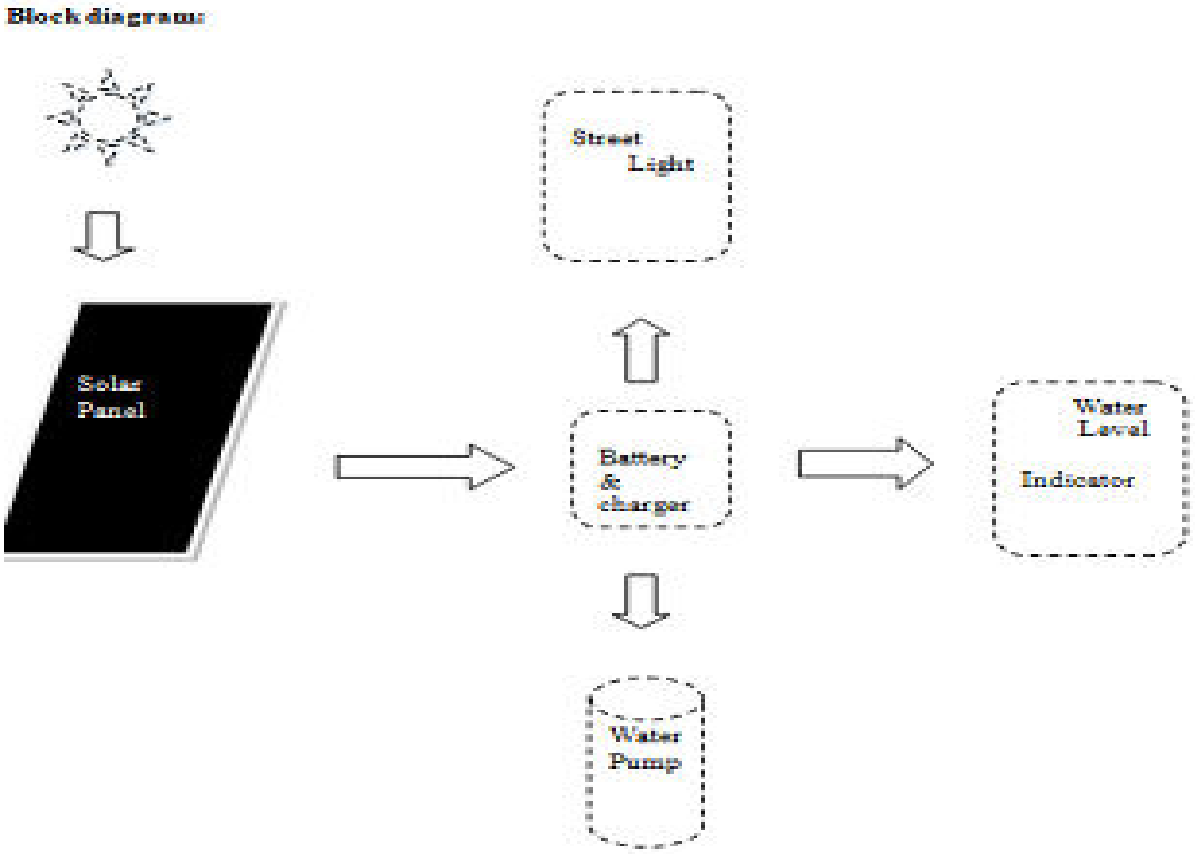
(F-8.1.7C-circuit diagram of the numeric water-level indicator with display)

Working of circuit

The Numeric Water Level Indicator employs a simple mechanism to detect and indicate the water level in a tank or any other container. The level sensing is done by a set of nine probes which are placed at nine different levels on the tank walls (with probe9 to probe1 placed in decreasing order of height; COM probe is placed on the base of the tank).Basically, level9 represents the "tank full" condition while COM represents the "tank empty" condition.When the tank is empty, all the inputs to the priority encoder IC1 remain high; as a result its output also remains high. Since these outputs are inverted and fed as inputs to the decoder driver CD4511 (IC2), all inputs to IC2 are low. The seven segment display correspondingly shows a '0', indicating that the tank is empty.

For example, when the water reacheslevel1 (but is below level2), pin11 (A0) of IC1 is pulled to ground and the out-put generated at pin9 (Y0) of IC1 also becomes low. After inversion, the bits fed to the input pins of IC2 are 0001(DCBA). Hence, the corresponding digit displayed by the seven segment display is a '1'. The same mechanism applies to the detection N of all the other levels When the tank is full, all inputs to IC1 become low and all its outputs also go low .This causes all the inputs to IC2to go high and hence the display shows a '9', thereby indicating a "tank full" condition.

BATTERY CHARGER CIRCUIT DIAGRAM:-



(F-8.1.7D-block diagram of solar system in agriculture)

WORKIND PRINCIPAL OF BATTERY CHARGER

The circuit uses a 12 volt solar panel and a variable voltage regulator IC LM 317. The solar panel consists of solar cells each rated at 1.2 volts. 12 volt DC is available from the panel to charge the battery. Charging current passes through D1 to the voltage regulator IC LM 317. By adjusting its Adjust pin, output voltage and current can be regulated. VR is placed between the adjust pin and ground to provide an output voltage of 9 volts to the battery. Resistor R3 Restrict the charging current and diode D2 prevents discharge of current from the battery. Transistor T1 and Zener diode ZD act as a cut off switch when the battery is full. Normally T1 is off and battery gets charging current. When the terminal voltage of the battery rises above 6.8 volts, Zener conducts and provides base current to T1. It then turns on grounding the output of LM 317 to stop charging.

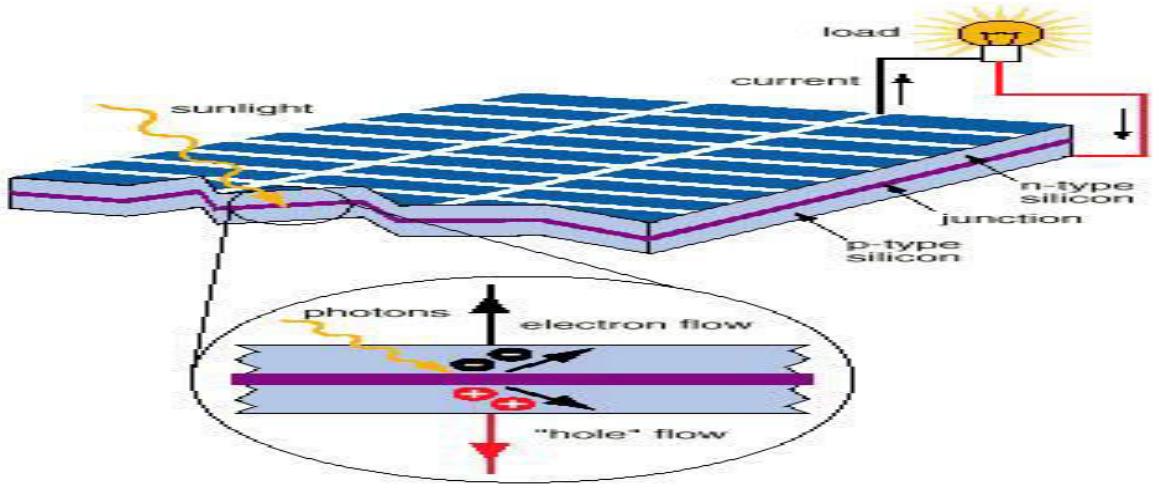
COMPONENTS OF WATER LEVEL INDICATOR

SR NO.	COMPONENT	UNIT
1.	Solar cell	NO.1
2.	Resister	
	R1 to R9=560k	N0.9
	R10 to R13=12k	No.4
	R14 to R17=33k	No.4
	R18 to R24=470Ω	No.7
	R1=180	No.1
	R2=1k	No.1
	R3=10R,1w	No.1
3.	Variable resister	
	1k	No.1
4.	IC	
	IC1=74HC147	No.1
	IC2=CD4511	No.1
	IC3=LM317	
5.	Transistor	
	BC 574	No.4
	BC 548	No.1
6.	LED display	
	LTS543	No.1
7.	D.C. series motor	No.1
8.	6V battery	No.1
9.	Diode	
	IN 4007	No.2
10.	Zener diode	
	ZD 6V,1W	No.1
11.	LED	No.1

(T-8.1.7A-component of water level indicator)

INTRODUCTION OF COMPONENT

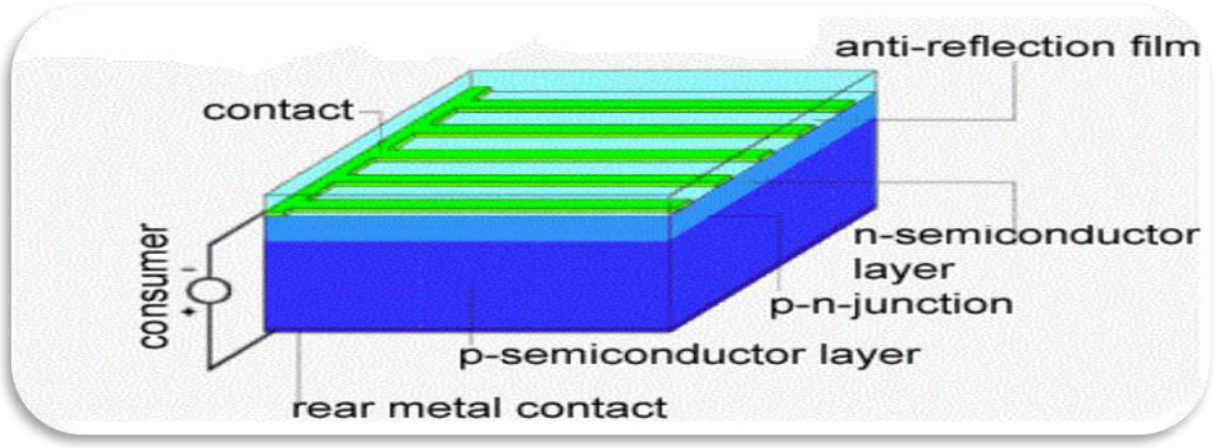
1.Solar cell



(F-8.1.7E-Solar cell)

Photovoltaic offer consumers the ability to generate electricity in a clean, quiet and reliable way. Photovoltaic systems are comprised of photovoltaic cells, devices that convert light energy directly into electricity. Because the source of light is usually the sun, they are often called solar cells. The word photovoltaic comes from "photo," meaning light, and "voltaic," which refers to producing electricity. Therefore, the photovoltaic processes "producing electricity directly from sunlight." Photovoltaic are often referred to as PV.PV systems are being installed by Texans who already have grid-supplied electricity but want to begin to live more independently or who are concerned about the environment.

Converting Photons to Electrons:



(F-8.1.7F-Solar cell 2)

The solar cells that you see on calculators and satellites are also called photovoltaic (PV) cells, which as the name implies (photo meaning "light" and voltaic meaning "electricity"), convert sunlight directly into electricity. A module is a group of cells connected electrically and packaged into a frame (more commonly known as a solar panel), which can then be grouped into 2larger solar arrays, like the one operating at Nellie Air Force Base in Nevada.Photovoltaic cells are made of special materials called semiconductors such as silicon, which is currently used most commonly. Basically, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material.

Energy Loss in a Solar Cell

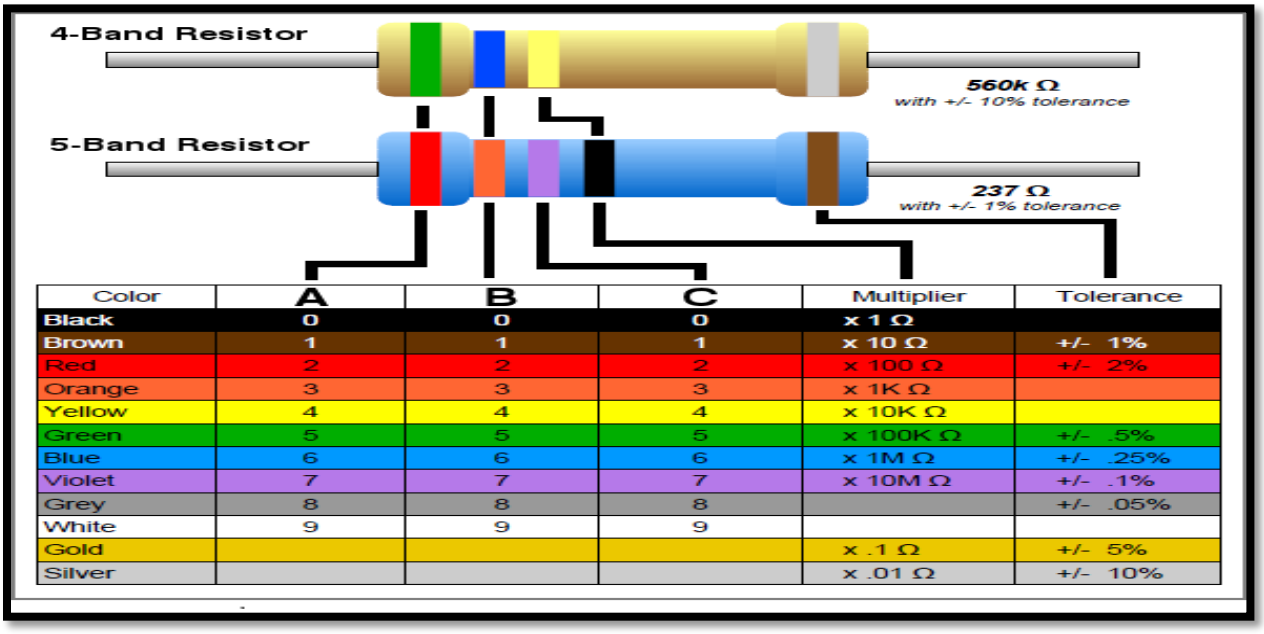
Visible light is only part of the electromagnetic spectrum. Electromagnetic radiation is not monochromatic -- it's made up of a range of different wavelengths, and therefore energy levelsLight can be separated into different wavelengths, which we can see in the form of a rainbow. Since the light that hits our cell has photons of a wide range of energies, it turns out that some of them won't have enough energy to alter an electron-hole pair. They'll simply pass through the cell as if it were transparent. Still other photons have too much energy. Only a certain amount of energy, measured in electron volts (eve) and defined by our cell material (about 1.1 eV for crystalline silicon), is required to knock an electron loose. Remember, silicon is a semiconductor -- it's not nearly as good as a metal for transporting current. Its internal resistance (called series resistance) is fairly high, and high resistance means high losses. To minimize these losses, cells are typically covered by a metallic contact grid that shortens the distance that electrons have to travel while covering only a small part of the cell surface. Even so, some photons are blocked by the grid, which can't be too small or else its own resistance will be too high.

2.Resistors:

(F-8.1.7G- Resistors)

The most basic role of resistors is current limiting i.e, precisely controlling the quantity of electrical current that is going to flow through a device or a conductor. Resistors can also be used as voltage divider, in other words they can be used to generate any voltage from an initial bigger voltage by dividing it.

They are also used as pull-up resistors in electronic logic circuits to ensure that inputs to logic systems settle at expected logic levels if external devices are d is connected or high-impedance. They may also be used at the interface between two different types of logic devices, possibly operating at different power supply voltages.



Color	A	B	C	Multiplier	Tolerance
Black	0	0	0	x 1 Ω	
Brown	1	1	1	x 10 Ω	+/- 1%
Red	2	2	2	x 100 Ω	+/- 2%
Orange	3	3	3	x 1K Ω	
Yellow	4	4	4	x 10K Ω	
Green	5	5	5	x 100K Ω	+/- .5%
Blue	6	6	6	x 1M Ω	+/- .25%
Violet	7	7	7	x 10M Ω	+/- .1%
Grey	8	8	8		+/- .05%
White	9	9	9		
Gold				x .1 Ω	+/- 5%
Silver				x .01 Ω	+/- 10%

(F-8.1.7H- Block Diagram of Colour Band Resistor)

The resistor is a component that has one purpose and that is to resist current and voltage by means of combining conductive material with a nonconductive one to form a substance that allows electrons to flow through its self but not as efficiently as a typical wire. The unit of measuring how much the resistor will oppose current is measured in ohms and to determine the outcome of the resistor we would use mathematical formulas known as ohms law. **T**here are three main types of resistors, which can then be broken down into other categories but let's first look at the three. The electrical resistance of an electrical element is the opposition to the passage of an electric current through that element; the inverse quantity is electrical conductance, the ease at which an electric current passes. Electrical resistance shares some conceptual parallels with the mechanical notion of friction. The SI unit of electrical resistance is the ohm (Ω), while electrical conductance is measured in Siemens (S).

3. Variable Resistor:

(F-8.1.7I- variable resistor)

Variable resistor is a potentiometer with only two connecting wires instead of three. However, although the actual component is the same, it does a very different job. The pot allows us to control the potential passed through a circuit. The variable resistance lets us adjust the resistance between two points in circuit. Variable resistors are often called potentiometers, or. pots. For short, because one very common use for them is as an adjustable voltage divider. For many years they were often called volume controls, because another very common use was in adjusting the audio volume produced by amplifiers, radio and TV receivers

(F-8.1.7J-Connection Leads)

Yet another early name for essentially the same component when it was used simply as a variable resistance was rheostat. Meaning a device to .set the flow. (of current).Pots are made in a variety of physical forms, and with the actual resistance element made from different materials. Some pots are made for frequent manual adjustment via a control knob, while others are designed to be adjusted only occasi only with a screwdriver or similar tool, for .fine tuning. Of circuit performance. The latter type are usually called .preset. Pots or trim pots.

Most commonly encountered pots designed for manual control have a resistance element consisting of either a carbon-loaded resistance compound .ink. coated on a fibre sheet, or a winding of resistance wire (nichrome, coppernickelalloy or similar). Not surprisingly these are called. Carbon composition. And .wire wound

(F-8.1.7 K-Variable Resistances)

Both rotary and slider pots can have a resistance element of either the carbon composition and wire wound type. Carbon composition types tend to be cheaper to make and fairly quiet in operation, and are also capable of good resolution. Wire wound types are generally more reliable and more stable in their performance, but are .coarser. in resolution due to the way the wiper makes contact with discrete turns of the wire element.

4 .IC

IC1= 74HC147:

The 74HC147 priority encoder accepts data from nine active LOW inputs (A0 to A8) and provides a binary representation on the four active LOW outputs (Y0 to Y3). Apriority is assigned to each input so that when two or more inputs are simultaneously active, the input with the highest priority is represented on the output, with the input line A8having the highest priority.

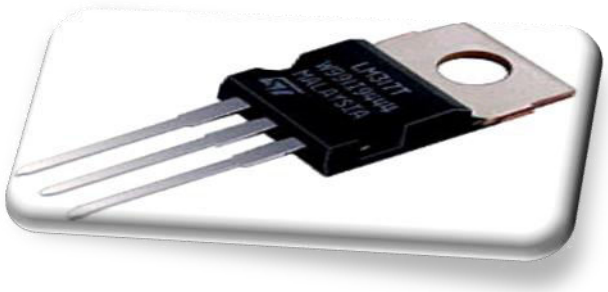
BCD to 7-segment latch decoder drivers CD4511:

The CD4511 is a BCD to seven segment latch decoder and driver. The circuit provides the functions of a 4-bitstorage latch, an 8421 BCD-to-seven segment decoder, and an output drive capability. It has a total of 4 inputs namely A, B, C and D.

Features

- Low logic circuit power dissipation
- High current sourcing outputs (up to 25 mA)
- Latch storage of code
- Blanking input
- Lamp test provision

IC3=LM317



(F-8.1.7 L- IC 317)

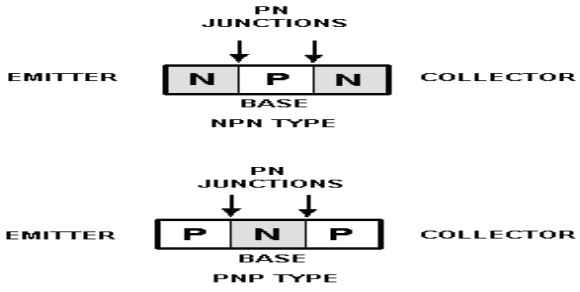
General Description

The LM317 is an adjustable 3-terminal positive voltage regulator capable of supplying 100mA over a 1.2V to 37V output range. It is exceptionally easy to use and requires only two external resistors to set the output voltage. Further, both line and load regulation is better than standard fixed regulators. Also, the LM317 is available packaged in a standard TO-92transistor package which is easy to use. In addition to higher performance than fixed regulators, the LM317 offers full overload protection. Included on the chip are current limit, thermal overload protection and safe area protection.

5.Transistor:

Transistors are classified as either NPN or PNP according to the arrangement of their N and P materials. Their basic construction and chemical treatment is implied by their names, "NPN" or "PNP." That is, an NPN transistor is formed by introducing a thin region of P-

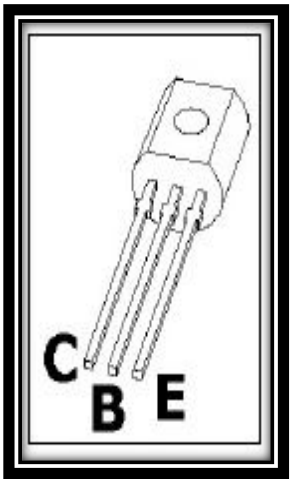
type material between two regions of N-type material. On the other hand, a PNP transistor is formed by introducing a thin region of N-type material between two regions of P-type material. Transistors constructed in this manner have two PN junctions, as shown in figure 2-2. One PN junction is between the emitter and the base; the other PN junction is between the collector and the base. The two junctions share one section of semiconductor material so that the transistor actually consists of three elements.



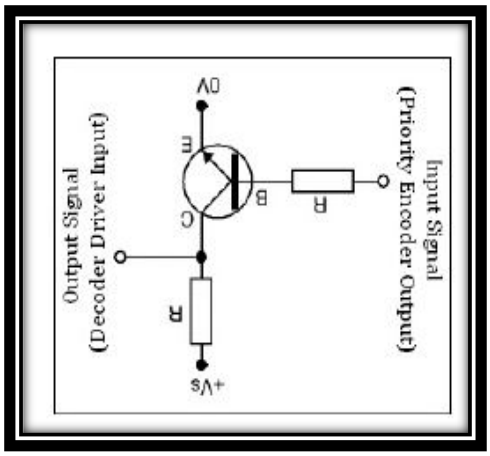
(F8.1.7M-Transistor block diagrams.)

(F-8.1.7N -Transistor representations.)

Another point you should keep in mind is that the arrow always points in the direction of hole flow, or from the P to N sections, no matter whether the P section is the emitter or base. On the other hand, electron flow is always toward or against the arrow, just like in the junction diode.



(F-8.1.7O- transistor)



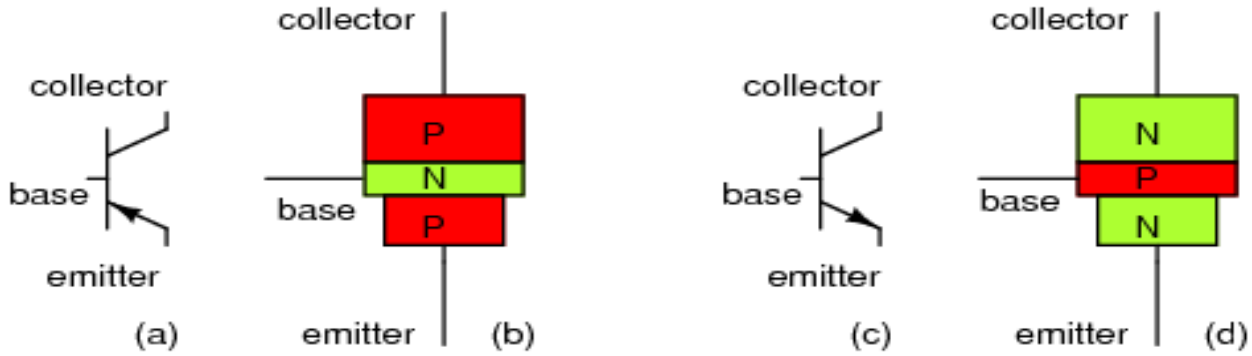
(F-8.1.7P-NOT gate)

• When the input is high (+Vs) the output is low (0V)
• When the input is low (0V) the output is high (+Vs).

Here I want to explore how to use these components, not analyze their intimate internal details. I don't mean to downplay the importance of understanding semiconductor physics, but sometimes an intense focus on solid-state physics detracts from understanding these devices' functions on a component level.

A bipolar transistor consists of a three-layer “sandwich” of doped (extrinsic) semiconductor materials, either P-N-P in Figure below (b) or N-P-N at (d). Each layer forming the transistor has

a specific name, and each layer is provided with a wire contact for connection to a circuit. The schematic symbols are shown in Figure below (a) and (d).

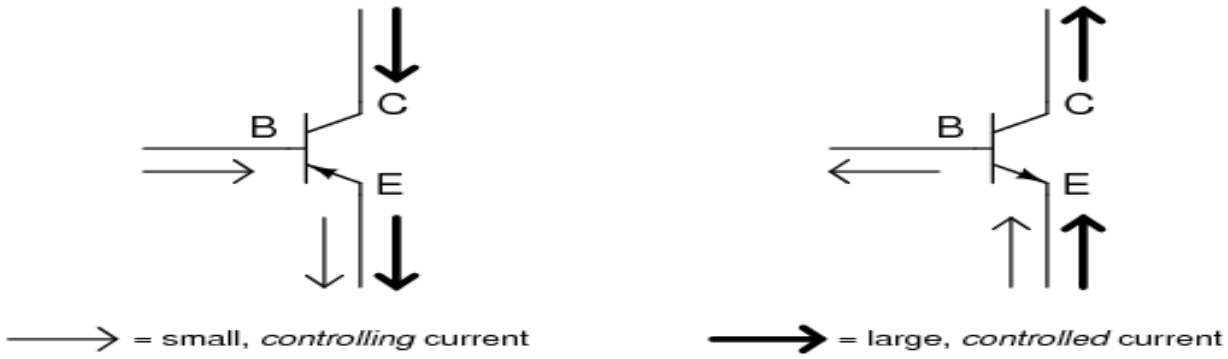


BJT transistor: (a) PNP schematic symbol, (b) physical layout (c) NPN symbol, (d) layout.

(F-8.1.7Q-PNP and NPN Transistors)

The functional difference between a PNP transistor and an NPN transistor is the proper biasing (polarity) of the junctions when operating. For any given state of operation, the current directions and voltage polarities for each kind of transistor are exactly opposite each other.

Bipolar transistors work as current-controlled current regulators. In other words, transistors restrict the amount of current passed according to a smaller, controlling current. The main current that is controlled goes from collector to emitter, or from emitter to collector, depending on the type of transistor it is (PNP or NPN, respectively). The small current that controls the main current goes from base to emitter, or from emitter to base, once again depending on the kind of transistor it is (PNP or NPN, respectively). According to the standards of semiconductor symbology, the arrow always points against the direction of electron flow.



(F-8.1.7R- symbol of transistor)

Small electron base current controls large collector electron current flowing against emitter arrow.Bipolar transistors are called bipolar because the main flow of electrons through them takes place in two types of semiconductor material: P and N, as the main current goes from emitter to collector (or vice versa). In other words, two types of charge carriers -- electrons and holes -- comprise this main current through the transistor.

6.Introduction dc motor

D. C. motors are seldom used in ordinary applications because all electric supply companies furnish alternating current However, for special applications such as in steel mills, mines and electric trains, it is advantageous to convert alternating current into direct current in order to use d.c. motors. The reason is that speed/torque characteristics of d.c. motors are much more superior to that of a.c. motors. Therefore, it is not surprising to note that for industrial drives, d.c . motors are as popular as 3-phase induction motors. Like d.c. generators, d.c. motors are also of three types viz., series-wound, shunt-wound and compound wound. The use of a particular motor depends upon the mechanical load it has to drive.

D.C. Motor Principle

A machine that converts d.c. power into mechanical power is known as a d.c. motor. Its operation is based on the principle that when a current carrying conductor is placed in a magnetic field, the conductor experiences a mechanical
force. The direction of this force is given by Fleming's left hand rule and magnitude is given by;

$$F = BI(\text{newtons})$$

Basically, there is no constructional difference between a d.c. motor and a d.c.generator. The same d.c. machine can be run as a generator or motor.

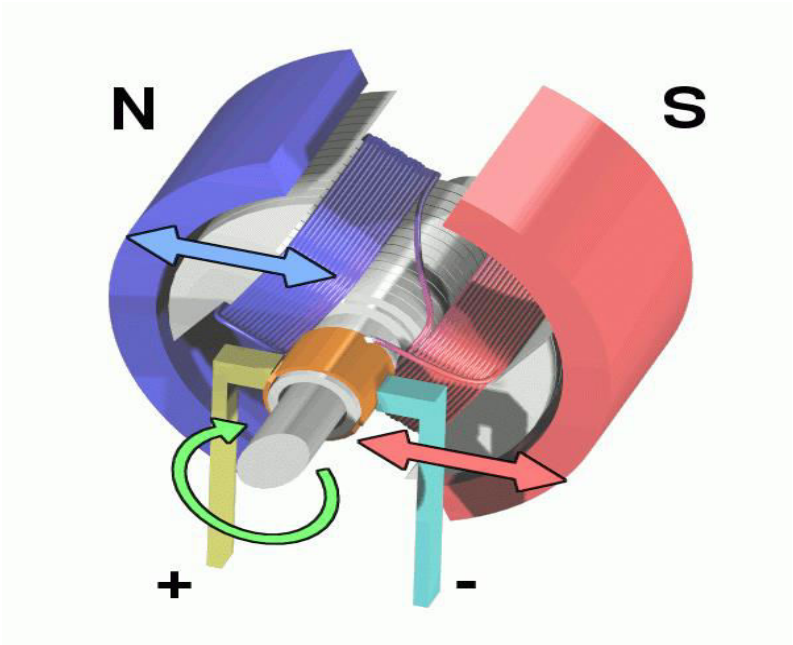
Working of D.C. Motor

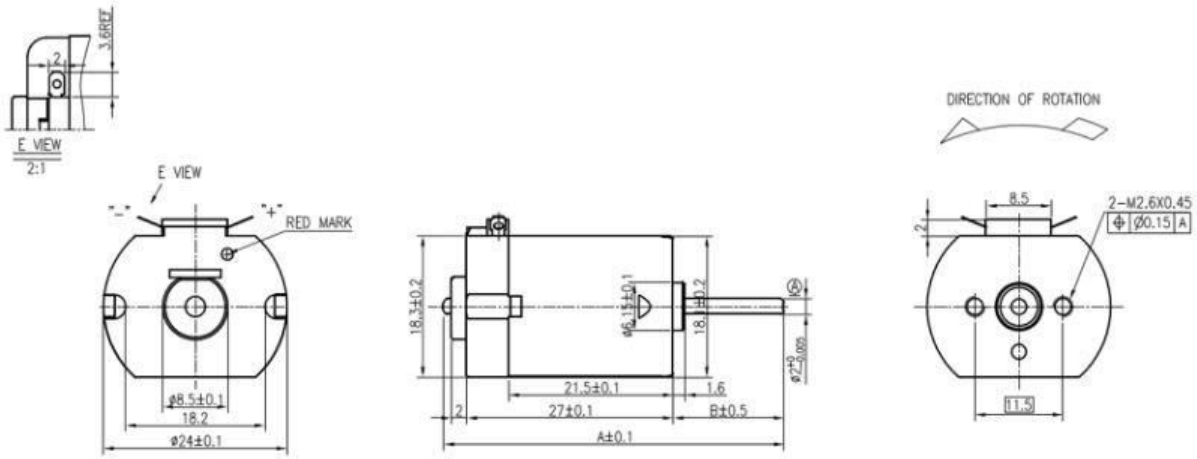
Consider a part of a multipolar d.c. motor as shown in Fig When theterminals of the motor are connected to an external source of d.c. supply:

(i) the field magnets are excited developing alternate N and S poles;
(ii) the armature conductors carry ^currents. All conductors under N-pole

carry currents in one direction while all the conductors under S-pole carry currents in the opposite direction.

Suppose the conductors under N-pole carry currents into the plane of the paper and those under S-pole carry currents out of the plane of the paper as shown in Fig. Since each armature conductor is carrying current and is placed in the magnetic field, mechanical force a





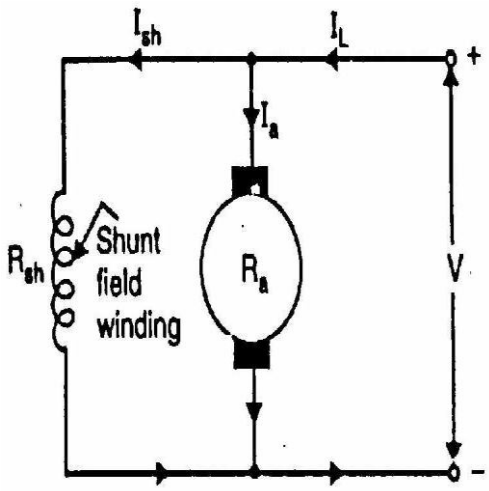
(F-8.1.7S-D C moter)

Referring to Fig. and applying Fleming's left hand rule, it is clear that force on each conductor is tending to rotate the armature in anticlockwise direction. All these forces add together to produce a driving torque which sets the armature rotating. When the conductor moves from one side of a brush to the other, the current in that conductor is reversed and at the same time it comes under the influence of next pole which is of opposite polarity. Consequently, the direction of force on the conductor remains the same.

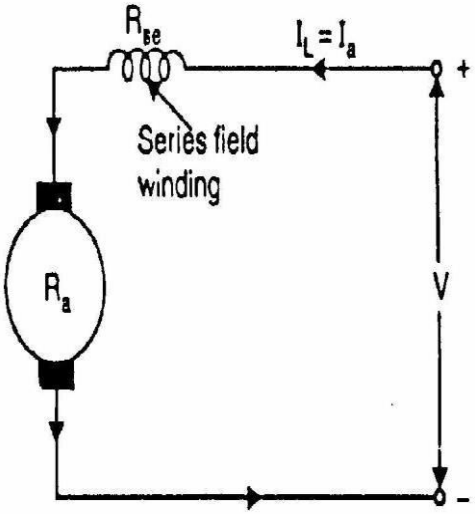
Types of D.C. Motors

Like generators, there are three types of d.c. motors characterized by the connections of field winding in relation to the armature viz.:

(i) Shunt-wound motor in which the field winding is connected in parallel with the armature [See Fig. 4.4]. The current through the shunt field winding is not the same as the armature current. Shunt field windings are designed to produce the necessary m.m.f. by means of a relatively large number of turns of wire having high resistance. Therefore, shunt field current is relatively small compared with the armature current



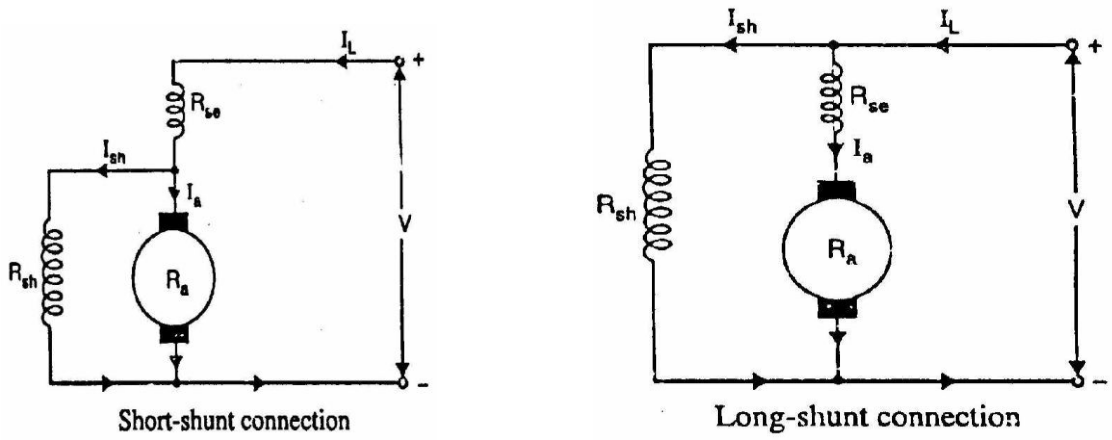
(F-8.1.7 T-shant-wound motor)



(F-8.1.7U-series-wound motor)

(ii) **Series-wound motor** in which the field winding is connected in series with the armature [See Fig. 4.5]. Therefore, series field winding carries the armature current. Since the current passing through a series field winding is the same as the armature current, series field windings must be designed with much fewer turns than shunt field windings for the same m.m.f. Therefore, a series field winding has a relatively small number of turns of thick wire and, therefore, will possess a low resistance.

(iii) **Compound-wound motor** which has two field windings; one connected in parallel with the armature and the other in series with it. There are two types of compound motor connections (like generators). When the shunt field winding is directly connected across the armature terminals [See Fig. 4.6], it is called short-shunt connection.



(F-8.1.7V-compound-wound motor)

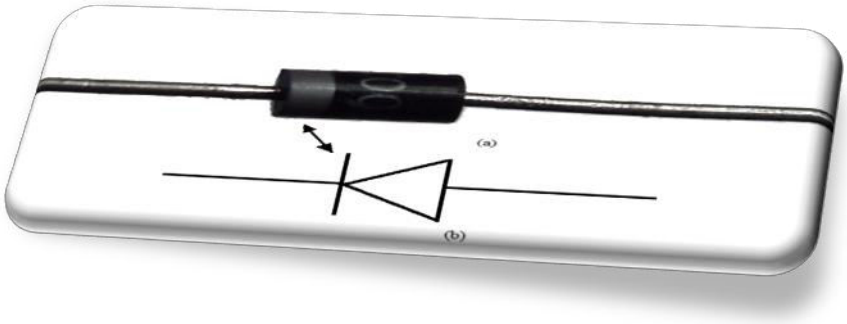
When the shunt winding is so connected that it shunts the series combination of armature and series field[See Fig. 4.7], it is called long-shunt connection .The compound machines (generators or motors) are always designed so that the flux produced by shunt field winding is considerably larger than the flux produced by the series field winding.

DC MOTORS

DC motors are widely used in industrial and consumer applications. In many cases, absolute precision in movement is not an issue, but precise speed control is. For example, a DC motor in a cassette player is expected to run at a constant speed. It does not have to run for precise increments which are fractions of a turn and stop exactly at a certain point. However, some motor applications do require precise positioning. Examples are high resolution plotters, printers, disk drives, robotics, etc. Stepper motors are frequently used in those applications.

7. Diode:

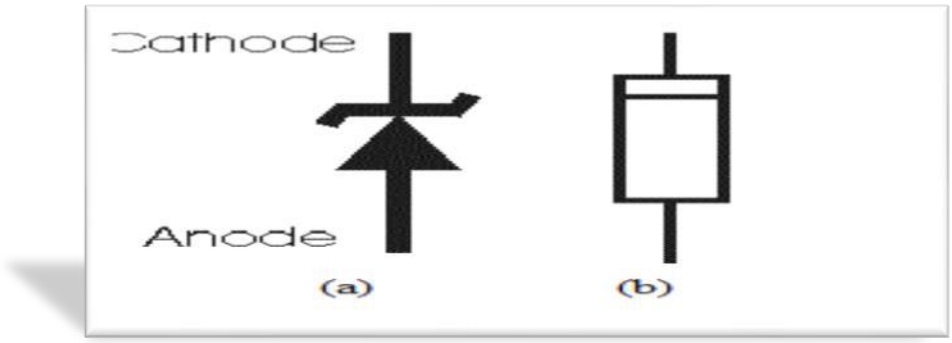
The diode is fabricated of a semiconductor material, usually silicon, which is doped with two impurities. One side is doped with a donor or n-type impurity which releases electrons into the semiconductor lattice. These electrons are not bound and are free to move about. Because there is no net charge in the donor impurity, the n-type semiconductor is electrically neutral.



(F8.1.7a- (a) Diode & (b) symbol)

8.Zener diode

Zener diodes are used to maintain a fixed voltage. They are designed to 'breakdown' in a reliable and non-destructive way so that they can be used in reverse to maintain a fixedvoltage across their terminals. The diagram shows how they are connected, with a resistor in series to limit the current.



(F-8.1.7b-(a) Symbol & (b) Zener Diode)

Zener diodes are a special type of semiconductor diode-- devices that allow current to flow in one direction only --that also allow current to flow in the opposite direction, but only when exposed to enough voltage. And while that sounds a bit esoteric, they're actually among the handiest components ever to cross an engineer's bench, providing great solutions to a number of common needs in circuit design.

9 .LED

Light-emitting diodes or .Leeds. Are now very widely used in almost every area of electronics, mainly as indicator and display devices. In effect, .solid state lamps... They're very well suited for such uses, because they are physically quite rugged and hence much more reliable than filament-type incandescent lamps. They also run much cooler and are
Much more efficient, requiring far less electrical power input for the same amount of light output. Other common uses for LEDs are as a source of either visible or infra-red light, as a carrier for data and other information over short .line of sight. Distances. A LED is basically just a specialised type of P-N junction diode, made from a thin chip of fairly heavily doped
Semiconductor material. When it is forward biased to reduce the potential barrier provided by the junction's narrow depletion layer, electrons from the semiconductor's conduction band can combine with holes from the valence band, releasing sufficient energy to produce photons of light. Because of the thin chip a reasonable number of these photons can leave it and radiate away as its light output. Unlike diodes made for detection and power rectification, which are generally made from either germanium or silicon, LEDs are made from compound semiconductor materials such as gallium arsenide (GaAs), gallium phosphide (Gap), gallium arsenide-phosphate (Gasp), silicon carbide (Sic) and gallium indium nitride (Gain).

❖ **Total image of model**

(F-8.1.7C- working model)

(F-8.1.7 d-water level indicator)

SR NO.	COMPONENT	UNIT	COST
1.	Solar cell	No.1	1800
2.	Resister		
	R1 to R9=560k	N0.9	20
	R10 to R13=12k	No.4	10
	R14 to R17=33k	No.4	10
	R18 to R24=470Ω	No.7	15
	R1=180	No.1	5
	R2=1k	No.1	5
	R3=10R,1w	No.1	5
3.	Variable resister		
	1k	No.1	10
4.	IC		
	IC1=74HC147	No.1	20
	IC2=CD4511	No.1	20
	IC3=LM317		15
5.	Transistor		
	BC 574	No.4	10
	BC 548	No.1	10
6.	LED display		
	LTS543	No.1	20
7.	D.C. series motor	No.1	200
8.	6V battery	No.1	150
9.	Diode		
	IN 4007	No.2	10
10.	Zener diode		
	ZD 6V,1W	No.1	15
	Total cost		2200

(T-8.1.7B-cost of project)

Advantage:

» It does not require electric power.
» Easy to operate and maintains.
» No fuel cost- uses abundantly available free sun light.
» Long operating life.
» Highly reliable and durable free performance.
» environment friendly, no noise, no pollution.
» Saving of conventional diesel fuel.
» one time investment, no running cost

8.1.8 Street lighting (electrical)

Street lighting design Parameters

- is the design of street lighting such that people can safely continue their travels on the road. Street lighting schemes never brings the same appearance of daylight, but provide sufficient light for people to see important objects required for traversing the road. Street lighting plays an important role in:
- Reducing the risk of night-time accidents.
- Assisting in the protection of buildings/property (discouraging vandalism).
- Discouraging crime

➢ Basic Features of Street Light Luminaires

- Roadway luminaires are mounted horizontally and thus have fixed vertical aiming.
- Roadway lighting luminaires have particular intensity distributions which are desired to light long narrow horizontal stripes on one side of the luminaire, while minimizing the intensities on the other side of the luminaire.
- The intensity distributions up and down the narrow strip are generally the same.
- Any fixed aimed luminaire which does not have this type of intensity distribution is called an area luminaire.

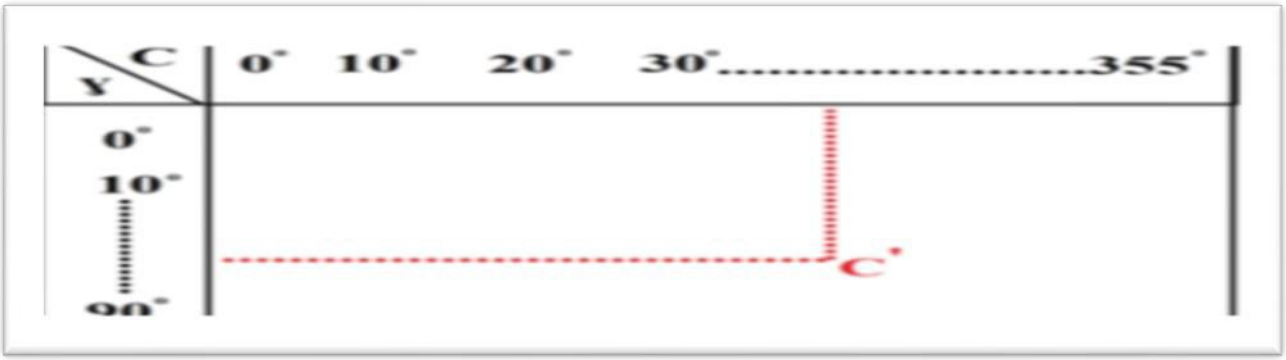
➢ Main Objectives of Street Lighting Design Scheme

- Perfect visual sensation for safety.
- Illuminated environment for quick movement of the vehicles
- Clear view of objects for comfortable movement of the road users
- Energy, mainly electrical energy is of utmost importance for developing country like India. Electricity is the basic need of any country. Today, about 88% of total electrical energy production of India is dependent on fossil fuels. The fossil fuels like coal, petroleum, etc. are not only exhaustible but they cause a lot of pollution too in the process of electricity generation. Besides this Energy generation through fossil fuels is very costly and troublesome. Keeping this in mind, it is need of time to start looking at the non-conventional sources and also the efficient utilization of electricity generated from them. To begin this at the ground level, the street lighting system, which forms the basis of infrastructure of any city is the thing which can be changed. Today, the reduction in amount of electricity used for illumination is a major concern. In particular, energy conserve

Main Factors in the Street Lighting Design Scheme

- Luminance Level Should be Proper
- Luminance always influences the contrast sensitivity of the obstructions with respect to the back ground. If the street is brighter, then darker surroundings makes the car driver adapted, unless the driver will be unable to perceive the objects in the surroundings. As per CIE, 5m away from the road on both sides will be lit by Illuminance level at least 50% of that on the road.

- To provide visual comfort to the viewer's eyes, enough luminous uniformity is needed. Luminous uniformity means the ratio between minimum luminance level to average luminance level, i.e



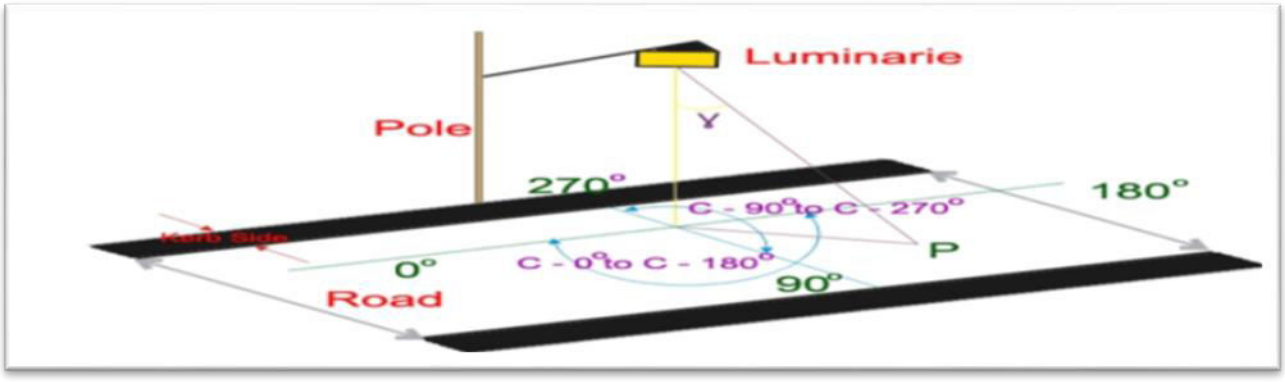
(F-8.1.8A- position of maximum intensity)

- Where, EP is the Illuminance at point P on the road and h is the vertical height from the point P to the luminaire. After calculation of the intensity, we put all
- The format of C-ɣ table is shown above. In this above chart C' is the position of maximum intensity on the table

.

➢ Type of lamp

Lamp that is used is a type of LED lights with theprovision electric power from the lamp is 200 Watt with apole height of 9 meters, either for one handlebar or twohandlebar



(F-8.1.8B-Luminar distribution)

Street light characteristics

- Pole Diameter: 48OD
- Pole Height (Ideal): 4meter
- Pole Thickness: 2.5 mm.
- Foundation Plate Size: 200/200
- Lamp type: LED
- Model: 200W (AC)
- LED Power: 200 Watt
- Light source : 6 pcs high power LED
- Voltage: 220 Vac ~ 50Hz-60Hz
- Power Efficiency:> 0.9
- LED Luminous : 100Im / Watt
- Efficiency of the Light:> 90%
- Light Color: Light Pure White / Warm
- Life Span:> 50000h
- Dimension: 740 x 242 x 142 (mm)

Determined the Angle of Inclination with a 9 Meter Road Width

- Street lighting is mounted with span, with a slope angle.The angle of inclination is to determine how many degrees ofslope of the lamp span will be installed. The tilt angle canalso determine the intensity of theheight at which the lamp isinstalled.

No	High pillar	Long of stem hand To the road 2.1 meterrs angle of Tilt(3.9)	Long of stem hand to the road 3meters angle of tilt(3m)
1	6	36.61	29.60
2	7	32.36	25.70
3	8	28.87	22.87
4	9	19.33	20.36
5	10	10.84	10.47
6	11	11.72	11.43
7	12	19.93	15.44

(T-8.1.8A-Inclination angle)

- Variations of lamp height from 6 to 12 meters aremaximized in order to select the optimum height so that the ergonomic light intensity is obtained .
- Take 9 meter height of street lighting for economical condition.

➢ **Calculation Illumination at the Lamp Point to theEnd of the Ro**

- Calculation Currents The large calculation of lights based on the selection, analysis, and needs with consideration in accordance with expectations and is not too extravagant. The magnitude of K (efficiency) of lamp with a large angle of slope ω = 4π

$$\text{Then } i = \frac{KP}{\omega} = \frac{200x100}{4\,x\,3.14\omega} = 1592.36\ \text{Cd}$$

➢ **Calculating the illumination with a 3 meters road width**:

$$r = \sqrt{9^2 + 3^2} = 9.49\ \text{meters}$$

$$\text{So Cos } \emptyset = \frac{h}{t} = \frac{9}{9.49} = 0.95$$

$$\emptyset = Cos^{-1}0.95 = 20.42^0$$

$$Er = \frac{i}{r^2}\ Cos\ \beta = \frac{1592.36}{9.49^2}\ x\ \frac{9}{9.49} = \frac{1592.36}{90}\ x\ 0.95 = 16.81\ \text{Lux}$$

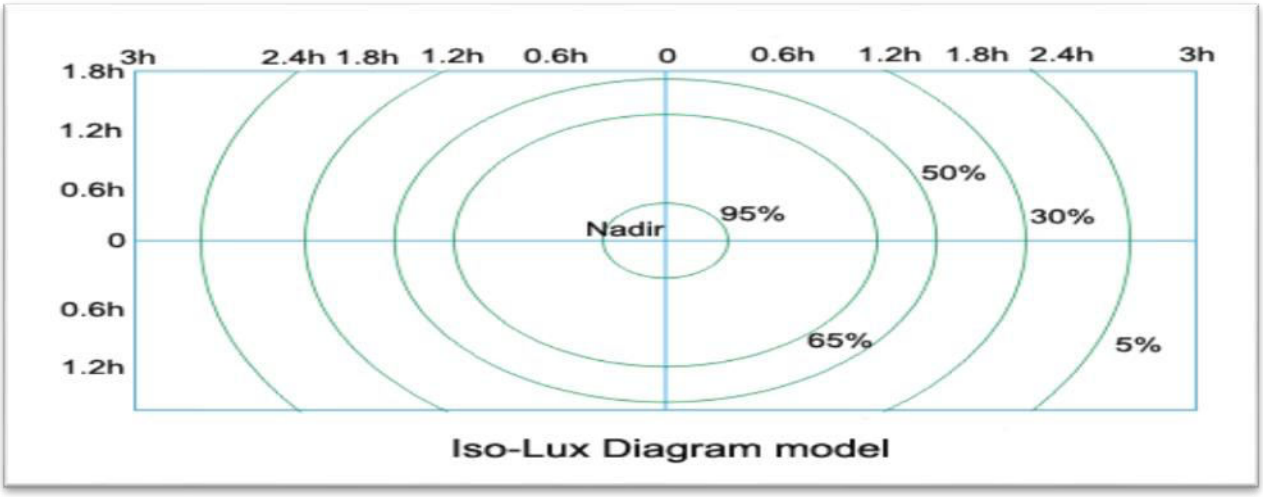
➢ **Illumination at a distance of 5 meters (r)**

$$r = \sqrt{9^2 + 5^2} = 10.29\ \text{meters}$$

$$\text{So Cos } \emptyset = \frac{h}{t} = \frac{9}{10.29} = 0.87$$

$$\emptyset = Cos^{-1}0.87 = 32.82^0$$

$$Er = \frac{i}{r^2}\ Cos\ \beta = \frac{1592.36}{10.29^2}\ x\ \frac{9}{10.29} = \frac{1592.36}{105.88}\ x\ 0.87 = 13.08\ \text{Lux}$$



(F-8.1.8C lux diagram model)

- **Number of Lamp Points Required At 35 MetersDistance**

$$B = \frac{l}{s} + 1 = \frac{1500}{35} + 1 = 44$$

- So the number of light points needed is 44 point lights.For public road with length of 1500 meters can be installed lamps with a distance of 35 meters as many as 44 pieces of light poles. Lamp that will be installed as many as 44 pieces with a distance of 35 meters is the result of calculations in the field. The results of this analysis may change in accordance with the common wish between thecommunity and the government. But this change will notwiden the distance but can be changed by minimizing thedistance, because the intensity obtained is the maximum intensity.

- **Power used 44 pieces of light = 44 x 200 = 8800 Watt.**

$$I_n = \frac{P}{V\ Cos\ \emptyset} = \frac{44x200}{220\ x\ 0.85} = 47.06\ A$$

$$I_{rating} = K\ x\ I_n = 125\%\ x\ I_n = 125\%\ x\ 47/06 = 58.82\ A$$

- **Current APP rating flows is are**

$$I_n = \frac{P_{total}}{\sqrt{3}\ V\ Cos\emptyset} = \frac{200\ x\ 44}{\sqrt{3}\ x\ 380\ x\ 0.85} = 8.68\ A$$

- **Flows rating on APP for,**

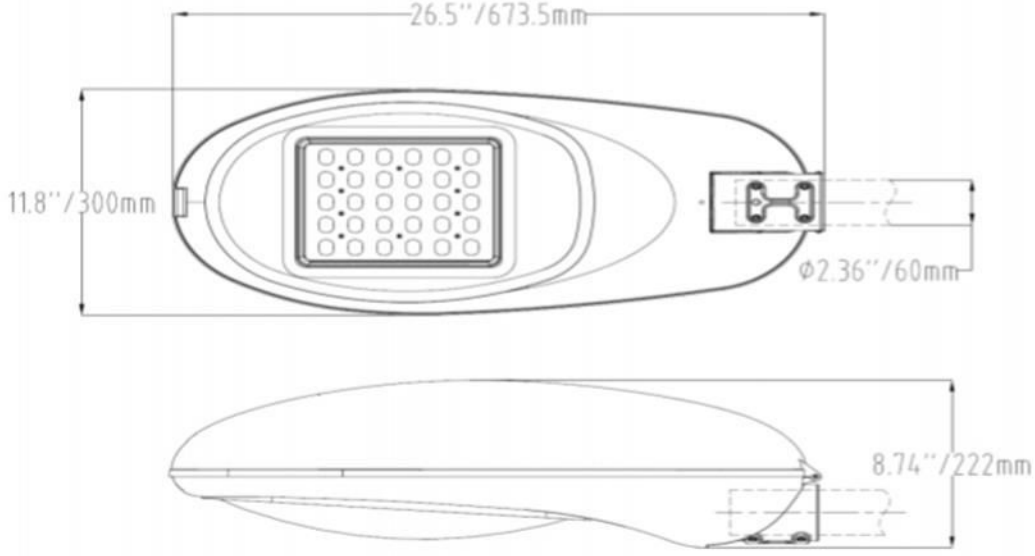
$$I_{rating} = K \times I_{n} = 125\% \times 8.68\ A = 10.84\ A$$

Specifications

Luminaire input voltage	DC 12V/24V
Power consumption	20W/30W/40W
Lumen output	2110/2880/3900 lumens
Color temperature	4300K~6200K
IES lighting type	Type II
Material	High pressure die-cast aluminum
Lens	5mm toughened glass, optical grade PMMA
IP class	IP 65
Insulation	Class I
Operating temperature	-30°C ~+50°C/ -22°F ~+122°F
LED Performance	≥120 lumens/watt
CRI	≥70
Fitting performance	≥95

Weight: **8.3 kg/ 18.3 lb.**

Dimensions:



➢ Street Light Cost Estimate

Solar LED street light price starts from Rs.12,000 to Rs. 50,000 and its rating starts from 9 watt to 60 watt. Generally, solar street light's price depend on the rating, solar brands and quality of solar panel, LED bulb, solar battery, luminary and pole.Solar street light is used to light Streets, Highways, Parks, Gardens, and To Secure Boundary Walls of a Factory, School, and College Campus, National Highway Roads, Parking Areas, Public Places in Villages such as Temples, Rivers, etc. do not get appropriate electricity as they are connected with the grid. Solar street light is a boon for such places.

To find the total cost of the load used by 44 lamps per month is the calculation

Load rate of PJU = (40 (flash time) xconnected power x usage cost per(KWH)

(Table 14-Street Light Cost Estimate)

No.	Number of pole	Number of zone	Power of electricity (Kwh)	Basic electricity traffic (TDL)(Rp/Kwh)	Total electricity traffic(Rp)
1	T20	1	1694.12	1049	1777131.88
2	T20	1	1694.12	1049	1777131.88
3	T4	1	338.82	1049	35522.18
Total Cost 2309685.94					

(T-8.1.8B- cost estimate)

The operational cost of conventional PJU (Public StreetLighting) is monthly electricity bill (load charge + electricityusage rate) to be paid. So the monthly electricity bill is:

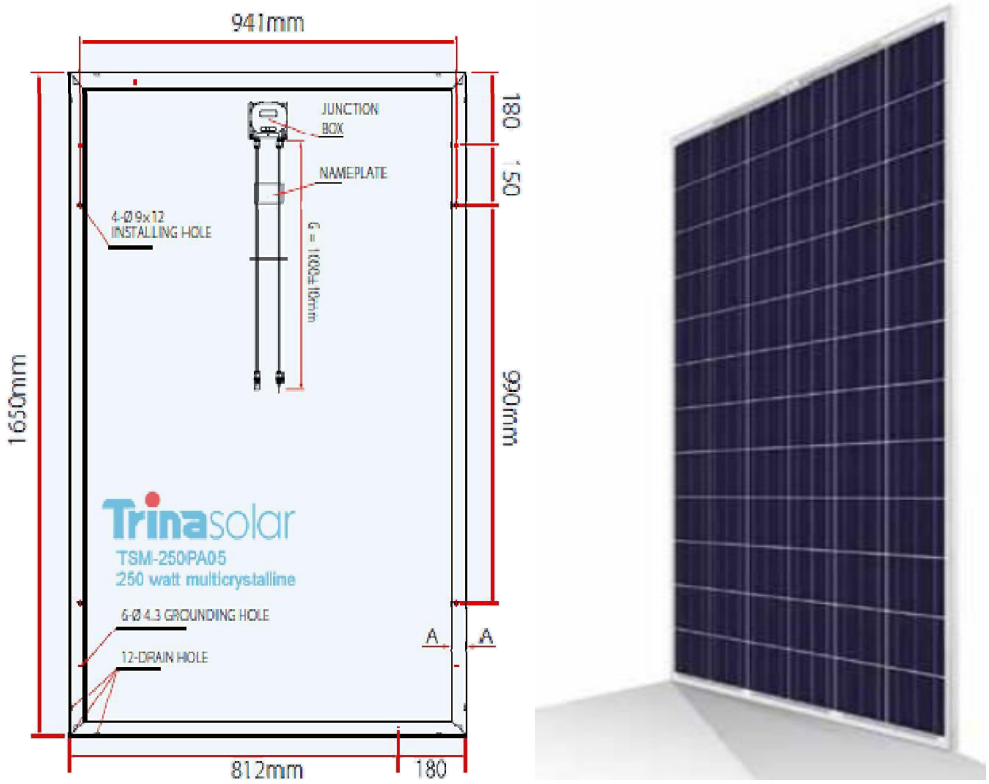
Total operational cost /month = Rs. 2,309,685.94 + Rs.1,846,240
= Rs. 4,155,925.94,
Total operational cost / year = Rs. 4,155,925.94 x 12
=49,871,111.28,

8.1.9 Roof top solar (electrical)

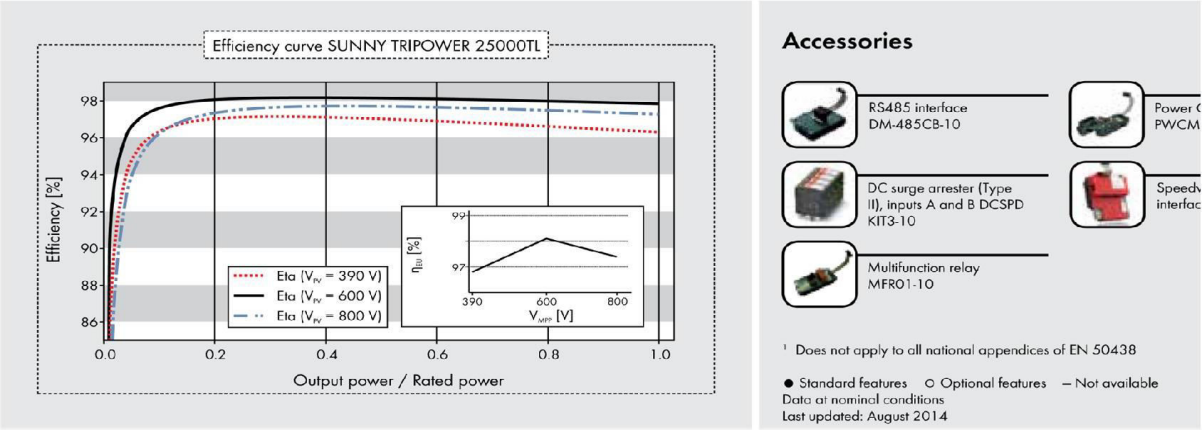
Introduction

Energy plays a pivotal role in our daily activities. The degree of development and civilization of a country is measured by the amount of utilization of energy by human beings. Energy demand is increasing day by day due to increase in population, urbanization and industrialization. The world's fossil fuel supply viz. coal, petroleum and natural gas will thus be depleted in a few hundred years. The rate of energy consumption increasing, supply is depleting resulting in inflation and energy shortage. This is called energy crisis. Hence alternative or renewable sources of energy have to be developed to meet future energy requirement.

Wiring Diagram for Grid-Connected Solar System

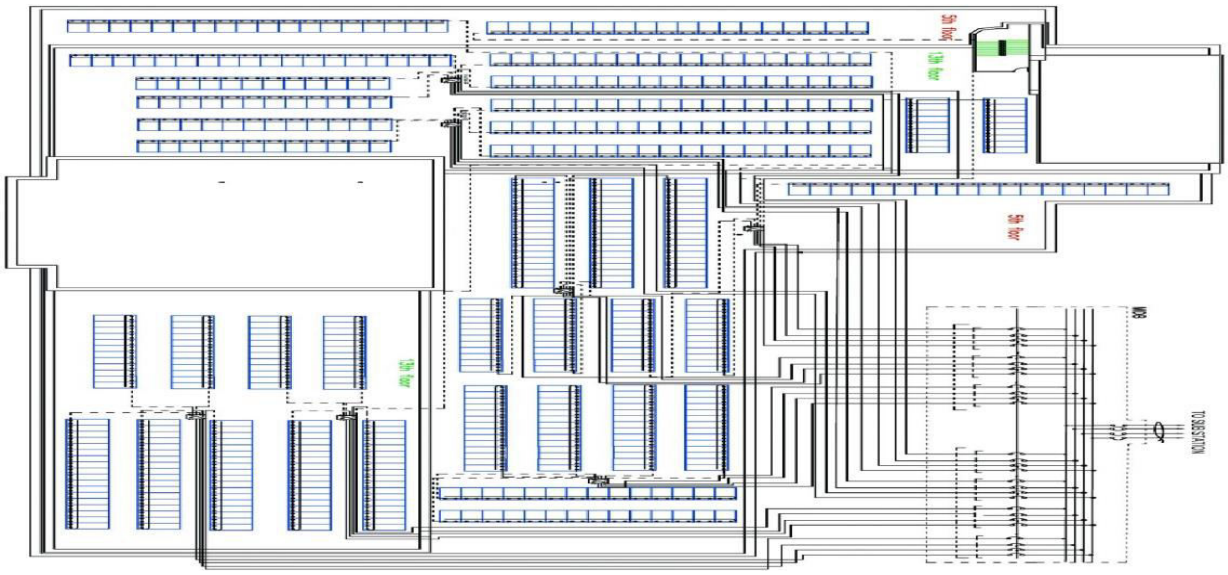


(F-8.1.9-A - Grid diagram)



(F-8.1.9B-Output diagram)

DESIGN LAYOUT BY AUOTOCAD



(F-8.1.9C Wiring diagram)

CALCULATIONS

1. **Plant Capacity Calculation**
   - For TSM PC-14 Solar Panel,
   - Peak power watts, Pmax= 295 W
   - Plant Capacity =(496.8 × 295)
     = 146.556 ≈ 150
   - The Energy = plant capacity * plant efficiency
     Operating Time
     = 150* 0.85 Kwh/ day =28.333 Kwh/ day
     4.5
2. **DC Output Power Calculation**

- Selected Utility Module of Solar panel is TSM PC-14
- Peak Power watts , Pmax=295 Wp
- Maximum Power Voltage, Vmp= 36.6 V

3. Output AC power Calculation :

- Number of strings =3
- PV modules per string=18

So, the peak power (DC) of input A is

= (3 × 18) =15.93 Kw/h

4. Output Current Calculation

- L = p/(vcosq) =27.44/3*230*v*0.8= 87A

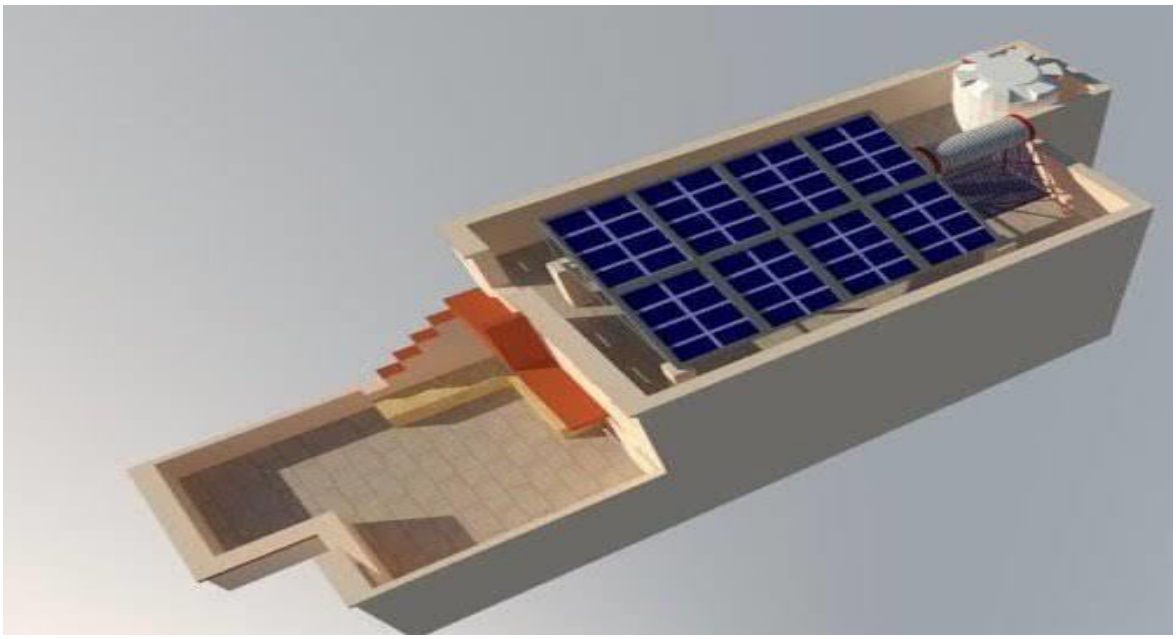
5. **Circuit Breaker Rating Calculation** :

For circuit breaker design, taking 20% overcurrent margin, the output AC current of each line becomes = (87 × 1.2)A

= 104.4A

6. Wire Length Calculation

1×4 NYY DC Cable for the connection between the solar panels and the Inverters.



(F-8.1 .9E Model Of Roof Top Solar)

Costing of solar panel

Serial No.	Component	Quantity	Value	Unit
1	Solar Panel	552 pieces	73226.89	Rs.
2	Inverter	7 pieces	20400.79	Rs.
3	Cable	4920 pieces	3220	Rs.
4	Circuit breaker	32 pieces	1457.57	Rs.
5	MDB		2571.98	Rs.
6	earthing		8573.27	Rs.
				Rs.
		Total cost	**1,09445**	Rs.

(T-8.1.9A- costing of solar)

8.2 Reason for Students Recommending this Design:

- ATM - to provide flexibility of urgent cash requirements to the villagers
- Pharmacy Store - to satisfy the requirements of medicines to the public
- Community hall - to organize events easily for the villagers
- Supermarket - to provide extra feasibility to the public
- Cybercafe - to provide a source of internet as a smart village concept
- Entrance gate – for the better aesthetic of the village main entrance

8.3 About designs Suggestions / Benefit of the villagers:

1.ATM

The population of Subir village is 2097 as per 2011 census. So it is required to have one ATM in the village. The villagers have to go in Unai village for cash requirement so that we have decided and finalized the design of ATM.

2.Pharmacy Store :

In the Subir village there is no any PHC or dispensary or private clinic or pharmacy store. So according to the feedback given by the villagers, one dispensary or pharmacy store should be there in the village.

3.Supermarket :

By designing the supermarket in the Subir, many needs of the villagers will be satisfied. Supermarket is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections.

4.Entrance Gate :

The Subir village has no main entrance gate at the village approach road. So that we have designed the village entrance gate as heritage village design.

5.Community Hall :

There is no Community hall in the Subir village. Community hall is a public location where members of a community gather for group activities, events, festivals and social purpose. A community hall of village generally consists of a hall , storage or kitchen area and washroom.

6.Entrance Gate :

The SUBIR village has no main entrance gate at the village approach road. So that we have designed the village entrance gate as heritage village design.

7.Solar street lighting:

Provide better night visibility in the village for the villagers

8.Solar pumping system:

It reduce electrical bill of meter of pumping moter.

9.Rooftop solar:

It gives additional power while electricity power has gone.

Maintenance can help:

- Prevent the process of decay and degradation.
- Maintain structural stability and safety.
- Prevent unnecessary damage from the weather or from general usage.
- Optimise performance.
- Determine the causes of defects and so help prevent re-occurrence or repetition.
- Ensure continued compliance with statutory requirements.

Common maintenance tasks include:

- Exterior and plastering.
- Landscaping and gardening.
- Paving repairs.
- Window and door repairs.
- Debris/rubbish removal and clearance.
- Jet washing with chemical cleaning agents to remove fungal stain or mould.
- Gutter clearance and repair.
- Carpentry.
- Lighting repairs.

Chepter- 9:Proposing designs for Future Development of the Village for The PART-2 Design

Civil concept

1.Sustainable design : Rainwaterharvesting

An additional source of water will be available which could be used at the time of emergency or water shortage by implementing the Rain Water Harvesting system in the village households.

2.Physical design : SolidWasteManagement

Currently the villagers are dumping their solid waste at outer part of the village and burn it at a specific location. By that air pollution will increase and waste collection is not done regularly so that solid waste management system should be there in the villagefor cleanliness andsafeenvironment

.

3.Socio-Cultural design : SkillDevelopmentCenter

There is no any child development or maternity home or skill development center in the Subir village but for the better development of students and children there should be one skill development center in the village.

4.Smart village design : Bank

For the smart development of the Subir village we have proposed the smart concepts as the bank.

5.Heritage village design : Tourist service center

In the Subir village there is no any recreational area existing. There is no any tourist service center in the subir village so that for the better operation of the tourism we decide to design the tourist service center.

6.water tank:

For the smart development of the Subir village we have proposed the smart concepts as the water tank..

Electrical concept:

1.Home automation system: For the smart development of the Subir village we have proposed the smart concepts as Home automation system.

2.Energy harvesting: For village development we design resources of energy harvesting.

3.Plant moisture Monitoring:

Soil moisture sensors aid good irrigation management. Good irrigation management gives better crops uses fewer inputs and increase profibility.

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

We have visited the allocated village unai and that visit helped us to know about the type of infrastructure needed by the village. With help of techno-economic survey and gap analysis and also studying / surveying our allocated village Ahwa , we were able to broadly define requirements of development for people of Subir village. Then we have visited the smart village PUNSARI and by that visit we better understood the smart technologies and concepts as smart development of our allocatedvillageSubir.

In the Subir village, the basic requirements like community hall, any recreational area, bank, etc. were not existing. By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area which will in turn reduce pressure on cities.

The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make arealdifference.

Students who want to work towards preservation of rural soul of country can do many things for our own good and environment. By implanting given design proposals, we can say that all the missing amenities are provided will stop the migration of rural people towards the urban area. This can cause reduce the load on urban areas as well as pollution in both sector can be minimized gradually.

Chepter-11:References refereed for this project

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Chapter 12.Annexure attachment

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

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase IV
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

Ideal Village Survey

An approach towards Rurbanisation for Village Development

Name of Village:	Unai
Name of Taluka:	Vansda
Name of District:	Navsari
Name of Institute:	SRI college Vadagama.
Nodal Officer Name & Contact Detail:	Prof Devang Gajjar Prof Anand Acharya
Respondent Name: (Sarpanch/ Panchayat Member / Teacher/ Gram Sevak)	Jyotiben M. Patel
Date of Survey:	20/10/2020

1. Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	-	-	-	-
ii)	2011	6,104	3,069	3,035	1,187

2. Geographical Detail:

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	308 Hectares (Approx) 20.841048 , 73.337638
	Forest Area (In hect.)	–
	Agricultural Land Area (In hect.)	–
	Residential Area (In hect.)	–
	Other Area (In hect.)	–
	Water bodies	–
	Nearest Town with Distance:	Vansda (12km)

Gujarat Technological University, Ahmedabad, Gujarat

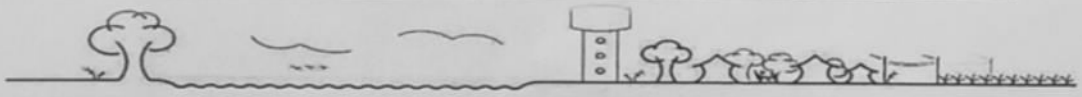
Vishwakarma Yojana: Phase IV
Techno Economic Survey

3. **Occupational Details:**

Name of Three Major Occupation groups in Village	1. Shopkeepers 2. Private / Government Job 3. Labour / workers

4. **Physical Infrastructure Facilities:**

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



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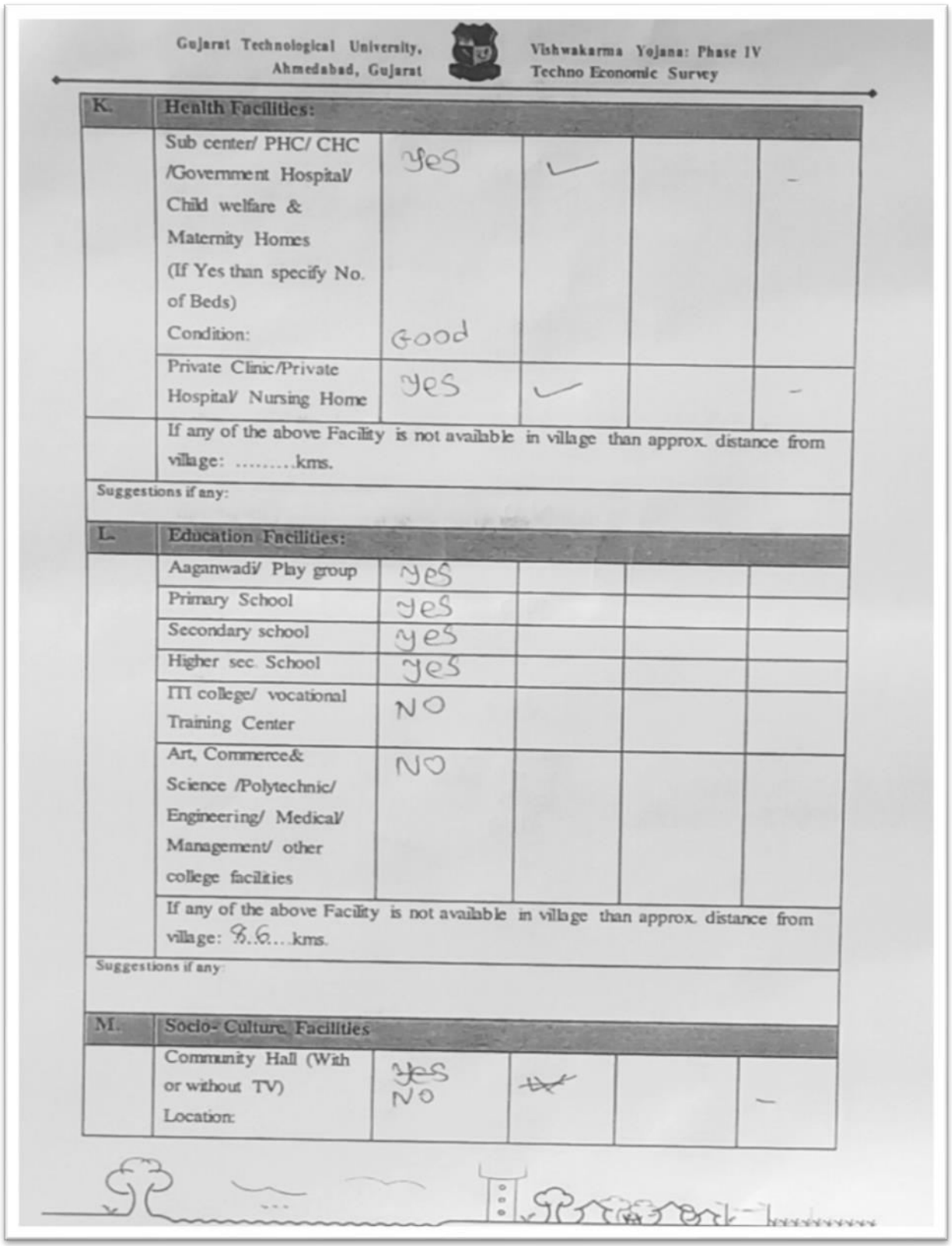
Vishwakarma Yojana: Phase IV
Techno Economic Survey

E.	Road Network: All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	WBM	✓		–
	Main road	CC/RCC	✓		–
	Internal streets	CC/RCC	✓		–
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 53 GJSH 5	✓		–
Suggestions if any:					
F.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	yes		✓	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	yes Good	✓		–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	yes	✓		–
Suggestions if any:					
G.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	yes	✓		–
	Power supply for Domestic Use	yes	✓		–
	Power supply for Agricultural Use	NO			–
	Power supply for Commercial Use	NO			–
	Road/ Street Lights	yes	✓		–

	Electrification in Government Buildings/ Schools/ Hospitals	YES	✓		-
	Renewable Energy Source Facilities (Y/ N)	NO			-
	LED Facilities	NO			-
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	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	Workers are enabled	✓		-
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	River	✓		-
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	PUCCA (94.20%)	✓		-

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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Vishwakarma Yojana: Phase IV
Techno Economic Survey

K.	Health Facilities:				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes Good	✓		-
	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	Yes			
	Higher sec. School	Yes			
	ITI college/ vocational Training Center	NO			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	NO			
	If any of the above Facility is not available in village than approx. distance from village: 8.6...kms.				
Suggestions if any:					

M.	Socio- Culture Facilities				
	Community Hall (With or without TV) Location:	Yes NO	~~✓~~		-

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	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			-
	Public Garden Location: Condition:	No			-
	Village Pond Location: Condition:	yes GJSHS Good	✓		-
	Recreation Center Location: Condition:	No			-
	Cinema/ Video Hall Location: Condition:	No			-
	Assembly Polling Station Location: Condition:	yes Navjivan Vidya Kiran School Good	✓		-
	Birth & Death Registration Office Location: Condition:	yes Good	✓		-

If any of the above Facility is not available in village than approx. distance from village: 5.2.....**kms.**

Suggestions if any:

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

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

6. Sustainable /Green Infrastructure Facilities:

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

7. Data Collection From Village

Village Base Map Available: Hard Copy/Soft Copy	NO

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Techno Economic Survey

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

8. Additional Information/ Requirement:

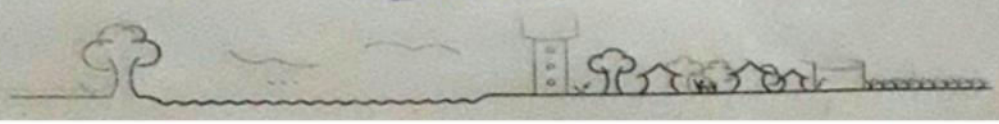
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Existing infrastructure are in good condition	—
2.	Additional Information/ Requirement	NO	—
		—	—
		—	—

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

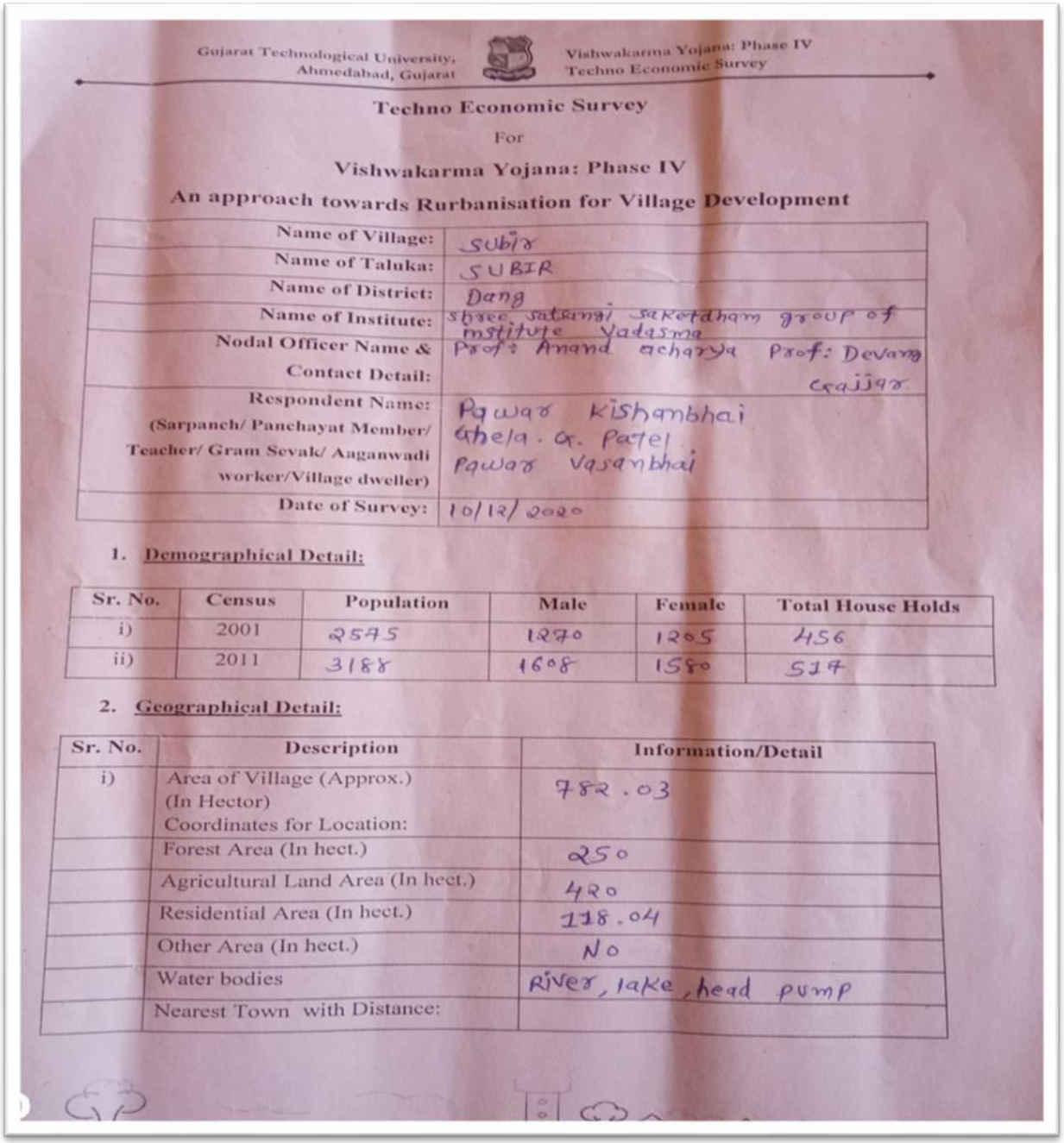
For Any Technical queries/ Difficulties:
Ms Jagruti Shah, OSD
Contact no. 9978980170

For Any Administration queries/ Difficulties:
Ms. Darshana Chauhan, OSD
Contact No. 9909944891

Email ID: rurban@gtu.edu.in



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



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase IV
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase IV

An approach towards Rurbanisation for Village Development

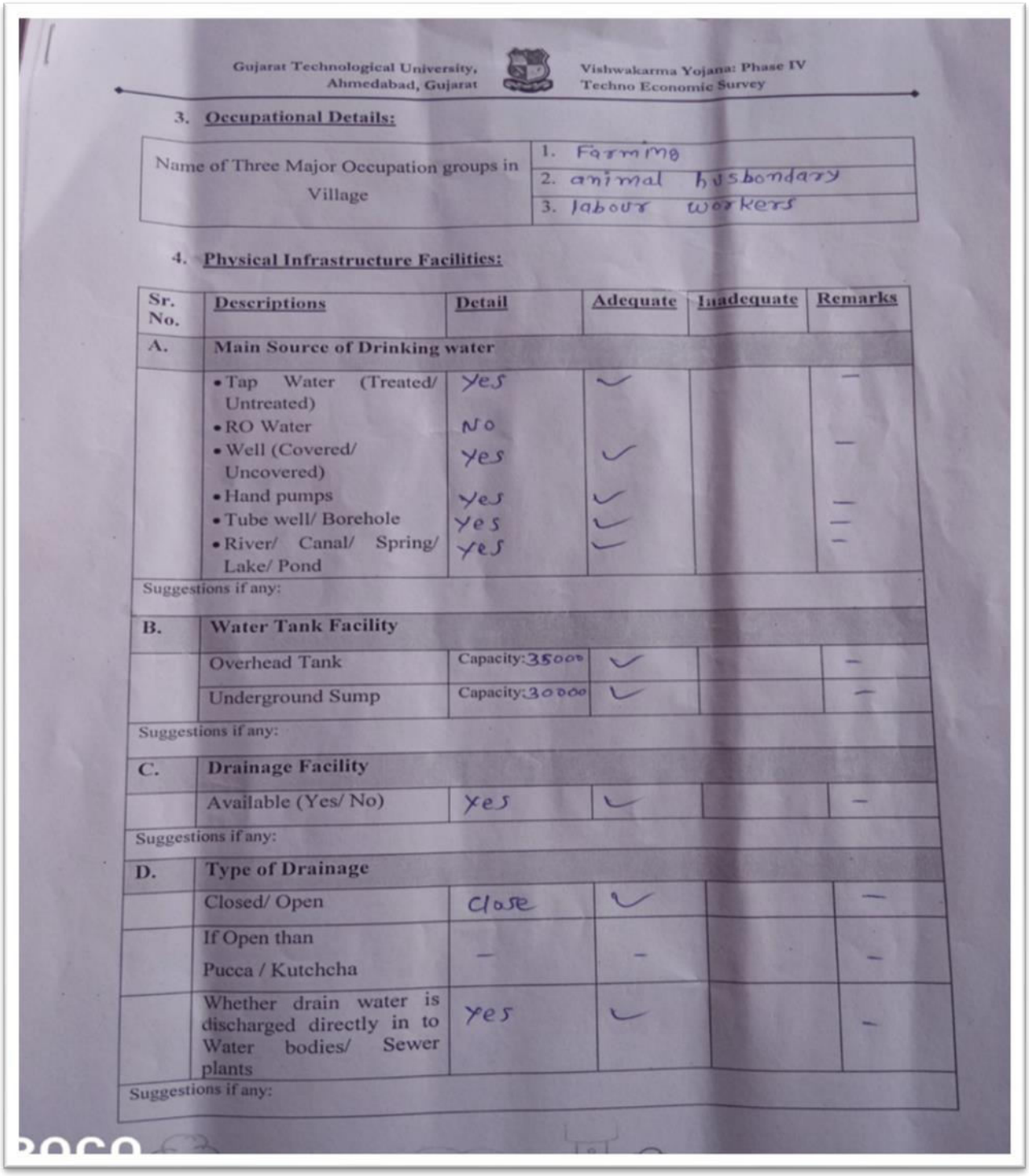
Name of Village:	Subir
Name of Taluka:	SUBIR
Name of District:	Dang
Name of Institute:	Shree satsangi saketdham group of institute Vadasma
Nodal Officer Name & Contact Detail:	Prof: Anand acharya Prof: Devang Gajjar
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Pawar Kishanbhai Chela. G. Patel Pawar Vasanbhai
Date of Survey:	10/12/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	2575	1270	1205	456
ii)	2011	3188	1608	1580	517

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	782.03
	Forest Area (In hect.)	250
	Agricultural Land Area (In hect.)	420
	Residential Area (In hect.)	118.04
	Other Area (In hect.)	No
	Water bodies	River, lake, head pump
	Nearest Town with Distance:	



Gujarat Technological University, Ahmedabad, Gujarat

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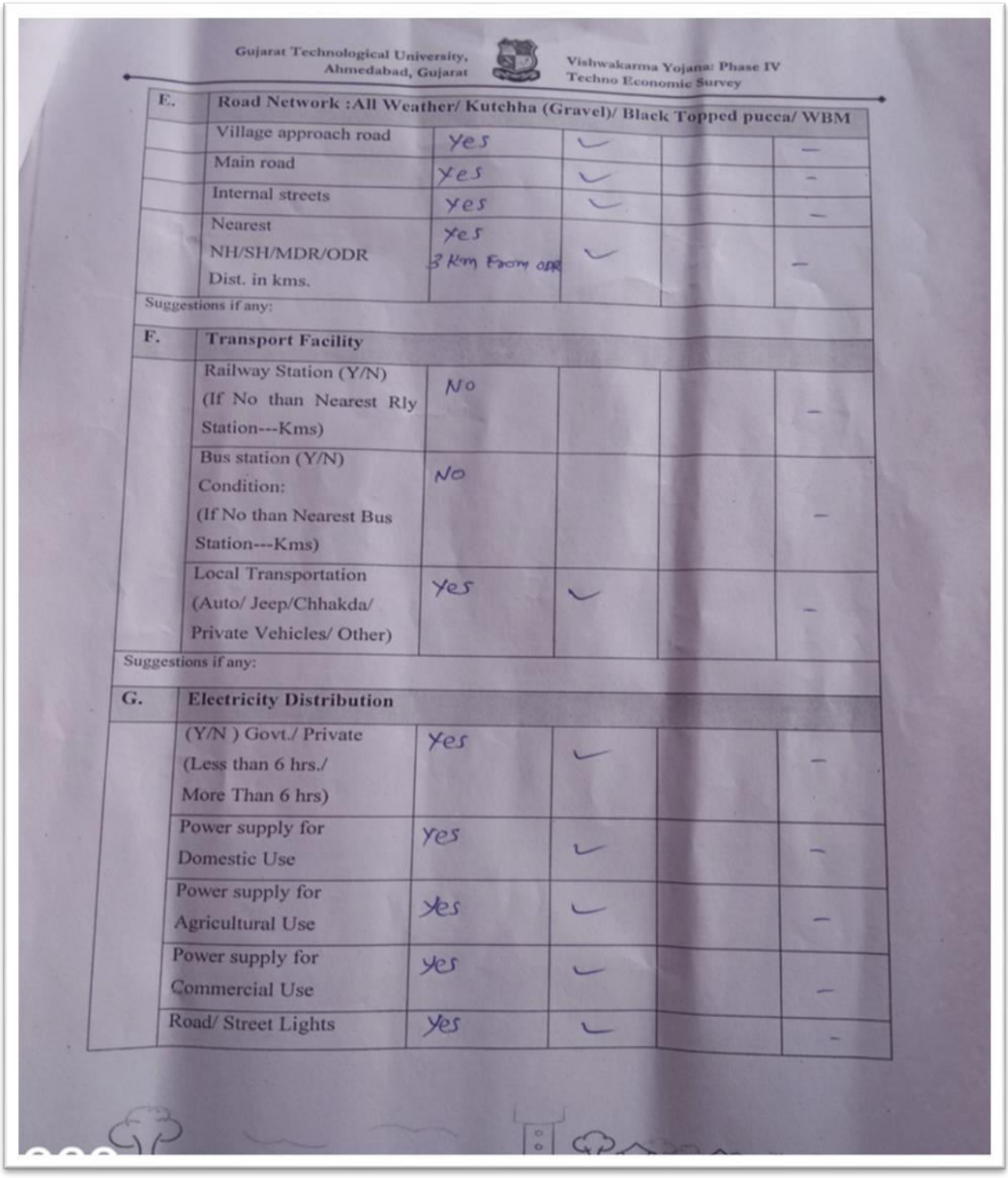
Techno Economic Survey

3. **Occupational Details:**

Name of Three Major Occupation groups in Village	1. Farming 2. animal husbandary 3. labour workers

4. **Physical Infrastructure Facilities:**

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Yes	✓		–
	• RO Water	No			
	• Well (Covered/ Uncovered)	Yes	✓		–
	• Hand pumps	Yes	✓		–
	• Tube well/ Borehole	Yes	✓		–
	• River/ Canal/ Spring/ Lake/ Pond	Yes	✓		–
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 35000	✓		–
	Underground Sump	Capacity: 30000	✓		–
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓		–
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	Close	✓		–
	If Open than Pucca / Kutchcha	–	–		–
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Yes	✓		–
Suggestions if any:					



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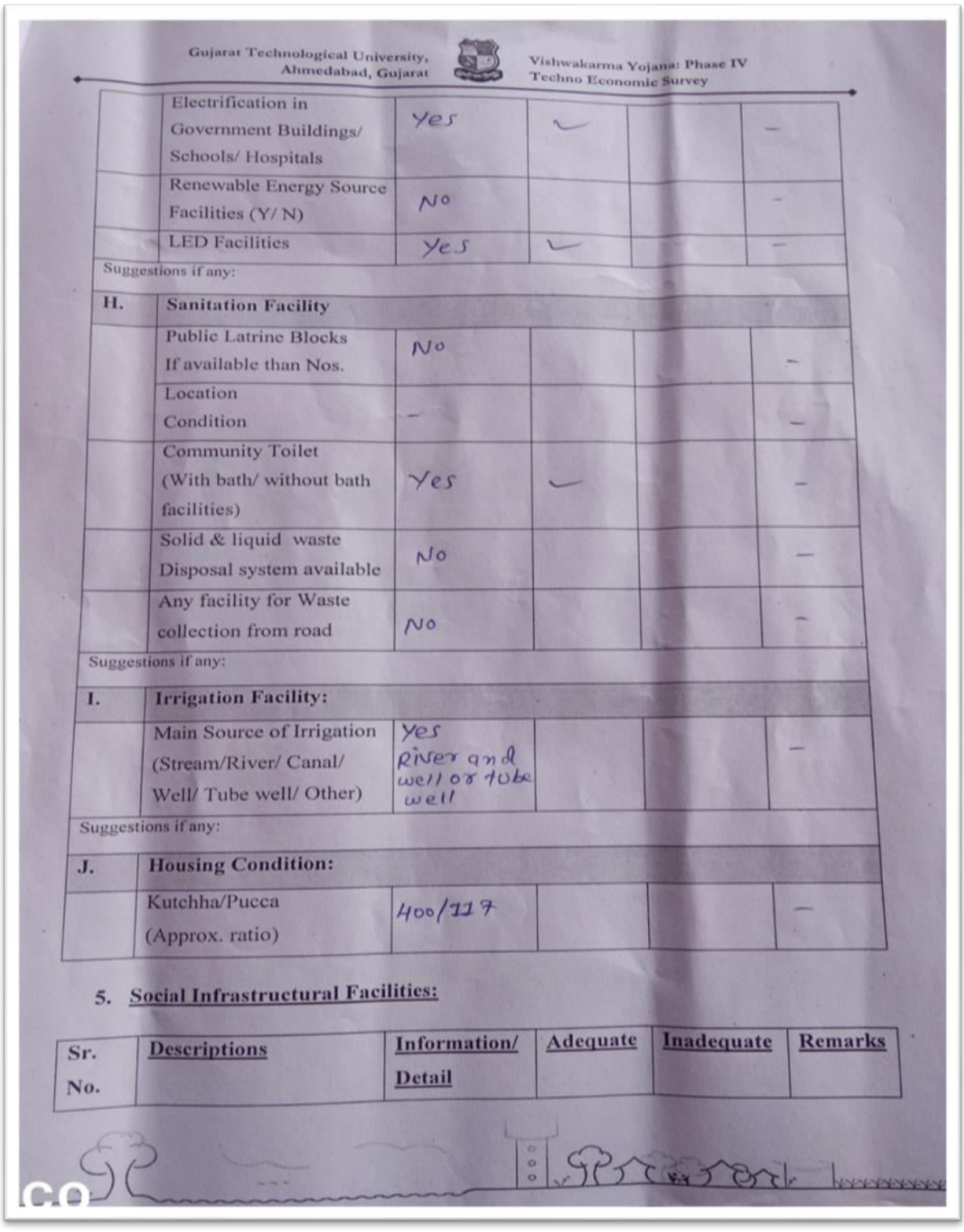
Vishwakarma Yojana: Phase IV
Techno Economic Survey

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



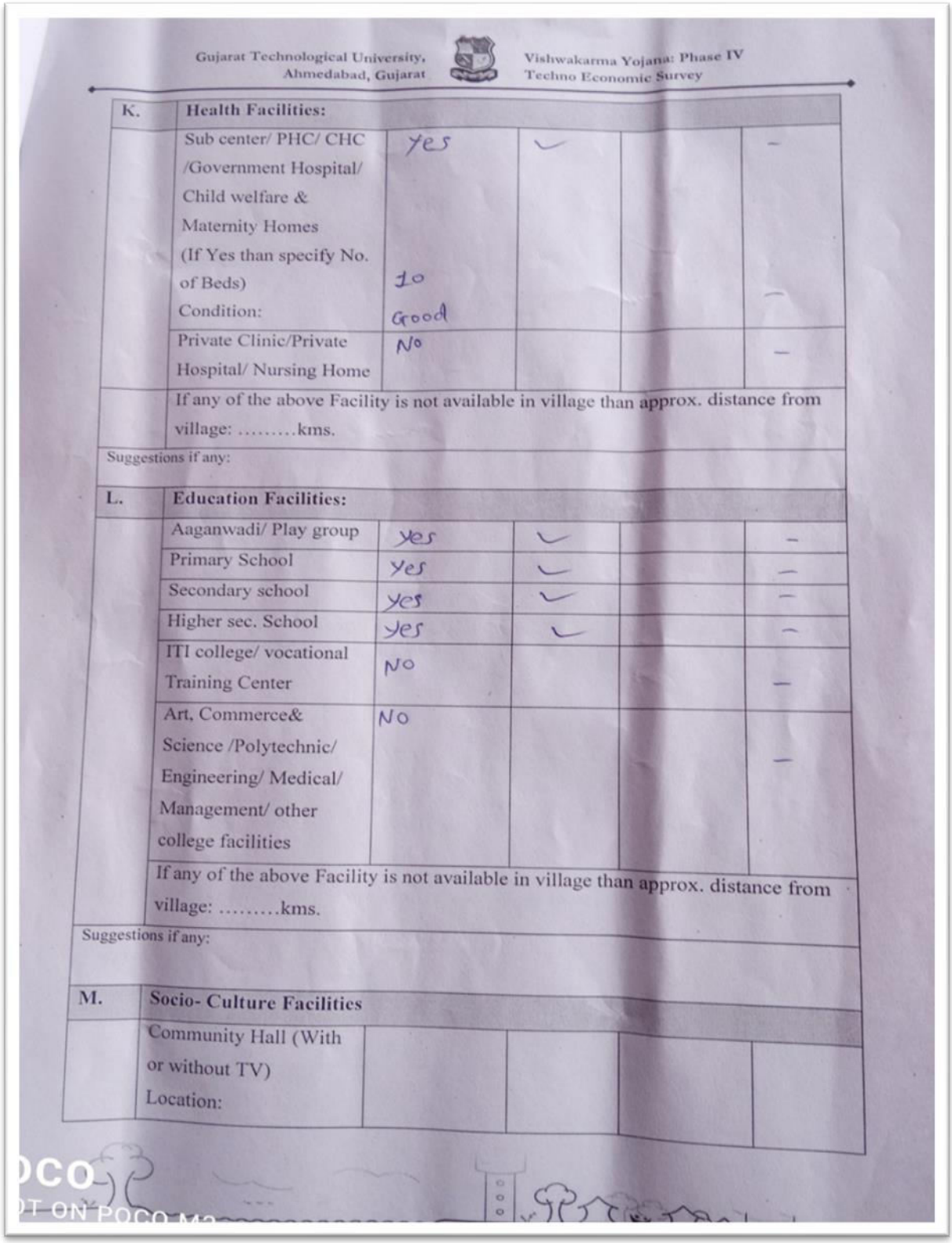
Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase IV
Techno Economic Survey

	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		–
	Renewable Energy Source Facilities (Y/ N)	No			–
	LED Facilities	Yes	✓		–
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No			–
	Location Condition	–			–
	Community Toilet (With bath/ without bath facilities)	Yes	✓		–
	Solid & liquid waste Disposal system available	No			–
	Any facility for Waste collection from road	No			–
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Yes River and well or tube well			–
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	400/117			–

5. Social Infrastructural Facilities:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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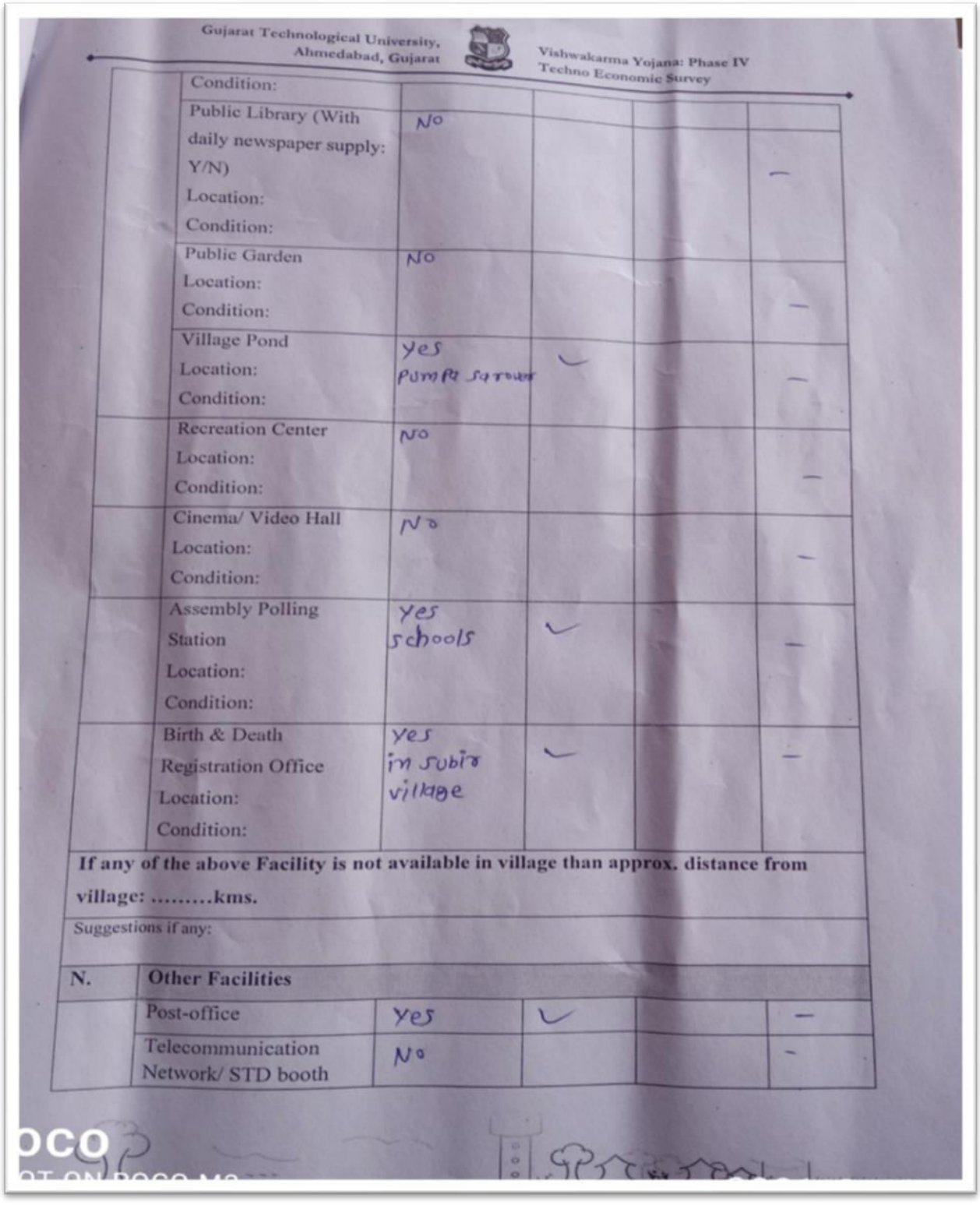
Vishwakarma Yojana: Phase IV
Techno Economic Survey

K.	Health Facilities:				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes 10 Good	✓		–
	Private Clinic/Private Hospital/ Nursing Home	No			–
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					

L.	Education Facilities:				
	Aaganwadi/ Play group	Yes	✓		–
	Primary School	Yes	✓		–
	Secondary school	Yes	✓		–
	Higher sec. School	Yes	✓		–
	ITI college/ vocational Training Center	No			–
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			–
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					

M.	Socio- Culture Facilities				
	Community Hall (With or without TV) Location:				



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase IV
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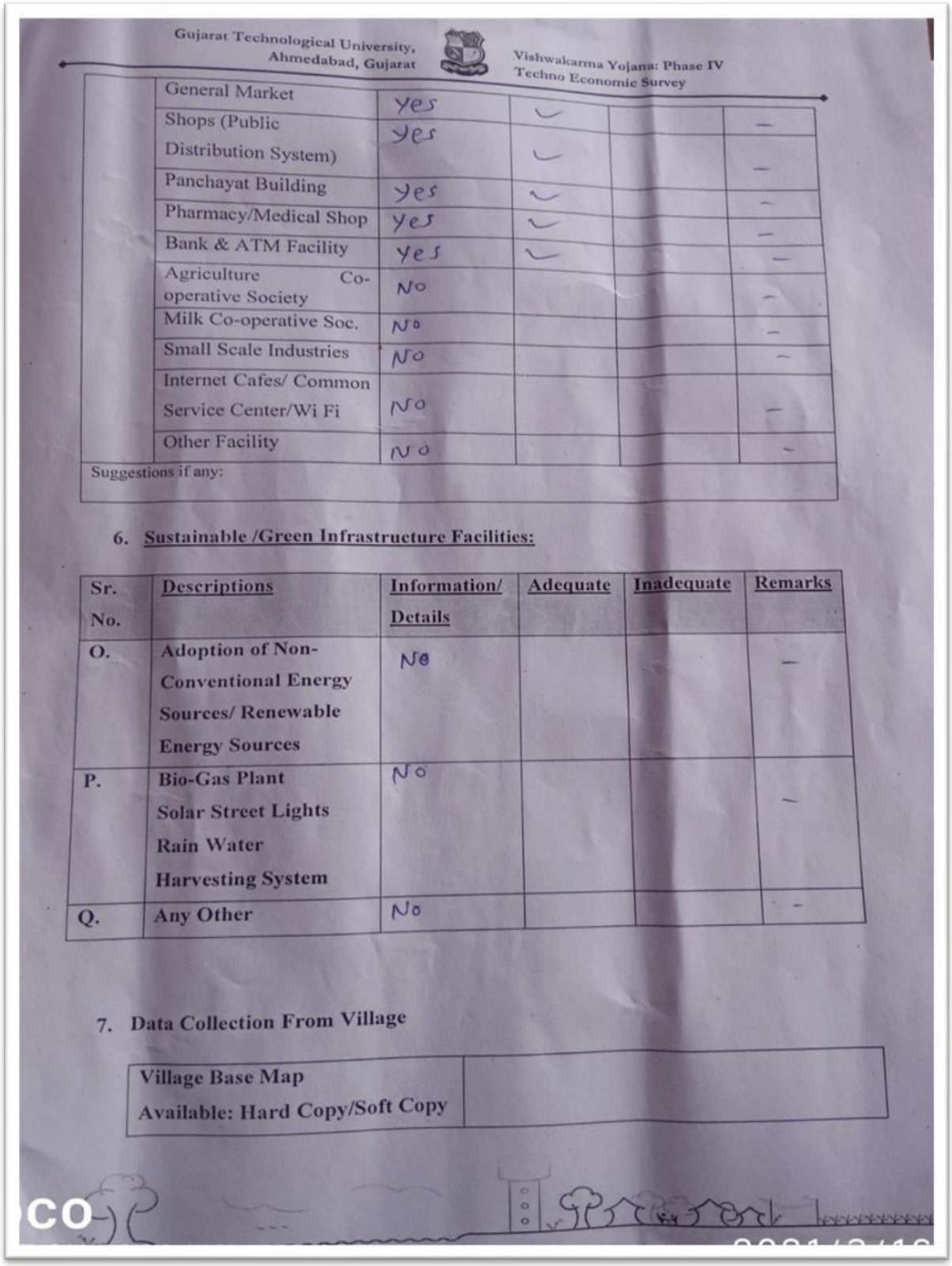
	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			–
	Public Garden Location: Condition:	No			–
	Village Pond Location: Condition:	Yes Pump Sarovar	✓		–
	Recreation Center Location: Condition:	No			–
	Cinema/ Video Hall Location: Condition:	No			–
	Assembly Polling Station Location: Condition:	Yes schools	✓		–
	Birth & Death Registration Office Location: Condition:	Yes in subir village	✓		–

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

Suggestions if any:

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



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Vishwakarma Yojana: Phase IV
Techno Economic Survey

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

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	

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Vishwakarma Yojana: Phase IV
Techno Economic Survey

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

2. 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 Requir	Some facilities require improvement and repairs
2.	Additional Information/ Requirement		

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 Technical queries/ Difficulties:
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Contact no. 9978980170

For Any Administration queries/ Difficulties:
Ms. Darshana Chauhan, OSD
Contact No. 9909944891

Email ID: rurban@gtu.edu.in

12.3 Gape Analysis of allocate village

VILLAGE GAP Analysis					
Village Facilities	Planning Commission/UDPFI Norms	Village Name :	Subir		
		Population:3188			
		Existing	Required as per Norms	Smart Village / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	2	1	-	+1
Primary School	Each Per 2500 population	1	1	-	0
Secondary School	Per 7,500 population	1	0	-	0
Higher Secondary School	Per 15,000 Population	1	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	1	0	-	+1
Skill Development Center	Per 100000 Population	0	0	-	0
Health Facility				-	
Govt/Panchayat Dispensary or Sub PHC or Health Centre	Each Village	1	1	-	0
Primary Health & Child Health Center	Per 20,000 population	1	0	-	0
Child Welfare and Maternity Home	Per 10,000 population	0	0	-	0
Multispecialty Hospital	Per 100000 Population	1	0	-	0

Public Latrines	1 for 50 families (if toilet is not there in home, especially for slum pockets & kutcha house)	0	1	-	-1
Physical Infrastructure Facilities					
Transportation		Adequate		-	-
Pucca Village Approach Road	Each village	Adequate	2 km approach road	-	-
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	Inadequate	Pickup stand at main highway of ahwa	-	-
Drinking Water (Minimum 70 lpcd)		Adequate	-	-	-
Over Head Tank	1/3 of Total Demand	Adequate	2	1	
U/G Sump	2/3 of Total Demand	Adequate	5	1	0
Drainage Network - Open		Adequate	30% open	-	-
Drainage Network - Cover		Adequate	70% covered	-	-
Waste Management System		Inadequate	-	-	-
In Socio- Cultural ilities frastructure Fac					
Community Hall	Per 10000 Population	0	1	-	-1
Public Library	Per 15000 Population	0	0	-	0
Cremation Ground	Per 20,000 population	0	1	-	-1
Post Office	Per 10,000 population	1	1	-	0
Gram Panchayat Building	Each individual/group panchayat	1	1	-	0
APMC	Per 100000 Population	0	0	-	0

Fire Station	Per 100000 Population	0	0	-	0
Public Garden	Per village	0	1	-	-1
Shopping Mall : Shops are available in village					
Electrical Design					
Elecrical power station					

(T-12.1A-GAPE Analysis)

12.4 Summary Details of All the Villages Designs in Table form as Part-I and Part-II:

Sr.No.	Village Name	Discipline	Part-I	Part-II
1.	SUBIR	Civil	Community Hall	Rain Water Harvesting
			ATM	Skill Development Center
			Pharmacy Store	Bank
			Cybercafe	Tourist service center
			Supermarket	Solid Waste Management
			Entrance Gate	Water tank
	Subir	Electrical	Solar street lighting	Plant moisture monitoring
			Solar pumping system	Energy harvesting
			Rooftop solar	Home automation system
2.	Waghai	Civil	Public Sanitary Complexes	Rain Water Harvesting
			Sewage Treatment Plant	Skill Development Center
			Community Hall	Super Market
			Cyber Café	Public Garden
			Pharmacy Store	Solid Waste Management
			Tourist Visitor Center	Culture Haritage Conservation Center
		Electrical	Solar Street Light	Solar Energy Charge Controller
			Roof Top Solar	Power Supply With Auto Switching
			Solar Water Pumping System	Home Automation With IOT

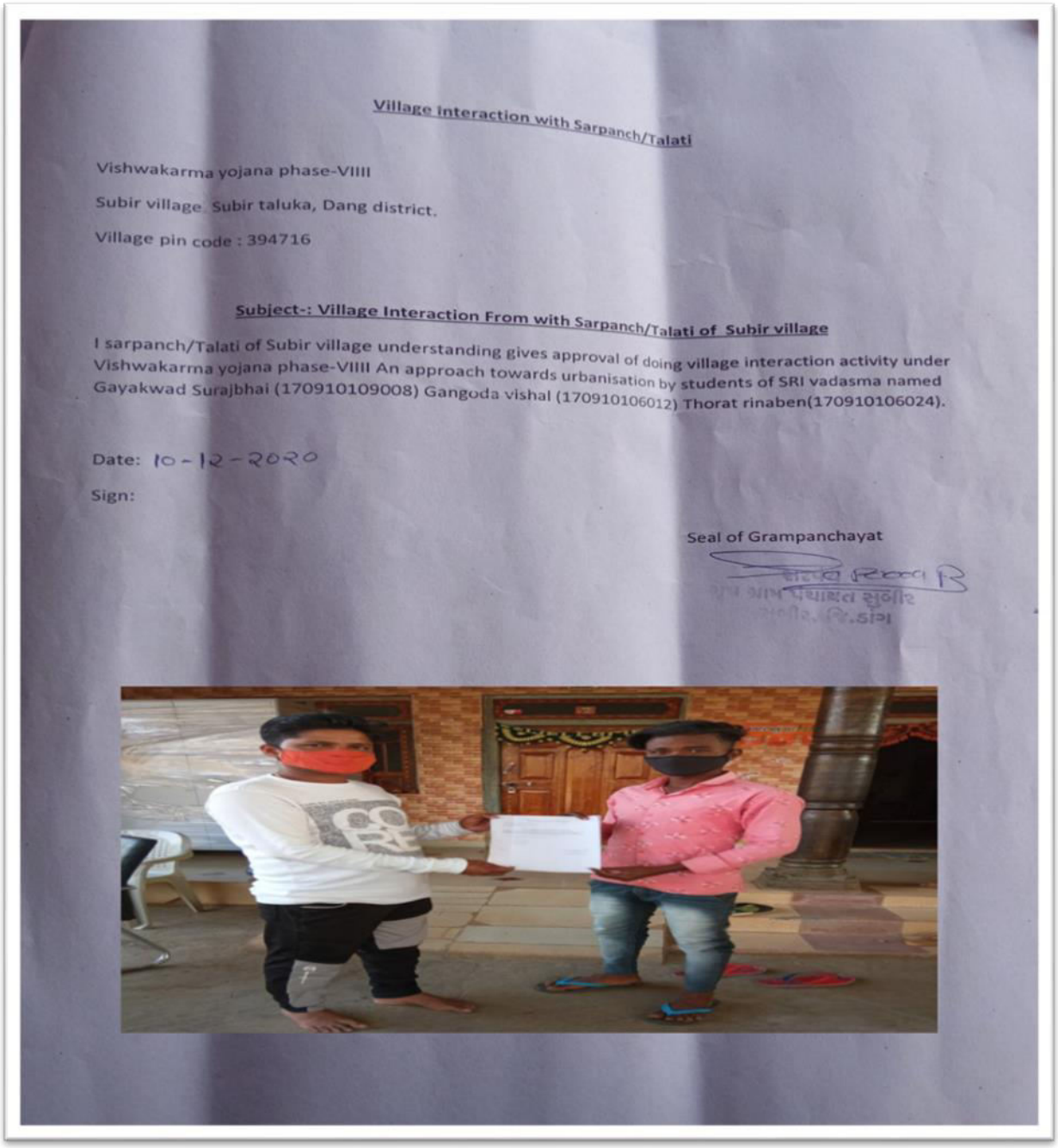
12.5 Summari of photographs (allocate ,Ideal, smart village)


વિજય હોટલ

12.6 Drawings(if required A1,A2,A3 Desing is not visible)

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

12.7 Village Interaction with sarpanch/talati Report with the photograph :



Village interaction with Sarpanch/Talati

Vishwakarma yojana phase-VIIII

Subir village Subir taluka, Dang district.

Village pin code : 394716

Subject-: Village Interaction From with Sarpanch/Talati of Subir village

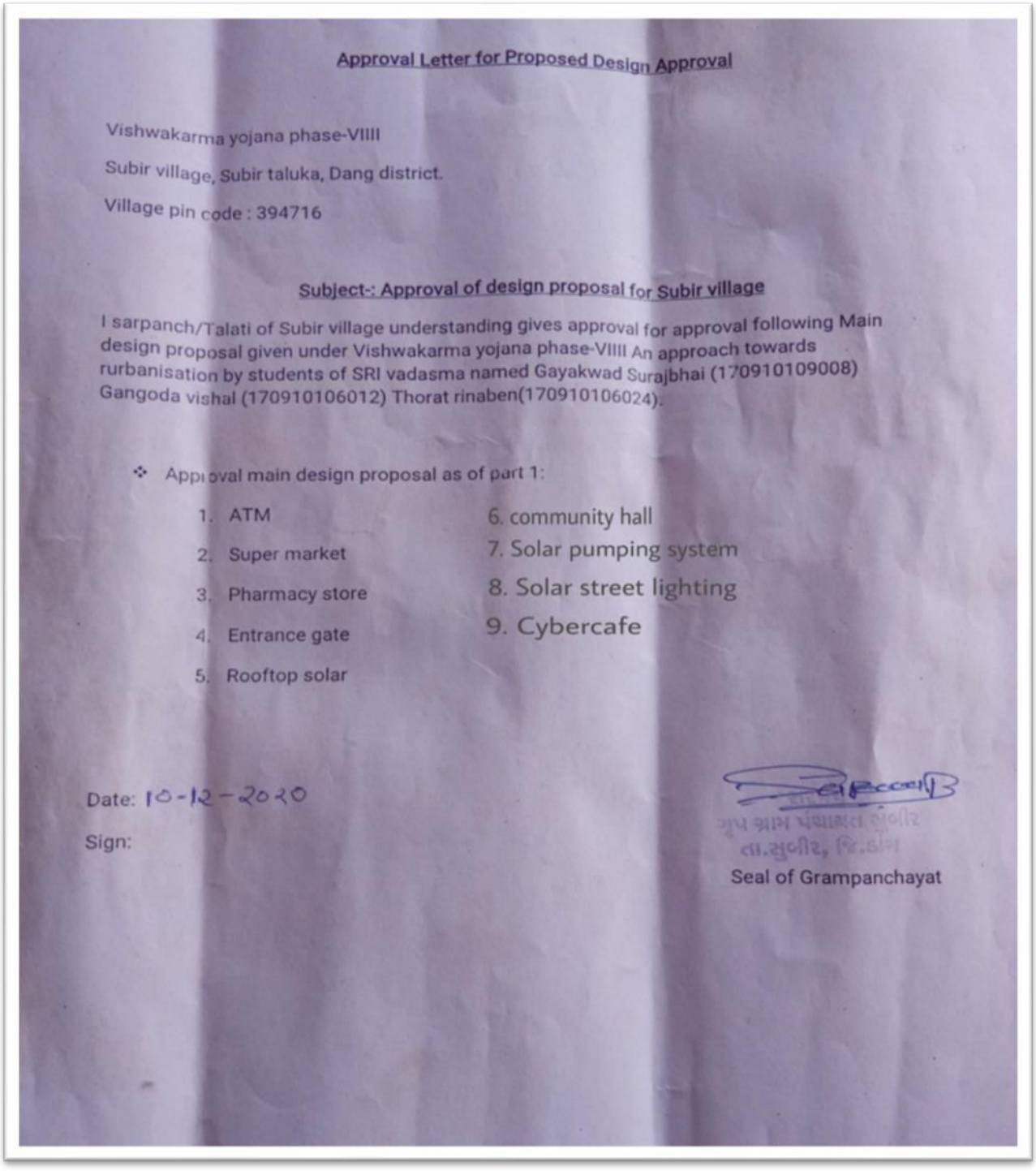
I sarpanch/Talati of Subir village understanding gives approval of doing village interaction activity under Vishwakarma yojana phase-VIIII An approach towards urbanisation by students of SRI vadasma named Gayakwad Surajbhai (170910109008) Gangoda vishal (170910106012) Thorat rinaben(170910106024).

Date: 10-12-2020

Sign:

Seal of Grampanchayat

12.8 Sarpanch Letter giving information about the village development



Approval Letter for Proposed Design Approval

Vishwakarma yojana phase-VIIII

Subir village, Subir taluka, Dang district.

Village pin code : 394716

Subject-: Approval of design proposal for Subir village

I sarpanch/Talati of Subir village understanding gives approval for approval following Main design proposal given under Vishwakarma yojana phase-VIIII An approach towards rurbanisation by students of SRI vadasma named Gayakwad Surajbhai (170910109008) Gangoda vishal (170910106012) Thorat rinaben(170910106024).

- Approval main design proposal as of part 1:

1. ATM
2. Super market
3. Pharmacy store
4. Entrance gate
5. Rooftop solar
6. community hall
7. Solar pumping system
8. Solar street lighting
9. Cybercafe

Date: 10-12-2020

Sign:

Seal of Grampanchayat

Approval Letter For Swachhta & Covid Awareness Activity approval :

Approval Letter For Swachhta & Covid Awareness Activity Approval

Vishwakarma Yojna Phase VIII

Subir Village, Subir Taluka, Dang Dist.
Village Code : 394710

Subject : Approval Letter Of Doing Awareness Activity For Kamrol Village

I Sarpanch / Talati Of Subir Village undersigned Gives Approval Of Doing Swachhta And Covid Awarness Activity Under Vishwakarma Yojna Phase VIII – An Approach Towards Rurbanisation By Students Of Sri Satsangi Ram Ashram Group Of Institution Named Gaykawad Surajbhai Prakashbhai (170910109008) Gangoda Vishalbhai Shivrambhai (170910106012) Thorat Rinaben Ishwarbhai (170910106024).

Date: 12/11/20

Sign :

Seal Of Gram Panchayat

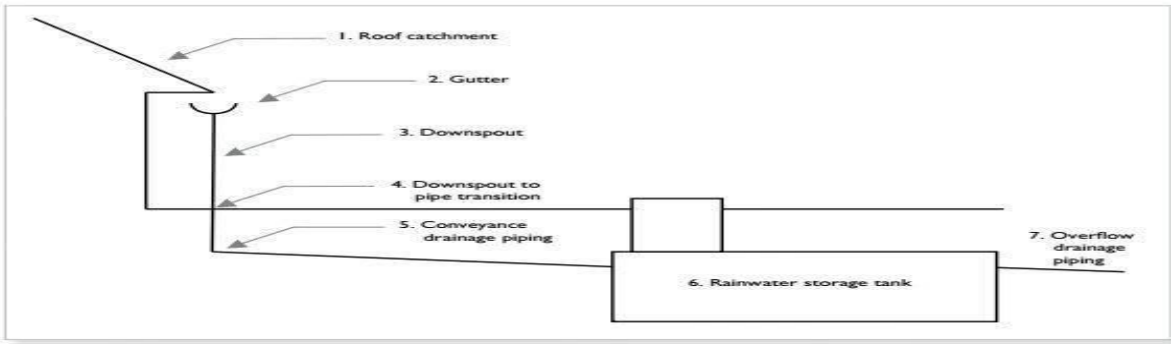
Chepter 13: Future design of the aspects (Feasibility, construction, operation and maitennance of various design option in rural area along cost with AutoCAD design/planning with any software

13.1 Design Proposals

13.1.1 Rain water harvesting

Water is our most precious natural resource and something that most of us take for granted. We are now increasingly becoming aware of the water to our survival and its limited supply.

The Harvesting of rainwater simply involves the collection of water from on surfaces which rain falls, and subsequently storing this water for later use. Normally water is collected from the roofs



(F-13.1.1A-Component of rain water harvesting)

Design:

We are providing Roof Top Harvesting System for the Primary School of the village Lilakha and which is granted by the Life N.G.O. It is having length of 85 ft. and width of 30 ft.Catchment Area (A) = 85 x 30 = 2550 ft^2 = 273.21 m^2 Average Annual Rainfall = 1.15 mAverage rate of Rainfall = 625 mm/hrRunoff co-efficient = 0.85

Step: 1
The maximum amount of rainfall that can be harvested potentially
= 337.21 x 0.85 x 1.15
= 231.87 cum.
Step: 2
From Table no: 1, Interpolating the value of the value of water availability = 232 cum.
Step: 3
Calculation of Downpours:

$$\text{No. of Downpours} = \frac{\text{Roof drainage area}}{\text{Max. roof drainage area served per downpour}}$$

$$= \frac{237.21}{53}$$
$$= 4.47 = 5$$

Step: 4

Diameter of gutter and width of G.I. sheet.

Rainfall Intensity = 60 mm/hr

From IS: 15797: 2008, table-3 [Cl. 6.1(b)]

By interpolating the values, D = 125.44 mm = 125.50 mm

Step: 5

Estimating the size of Conveyance Pipe.

From table A-4, Guidelines for Rain Water Harvesting System handbook by Canada Authority

By interpolating the values, we got 5 inches for pipes.

Step: 6

Estimating the size of the required system.

V = t x n x q | from IS: 15797: 2008, cl. 6.3Where, V = Volume of tank, in litres t = Length of Dry season, n = number of peoples using that tank q = Consumption in litres per capita per dayVolume = 17.5 m x 17.5 m x 3.35 m = 1025.937 m^3 = 1025937 litres

Sr. No.	Particular	Nos.	L	B	H	Quantity	Total Quantity
1.	Excavation for Foundation for depth more than 3.3m including sorting out and stacking of useful material	1	17.5	17.5	3.5	1071.8 m3	1071.8 m3
2.	Providing and laying Cement Concrete 1:3:6 (1 cement : 3 coarse sand : 6 stone aggregate 40 mm nominal size)	1	17.5	17.5	0.10	30.625 m3	30.625 m3
3.	Providing and laying controlled cement concrete M15 for curing complete excluding the cost of formwork & reinforcement including curing Walls Slabs	4 2	17.5 17.5	3.5 17.5	0.10 0.10	24.50 m3 61.25 m3	85.75 m3
4.	Deduction of Manholes from the top slab	2	0.60	0.60	0.10	0.072 m3	61.25-0.072 = 61.178 m3
5.	Providing H.Y.S.D bar reinforcement for R.C.C work including bending binding and placing in position	85.67 m3	@	70 kg/m3		6000 kg	6000 kg

(T- 13.1.1.A Measurement Sheet)

Sr. No.	Particular or Item	Quantity	Rate (in Rs.)	Per	Amount (in Rs.)
1.	For Excavation of foundation	1071.8	124.00	Cum	132903.20
2.	Providing and laying P.C.C (1:3:6) excluding cost of formwork	30.625	2932.00	Cum	89792.50
3.	Providing and laying controlled cement concrete M15 for the walls excluding cost of reinforcement	24.50	4077.00	Cum	99886.50
4.	Providing and laying concrete and finishing smooth curing including the cost of formwork but excluding the cost of reinforcement in R.C.C slab	61.25	5927.00	Cum	363028.75
5.	Reinforcement	6000	40.00	Kg	24000.00
				Total Rs.	709613.95
				Say Rs.	709614.00

(T-13.1.1B Abstract Sheet)

(F-13.1.1B- Rain water harvesting)

13.1.2 Skill development center

Scenario :-

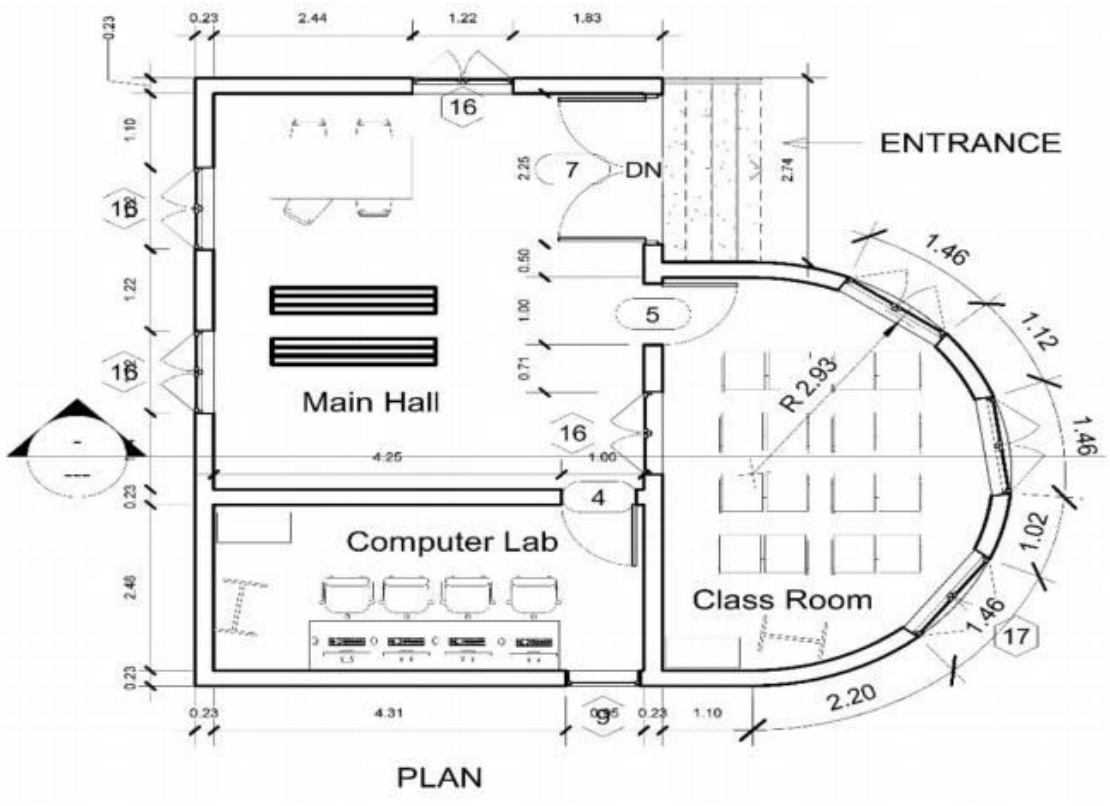
Design Utilized by :- All the people living in the village or even outsiders from nearby villages can use or utilize this for their personal development and skills.

Needs / Benefits :- Skill development of the children, Mahila, etc. in the village; Mahila Mandal can also be implemented.

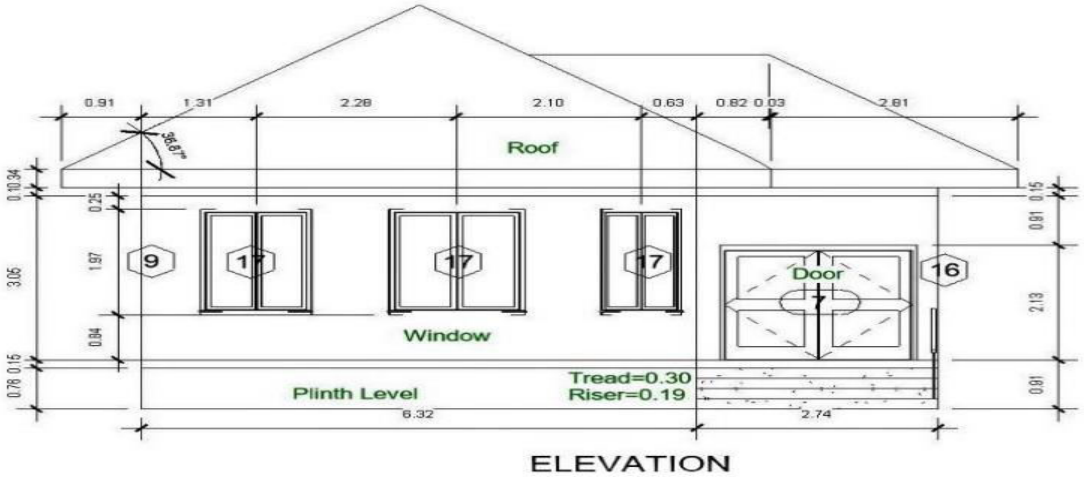
Design brief :- Skill Development training Centre is a platform to enhance the skill and make the students industry ready in Training is crucial for organizational development and its success which is indeed fruitful to both employers and employees of an organization and also the development of the village mahila and children.

Existing Situation In Kamrol ;- There is no any child development or maternity home or skill development center in the Subir village but for the better development of students and children there should be one skill development center in the village. It can also be used for the development of women or as a Mahila Mandal in the village

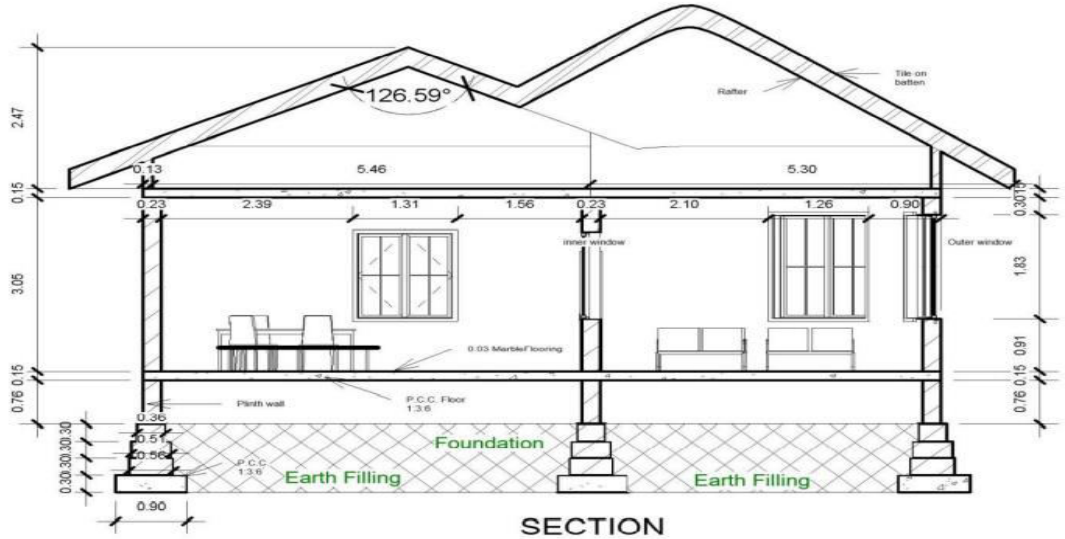
Proposed Design in Auto cad; Revit and Sketchup:



(F-13.1.2A- plan of Skill development center)



(F-13.1.2 B- Elevation Skill development center)



(F-13.1.2C – Section of Skill development center)

(F-13.1.2D -3D model of Skill development center)

Skill Development Center : Measurement Sheet (T-13.1.2A - SDC measurement sheet)

Sr. No.	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m3)
1	Basic Wall: 0.36: 8	46.75	0.36	0.3	8	**4.96**
2	Basic Wall: 0.51: 8	46.75	0.51	0.3	8	**7**
3	Basic Wall: 0.56: 8	46.75	0.56	0.3	8	**7.67**
4	Basic Wall: 9": 8	46.75	0.228	10	8	**25.99**
5	Basic Wall: Generic - 5": 6	34.94	0.127	10	8	**2.93**
6	Basic Wall: PLINTH WA: 8	55.75	0.228	0.762	8	**9.64**
7	Window-Casement-Double: 48" x 60"	1.2192	0.22	1.524	4	
8	Fixed: 36" x 72"	0.9144	0.22	1.8288	1	
9	Window-Casement-Double: 57" x 72"	1.4478	0.22	1.8288	3	
10	Cast-In-Place Stair: Monolithic Stair	1.82	0.3	0.19	5	**1.581**
11	Basic Roof: Generic - 12"	1434	15.95	0.15	1	**30.73**
12	Floor: 6" floor	1434	15.95	0.15	1	**11.4**
13	Floor: 6" floor	1434	15.95	0.15	1	**11.4**
14	Floor: 12"				1	**34.96**
15	Single-Flush: 36" x 80"	0.91	0.05	2.03	2	
16	Door-Exterior-Double-Two_Lite: 84" x 80"	2.13	0.04	2.03	1	
17	Excavation	38.29	1.2	1.5		**68.922**

Skill Development Center : Abstract Sheet (T-13.1.2B- SDC abstract sheet)

SR NO.	Description	Quantity	Rate	Per	Amount
1	Basic Wall: 0.36: 8	4.96	5000	m^3	24800
2	Basic Wall: 0.51: 8	7	5000	m^3	35000
3	Basic Wall: 0.56: 8	7.67	5000	m^3	38350
4	Basic Wall: 9": 8	25.99	6500	m^3	168935
5	Basic Wall: Generic - 5": 6	2.93	4500	m^3	13185
6	Basic Wall: PLINTH WA: 8	9.64	4500	$\boldsymbol{m^3}$	43380
7	Window-Casement-Double: 48" x 60"		2000	No.	8000
8	Fixed: 36" x 72"			No.	1200
9	Window-Casement-Double: 57" x 72"		3500	No.	10500
10	Cast-In-Place Stair: Monolithic Stair	1.581		m^3	4987.5
11	Basic Roof: Generic - 12"	30.67	3500	m^3	107555
12	Floor: 6" floor	11.4	3500	m^3	
13	Floor: 6" floor	11.4	3500	m^3	
14	Floor: 12"	34.96	3500	m^3	122360

15	Single-Flush: 36" x 80"		3200	No.	6400
16	Door-Exterior-Double-Two_Lite: 84" x 80"			No.	4800
17	Excavation	68.922	350	m^3	24122.7
				Grand Total	613575.7

Total cost: Rs. 613575.7

13.1.3 Bank building

Existing Situation in Subir Village :-

In the subir village there is no any bank and villagers have to go outside the village at ahwa for banking facility so that one bank should be there in village so villagers can easily do their banking related works and for easy access of it.

Design Utilized by :-

People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a Bank for their different banking related purposes.

Needs / Benefits :-

Availability of banking facilities in the village; Ease of Use.

Design brief :-

A bank is a financial institution that accepts deposits from the public and creates a demand deposit while simultaneously making loans. Lending activities can be directly performed by the bank or indirectly through capital markets.

Common repair and maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc. For most effective maintenance , it should be organized through a programme of cyclical maintenance.

➢ Ensure continued compliance with statutory requirements.

Common maintenance tasks include:

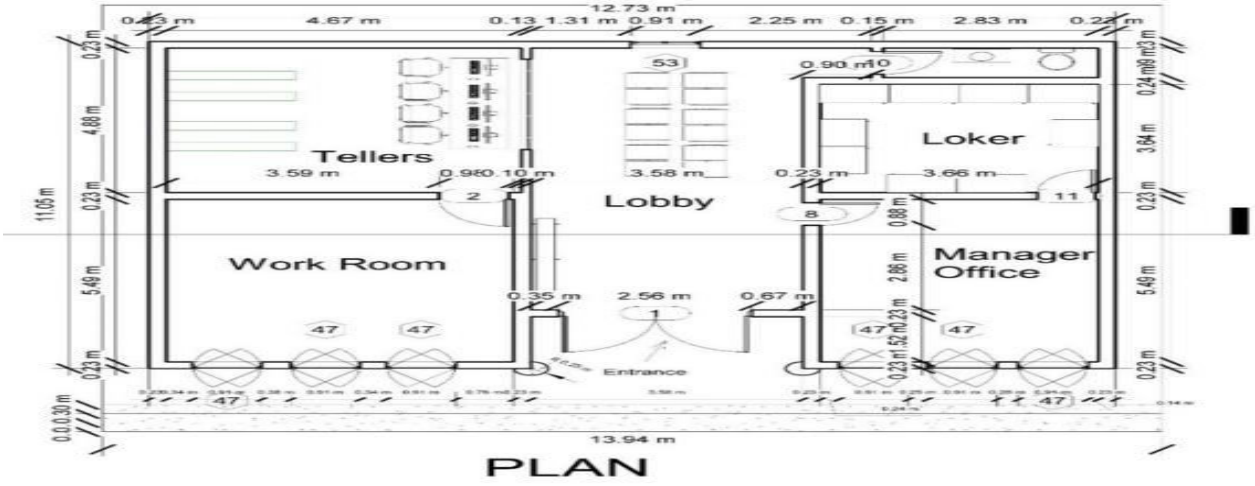
➢ Carpeting and flooring

➢ Plumbing

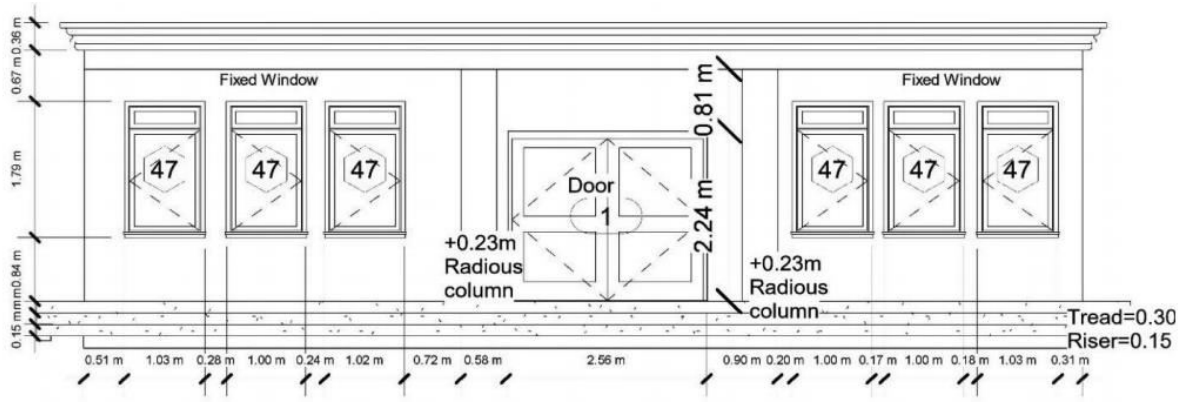
➢ Repairing cracking or leaning walls

➢ Window and door repair

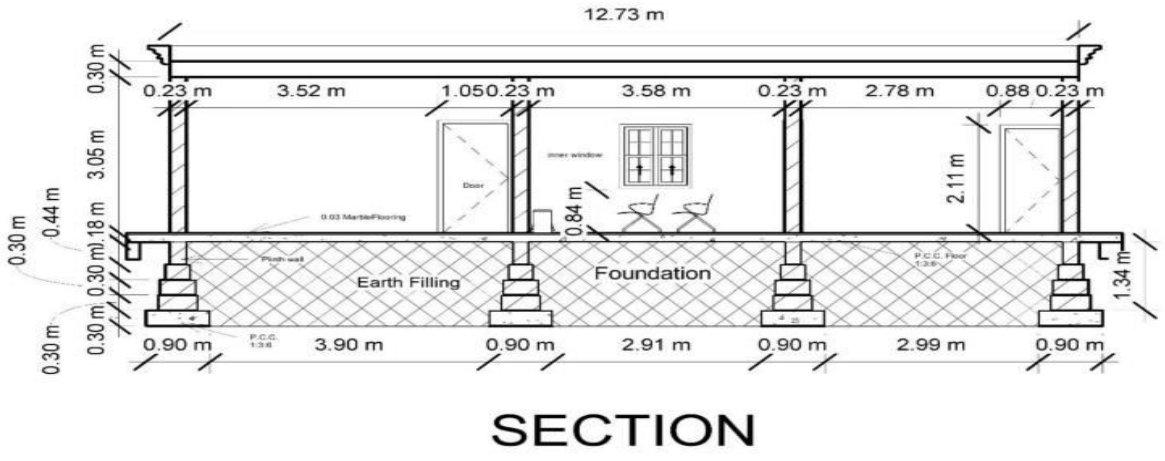
Proposed Design in Auto cad; Revit and Sketchup :



(13.1.3A-bank plan)



(13.1.3B- Bank Elevation)



(13.1.3C- Section plan of plan)

(F-13.1.3D – 3D model of bank building)

Bank : Measurement Sheet(T-13.1.3A- Bank measurement sheet)

SR NO.	Description	Length (m)	Width (m)	Height (m)	Count (Nos)	Total Quantity (m^3)
1	Basic wall:0.24:9	80.78	0.24	0.3	9	8.33
2	Basic wall:0.36:9	80.78	0.36	0.3	9	8.53
3	Basic wall:0.51:9	80.78	0.51	0.3	9	11.98
4	Basic wall:0.56:9	80.78	0.56	0.3	9	13.1
5	Basic wall:9":13	74..56	0.23	3	9	46.66
6	Basic wall:Generic-5"	5.1	0.13	0.3	1	1.48
7	Basic wall: Generic-6"	1.22	0.15	15.83	1	0.22
8	Curtail wall : Curtain wall1	3.05	0.012	2	6	55.72 sq ft
9	Window casement-inside-outside:36"X 65":6	0.914	0.23	1.65	1	
10	Window - Single-Hung-double:36"×46":	0.914	0.23	1.17		
11	Roofs1					3.37
12	Floor:Generic-12"2	12.73	11.05	0.15		33.67
13	Floor :Generic-12"1	12.73	11.05	0.15	1	20.12
14	Door-Exterior-Double-Two-lite:96"×84"		2.44	2.13	1	
15	Single-Flus:36"× 84"		0.91	2.13		
16	Single-Flus:30"× 84"		0.76	2.13	3	
17	Excavation	80.78	1.2	1.5		145.404

Bank : Abstract Sheet (T-13.1.3B - Bank abstract sheet)

SR NO	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT
1	Basic wall:0.24:9	8.33	6000	(m^3)	49980
2	Basic wall:0.36:9	8.53	6000	(m^3)	51180
3	Basic wall:0.51:9	11.98	6000	(m^3)	71880
4	Basic wall:0.56:9	13.1	6000	(m^3)	78600
5	Basic wall:9":13	46.66	7000	(m^3)	326620
6	Basic wall:Generic-5"	1.48	3500	(m^3)	4130
7	Basic wall: Generic-6"	0.22	3500	(m^3)	770
8	Curtail wall : Curtain wall1	55.72 sq ft	200	Sq.ft	1035.4
9	Window casement-inside-outside:36"X 65":6		6038.7	(m^3)	36232
10	Window - Single-Hung-double:36"×46":		3500	No	3500
11	Roofs1	3.37	3500	(m^3)	11795
12	Floor:Generic-12"2	33.67	3500	(m^3)	117845
13	Floor :Generic-12"1	20.12	3500	(m^3)	70420
14	Door-Exterior-Double-Two-lite:96"×84"		8000	No	8000
15	Single-Flus:36"× 84"		4200	No	4200
16	Single-Flus:30"× 84"		3600	No	10800
17	Excavation	145.404	350	(m^3)	50891.1
				Grand total	**897878.4**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

Total cost: Rs.897878.4

13.1.4 Overhead water tank

Water tanks are liquid storage containers. These containers are usually storing water for human consumption, irrigation, fire, agricultural farming chemical manufacturing, food preparation, rainwater harvesting as well as many other possible solutions. Water plays a predominant role in day to day life so water storage is necessary to store the water.

The main objectives in design of water tanks are to provide safe drinkable water after storing for a long time, optimizing cost strength, service life, and performance during a special situation like earthquakes. The other objectives are to maintain pH of the water and to prevent the growth of the microorganism. Water is susceptible to a number of ambient negative influences, and in the subir village we provide design of water tank for above purpose

Design of tank:

Design of an intze tank for a capacity of 300000 lts .

Assuming height of tank floor above the ground level is

17.3m. Safe bearing capacity of soil 200kn/m^2

Wind pressure as per IS875 1200N/m^2

Assuming M_{20} concrete

For which σcbe = 7N/mm^2, σcc = 5N/mm^2

Direct tension σt = 5N/mm^2

Tension in bending = 1.70

N/mm^2 Modular ratio m =13

For Steel stress,

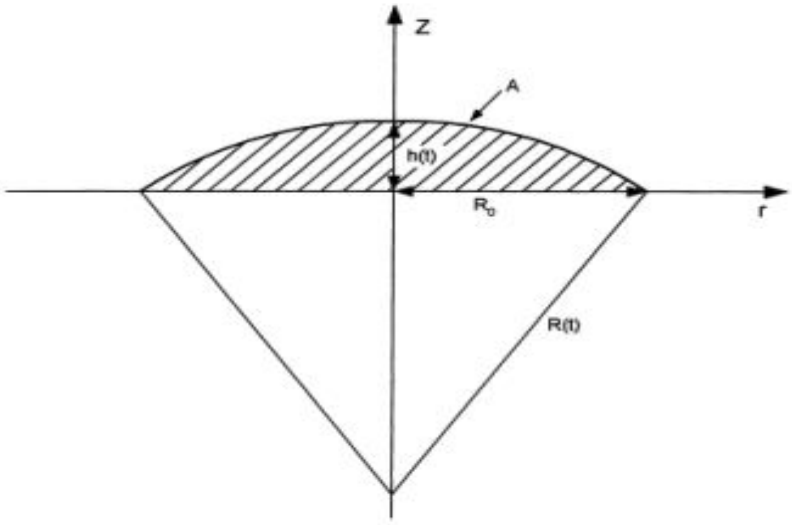
Tensile stress in direct tension =115 N/mm^2

Tensile stress in bending on liquid face =115 N/mm2 for t < 225 mm

and 125 N/mm^2 for > 225 mm.

Design of intze tank:

Design of Roof Dome:



Considering a rise of 1.80 m, radius of the roof dome is given from

$1.80(2R-1.80) = (4.75)^2$

R = 6.525m.

Sin φ = (4.5)/6.525= 0.7241

and φ= 43.36< 51.8°

Hence no tension

Assuming t = 100mm.

Hoop stress @ level of springing:

$f = \frac{WR}{t}[\cos\theta - \frac{1}{1-\cos\theta}]$

$= \frac{5250 \times 6{\cdot}525}{0{\cdot}15}[0.72 - \frac{1}{1.72}]$

$f = 0.0298\ N/mm^2$

Hoop stress @ Crown:

$\theta = 0°$

$f = \frac{4950 \times 6.525}{0.15}[1 - \frac{1}{2}]$

$f = 0.107\ N/mm^2$

Meridional thrust @ level of sprining:

$T = \frac{WR}{1+\cos\theta}$

$= \frac{4950 \times 6.525}{1+0.72}$

$= 18778.34\ N/m$

Compressive stress

$= \frac{18778.34}{150 \times 1000}$

$= 0.125\ N/mm^2$ provoide 8mm

Ring beam @ top :

Horizontal component of T= $T\cos\theta$

$= 13520.40\ N/m$

Hoop stress in the ring beam

$= 14339.82 \times \frac{9}{2}$

$= 60841.82$

Area of steel required

$= \frac{64529.2}{0.9230}$

$= 311.73\ mm^2$

We have to provide 12 mm ϕ,4 bars of 452.38 mm

This horizontal load H_2 will produce a hoop tension in ring beam B

Hoop tension due to H_2 $= H_2 \times \frac{d}{2}$

$= 38184.137 \times \frac{9}{2} N$

$= 171828.6165 N$

Let the rinmg beam be 500mm deep

Water pressure on the ringh beam

$= 9810 \times 4 \times \frac{500}{1000}$

$= 19620$ N/m

Hoop tension due to water $= 19620 \times \frac{9}{2}$

$= 88290$ N

Total hoop tension $= 88290 + 171828.61$

$= 260118.61$ N

Steel for hoop tension $= \frac{260118.61}{230 \times 0.9}$

$= 1256.611 mm^2$

Provide 6 bars 18 mm Ø

$A_{st} = 1526.81 mm^2$.

Let 'A' be the area of ring beam

Equivalent concrete area $= A + (m-1)A_{st}$

$= A + (13.33-1) \times 1526.81$

$= A + 18825.61$

Limiting the tensile stress on the equivalent concrete area to 2 N/mm^2

$\frac{260118.61}{A + 15688.014} = 2$

$A_c = 11233.688 mm^2$

Provide 250× 500 mm size

Design of conical slab:

Conical slab should be designed for

a) Hoop tension
b) Bending as it spans on a sloping slab from the ring beam @ B at the ring girder @ 'c'

Design for hoop tension:

$$\frac{w_w+w_s}{2\pi}+\frac{w_w}{2\pi}\tan\alpha$$

Where

W_w= weight of water resting on the conical slab.

W_s = weight of the conical slab.

α = inclination of the conical slab with the horizontal.

Area of water section standing on the conical slab

$$= \frac{5.5+4}{2} \times 1.5 = 7.125 \text{ m}^2.$$

$$X = \frac{6+[\frac{2.25}{3}]}{7.125} = 0.52 \text{ m.}$$

Weight of water resting on the conical slab $W_w = 9810\times7.125\times2\pi[3.52]$

$= 1545882.24$ N

Length of conical slab = 2.121 m.

Take thickness of the slab as 200 mm.

Weight of the conical slab $W_s = 0.2\times2.121\times25000\times2\pi[\frac{7.5}{2}] = 249874.42$ N.

$$\text{Hoop tension} = \frac{1545882.24+249874.42+1545882}{2\pi}$$

=531838.349 N.

$$\text{Hoop steel on the entire section} = \frac{531838.49}{230\times0.9}$$

$$= 2569.267 \text{ mm}^2.$$

Provide 14 bars of 6 mm Ø

$= 14 \times \pi \times 64 = 2814.86 \text{ mm}^2.$

Design for bending moment:

Load per metre width of the conical slab $= \frac{W_w + W_s}{2\pi \times mean\ radius}$

$= \frac{1545882.24 + 249874.42}{2\pi \times 3.75} = 76214.279$ N.

Maximum bending moment $= \frac{Wl}{8} = \frac{76214.279 \times 1.5}{8}$

$= 14290.177$ Nm.

Axial compression $V_2 = T_2 \sin\alpha = \frac{38184.137}{\sin 45^\circ}$

$= 54000.52$ N.

Providing 16 mm diametre bar at clear covers of spacing 25 mm.

Effective depth $= 200 - 25 - 8 = 167$ mm.

Distance between centre of section and centre of steel $x = d - \frac{t}{2} = 167 - 100$

$= 67$ mm

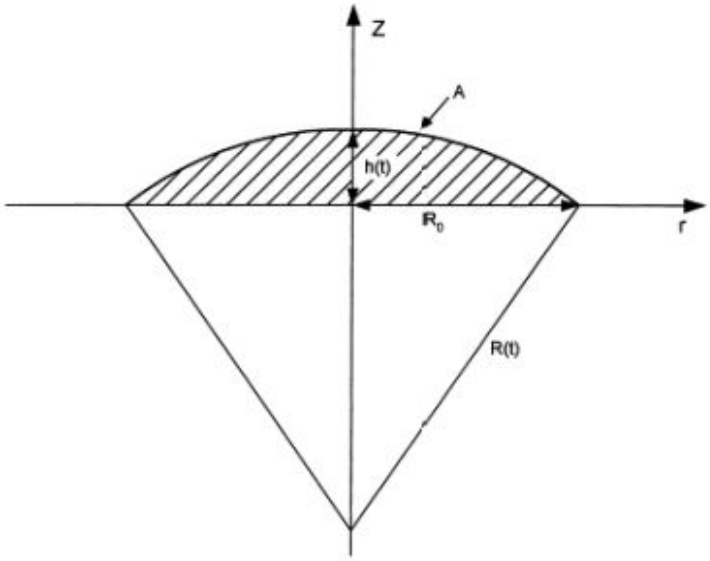
Resultant bending moment $= M + T_2.x = 14290.177 \times 10^3 + 54000 \times 67$

$= 17908212.15$ Nmm.

$A_{st} = \frac{17908212.15}{167 \times 230 \times 0.9} = 518.04 \text{ mm}^2$

Spacing of 16 mm diameter bars = 333.33 mm and provide 3 bars.

The bottom dome:



Let R be the radius of the dome,then $3^2 = 1.2(2R-1.2)$

$= 4.35$ m.

Let 2θ be the angle subtended by the dome.

$\sin\theta = \frac{3}{4.35} = 43°36°°$

$\cos\theta = 0.68$

Thickness of dome = 200 mm.

Loads:

Dead load = $25000 \times 0.2 = 5000$ N/mm^2.

Weight of water resting on the dome = $\gamma_w[\pi r^2 h - \frac{\pi h_c}{3}(3R-h_c)]$

$=9810[155.508-17.869] = 1350234.872$

Area of dome surface = $2\pi Rh = 2\pi \times 4.315 \times 1.2$

Weight of lower dome W_5 = 5000×32.79 = 163950 N.

= 0.0075×4560396.668×3 = 102608.925 N.

Torsion = 0.0015×W×r = 20521.785 N. (from table 2)

Angular distance for maximum torsion = 12°44°°.

Let us provide 8 coloumns.

Bending momment at the support = 0.0083×W×r = 0.0083×4591027.197×3

= 114316.577 Nm.

Bending moment at centre = 0.00416×W×r = 0.00416×4591027.197×3

=57296.01 Nm.

Torsion = 0.0006×4591027.197×3 = 8263.84 Nm.

Angular distance for maximum torsion = 9°33°°.

Load at each support = $\frac{W}{8} = \frac{4594561.4488}{8}$

= 573878.39 N.

Shear force at the support = $\frac{W}{2}$, V = 286939.199.

Design at support section:

Equating moment of resistance to the bending moment at support

$0.913bd^2$ = 114316.577×1000,

$0.913\times400\times d^2$ = 114316.577×1000,

Then d^2 = 278458.26, d =560 mm.

Let the clear cover be 40 mm.

Over all depth of beam = 600 mm.

Actual effective depth = 600 mm.

Equivalent shear force = $V+1.6\frac{T}{b} = 286939.199+1.6\frac{T}{b}$.

$= 287160.093+(\frac{1.6\times8270.21\times1000}{400})$.

$V_e = 319994.559$.

Equivalent nominal shear stress $\tau_{ve} = \frac{V_e}{bd} = \frac{316565.28}{400\times560} = 1.42\ N/mm^2$.

Maximum shear stress $\tau_{max} > \tau_v$.

$\tau_{max} = 1.8\ N/mm^2$.

$\tau_c < \tau_v$.

Provide longitudinal and transverse reinforcement according to B-6.4

Longitudinal reinforcement:

$M_e = M+M_t$, $M_t = \frac{T(1+\frac{D}{b})}{1.7} = \frac{8263.84[1+\frac{600}{400}]\times1000}{1.7}$

$= 12152705.88$ Nmm.

M = moment at crosssection.

$M_{er} = 1000\times114316.577+12152705.88 = 126469282.9$ Nmm.

$A_{st} = \frac{M_{er}}{230\times0.9\times560} = \frac{125215312}{230\times0.9\times560}$

$= 1080.187\ mm^2$.

Transverse reinforcement:

$A_{sv} = \frac{T\cdot S_v}{b_1 d_1 \sigma_{sv}} + \frac{V\cdot S_v}{2.5 d_1 \sigma_{sv}}$, $b_1 = 400-80 = 320$ mm , $d_1 = 600-80 = 520$ mm.

$A_{sv} = [\frac{8263.84\times1000}{320\times520\times230} + \frac{2869.199}{2.5\times520\times230}]S_v$

Providing 4 legged 10 mm stirrups.

$A_{sv} = 315\ mm^2$, 315 = 1.175, $S_v = 267.95$ mm.

Take S_v as 250 mm.

$[\frac{\tau_{ve}-\tau_c}{\sigma_{sv}}]b\times S_v$, $\frac{1.42-0.28}{230}\times400\times S_v = 315$, $S_v = 158.88$ mm.

Provide 150 mm spacing.

Steel for sagging moment = $\frac{57296.01\times1000}{230\times0.9\times560}$

= 494.27 mm^2.

Provide 5 bars of 12 mm diameter.

A_{st} = 565.48 mm^2.

Hoop stress:

T_c = thrust exerted by the conical slab on the girder.

$T_c \sin\alpha \times 2\pi r = W_w + W_s$ + weight of cylindrical wall and upper dome.

$T_c \sin\alpha \times 2\pi r$ = 154588.24+249874.42+1079631.039

$T_c \sin\alpha \times 2\pi r$ = 2875387.699.

$T_c = \frac{2875387.699}{2\pi\times3\times\sin45^\circ}$ = 215729.87 N.

Horizontal component of T_c = $215729.87\times\cos45^\circ$, H_1 = 152544.055 N.

Horizontal component due to dome = $11678.016\times\cos43^\circ36'$, H_2 = 84574.59,

$H_1 - H_2$ = Net,Net = 67969.46 N. Hoop stress = 67969.46×3 = 203908.38 N.

Hoop compressive stress = $\frac{203908.38}{400\times600}$ = 0.849 N/mm^2.

Coloumns:

Coloumns should be designed for direct loads coming upon them and for bending moments caused by wind load.

Vertical load on one column at top = $\frac{4591027.197}{8}$

= 573878.399 N.

Let α be the inclination of the column with the vertical.

$\tan\alpha = \frac{1}{10}$, $\alpha = 5^\circ42'$, $\sin\alpha$ = 0.0995, $\cos\alpha = \frac{10}{\sqrt{101}}$ = 0.995.

Actual length of column = $\sqrt{10^2+1^2}$ = 10.05 m.

Providing 300 mm × 300 mm column.

Analysis due to wind pressure:

Wind pr. =1200 mm^2.

Wind force on the top dome & cylindrical walls $=(4+\frac{1.8}{2})\times 9.4\times 1200$

@Ht=13.95 =55272 N

Wind force on the circular wall $=\frac{9.4+6.4}{2}\times 1.5\times 01200$

=14220 N

Wind force on circular girder =0.6×6.4×1200

=4608 N

Wind force on column & braces $=5\times 0.3\times 10\times 1200+3\times\frac{5+8}{2}\times 0.3\times 1200$

=25560 N

Total moment of wind pr. About the base

=55272×13.95+14220×0.8+4608×10+25560×5

=10982500Nm.

Vetrical load on any column due to wind load $=\frac{Mx}{\sum x\text{^}2}$

$\sum x^2 = 2\times 4^2 + 4(\frac{4}{\sqrt{2}})^2 = 64m^2$

Max. Wind load force in the most leeward side &the most windward side.

$=\frac{1098500.4\times 4}{64}$ =68656.275 N

Max. Wind force in columns marked 5

$=\frac{1098500.4}{64}\times\frac{4}{\sqrt{2}}$ =48547.317 N

Consider the windword column 1

Vertical load due to dead +wind load

=596378.399 +68656.275 N

=665034.674 N.

Corresponding axial load $=\frac{665034.674}{0.9950}$

=668376.556 N

Horizontal comoponent of the axial forces caused by wind action

$=2\times68456.275\times0.0995+4\times48547.317\times 0.0995 \times\frac{1}{\sqrt{2}}$

=27285.39 N.

Aactualhorizontal force @ base

= 55272+14220+4608+25560−27285.39 = 72374.61

Horizontal shear column = $\frac{72374.61}{8}$ = 9046.826 N.

Maximum bending moment for the column = $9046.826\times\frac{2.5}{2}$ = 11308.532 N.

Analysis of column section:

Direct load = 668376.556 N.

Bending moment = 11308.532 Nm.

Provide 300×300 column.

Provide 6 bars of 20 mm diameter at effective cover of 50 mm.

A_{st} = 1884 mm^2,

Equivalent concrete area = $A_c+(m-1)A_{st}$ = (300×300)+(12.33×1884)

= 113229.72 N

Polar moment of inertia of the equivalent concrete section,

$=\frac{a^4}{12}+(mA_{st}\times$effective depth fromcentre),

$=\frac{300^4}{6}+1884\times12.33[150-50]^2 = 1.582\times10^9$ mm^4.

Equivalent moment of inertia about full section = $\frac{1.582\times10^9}{2}$ = 791.14×10^6 mm4.

Direct stress in concrete = $\frac{direct\ load}{equivalent\ concrete\ area}$ = 5.9 mm^2.

Bending stress in concrete = $\frac{150\times11308.532\times1000}{791.14\times10^6}$ = 2.14 N/mm^2.

Maximum stress = 5.9+2.14 = 8.04 N/mm^2.

Design of braces:

Moment in brace BC = 2×moment for the column× sec 45°,

= 2×11308.532× $\sqrt{2}$ = 31985.358 Nm.

Provide 300×300 mm bar section and a doubly reinforced beam with equal steel at top and bottom.

$A_{st} = A_{sc} = \frac{31985.358\times1000}{230\times220\times0.9}$ = 702.357 mm^2.

Provide 4 bars of 18 mmdiameter at top and equal amount at bottom.

Shear force for brace = $\frac{bending\ moment\ for\ brace}{\frac{1}{2}span\ of\ brace}$,

Span of brace =2 × $\frac{7}{2}$ × sin 22°30′ = 2.678 m.

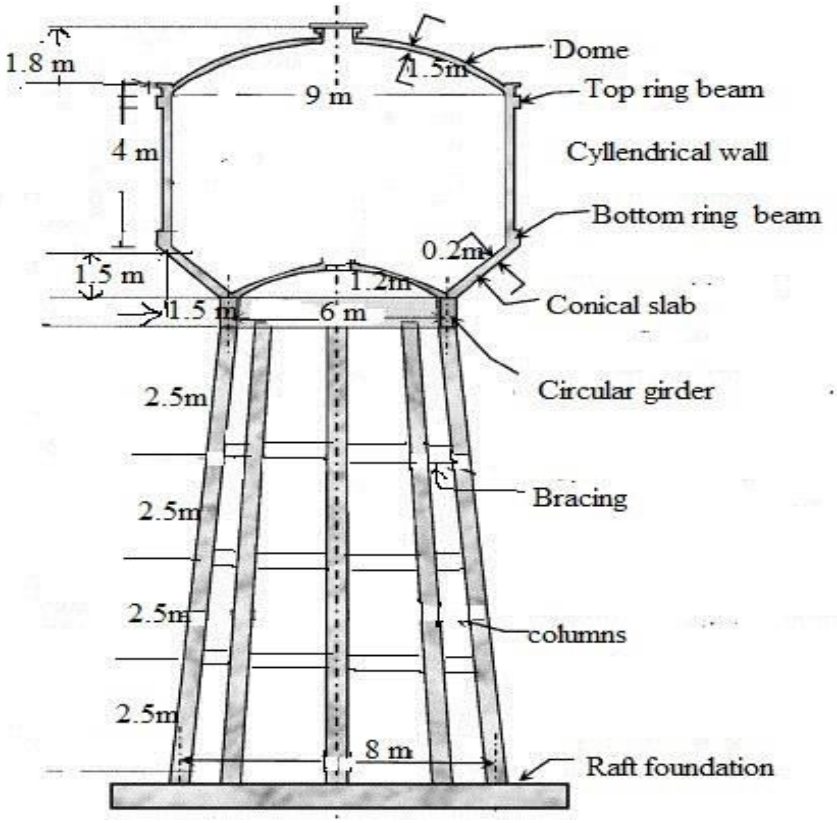
Shesr force for brace = $\frac{31985.358}{\frac{1}{2}\times2.678}$

= 23887.49 N.

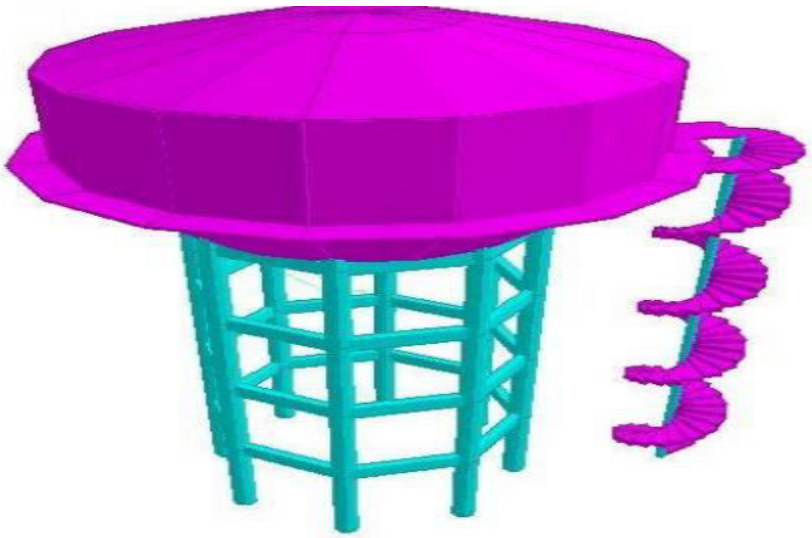
Nominal shear stress $\tau_v = \frac{V}{bd} = \frac{23887.49}{300\times260}$

= 0.30 N/mm^2.

Provide nomonal stirrups say 2 legged 10 mmdiameter stirrups at 200 mm clear cover.



(F- 13.1.4A plan of tank)



(F- 13.1.4B- 3D model of tank)

T-13.14A- MEASURMENT SHEET OF WATER

S. No	DECRIPTION OF WORK	NOS	L m	B m	A m^2	Hor D (m)	QTY m^3	REMARKS
1	Earthwork in	1			73.89	1	73.89	A = $nd^2/4$
	excavation							$=n \times 9.7^2/4$
								=73.89
	Earthwork in filling	1					64.316	
2	a)R.C.C work in	1			7.068	0.2	1.4136	
	foundation							
	b)steel in							
	foundation i)Longitudanal	9			$n \times 0.008^2$ $0.008^2 \times n$		0.045 0.02	= n ×8
	ii)Transverse	4						
3	R.C.C in columns	8	0.3	0.3	0.09	10.0	7.235	
	Steel in columns	8×			$n \times 0.01^2$	49 10.0	0.151	
		6				49		
4	RCC in	8	0.637	0.3	0.09	0.3	=0.459	$A=n \times 0.009^2$
	Bracings@2.5 Steel in Bracings	8×	5 0.637		$n \times 0.009^2$		=0.01	=0.000254
	@2.5m from G.L	8	5					
5	a) R.C.C in	8	0.575	0.3	0.09	0.3	0.414	$A=n \times 0.009^2$
	bracings @5m							=0.000254
	from G.L.							
	b) Steel	8×	0.575		$n \times 0.009^2$		0.0093	
		8					6	
6	a)RCC in bracings	8	0.45				0.324	$A=n \times 0.009^2$
	7.5m b)steel	8×	0.45		$n \times 0.009^2$		0.0072	=0.000254
		8						
7	Top ring girder a) R.C.C	1	nD 6n	0.4	0.24	0.6	4.52	
	b) steel longitudinal	5	6n		$n \times 0.009^2$		0.02	
	transeverse	125					0.066	
8	Bottom dome							A=2nrh
	a)RCC in dome	1			=22.619	0.2	4.523	=2n ×3×1.2 =22.619
	b) steel		L=6.6		0.067		0.443	$L = \frac{s}{360^\circ} \times 2nr$

			2					=6.62
9	a)RCC conical	1	23.56	0.2		2.12	9.994	$\frac{n[D1 + D2]}{2}$
	slab					1		= n(9+6)/2
	b)steel	14	23.56				0.066	
					$n \times 0.008^2$			
	steel for B.M.	3	23.56				0.014	
10	a) RC ring beam C @ B b) steel	1 6	28.27	0.25	$n \times 0.008^2$	0.5	3.534 0.034	
11	Cylindrical wall	1		0.2		4	22.619	
							0.098	
	a) Main steel b) Distribution steel	20 4	4.32 28.27		$n \times 0.006^2$ $n \times 0.004^2$		0.0056	L=4+16d =4+16×0.012 =4.32
12	Ring beam @ A a)concrete	1	9 n	0.2	0.04	0.2	1.13	L=nD =9 n
	b)Steel	4	9 n		n ×0.0062		0.012	
13	Top dome R.C.C a) concrete b) Steel	1 100	9.93		2nrh =50.89 n ×0.0042	0.15 0	7.63 0.05	A=2nrh = L = s × 2nr 360°
12	Total RCC work						63.795 6	
13	Total steel						1.017	
14	Plastering in CM (1:2) for Inner surface Of conical dome (12mm)	1			50.89		9.15	A=2nrh =50.89
15	Plastering in CM (1:6) for outer surface Of conical dome (12mm)	1			55.135		9.92	A=2nrh =55.135
16	Plastering in CM (1:2) for Inner surface Of cylindrical wall (12mm)	1	n ×D	28.2	112.8	4	20.354	

17	Plastering in CM (1:6) for outer surface Of cylindrical wall (12mm)	1	n ×D	29.5	118.82	4	28.349	
18	Plastering in CM (1:2) for Inner surface Of domed roof (12mm)	1			22.619		4.07	A=2nrh =2n ×3×1.2 =22.619
19	Plastering in CM (1:6) for outer surface Of domed roof (12mm)	1			26.38		4.74	A=2nrh =2n ×3×1.4
20	Plastering in CM (1:6) for columns (12mm)	8	0.3	0.3	0.09		17.28	
21	Plastering in CM (1:2) for ring beam at top (12mm)	1	9 n	0.2	5.65		1.01	
22	Plastering in CM (1:2) for ring beam at bottom (12mm)	1					1.27	
23	Plastering in CM (1:6) for bracings at 2.5m ht.(12mm)	1					0.27	
24	Plastering in CM (1:6) for bracings at 5m ht.(12mm)	1					0.24	
25	Plastering in CM (1:6) for bracings at 7.5m ht.(12mm)	1					0.19	
26	Plastering in CM(1:2) for inner surface of conical slab(12mm)	1					4.239	n[D1 + D2] / 2 = n(9+6)/2
27	Plastering in CM(1:6) for outer surface of conical slab(12mm)	1					4.46	
28	Total plastering						105.533	
29	Thick water proof cement painting for tank portion						85.278	

30	white washing for columns	8	0.312	0.31 2	10.04		7.826	
31	Total white washing						93.104	

ABSTRACTSHEET

S.NO	DESCRIPTION OF WORK	QTY OR NOS	RATE RS PS	COST RS PS
1	Earth work in excavation	73.89		
2	Beldars	13	250	3250
3	Mazdoors	11	250	2750
4	Total			6000
5	Earth work in Filling In foundation	64.316		
6	Beldar	7	250	1750
7	Bhisthi	2	285	570
8	Mazdoors	5	250	1250
9	Total			3570
10	Total earth work in Filling			
11	Disposal of surplus earth in a lead 30m	9.574		
12	Mazdoor	4	250	1000
13	Total			1000
	Total cost of earth work			10,570

Total cost of project:

Total cost of R.C.C = 2,23,930

Total cost of steel = 5,18,924

Total cost of plastering = 1,14,951

Total cost of painting = 28,335

Total cost of earthwork = 10,570

RS.8,96,710

13.1.5 Solid waste mangement

SMART GARBAGE COLLECTING BIN FOR MUNICIPAL SOLID WASTE:

The most serious environmental concerns at present have been solid waste management which contributes to disturbing the balance of the environment and that has adverse effects on the health of the society. Detection, monitoring and management of urban wastes are one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies in any way. This paper proposes an advanced method in which waste management is automated. Global System for Mobile Communication (GSM) and ARM (Acorn RISC Machine) 7 controller is the latest trends and is one of the best combination to be used in the project.

The trend of making the manually controlled things automatic has become a common practice these days. The process of making the things automatic is being exploited in almost all the major fields of life. Making things automatic reduces burden on the humans. The cost and effort used in manually controlled products is much higher than the automated systems. Considering the fact, that the problem of efficient waste management is one of the major problems of the modern times, there is an utmost need to address this problem.

NEED FOR THE STUDY:

In our daily life, we see the pictures of garbage bins being overfull and all the garbage spills out resulting in pollution. This also increases number of diseases as large number of insects and mosquitoes breed on it. Hence our problem statement is to design a System for collecting the garbage from a particular area the area whose public Garbage Bins are overflowing with prior concern. A big Challenge in the urban cities is Solid waste management, not only in India but for most of the countries in the world. The project gives us one of the most efficient ways to keep our environment clean and green.

Objectives And Scope Of The Work:

The concurrent effects of a fast national growth rate, of a large and dense residential area and a pressing demand for urban environmental protection, create a challenging framework for waste management in INDIA. In order to design and implement a suitable urban solid waste system, the first task is to forecast the quantity and variance of solid waste as it relates to residential population, consumer index, season, etc. Then the major effort is focused on optimizing the schedule and routing of transportation trucks considering cost, waste weight and volume, distances, road condition, etc. In recent years, the local authorities of Indian municipality have placed significant importance on the solid waste problem and made relevant achievements, but there is still a need for a more efficient waste disposal system to cope with the complexity of urban solid waste disposal. The solution proposed in this paper is a new tool based upon distributed technology in order to acquire information from every waste collection point that afterwards can be used for the information flow related to solid waste production, collection and disposal.

(F-13.1.5A- Smart Waste Management System)

Waste Management Is The Key To A Clean City

The quantity of MSW generated in India is increasing rapidly due to increasing population and change in lifestyles. Land is scarce and public health and environmental resources are precious. The current MSW crisis in India should be approached holistically; while planning for long term solutions, focus on the solving the present problems should be maintained. Garbage Full, Garbage Out is a smart waste management system. The garbage bins have sensors which send out alerts when the bins are full, thus preventing overflow and letting cleaners schedule their visits accordingly.

Generation Of MSW

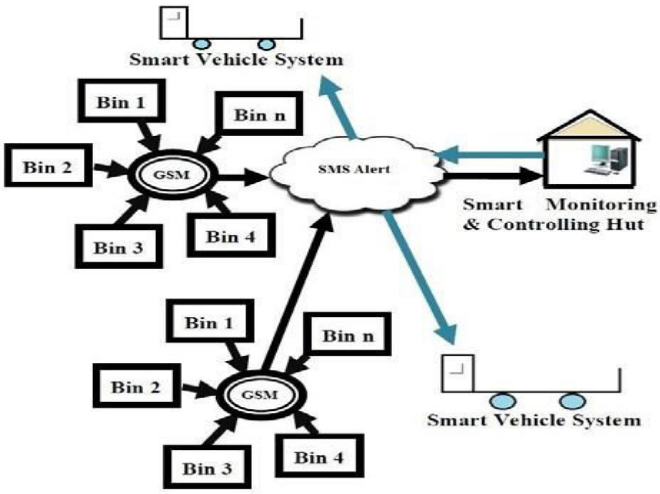
Municipal solid waste (MSW), also called Urban Solid Waste, and is a waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes, construction and demolition debris, sanitation residue, and waste from streets collected by a municipality within a given area. They are in either solid or semisolid form and generally exclude industrial hazardous wastes. MSW can be broadly categorized into five broad categories as

METHODOLOGY:

The world is witnessing tremendous innovation in wireless technologies, leading to significant changes in how humans and machines interact with one another. These new wireless technologies and the changes they support are generating exciting opportunities in environmental impacts. Solid waste management is one among the basic essential services provided by municipal authorities in the country to keep urban centres clean. However, it is among the most poorly rendered services in the basket. The systems applied are unscientific, out-dated and inefficient; population coverage is low; and the poor are marginalized. Waste is littered all over leading to insanitary living conditions. Municipal laws governing the urban local bodies do not have adequate provisions to deal effectively with the ever-growing problem of solid waste management. With rapid urbanization, the situation is becoming critical.

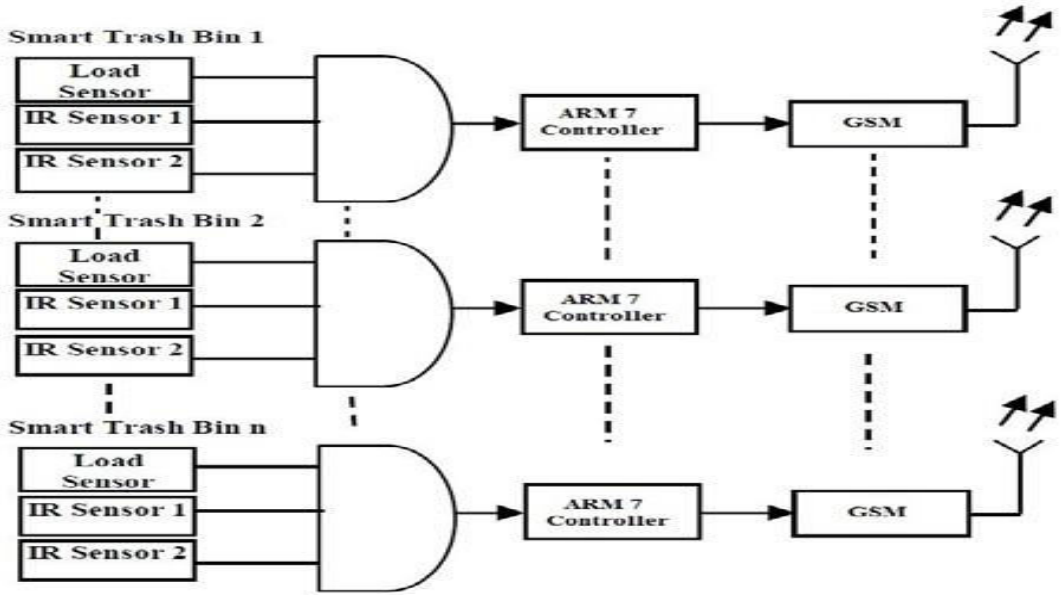
Automatic Waste Management System:

Automatic waste management system is the latest trends and is one of the best combinations to be used in this project. To give a brief description of the project, the sensors are placed in the common garbage bins placed at the public places. When the garbage reaches the level of the sensor, then that indication will be given to ARM 7 Controller.



(13.1.5B- Architecture of the Automatic Waste Management System)

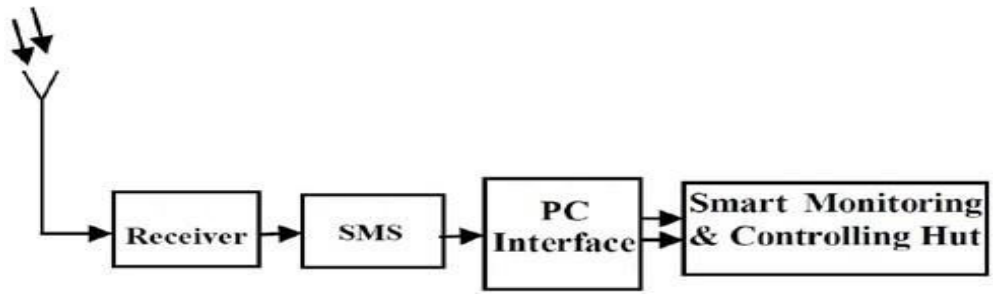
A major difficult task is that checking process of waste bins for the collection of wastes. The usual method by which, a person has to wander through the different spots and check the places for waste collection. This is somewhat complex and time consuming process. The present day waste management system is not as efficient as it should have been taking into consideration the advancements in the technologies that arose in the recent years. There is no surety about the management/ clearing of wastes at all the places. To overcome this problem a new approach, Automatic waste management system is proposed. It is a step forward towards making the waste collection process automatic and efficient in nature.



(13.1.5C- Smart Trash System)

Smart Monitoring And Controlling Hut

The Smart Monitoring and controlling Hut is a centrally controlling hub for all the smart functioning of this management system. This is the heart of the entire system and always takes signals as input from the local base stations spread over an area. It is the signal from the local base stations that invokes the controlling hut to make a decision about the management of waste of some particular trash bin.



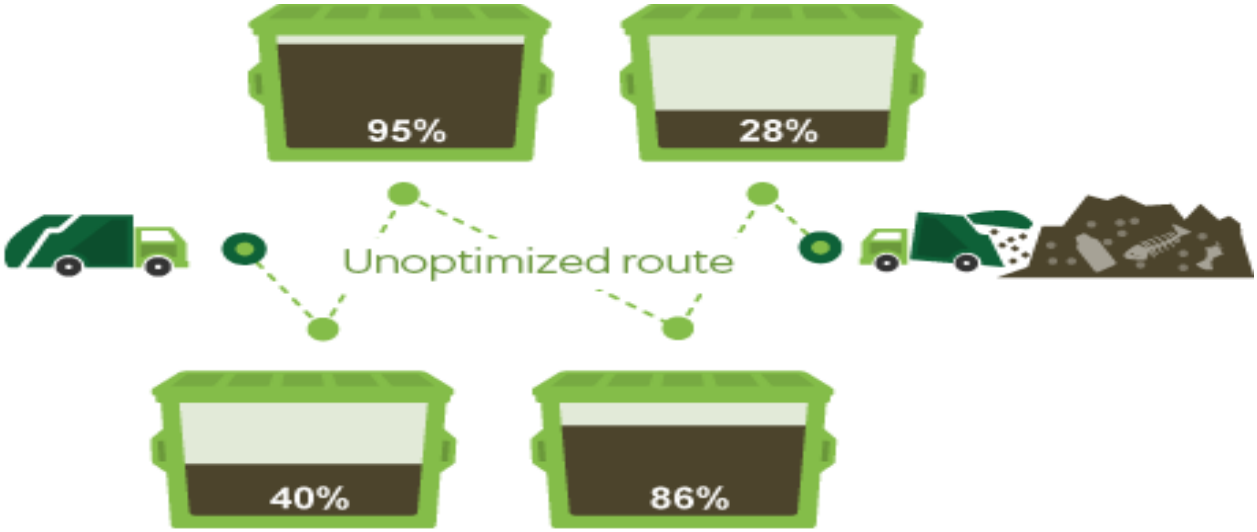
(F-13.1.5D- Smart Monitoring and controlling Hut)

Smart Vehicle System

The Smart Vehicle System is web interlaced vehicle that continuously keeps track with the monitoring and controlling hut about the status of the previous jobs that have been assigned to it and constantly waits for the new task. The Smart vehicular system consists of a task profile display. The new task of disposing a trash bin and all the relevant details about it are displayed on the mobile present in the smart vehicle.

Un-optimized system

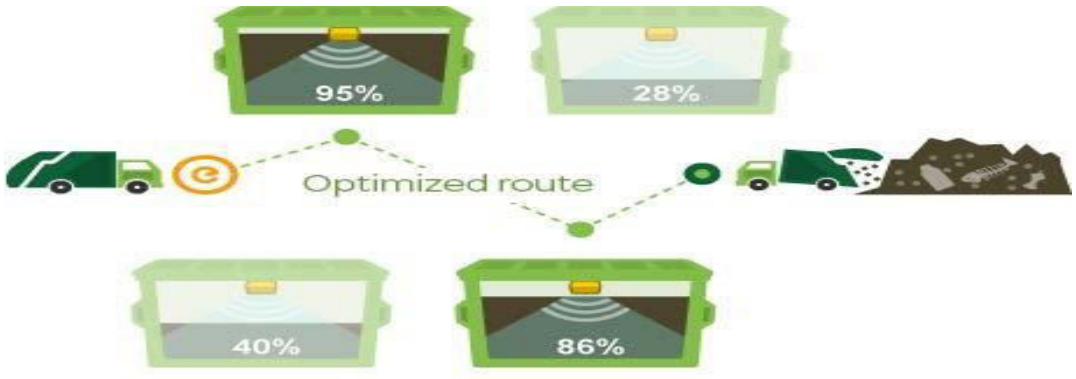
Until now collecting waste has been done using static routes and schedules where containers are collected every day or every week regardless if they are full or not. This system is not a sustainable system and has many drawbacks in collecting waste from the bin.



(F-13.1.5E- Un-optimized system)

Optimized System

Optimized System changes all this by using smart wireless sensors to gather fill-level data from waste containers. The service then automatically generates schedules and optimised routes which take into account an extensive set of parameters. New schedules and routes are planned not only looking at the current situation, but considering the future outlook as well.



(F-13.1.5F-optimized system)

THE COMPONENT DESCRIPTION

Power Supply:

All electronic circuit works only with low D.C voltages. The main components used in power supply unit are transformer, rectifier, filter and regulator. A.C voltage typically of 230V is connected to a transformer which steps down the voltage to a desired level (12V). A diode rectifier provides a full-wave rectified voltage is initially filtered by simple capacitor filter to produce a DC voltage. The required DC supply is obtained from available AC supply after rectification, smoothing and regulation.

Microcontroller:

A microcontroller is a complete microprocessor system built on a single IC. Microcontrollers were developed to meet a need for microprocessors to be put into low cost products. Building a complete microprocessor system on a single chip substantially reduces the cost of building simple products, which use the microprocessor's power to implement their function, because the microprocessor is a natural way to implement many products.

(F-13.1.5G- Microcontroller)

GSM Technology

Global System for Mobile Communications, originally Groupe Spécial Mobile commonly known as GSM, is a standard set developed by the (ETSI) to describe protocols for second generation digital cellular networks used by mobile phones. It became the fact of global standard for mobile communications with over 80% market share. The GSM modem is interfaced with the ARM microcontroller. If the garbage Box is full, automatically the SMS alert has to be sent to the controlling hut through the GSM. Mobile is in the hand of user which receives SMS. The GSM Module is interfaced with the ARM microcontroller through MAX 232 microprocessor. GSM Module has a SIM card, it sends an SMS to user, when an error introduced. They are used for sending and receiving SMS and MMS alerts.

(F-13.1.5H-GSM modem)

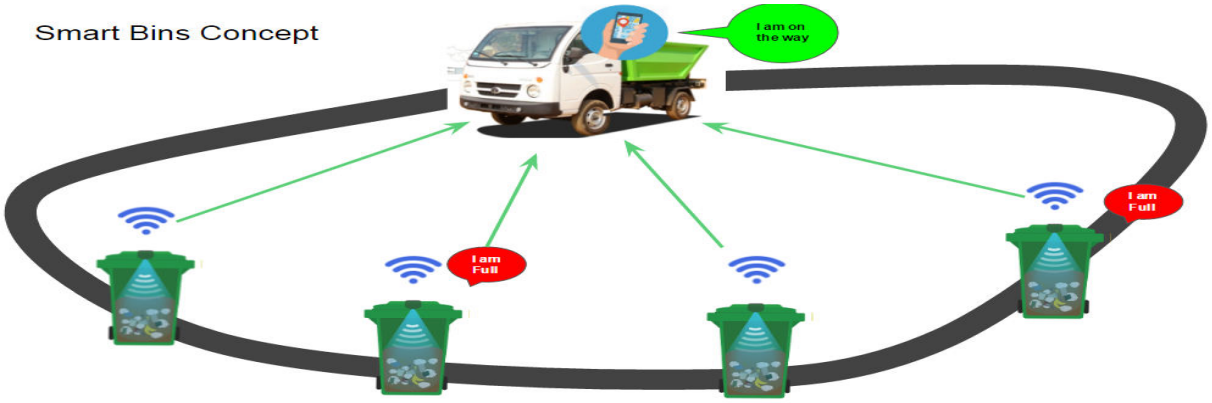
Liquid Crystal Display

Liquid Crystal Display (LCD's) has materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

(F-13.1.5I- Liquid Crystal Display)

Implementation Of Smart Garbage Bin

The input to the sensor module would come from the waste bin which is placed at different localities in the public area. The sensor is placed in the garbage bin at a max level , if that level is crossed by the garbage in the bin, then sensor will sense that and will communicate to ARM 7 controller technology.



(T- 13.1.5J- Network of bins)

	**Completely filled:**3 weeks once **Truck check:** once in a week **Area:** middle of subir village **Km from municipality:** 5km

	**Completely filled:** 1 weeks once **Truck check:** once in a week **Area:** Near the school **Km from municipality:** 3km

	**Completely filled:** 1 weeks once **Truck check:** once in a week **Area:** sabharidham **Km from municipality:** 6km

CATEGORY	NORMAL GARBAGE BIN	**SMART GARBAGE BIN**
MONTHLY KM	148(APPROX.)	95(APPROX.)
FUEL CONSUMPTION	HIGH(53KMEXTRA)	LOW
POLLUTION FROM TRUCK	HEAVY	REDUCED
GARBAGE OVERFLOW	HEAVY	NO OVERFLOW
DISEASE SPREADING	HIGH CHANCE	LOW CHANCE

Advantages of Smart Garbage Bin over Normal Garbage Bin)

ITEM	QUANTITY	PER RS.	Rs.
Smart dustbins	35	2445	85,575

(T-13.1.5A- cost of bins)

13.1.6 Design of public garden

Scenario :-

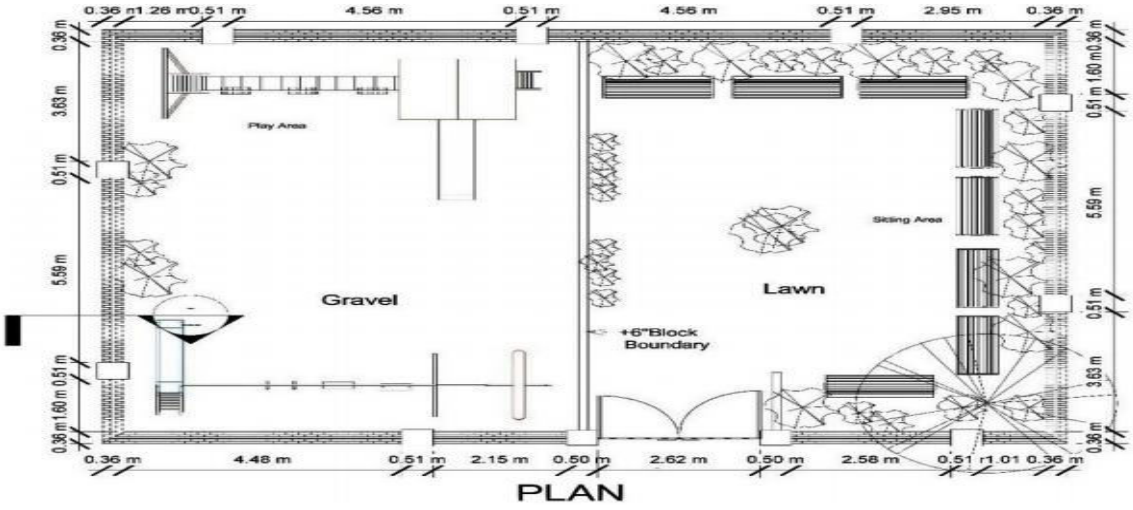
Design Utilized by :- People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a public garden for recreational purposes.

Needs / Benefits :- Availability of the recreational area in the village; Growth of plants; Exercise Purpose; etc.

Design brief :- A public garden is an institution that maintains collections of plants for the purposes of public education and enjoyment, in addition to research, conservation, and higher learning. It must be open to the public and the garden's resources and accommodations must be made to all visitors.

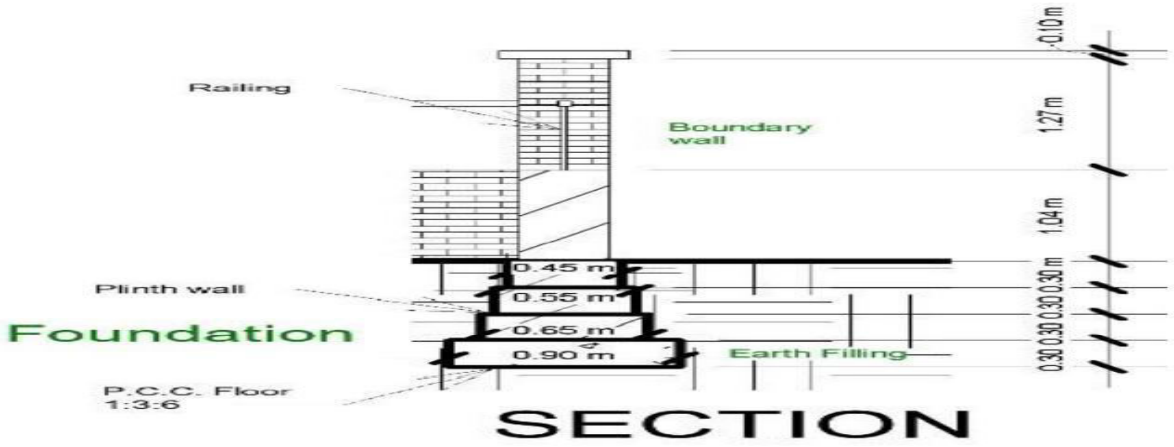
Existing Situation In Subir :- In the Subir village there is no any recreational area existing. So that for the better living standard and enjoyment purpose we have proposed one design of public garden as recreational area in the village

Proposed Design in Auto cad; Revit and Sketchup :



(F-13.1.6A- Public Garden - Plan)

(F-13.1.6B- Public Garden - Elevation)



(F-13.1.6C- Public Garden - Section)

(F-13.1.6D- Public Garden – Sitting Area 3D Model)

(F-13.1.6E- Public Garden – Playing Area 3D Model)

T- 13.1.6 A Public Garden : Measurement Sheet

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m3)
1	Basic Wall: Generic - 6"		0.15 m	0.15	2	**2.63**
2	Basic Wall: 0.45	54.8	0.45	0.3	4	**261.82**
3	Basic Wall: 0.55	54.8	0.55	0.3	4	**319.98**
4	Basic Wall: 0.65	54.8	0.65	0.3	4	**378.16**
5	Basic Wall: 14" COMPOUND WALL	54.8	0.36	1.828	4	**19.73**
6	Railing: BRICK	51.29		0.91	1	**46.673sqft**
7	Floor: Generic - 12"	54.8	0.9	0.3	1	**14.796**
8	Excavation	54.8	1.2	1.5		**98.64**

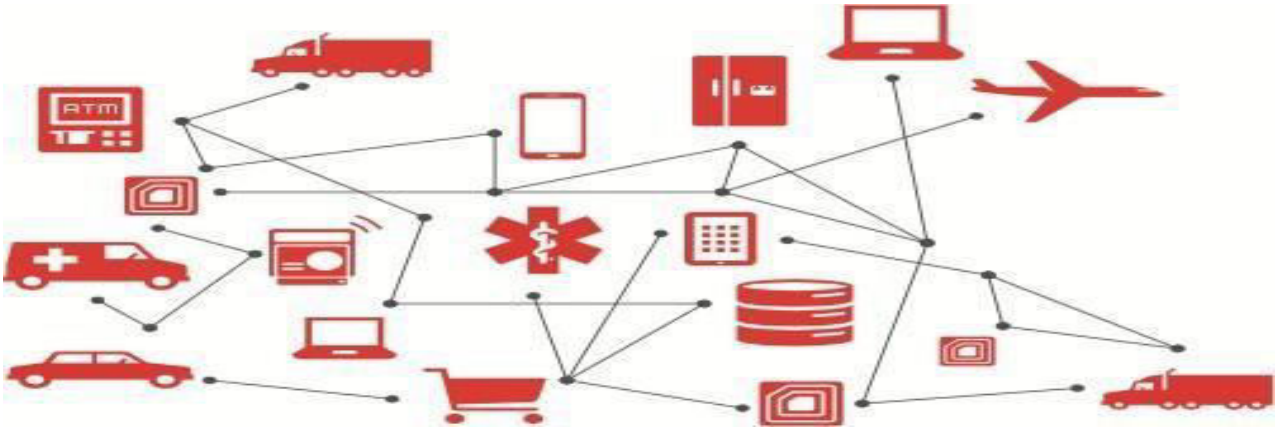
T-13.1.6 B Public Garden : Abstract Sheet

Sr No.	Description	Quantity (M^3)	Rate	Per	Amount
1	Basic Wall: Generic - 6"	**2.63**	45	**M^2**	**1046.25**
2	Basic Wall: 0.45	**261.82**	150	**M^2**	**26598**
3	Basic Wall: 0.55	**319.98**	180	**M^2**	**31917.6**
4	Basic Wall: 0.65	**378.16**	210	**M^2**	**37237.2**
5	Basic Wall: 14" COMPOUND WALL	**19.73**	180	**M^2**	**3043.8**
6	Railing: BRICK	**46.673sqft**	300	**M^2**	**14002.2**
7	Floor: Generic - 12"	**14.796**	3500	**No.**	**52500**
8	Excavation	**98.64**	350	**M^3**	**34524**
				Grand Total	**200869**

Total cost: Rs. 200869

13.1.7 Home automation system

Home automation structures have gotten commonness of late, paralleling advances in the possibility of the Internet of Things. The current endeavour exhibits the utilization of an unobtrusive home computerization system, inside the structure of assistive advancement. The system utilization relies upon the Arduino microcontroller along with Bluetooth correspondences capacity, and it is proposed for use by the elderly and people with insufficiencies. The structure is anything but difficult to use, with an instinctual interface executed on an Android based propelled cell phone. Showings exhibit that the structure empowers control of home devices, lights, warming, cooling systems and security devices by the arranged customers, i.e., the elderly and crippled.



(F-13.1.7A-home robotics at varios location)

An international, accepting, imperceptible, ambient with all the networks computing placing constructed in the course of the sustained advent of clever sensors, smart cameras, database, gentle wares, and enormous statistics centers of the global-spanning which are on the basis of records that is called “net of factors”.Essential designs of net of things is like that, nearly all good sized object in this entire global also can be converted right into a laptop that's related to net.

Why are Smart homes needed?

Savings- With all the connected electrical devices that are inclusive of getting to know coolers, sprinklers which might be clever, lights which might be wireless enabled, tracking the electricity retailers in addition to water heating and cooling modules that will also reduce energy and water use.

Control- Many of the todays apparatuses in a household, from broilers and fridge to deadbolts and cooling gadgets, might be controlled naturally by means of projects in PCs, phones and pills. In many occurrences, the control of every one of these gadgets works when you are out of the house as well and can transform them, which implies you could close the entry via the air terminal, check at the pooch from any of the nation, or affirm that you turned off your stove from the commercial center or some other store.

(F-13.1.7B-automation system)

Security- They are so clear, connected responses for wellbeing for the sharp home that are sensibly estimated choices for each checking security verified frameworks.

Safety- Sensors that are verified that can discover spillage of water, phase of stickiness, carbon dioxide, development, warmness and each ecological issue that could be envisioned assistance keep occurrence from transforming into catastrophes as they could speak with proprietor legitimately, on each event you're, wherever you need.

PROBLEM STATEMENT

In these present days home computerization is persuading the chance to be vital to improve our life conditions. Comfort and straightforwardness of utilizing home machines is the thing that home robotization is progressing. Home robotization offers a bleeding edge lifestyle in which an individual finds the opportunity to control his whole house utilizing a pushed wireless, from turning on a TV to locking/opening sections; it in like way offers a competent utilization of centrality.

OBJECTIVES

1. To assembling a remote home robotization structure constrained by gadget associated with the web.
2. Integrate the contraption to the controller: The overwhelming need that must be recollected when developing a Smart Home is that it must be savvy. The contraption controller must be humbly organized with the machines in the house with a basic foundation.
3. Test the set up and analyze the data: After the system is set-up, with the help of a mobile phone and a controller, tests are driven while data is recorded and inspected.
4. To arrangement and execute monetarily adroit home robotization structure yet a capable one.
5. To plan an easy to use and a guaranteed structure to control home machines particularly planned to support the more prepared individuals and weakened.

METHODOLOGY

Proposed System Feature

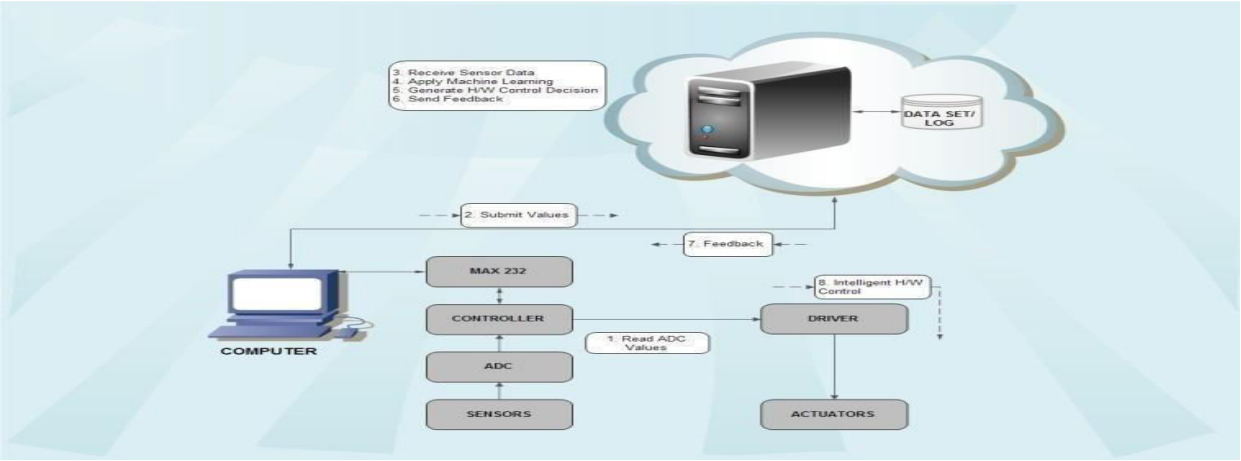
As we enter the twenty first century, the transaction among individuals and pc is breaking vintage confinements and coming into another domain. inside the massively innovation driven worldwide of these days' phones have develop as a piece of our ways of life. cell phones are not simply discussion device. Our endeavor attempts to infer arrangement furnishing better oversee on local machine with assistance of cell phone. the current contraption incorporates substantially machines in our home which can be been controlled through switches.

Proposed Home Automation System

The end individual can utilize their mobile phone or PC to sign into the machine. A fundamental test is accomplished for whether the equipment instrument is ON or not. handiest on the off chance that the equipment is approved and ON, at that point the individual is verified. when the confirmation is done accurately, individual is then equipped for send the control alarms to the equipment machine.

Framework of the System

By techniques for and huge this diagram is remoted into two number one responsibilities to be explicit controlling contraptions and giving gift data. The controlling and for the reason that the records errand is driven by strategies for joining the Arduino little scale controller which mates with the switch inside the house and may be gotten to by bleeding edge cell phones utilizing the web.



(F-13.1.7C- Framework of system)

Development of system:

Home mechanization depicts a course of action of sorted out, controllable devices that participate to make your home increasingly pleasant, revamp, capable, and secure. You "talk" with your automated home through a remote control or astute contraption. In the accompanying area we will examine the advancement of our home robotization framework.

HARDWARE DESCRIPTION

Arduino Uno R3:Arduino is an open source physical getting ready gear, which depends upon a microcontroller board and a hardened upgrade condition for the board to be adjusted. Arduino is fundamental and can be easily learned by juveniles. Arduino can continue running on any phase that joins Windows, Linux Operating System, and Macintosh, as opposed to different microcontrollers, which run just in the Windows working structure. The Arduino can be used to develop a natural interface, get commitments from a different aggregation of switches and furthermore sensors, and at the same time control the yield from various physical contraptions including lights and diverse mechanical assemblies.

Specialized determinations :

“Microcontroller: - Microchip

ATmega328P Usage Voltage: - 5

Volts

Voltage: - 7 - 20 Volts

Computerized I/O Pins: -14 (of which 6 give PWM

yield) Simple Pins in Input: - 6

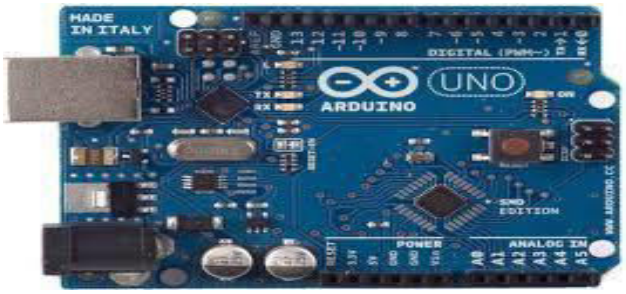
Current of DC per I/O

Pin: - 20 mA Current

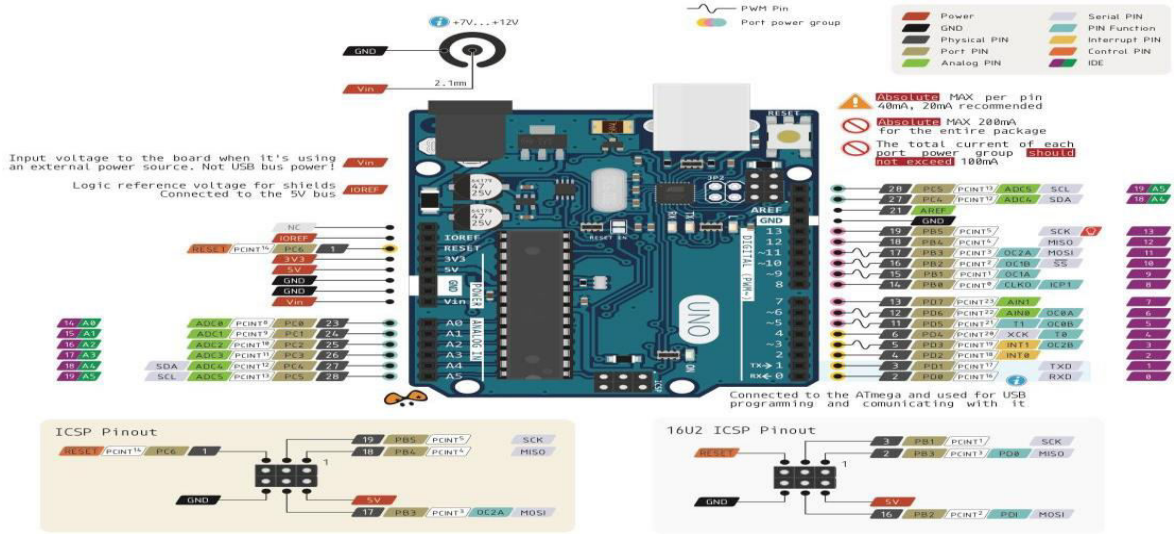
of for 3.3V Pin: - 50 m

Streak Memory: - 32 KB of which 0.5 KB utilized by the bootloader

SRAM: - 2 KB
EEPROM: - 1 KB
Speed of clock: - 16 MHz Length: - 68.6 mm Width: - 53.4 mm Weight: -25 g”



(F-13.1.7D-Arduino Uno)



(F-13.1.7E- circuit of Arduino Uno)

Transformer

A Step-down voltage of 230 V AC to 12V transformer with a maximum current of 1Amp.
Specifications:
voltage: - 2 x 12V
current: -1 x 1000mA
power rated: - 24VA

(F-13.1.7F- Transformer)

Light bulbs :Two light bulbs to demonstrate home automation.

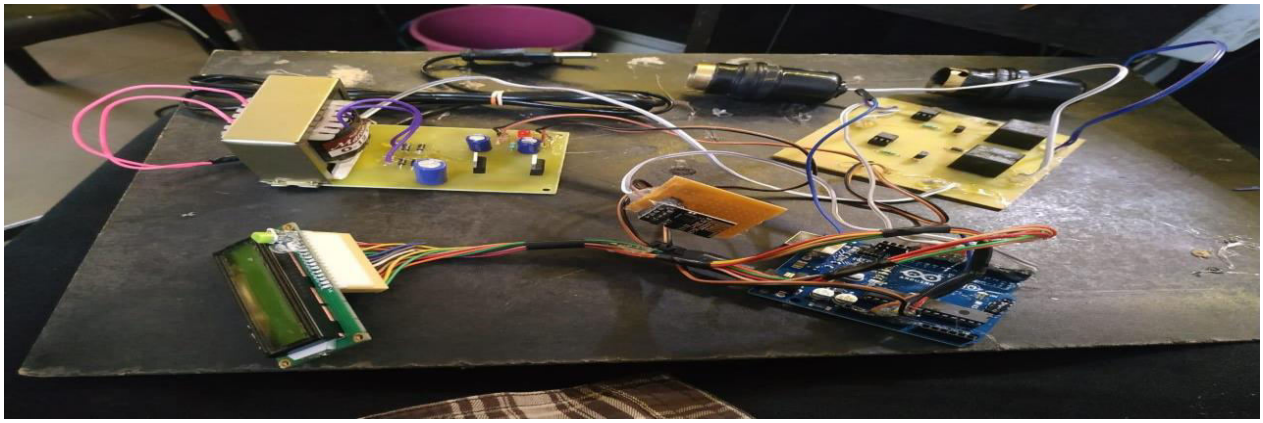
(F-13.1.G-bulbs)

Relay module:A relay module is used to connect various devices to Arduino uno R3.

(F-13.1.7H-relay module)

System Design:

In our home automation system we have shown how we can control two devices using internet of things (IOT). The Arduino uno R3 is the microcontroller. There are two sorts of correspondence engaged with this venture: wired and remote correspondence. We have used remote communication to operate the device using internet of things. Figure 12 depicts the picture of our model



(F-13.1.7I- System design)

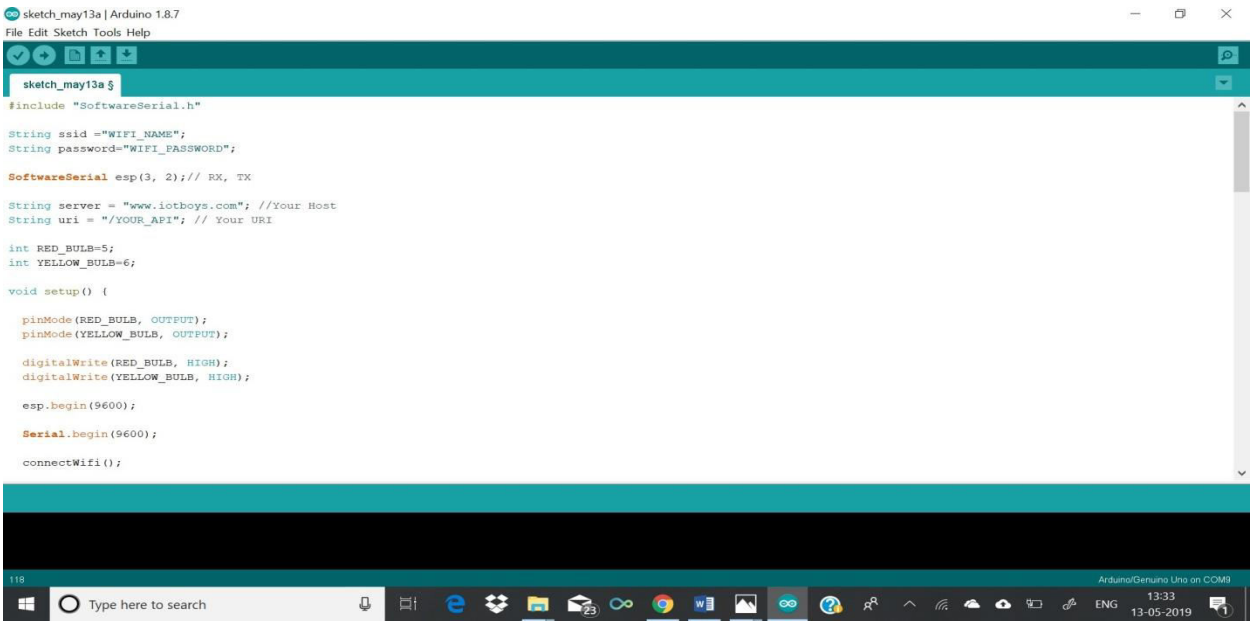
(F-13.1.7J- Opratping System design)

Associating the Appliance to the Arduino Board

After every one of the associations are done, the home machines ought to be associated with the Arduino. The positive end of the home apparatus must be associated with the anode port of the optocoupler and negative end of the machine must be associated with the power source utilizing wires. Utilizing distinctive optocouplers and Arduino ports, the associations is made for different apparatuses.

ALGORITHMS:

Programming the Arduino uno isn't extremely troublesome errand. When the circuit has been made on the breadboard, you'll have to transfer the program (known as a draw) to the Arduino. The draw is an arrangement of guidelines that tells the board what capacities it needs to perform. An Arduino load up can just hold and perform one outline at any given moment. The product used to make Arduino portrays is known as the IDE which represents Integrated Development Environment.For, this particular project we have developed a simple code. The code has been illustrated using screen shots taken from our laptop.



Costing of system:

ITEMS	QUANTITY	RS.
Arduino Uno	1	2500
Transformer	1	25000
Relay module	1	450
LED display	1	600
Bulbs	2	60
Wiring material	-	200
Other expense	-	50
Total		1,08.060

13.1.8 IoT Based Plant Monitoring System

As we can see in today's world only some devices like PC's and mobiles are connected to internet. Now-a-days world is fully overtaken by the internet and internet of things. Internet is use for basic need of all human beings. The Internet of Things (IOT) is the network of physical objects. It simply means to monitor a physical device or machine or it is inter-networking of physical devices which is embedded with electronics, sensors, software and network connectivity to enable it to achieve greater value and services by exchanging data with the manufacturerIOT permits objects to be sensed or controlled remotely across the network infrastructure

LITERATURE SURVEY:

In India about 35% of land was under reliably irrigated. And the 2/3rd part of land is depending on monsoon for the water. Irrigation reduces dependency on monsoon, improves food security and improves productivity of agriculture and it offers more opportunities for jobs in rural areas. Farmers are facing problems related to watering system that how much water has to supply and at what time? Sometimes overwatering causesthe damage to crops and as well as waste of water. Hence for avoid such damage we need to maintain approximate water level in soil.

EXISTING SYSTEM:

The system is developed for irrigation is on two ways:
1. System Software
2. System hardware

Software is web page designed by using PHP and hardware consists of embedded system which monitors soil content. In this system open source Arduino boards along with moisture sensors, it is applicable to create devices that can monitor the soil moisture content and accordingly irrigating the fields as when needed.This system introduced a GSM-SMS remote measurement and control system for farms based on PC- based database system connected with base station,

PROPOSEDSYSTEM:

The system is combination of hardware and software components.

1.Hardware components:

I) Sensors (Moisture, DHT22, Ultrasonic)
II) ESP8266 Wi-Fi module
III) Arduino Uno
IV) Water pump

2.Software components:

I) Android application

Sensor Section:

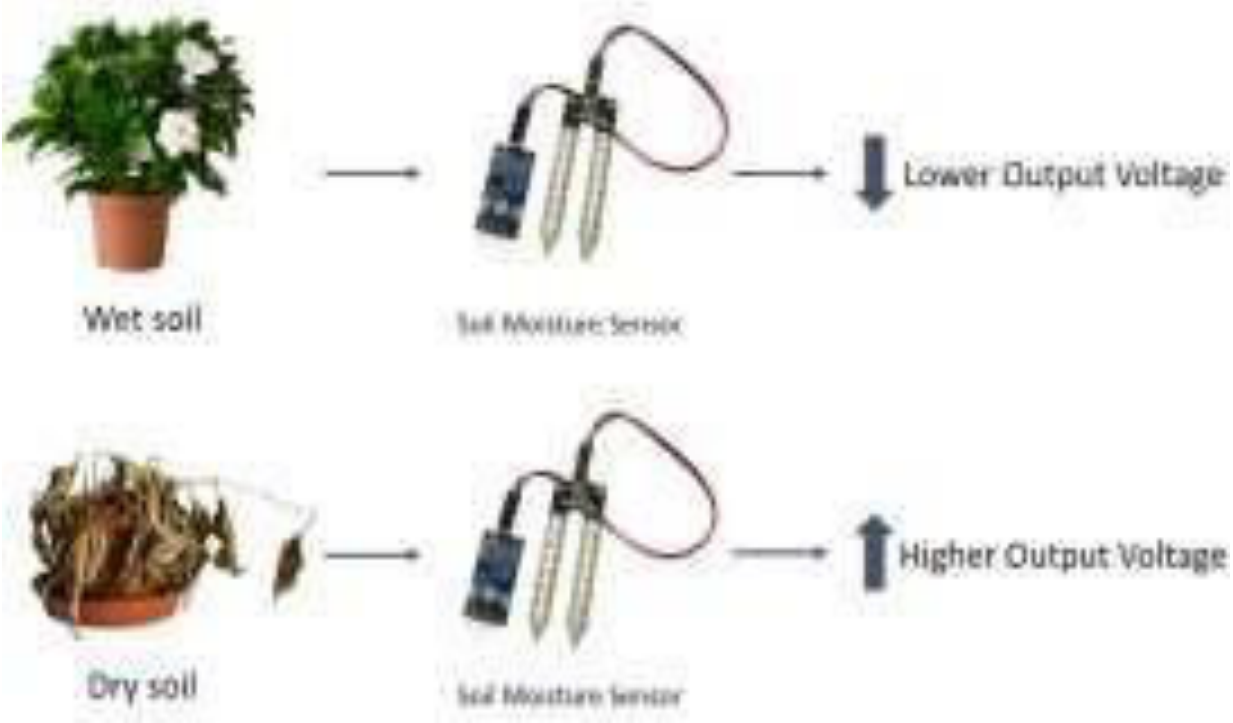
Moisture sensor

Soil moisture sensor is used to detect the moisture of the soil. This sensor is made up of two pieces: the electronic board at the right, and the probe with two pads, that detects the moisture content of soil.

The voltage of the sensor outputs changes accordingly to the moisture level in the soil. When the soil is:

Wet: The output voltage decrease

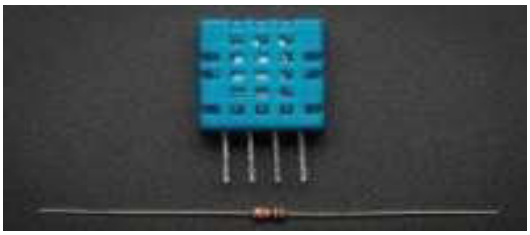
Dry: The output voltage increase



(F-13.1.8A-Moisture sensor)

DHT 11 (Temperature and Humidity)

DHT11 consist of both humidity and temperature sensor. For measuring humidity there are two electrodes with moisture holding substrate between them. So when the humidity changes, the resistance between these electrodes changes and conductivity of the substrate changes. This change in resistance are measured and processed by the IC which makes it ready to be read by a microcontroller.



(F13.1.8B-DHT 11)

Control Section:

ESP 8266 Wi-Fi module:

The ESP8266 Wi-Fi Module is used to give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of hosting an application or it also offloads all Wi-Fi network functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set so you can simply hook this up to your Arduino device and get about Wi-Fi-ability. The ESP8266 Wi-Fi module is used to transfer the data from Arduino to dummy sever and from server to Arduino.

(F-13.1.8C- ESP 8266 Wi-Fi module)

Arduino Uno:

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and Analog I/O pins that may be interfaced to various shields and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus(USB) on some models, which are also used for loading programs from personal computers.

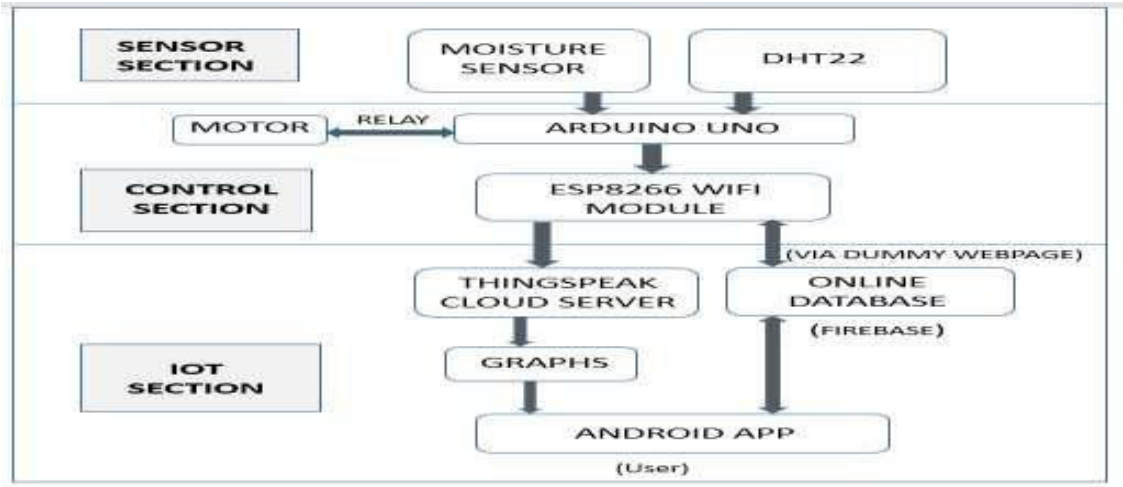
IOT Section:

AT	This will check that module is connected properly and is it functioning, the module gives acknowledgment.
AT+RST	This will reset the Wi-Fi module
AT+CWLAP	This will detect the Access points and their signal strengths available nearby.
AT+CWJAP	”SSID”,”PASSWORD” This connects the ESP8266 to the specified SSID
AT+CWMODE=1	This sets the Wi-Fi mode. It should be always set to Mode 1.

(T-13.1.8A-IOT FORMS)

METHEDOLOGY

Fig 4. Shows the block diagram of Automatic Plant Watering System with I0T. Farmer monitors and control system in order to improve the efficiency with help of sensor parameters like temperature, humidity, soil moisture.



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(F-13.1.8D-Block Diagram)

CONCLUSION

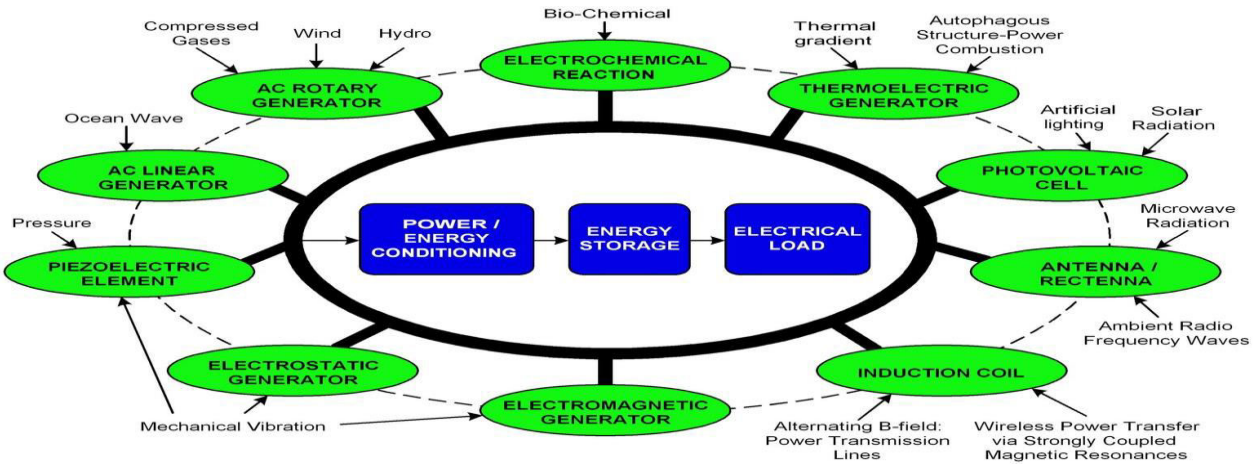
A system to monitor temperature, humidity, moisture levels in the soil was designed and the project provides an opportunity to study the existing systems, along with their features and drawbacks. Agriculture is one of the most water-consuming activities. The proposed system can be used to switch the motor (on/off) depending on favourable condition of plants i.e sensor values, thereby automating the process of irrigation. which is one of the most time efficient activities in farming, which helps to prevent over irrigation or under irrigation of soil thereby avoiding crop damage. The farm owner can monitor the process online through a android App. Though this project can be concluded that there can be considerable development in farming with the use of IOT and automation

ITEMS	QUANTITY	RS.
DHT 11 (Temperature and Humidity)	1	2500
Moisture sensor	1	1030
ESP 8266 Wi-Fi module	1	298
Wiring material	-	200
Other expense	-	50
Total		4078

(T-13.1.8B- COST OF PLANT MONITORING SYSTEM)

13.1.9 Energy harvestinng

Energy harvesting (EH) is a technique that captures, harvests or scavenges a variety of unused ambient energy sources such as solar, thermal, vibration and wind, and converts the harvested energy into electrical energy to recharge the batteries. The harvested energy is generally very small (of the order of mJ) as compared to those large-scale EH using renewable energy sources such as solar farms and wind farms of the order of several hundreds MJ. Unlike the large-scale power stations which are

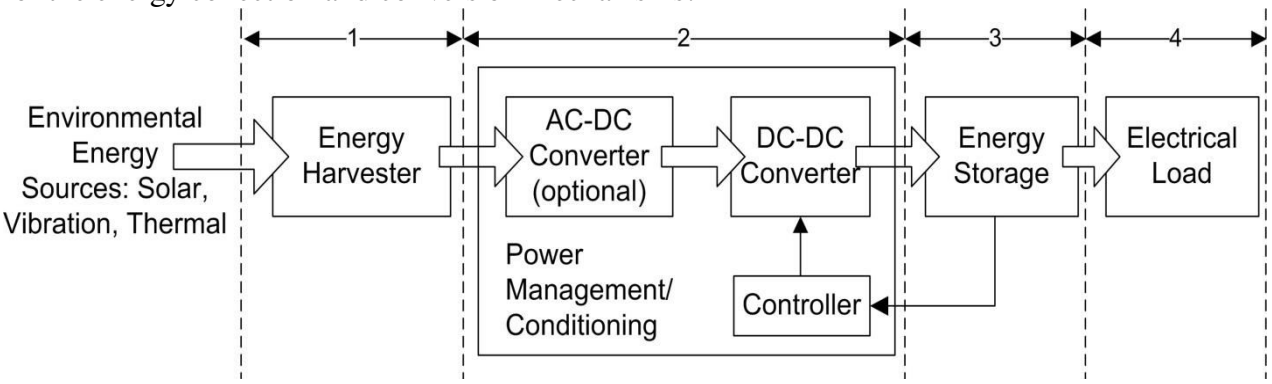


(F-13.1.9A: Energy harvesting sources and their energy harvesters, adapted from)

In our environment, there are full of waste and unused ambient energy gener- ated from these energy sources seen in Figur These renewable energy sources are ample and readily available in the environment and so it is not necessary to deliberately expend efforts to create these energy sources like the example of burn- ing the non-renewable fossil fuels to create steam which in turn would cause the steam turbine to rotate to create electrical energy. Unlike fossil fuels which are exhaustible, the majority of the environmental energy sources are renewable and sustainable for almost infinite long period.

ENERGY HARVESTING SYSYTEM:

In an energy harvesting (EH) system, there are generally four main components namely: energy collection and conversion mechanism (energy harvester), electrical power management/conditioning circuit, energy storage device and electrical load (wireless sensor node) Power output per unit mass or volume i.e. power/energy density is a key performance unit for the energy collection and conversion mechanisms.

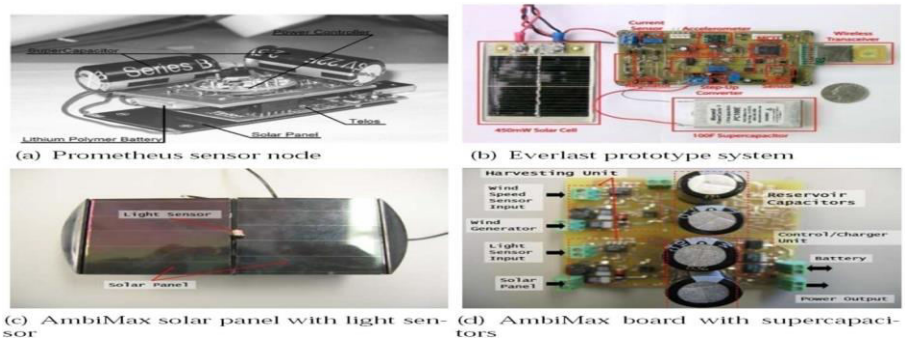


(F-13.1.9B-General block diagram representation of energy harvesting system unit)

Referring to Figure, it can seen that the function of the energy harvester is to convert energy harnessed from environmental energy sources into electrical energy. Some typical examples of the energy harvesters, as shown in Figure include: the Lead Zirconate Titanate (PZT) ceramic material converts mechanical (strain or stress) energy into electrical energy due to the piezoelectric effect, the photovoltaic cell converts solar energy into electrical energy, the thermoelectric generator output electrical voltage when there is a thermal gradient across it and the wind turbine converts kinetic energy from wind flow into electrical energy.

Solar Energy Harvesting System:

Solar energy of an outdoor incident light at midday holds a power density of roughly 100 mW per square centimeter indicates that in a small volume of 1 cm^2, 100 mW of electrical power can be harvested from the sun by using the solar panel. Conversely the lighting power density in indoor environments such as illuminated offices drops tremendously to almost 100 µW/cm2 . Commercially off-the-shelf single crystal solar cells offer efficiencies of about 15 % and up to 20 - 40 % for the state of the art expensive research photovoltaic (PV) cells recorded by Green et al.



(a) Prometheus sensor node (b) Everlast prototype system

(c) AmbiMax solar panel with light sensor (d) AmbiMax board with supercapacitors

(F-13.1.9C-: Examples of solar energy harvesting system)

However, the drawback with this technique is the transient drop of power during that time where no energy is harvested.Another SEH system, known as AmbiMax, has been proposed by Park et al. in . The AmbiMax system exploits a small photosensor to detect the ambient light conditions and to force the solar panel to work in its MPP (see Figure. In similar nature as AmbiMax, Dondi et al

Materials and Methods:

Various types of renewable energy sources such as geothermal, ocean tides, wind and sun have geographical limitations, but solar energy has less geographical limitation as compared to other non-conventional energy sources because solar energy is available over the entire globe.

Ways for Converting Solar Energy into Electrical Energy:

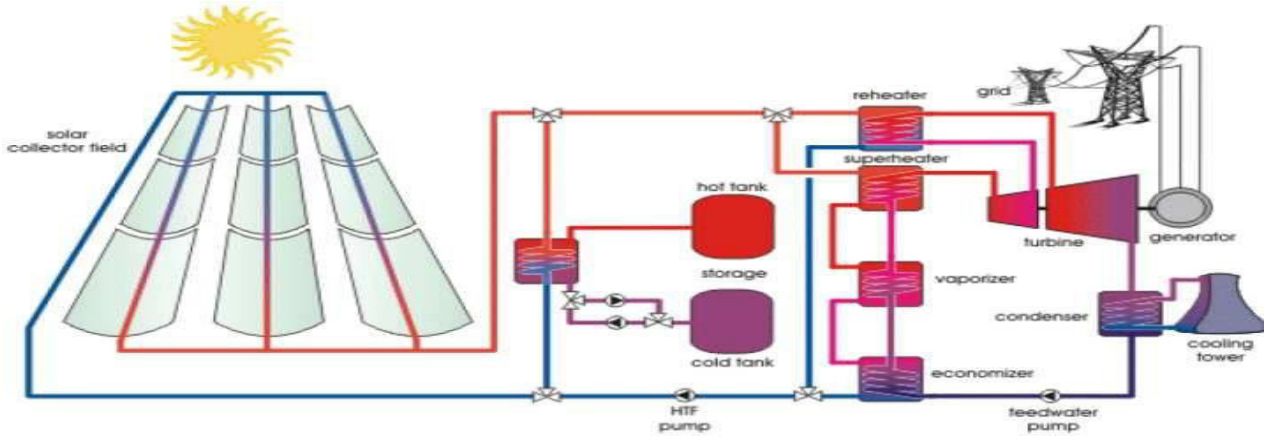
There are two ways by which we can convert solar energy into electrical energy: by solar thermal or solar photovoltaic systems.

Solar Thermal:

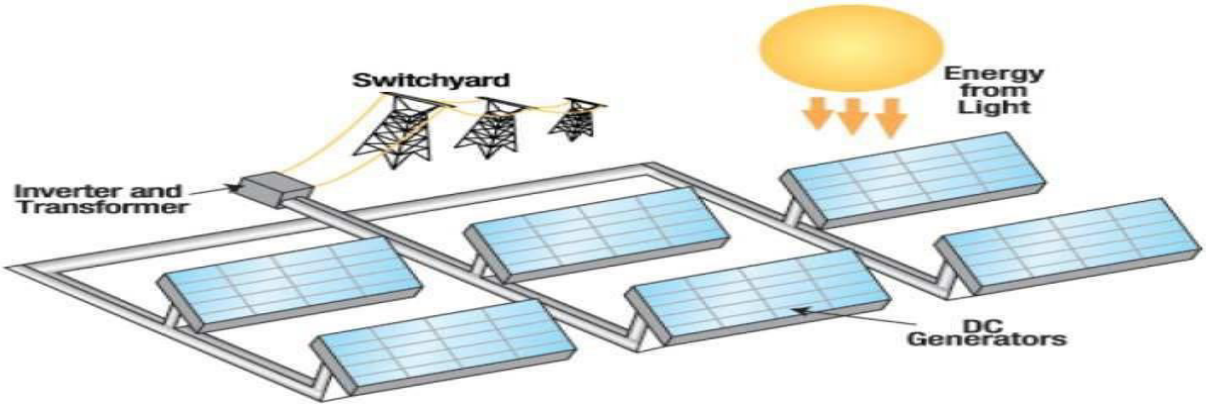
The solar collectors concentrate sunlight to heat a heat transfer fluid to a high temperature. The hot heat transfer fluid is then used to generate steam that drives the power conversion subsystem, producing electricity. Thermal energy storage provides heat for operation during periods without adequate sunshine. Figure 1 shows the solar thermal system for generating electrical energy

Solar Photovoltaic

Another way to generate electricity from solar energy is to use photovoltaic cells; magic slivers of silicon that converts the solar energy falling on them directly into electricity.It is a device that produces an electric reaction to light, producing electricity. PV cells do not use the sun's heat to produce electricity. They produce electricity directly when sunlight interacts with semiconductor materials in the PV cells.



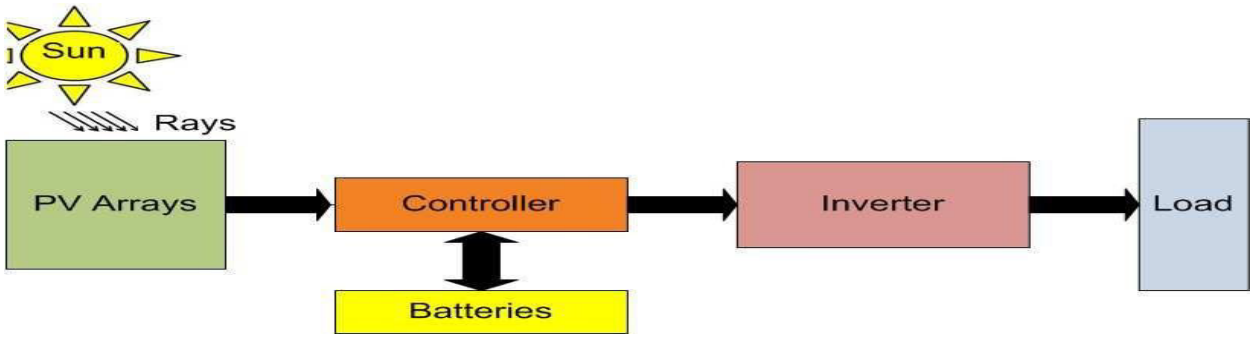
(F-13.1.9D solar Thermal Energy System)



(F-13.1.9E- Solar Photovoltaic Plant)

Elements included in a System of Photovoltaic Conversion:

The main elements that can be included in a system of photovoltaic conversion are solar panels, batteries, regulators/controllers, invertors and load as summarized in the block diagram of Figure 8.



(F-13.1.9F- Block diagram of a PV system)

Evaluating a Building Site

While the Pacific Northwest may have good to excellent solar potential, not every building site will be suitable for a solar installation. The first step in the design of a photovoltaic system is determining if the site you are considering has good solar potential

Mounting Location – Solar modules are usually mounted on roofs. If roof area is not available, PV modules can be pole-mounted, ground-mounted, wall-mounted or installed as part of a shade structure (refer to the section "System Components/Array Mounting Racks" below).

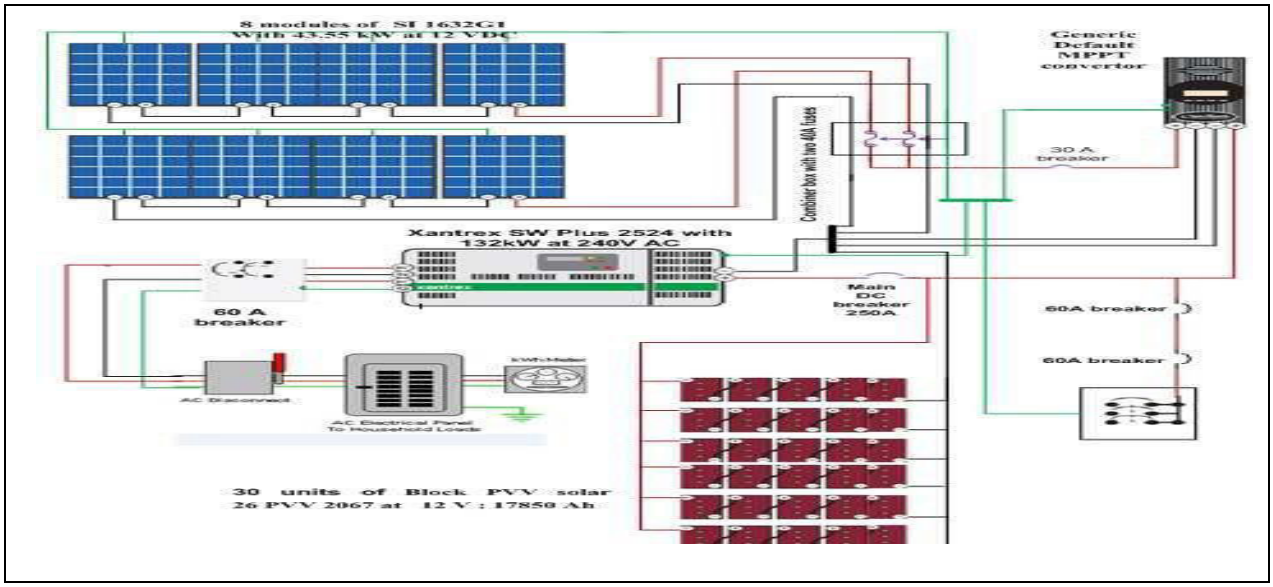
Shading – Photovoltaic arrays are adversely affected by shading. A well-designed PV system needs clear and unobstructed access to the sun's rays from about 9 a.m. to 3 p.m., throughout the year.

Solar Radiation at the Premise

The average daily solar irradiation and temperature is 4.5 kWh/m^2/day and 25.1℃ respectively with monthly average daily sunshine ranging from 6 hours to 8 hours. Figure 9 displays the average solar energy per square meter per day in any given month. The amount of power produced by a PV panel depends upon the amount of solar irradiation and temperature. The output result is used to directly compare with electricity bills paid monthly to the ECG.

Load Data

Eight hours of operational time was chosen for each illuminant. The number of lamps in the various parts of the premise and the total energy consumption of each type of lamp were analysed. The total daily energy utilization of the premise for eight hours is 3348 Wh. With the load assessment detail in hand, the total Watt-hours per day needed from the PV modules was calculated by multiplying the daily energy utilized (DEU) per day by 1.3 (this is the standard energy lost in a PV system taking into account the wasted energy from wiring, charge controllers, batteries and inverters) to get the total Watt-hours per day which must be provided by the panels [17]. Therefore, 3348 Wh/day×1.3 = 43534.4 = 43.53 kWh/day.



(F-13.1.9G- The Proposed Circuit Design of the Photovoltaic System)

Materials Used

The materials employed for this design are categorized into software and PV hardware components. The PVSYST V5.0 software is a computer software package for the study, sizing and data analysis of complete PV systems. It deals with grid-connected, stand-alone, pumping and DC-grid PV systems, and includes extensive meteorological and PV systems components databases, as well as general solar energy tools.It is designed to entail a contextual help which explains in details procedures and models used and offers an ergonomic.approach with a guide in the development of this paper providing results in the form of a full report, specific graphs and

tables. Figure 10 shows the circuit diagram of the proposed PV design using the PVSYST V5.0 software.

Sizing of Components and System Design

With the aid of the PVSYST V5.0, specifications, sizing and configurations of the major components with the exception of the invertor explained above were achieved.

Estimation of Electric Load on a Daily Basis

The first step required for gathering the energy load data is to find the overall amount of energy that the premise can store. This step also identifies opportunities for efficiency improvements and paves the way for sizing the system components. Equation 1 is used to compute the average number of watt hours required by the premise.

$$\textbf{Average } \frac{Wh}{Day} = \textbf{power} \times \textbf{Quantity} \times \frac{Hours\ use}{Day} \textbf{(1)}$$

The calculation and estimation of the required load on a daily basis for the premise is 43534.4 Wh/day or 43.53 kWh/day calculated earlier.

PV Module Sizing

Different size of PV modules will produce different amount of power. To determine the sizing of the PV module to use, the total watt-peak rating is needed which also depends on size of the PV module and the climate of site location. However, the module sizing was derived using the software. The total number of modules = 8 modules, with I_{sc}= 5.1 A, V_{oc} = 554.4 V and module area = 298 m^2.

Battery Sizing

The batteries must be able to store the total daily load, in addition to the extra energy lost by inverting from DC to AC. With the help of the software, 30 batteries (6 in series × 5 in parallel) of a 12 V battery with capacity of 17850 Ah were required. These batteries will provide adequate storage to meet the daily energy requirements, operating temperature effects of 50°C, 4 days of autonomy, which is the number of days the battery sustains its charge with no sunshine to recharge it, and 5% of loss of load (LOL), which is the probability time fraction at which the battery is disconnected due to the "low charge" regulator security.

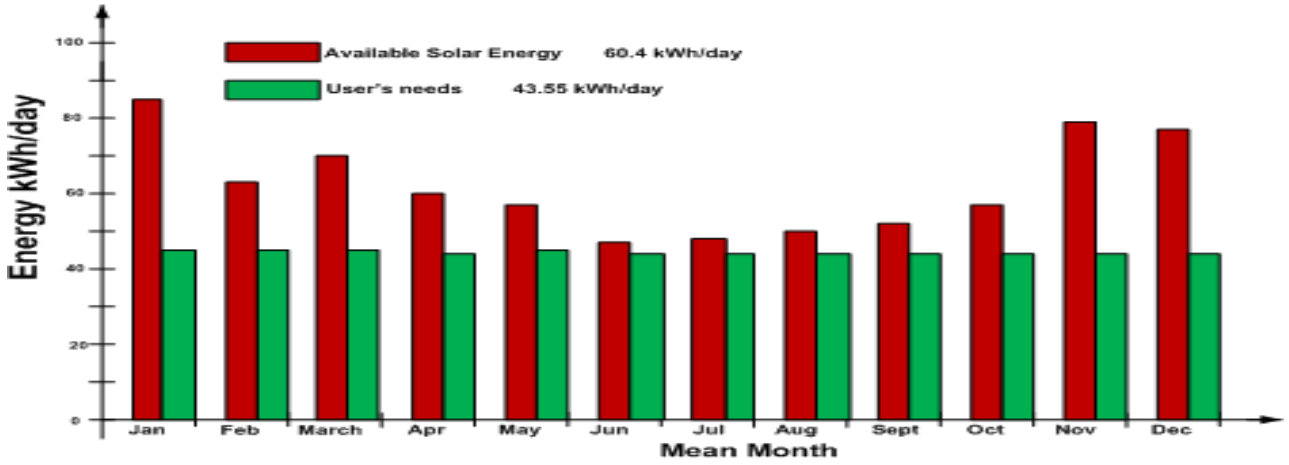
Safety Regulations

This PV system complies with Health and Safety Requirements, BS 7671, and other relevant standards and Codes of Practice. The designed system had an effective grounding system to limit voltages due to lightning, power line surges and unintentional contact with higher voltage lines and also provide a current path for surplus electricity to travel to earth .

Proposed Design Output: The function of the proposed design is to provide an alternative source of electrical energy to power the lighting circuits of the premise. The design produced 8

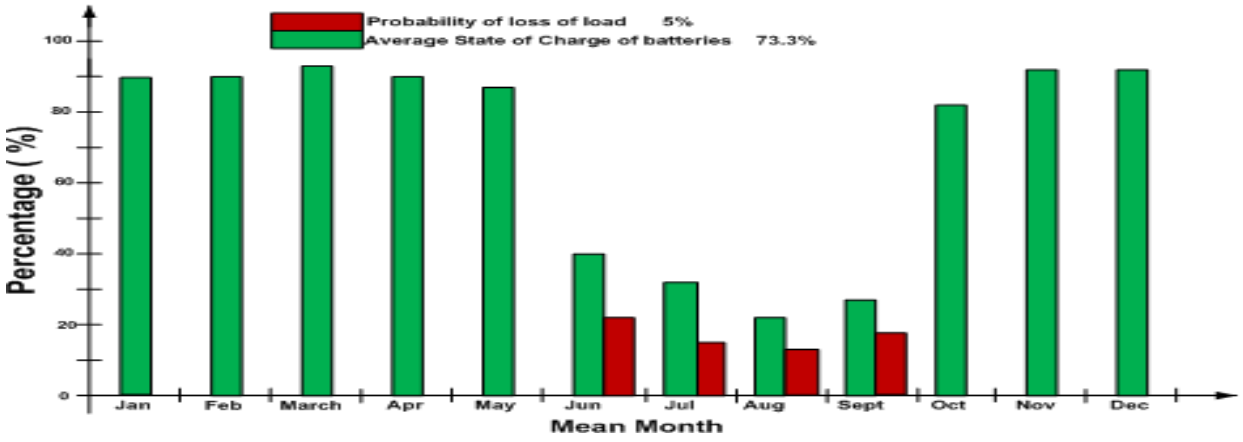
modules at12.53 kWp (peak kilowatt) at operating conditions and a battery capacity of 17850 Ah, thereby improving the reliability, adequacy, economic and environmental impacts

The graph in Figure demonstrates the proposed design output. The green bars in the graph represent the monthly energy demands of the premise with the red bars representing the amount of energy that can be produced by a12.53 kWp system.



(F-13.1.9H- Graph Showing Available Solar Energy and User's Needs by Mean Monthly Output of the Proposed PV System)

Figure also shows the average state of charge of batteries and the probability of LOL by mean monthly. The state of charge of batteries is the actual capacity of the battery, which is defined at nominal current, but varies with the discharge current level and temperature. It was however, noted from the graph above that June, July, August and September had less probability of LOL.



(F-13.1.9I-Graph Showing Average State of Charge of Batteries and Probability of Loss of Load by Mean Monthly Output)

Life Cycle Cost for Proposed Design

The life cycle costs (LCC) are the sum of the equipment (initial) costs and operational costs arising during the project until the end of the project horizon, which is usually set between 20 and 30 years .The equipment costs are the initial costs incurred at the beginning of the PV system electrification whilst the operational costs include the running costs, maintenance and replacement costs. Tables 1 and 2 below represents the initial and maintenance cost respectively for a period of 20 years and at a rate of 5%.

PV Components	Quantity	Unit Price (GH¢)	Price (GH¢)
Solar PV Module	8	1,000.00	8,000.00
Battery	30	390.00	11,700.00
Inverter	1	6,504.70	6,504.70
Controller	1	3,000.00	3,000.00
Labour and Miscellane0ous	-	-	10,000.00
Total Initial Cost (GH¢)			**28,674.70**

(T-13.1.9A- Initial Installation Cost Analysis for the Proposed Photovoltaic System)

Maintence cost	
Energy cost (GH¢/hour)	1.78
Annuities and maintence (GH¢/20 year)	14460
Total life cost	43134.70

(T-13.1.9B-Maintenance Cost Analysis for the Proposed Photovoltaic System)

13.2 Reason for students Recommending this design

- Rain water harvesting - to provide flexibility of urgent water requirements to the villagers
- Skill development centre - to develope skill of villagers
- Bank building - to provide flexibility of urgent cas requirements to the villagers
- Water tank - to provide extra feasibility to the public and provide water to villagers
- Public garden- to provide beautifull area for relexing
- Solid waste management– for the better health environment
- Home automation system- to provide safety and privacy
- Plant moisture monitoring system-to provide for agriculture purpose
- Energy harvesting – to store the energy

13.3About designs Suggestions / Benefit of the villagers:

1 Rain water harvesting

The population of Subir village is 2097 as per 2011 census. So it is required to large quantity of the village.

2. Skill development centre:

In the Subir village there is no any skill development centre. So according to the feedback given by the villagers, one skill development centre in the village.

3 Bank building:

In the subir village there is only one bank baroda gujrat gramin bank but its infrastructure is not better so we design 2 floor building for better convenience

4. Water tank:

For distributing water throught out the viilage we design the water for the villagers.

5. Public garden:

For best asthetic view of village the public garden is require for the villagers and provide relaxing place.

6. Solid waste management : Solid waste management consist of smart dustbins which are provide in all the vilaage.

7.Home automation system: Provide better safety and automation of activities.

8.Plant moisture monitoring system: It monitor the moisture of plant which is very impotent for the agriculture purpose

9.Energy harvesting:

It gives additional power while electricity power has gone.

Maintenance can help:

- Prevent the process of decay and degradation.
- Maintain structural stability and safety.
- Prevent unnecessary damage from the weather or from general usage.
- Optimise performance.
- Determine the causes of defects and so help prevent re-occurrence or repetition.
- Ensure continued compliance with statutory requirements.

Common maintenance tasks include:

- Exterior and plastering.
- Landscaping and gardening.
- Paving repairs.
- Window and door repairs.
- Debris/rubbish removal and clearance.
- Jet washing with chemical cleaning agents to remove fungal stain or mould.
- Gutter clearance and repair.
- Carpentry.
- Lighting repairs.

14: Technical Options with Case Studies (EXPLAIN ALL TOPIC AND FOR MINIMUM ONE TOPIC EXPLAIN NEW CONCEPT, DESIGN, PROTOTYPE MODEL WITH ACTUAL COST ESTIMATION)

14.1 .1Advance Earthquake Resistant Construction Techniques:

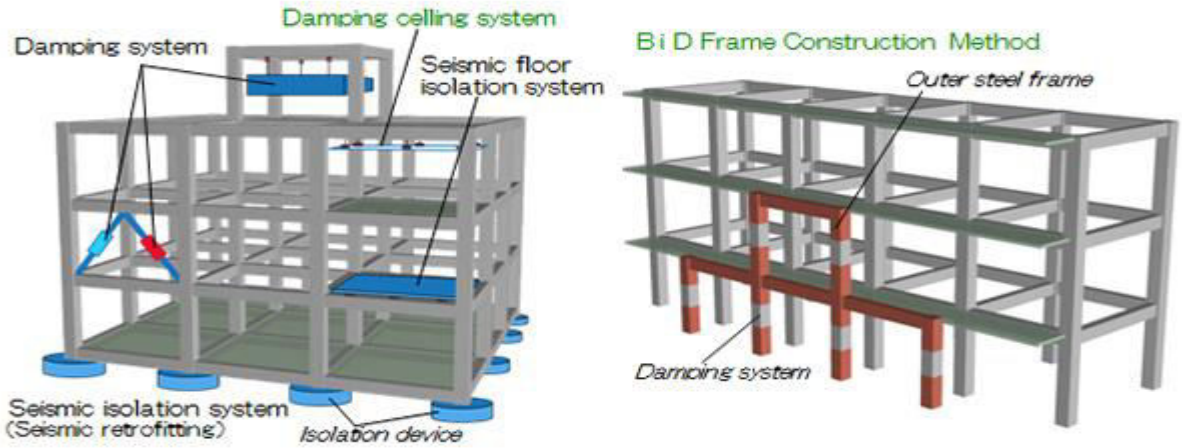
Earthquakes are one of the most destructive of natural hazards. Earthquake occurs due to sudden transient motion of the ground as a result of release of elastic energy in a matter of few seconds. The impact of the event is most traumatic because it affects large area, occurs all on a sudden and unpredictable. They can cause large loss of life and property and disrupts essential services such as water supply, transport etc. They do not destroy villages, town and cities but the aftermath leads to destabilize the economic and social structure of the nation. Earthquake is sudden rolling or shaking events caused by movement under the earth surface, resulting from the sudden release of energy in the earth's crust that creates seismic waves.

(F-14.1.1A- Earthquake resistant buildings)

This means that when an external force is applied to a system, such as wind pushing on a skyscraper, there has to be acceleration. Consequently, the people in the skyscraper would feel this acceleration. In order to make the occupants of the building feel more comfortable, tuned mass dampers are placed in structures where the horizontal deflections from the wind's force are felt the greatest, effectively making the building stand relatively still. When the building begins to oscillate or sway, it sets the TMD into motion by means of the spring and, when the building is forced right, the TMD simultaneously forces it to the left. Ideally, the frequencies and amplitudes of the TMD and the structure should nearly match so that EVERY time the wind pushes the building, the TMD creates an equal and opposite push on the building, keeping its horizontal displacement at or near zero. If their frequencies were significantly different, the TMD would create pushes that were out of sync with the pushes from the wind, and the building's motion would still be uncomfortable for the occupants.

14.1.2 Seismic Retrofitting of Buildings:

The need for retrofitting or strengthening of earthquake damaged or earthquake vulnerable buildings in India have been tremendously increased during recent years after the devastating Bhuj earthquake with an alarming awakening for sufficient preparedness in anticipation to face future earthquakes. Many professional engineers are accustomed to the designing of new building but they may find themselves not fully equipped to face the challenges posed at the time of strengthening the existing buildings with a view to improving their seismic performance. This section presents the most common devices for retrofitting of reinforced concrete buildings with technical details, constructional details and limitations.One of the most common methods to increase the lateral strength of the reinforced concrete buildings is to make a provision for additional shear walls, Figure 6 (CEB, 1997). The technique of infilling/adding new shear walls is often taken as the best and simple solution for improving seismic performance.



(F14.1.2A-seismic structure)

14.1.3 Advance Practices In construction field in Modern Material,Techniques and equipements:

Building material is any material which is used for a construction purpose. Many naturally occurring substances, such as clay, sand wood and rocks, even twigs and leaves have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use, some more and some less synthetic. Light weight construction materials can be a great choice when it comes to building a home. New technology has also made building with metal more practical than in previous human history. Most high rise buildings and sky scrapers are built with steel or other metal frames. Plastics are another widely used modern building material. Formed of polymers, plastics are easily molded while in the liquid state. Compared to metal and many other materials, plastic is very light in weight and relatively low in cost. Plastic is often used to make pipes and to decorate the interior of buildings.

1. INTRODUCTION :

In most parts of the country, the soil bearing capacity is very low or the soil of expansive nature likes black cotton soil. Under such conditions, use under-reamed or pedestal pile foundation with plinth beam.

2.FOUNDATION

In most parts of the country, the soil bearing capacity is very low or the soil of expansive nature likes black cotton soil. Under such conditions, use under-reamed or pedestal pile foundation with plinth beams.

1.**Under Reamed Pile Foundation:**

Such type of foundations is ideally suitable in the areas where the black cotton soil or expansive soil is beyond 2.50 meter. The basic principle of under reamed pile is to anchor the structure at a depth where ground movement is negligible due to moisture variation or other reasons. Simple tools are required for construction of under-reamed piles like spiral auger, under reaming tool, and boring guide.

2.Brick Arch Foundation:

Construction of arches is an old technology. Such type of foundation is of much use where the bearing capacity of soil is good and their exist some loose/filled up soil pockets in between. The arches can be built by avoiding the pressure on such loose pockets and transfer the load to the isolated footings built to support the arches. For construction of such foundation the use of available material like brick or concrete blocks can be made

3.Walling:

1.Stabilized, Compressed earth Blocks:

are made of mud stabilized with 5% cement/lime etc. and compacted in block making machine with no burning. A good walling material as burnt bricks and is economical, stronger, energy saving and simple to manufacture. The soil to be used for the blocks should have the requisite component of clay and silt and sand etc.

2. Stabilized Adobe: is an improvement over traditional adobe or hand moulded and sun dried mud block in which mud is mixed with a small proportion of cement or lime or broken or cut dry grass as reinforcing media to impart added strength and lower the permeability. It is appropriate in dry climates.

3. Clay Fly ash Burnt Bricks: produced from fly ash and clay, are stronger than conventional burnt clay bricks, consume less energy, provide better thermal insulation and solve the environmental problem through utilization of the fly ash, an industrial waste.

4. Fly ash/ Sand-Lime Bricks: produced from fly ash or sand with lime as binder, are strong, superior in water absorption and crushing strength. However this needs autoclaving.

5. Fly ash-Lime-Gypsum (Fal-G) Products: manufactured by blending fly ash, lime and calcined gypsum (from byproduct of phosphogypsum or natural gypsum) for making a useful

product, named Fal-G, and can be used as a cementeous material for mortar/plasters and for masonry blocks of any desired strength. It can also be used for road pavements and plain concrete in the form of Fal-G concrete.

6. Clay Red Mud Burnt Bricks: produced from alumina red mud or bauxite an industrial waste of aluminum producing plants in combination with clay. Possess all the physical properties of normal clay bricks and solves the problem of disposal of the waste product and environmental pollution. In addition, they have good architectural value as facing bricks due to their pleasing hues of colour. Red mud in addition improves the quality of bricks made from inferior soil deficient in clay content.

7. Lato Blocks: are improved bricks made from lateritic soil and cement or lime. Available in South-West India as large soft rock masses. The blocks are moulded under pressure to produce strong and good quality blocks which consume lesser energy than conventional bricks and hence cheaper. They are available in pleasing hues of colours ranging from cream to light crimson.

8. Precast Stone Blocks: of larger size than normal bricks are manufactured by using waste stone pieces of various sizes with lean cement concrete and enable a rationalized use of natural locally available materials. Shaping stones in this manner, enables speedy construction saves on cement, reduces thickness of stone walls and effects overall saving by eliminating plasters on internal/external wall surface. Appropriate architectural rendering on exterior surfaces can also be given.

9. Precast Concrete Blocks: made to similar dimension of stone blocks without large size stone pieces, but using coarse and fine graded aggregate with cement. They have excellent properties comparable to other masonry block, are cheaper and facilitate speedy construction and especially suitable where good quality clay for brick making is not available.

10. Hollow Concrete Blocks: are manufactured using lean cement concrete mixes and extruded through block making machines of egg laying or static type need lesser cement mortar and enable speedy construction as compared to brick masonry. The cavity in the blocks provides better thermal protection and also do not need external or internal plastering. These can be used for walling block or as roofing blocks along with inverted precast tee beams.

11. Fly ash Based Light Weight Aerated Concrete Walling and Roofing Blocks: are manufactured by a process involving mixing of fly ash, quick lime or cement and gypsum, foaming agents such as aluminum powder. These are considered excellent products for walling blocks and prefab floor slabs.

12. Precast Aerated/Cellular Concrete Walling Blocks and Roofing Slabs: are manufactured through aerated cellular concrete manufacturing process. When used in multistoried structures reduce weight, resulting more in economic design of structure. These components can also be worked and handled easily, have high fire resistance rating and provide better insulation.

ADVANCED BUILDING CONSTRUCTION EQUIPMENT

It is a common fact that we find a wide variety of construction machines on every construction sites, which make the construction jobs easy, safe and quicker. Depending on the application, construction machines are classified into various categories which we are discussing here.

- Earthmoving equipment
- Construction vehicles
- Material handling equipment
- Construction equipment

EARTHMOVING EQUIPMENTS

Earthmoving equipment is used in the construction industry to :shift large amounts of earth, dig foundations and landscape areas.
Types of earthmoving equipment include hydraulic excavators, bulldozers, compressors and loaders.

CONSTRUCTION VEHICLES

Engineering or Construction vehicles are heavy-duty vehicles, specially designed for executing construction (Civil engineering) tasks, most frequently, ones involving earth moving.

MATERIAL HANDLING EQUIPMENTS

CONSTRUCTION EQUIPMENTS

TRACK-TYPE

A bulldozer is a crawler equipped with a substantial metal plate used to push large quantities of soil, sand, rubble, or other such material
during construction or conversion work and typically equipped at the rear with a claw-like device) to loosen densely compacted materials.

	A **tractor** is an engineering vehicle specifically designed to deliver a high tractive effort at slow speeds, for the purposes of haulinga trailer or machinery used in construction.
GRADER	
	A grader, also commonly referred to as a road grader, a blade,a maintainer, or a motor grader, is a construction machine with a long blade used to create a flat surface during the grading process.
EXCAVATORS	
	A **compact** or **mini excavator** is a tracked or wheeled vehicle with an approximate operating weight from 0.7 to 8.5 tonnes. It generally includes a standard backfill blade and features independent boom swing.
	**Excavators** are heavy construction equipment consisting of a boom, dipper (or stick), bucket and cab on a rotating platform known as the "house".The house sits atop an undercarriage with tracks or wheels. They are a natural progression from the steam shovels and often mistakenly called power shovels. All movement and functions of a hydraulic excavator are accomplished through the use of hydraulic fluid, with hydraulic cylinders and hydraulic motors.

BACKHOE	
	A **backhoe loader** is a heavy equipment vehicle that consists ofa tractor like unit fitted with a shovel/bucket on the front and a small backhoe on the back. Due to its small size and versatility, backhoe loaders are very common in urban engineering and small construction projects as well as developing countries.
	A **backhoe** is a piece of excavating equipment or digger consisting of a digging bucket on the end of a two-part articulated arm.
LOADER	
	A loader is a heavy equipment machine used in construction to move aside or load materials such as asphalt, demolition debris, dirt, snow, feed, gravel, logs, raw minerals, recycled material, rock, sand, woodchips, etc. into or onto another type of machinery.
MATERIAL HANDLERS	
t 	A **cherry picker** is a type of aerial work platform that consists of a platform or bucket at the end of hydraulic lifting system.

14.1.4 Engineering aspect of Soil Mechanics-environmental Impact Assessment:

The EIA course introduces environmental concepts as a means to perform environmental assessment, a practice employed by engineers of all specializations to develop more sustainable engineering designs. As such, the EIA course focuses on the environmental media of greatest relevance to EIA, namely air, water, soil, and sound; the physical and chemical descriptions of these media; and the transport and transformation of pollutants in and across these media. 23321Environmental engineering practices to reduce these pollutant concentrations at the source or in the environment are only introduced, and only to make students aware of conventional means to mitigate environmental impact

The objectives of the new EIA course are as follows:

1. Develop knowledge of soil, water, air, and noise pollution, their sources, and why they are regulated

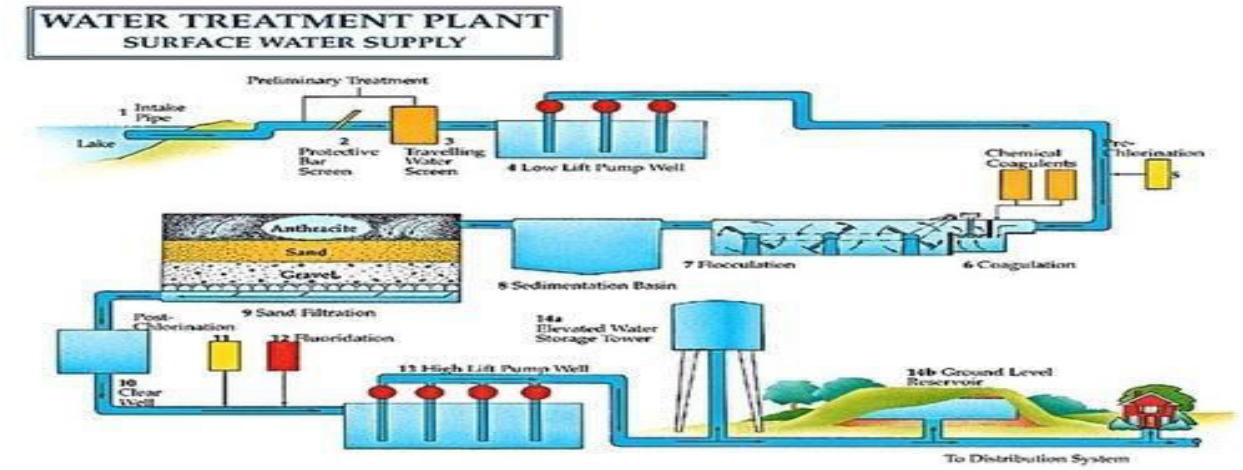
2. Predict the transport and transformation of pollutants in and across the environment

3. Recommend and apply environmental engineering practices to reduce the impact of a potential activity on the environment

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

This paper presents a study where sustainable development indicators (SDIs) for sludge handling and wastewater treatment systems were constructed in co-operation with a large Swedish water company. Results from a life cycle assessment, a risk assessment, an economic assessment and an uncertainty assessment were used as inputs for ranking technical options of sludge handling by use of multi-criteria analysis (MCA). The MCA included assessment of the different technical options, valuation of different, and often conflicting, aspects of sustainability and weighting of various criteria. On basis of the preferences expressed in the MCA, a number of SDIs and, when possible, targets for sustainable development, were formulated. The resulting SDIs reflected economic, environmental, technical and social aspects of sustainable development of sludge handling systems. Where possible, the coverage of the indicators was extended to the entire wastewater system.

The municipal government can develop a “Municipal Water Reuse System” which is a current approach to manage the rainwater. It applies a water reuse scheme for treated wastewater, on a municipal scale, to provide non-potable water for industry, household and municipal uses. This technology consists in separating the urine fraction of sanitary wastewater, and collecting it for recycling its nutrients. The feces and graywater fraction is collected, together with organic wastes from the households, using a gravity sewer system, continuously flushed with non-potable water. The water is treated anaerobically and the biogas is used for energy production.



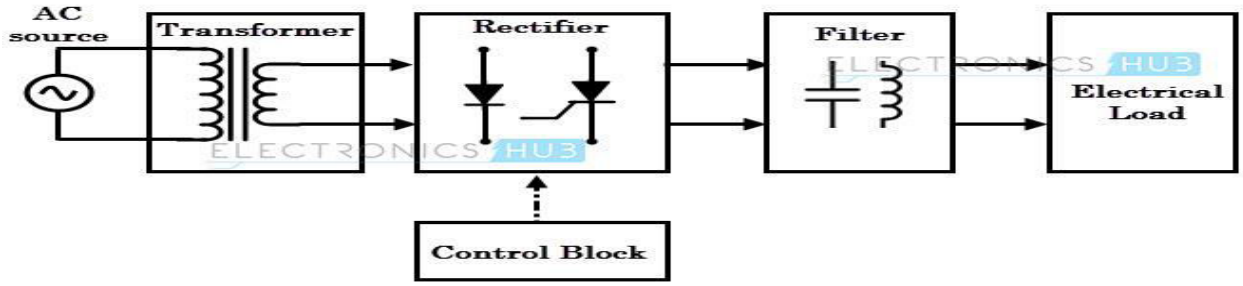
(F-14.1.5A-WATER TREATMENT PLANT)

14.2.1 Design of Power Electronics converter:

Nowadays, power electronic converters play an essential role in the majority of consumer electronic devices and are widely used in industrial applications. Since most of these applications are supplied through the AC grid, the use of rectifiers and DC-DC conveters are mandatory to adapt the grid voltage to the application requirements. In this book, most used AC-DC rectifier topologies and DC-DC converter topologies are thoroughly discussed. Basics of each converter, equations for the power losses evaluation and passive elements design are described. Moreover, the medium frequency transformer required by several of the studied DC-DC converters is analysed in depth.

AC to DC = Rectifier: It converts AC to unipolar (DC) current

- **DC to AC** = Inverter: It converts DC to AC of desired frequency and voltage
- **DC to DC** = Chopper: It converts constant to variable DC or variable DC to constant DC
- **AC to AC** = Cycloconverter, Matrix converter: It converts AC of desired frequency and/or desired voltage magnitude from a line AC supply.



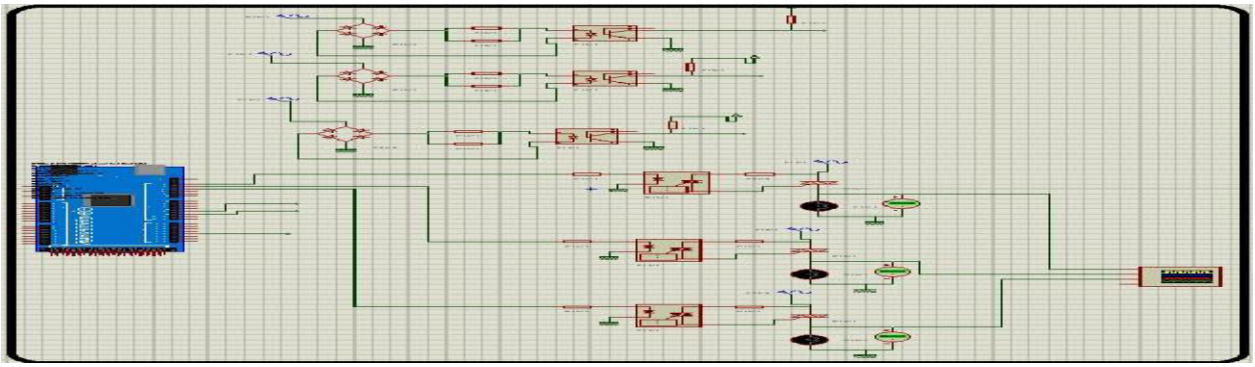
(14.2.1A-BLOCK DIAGRAM)

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

The ac motor starters are increasingly becoming popular due to its controlled soft-starting capability. The ac motor starter provides limited starting current and hence conventional electromagnetic line starters and reducedvoltage starters are replaced with ac motor starters. Thyristor-based soft starters have many desirable properties and provide a viable solution to starting problems in three phase induction motors. These power semiconductor based starters are cheap, simple, and reliable and occupies less volume. The power density of these soft starters is also very high. A three phase induction motor produces electromagnetic torque on its shaft but initial switching instants of all three phases to the supply produces pulsations on the electromechanical torque when it is controlled by a direct- online starter. These severe pulsations in electromagnetic torque might cause shocks to the shaft and hence to the driven equipment. These pulsations might damage mechanical system components, such as shafts, couplings and gears etc.

OPERATING PRINCIPLE OF SOFT STARTER

A soft starter provides reduced voltage to stator windings of three phase induction motor by controlling the acceleration of an electric motor. A three phase induction motor is a self-starting motor and electromagnetic torque is produced due to an interaction between revolving magnetic field around rotor and rotor current. Initially during starting, a rated voltage is applied which causes high current to flow through stator windings

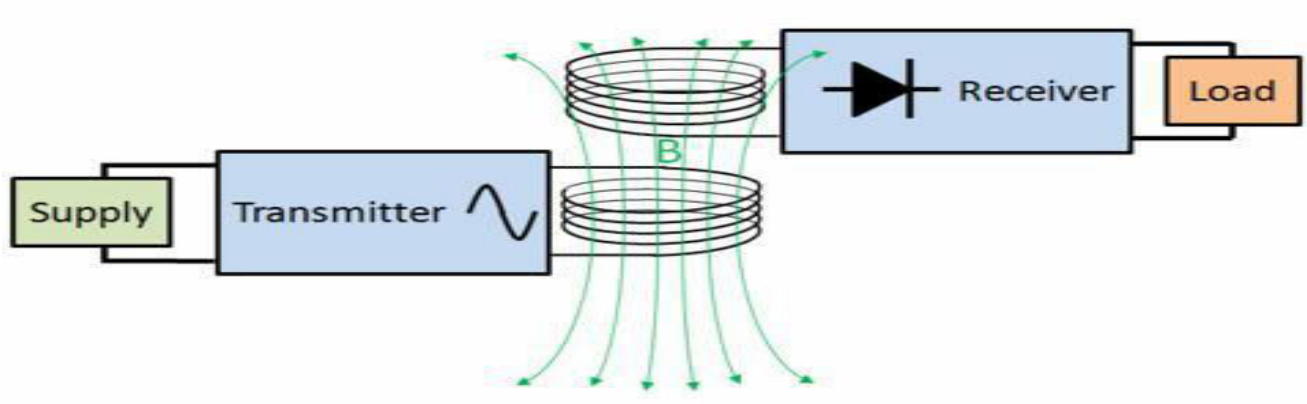


(F-14.1.2A Block diagram)

14.2.3 Advanced Wireless Power Transfer System:

The Transfer of electrical power in reliable and efficient way is always challenging for the designers and engineers. Presently all electrical power from the generating stations to the distribution station is transferred by the uses of wires and underground cables. One of the major issues in these types of systems is the losses due to resistance of the material. Generally the percentage of loss of power during the transmission and distribution is 26%. In modern technology the use of portable device has increased such as mobile robots and electric vehicle.

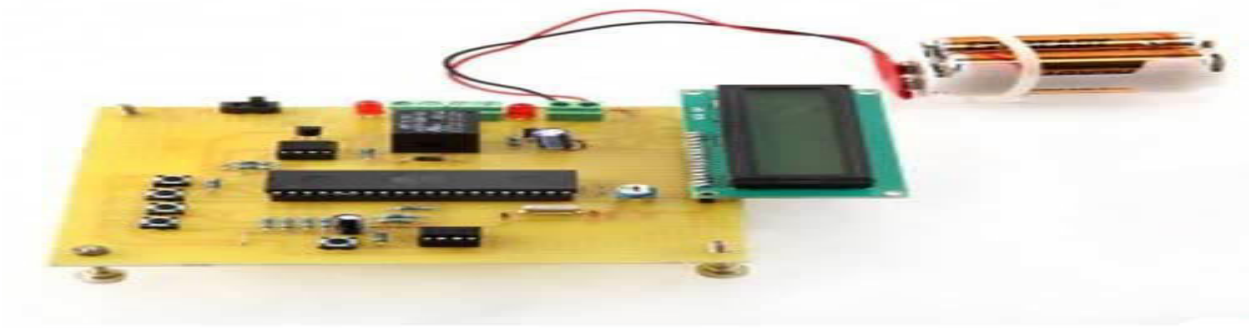
Mobility is the main concern of these equipment i.e. they are not connected to the main source of power. All these problems are the main motivation for researchers.



(F-14.2.3block diagram)

14.2.4 Industrial Temperature Controller:

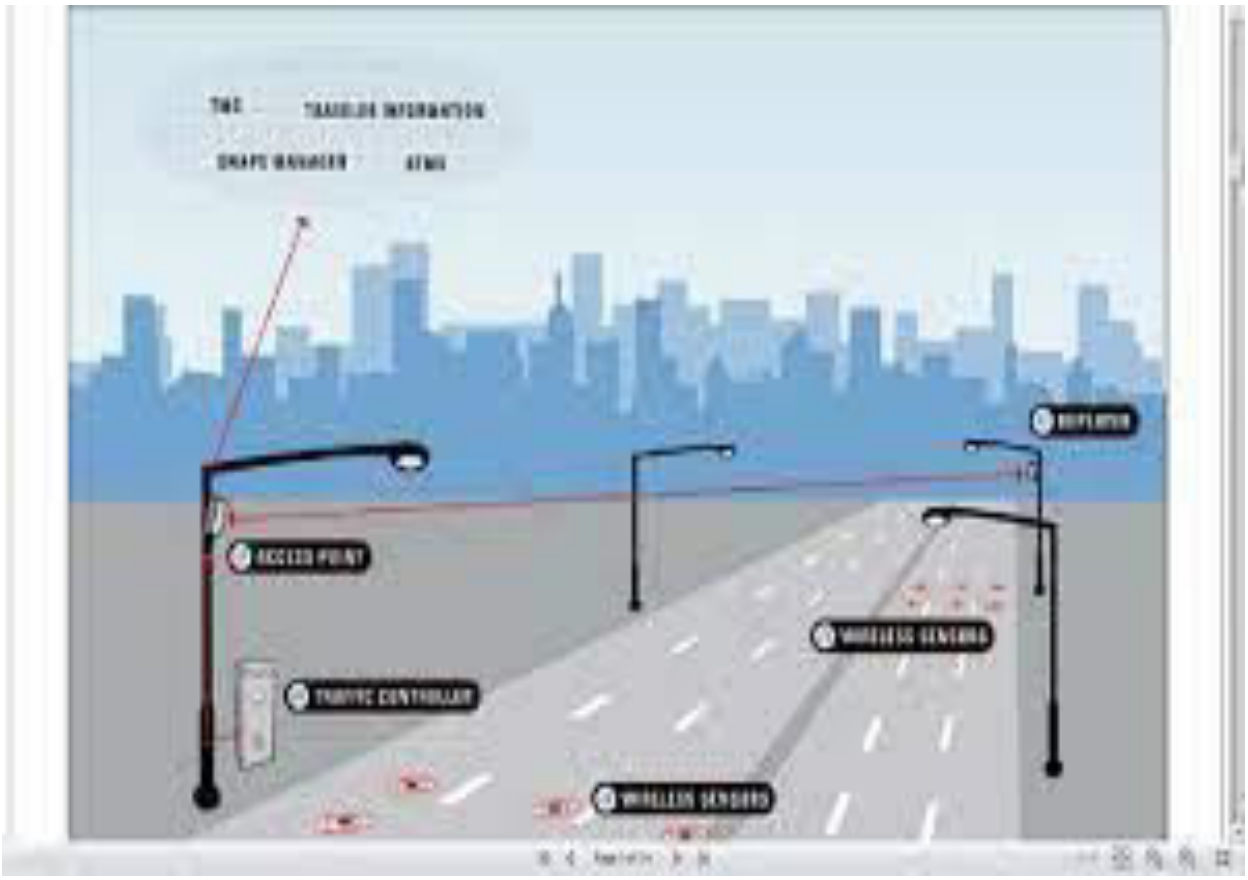
The modern sensing technology and control methods are undergoing continuous innovation, where the real-time temperature control is demanding higher accuracy and faster response more than ever. Temperature control is widely used in production and industrial control processes in all aspects. For example,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



(F-14.2.4A- Temperature controller)

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

This project is developed for the users to have accident alert in modern traffic system. This device can be used in highly accidental area and pin drop curves to avoid accidents.It consists of two transmitters and two receivers. One transmitter is connected first (One arm of the curve) and a receiver is fixed just opposite to the transmitter. The other transmitter is connected at the same side(Other arm of the curve) and the receiver is fixed just opposite to the second transmitter.
When the vehicle passes the first transmitting and receiving unit(One arm of the curve), it senses that one vehicle is crossing. When it crosses the second unit(Other arm of the curve), it also senses.



(14.2.5A- smart traffic system)

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

Development Works in the Village & Funding Details :

Sr. No.	Year	Yojana	Development Work Name	Fund / Amount (Rs.)
1.	2015-16	14th Finance Commission	Paver Blocks work in Kamrol	186700
2.	2016-17	14th Finance Commission	R.C.C Road work from house of Javer Chandu to Puja Magan's House	187400
3.	2016-17	14th Finance Commission	R.C.C Road work from Baliyadev Pal to Narmadaben House	433243
4.	2017-18	14th Finance Commission	R.C.C. Road work to Cremation ground	181000
5.	2017-18	14th Finance Commission	PVC Borewell Water supply work at R.Pura	215200
6.	2017-18	14th Finance Commission	Paver Blocks work at R.pura – Kamrol	175228
7.	2017-18	14th Finance Commission	Paver Blocks work	381800
8.	2017-18	14th Finance Commission	Paver Blocks work at Vankarvaas & Ramji Mandir Khadki	535000
9.	2017-18	14th Finance Commission	Paver Blocks work & R.C.C. Road work	477550
10.	2018-19	14th Finance Commission	Paver Blocks work	525600
11.	2018-19	M.L.A.	Paver Blocks work at R.Pura Anganwadi	187000
12.	2018-19	A.T.V.T.	Hand Pump work at Bus stand	50000

(T-15A- Development Works in the Village & Funding Details)

Sustainability of the designs : (T-15B- Sustainability of the designs)

Designs	Design Utilized by	Needs / Benefits	Design brief
PART-1			
ATM	Illiterate/ Semiliterate users ; Under-served ; Unbanked ; People living in remote area; etc.	Basic banking facilities ; Security ; Ease of use ; A suitable and simple product ; etc.	Atm design to assist illiterate, semi-literate with banking; Providing services through familiar devices; Net reduction in transaction processes; Aim to help in financial inclusion policies; etc.
Pharmacy Store	All the people living in the village or even outsiders from nearby villages can use or utilize a pharmacy store for their medical uses.	Anyone using drugs benefits when they have easier access to a pharmacist; When emergency requirements of drugs or medicines ; etc.	A pharmacy is a retail shop which provides pharmaceutical drugs, among other products. At the pharmacy, a pharmacist oversees the fulfillment of medical prescriptions and is available to give advice on their offerings of over-the-counter drugs. A typical pharmacy would be in the commercial area of a community
Community Hall	All the people living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a community hall for their different uses	Where members of a community gather for group activities, events, festivals and social purpose ; for mahila mandal in the village ;etc.	The Community Hall is an important public building in a prominent location. Village and community halls are the smallest buildings that can accommodate a sports programme alongside the customary social and arts pursuits.

Supermarket	All the people living in the village or even outsiders from nearby village	Ease of use; Availability of more grocery and food products ;etc.	Supermarket - a large self-service grocery store selling groceries and dairy products and household goods food market, grocery, grocery store, market - a marketplace where groceries are sold.
Cybercafe	People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a cybercafe for their different uses	Ease of use; Availability internet and for the people who can know about the internet ;etc.	A cybercafe alternatively referred to as an Internet cafe, PC bangs, or Net cafe. Cybercafe is a place to use computers to access the Internet, play games, create documents, chat with friends using voice and video, and other computer-related tasks. At most Internet cafes the computer and Internet access is provided for an hourly or daily fee
Entrance Gate	People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a village entrance gate for their different uses	For better esthetic entrance view; Ease of use; Availability of good approach road ;etc.	The village entrance gate design as a heritage village design is for better esthetics and looks of the village approach road.
Solar pumping system	People living in that household where this design is to be near by some households if the solar pumping system is develop.	Availability of more solar pumping system in a particular house; Ease of Use; etc	Solar pumping system is the system which exert the water with help of solar energy which is reduce power bill.
Street lighting	People living in the village or even outsiders from nearby villages and relatives of the villagers can use the street lighting system.	Availability of street lighting is more use full in night to visibility purpose.	Street lighting is the system whise utilize the sun energy and store in the battery .
Roof top solar	People living in the village there is no any external source of power so that roof top solar is best for it.	Availability of roof top solar is best use full as as external power resources for villagers.	Roof top solar system is the which gives power with help of the sun energy.roop tp solar system reduce monthly electrical light bills of the villagers and it is very beneficial to to villagers house holds.

PART-2			
Rain Water Harvesting	People living in that household where this design is to be implemented or even nearby some households if the capacity of tank will be increased	Availability of more water in a particular house; Ease of Use; etc	Rainwater harvesting is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit, aquifer, or a reservoir with percolation, so that it seeps down and restores the ground water;
Solid Waste Managemen	All the people living in the village or even outsiders from nearby villages can use or utilize this solid waste management system.	Ease of Use; Cleanliness of the village; Safe and Healthy environment of the villagers.	Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes
Bank	People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a Bank for their different banking related purposes.	Availability of banking facilities in the village; Ease of Use.	A bank is a financial institution that accepts deposits from the public and creates a demand deposit while simultaneously making loans. Lending activities can be directly performed by the bank or indirectly through capital markets.
Skill Development Center	All the people living in the village or even outsiders from nearby villages can use or utilize this for their personal development and skills.	Skill development of the children, Mahila, etc. in the village; Mahila Mandal can also be implemented.	Skill Development training Centre is a platform to enhance the skill and make the students industry ready in Training is crucial for organizational development and its success which is indeed fruitful to both employers and employees of an organization and also the development of the village mahila and children.
Public Garden	People living in the village or even outsiders from nearby villages and relatives of the villagers can use or utilize a public garden for recreational purposes	Availability of the recreational area in the village; Growth of plants; Exercise Purpose; et	A public garden is an institution that maintains collections of plants for the purposes of public education and enjoyment, in addition to research, conservation, and higher learning.

Water tank	People living in that household where this design is to be implemented or even nearby some households if the capacity of tank will be increased	Availability of more water in a particular house; Ease of Use; etc	Water tank is the collection of the water and also storage of water.
Home automation system	All the people living in the village or even outsiders from nearby villages can use or utilize this home automation system.	Availability of this system gives security to people and .	Home automation is the automation process of home appliances and other home functions so that they can be controlled with your phone, computer, or even remotely. Below is a list of some home automation projects which are based on various microcontrollers, arduino, raspberry pi, etc.
Plantmoisture monitoring system	Planting a tree in an environment where the seed or the plant would not get water adequately through natural sources like rain or ground water in its initial phases has been always a matter of concern for tree planters. This is where an autonomous moisture monitor for plants system can help.	The system timely monitors the moisture level of the soil. If at the time of monitoring it comes to know that the moisture level of the soil is lower than recommended then it will raise an audio visual alert.	In this system we use a timer IC to time the monitoring process. A moisture level sensor is used to detect the moisture level of the soil. An LED is used to give visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant.
Energy harvesting	All the people livilg in the village are use the energy harvesting power. Rapid advances in wireless technologies and low-power electronics have enabled the increased use of autonomous systems for the monitoring of structural health. provide continuous monitoring.	Energy harvesting is beneficial because it provides a means of powering electronics where there are no conventional power sources, eliminating the need for frequent battery replacements and running wires to end applications.	This paper reviews recent developments in energy harvesting technologies for structural health monitoring applications. Many industries have a great deal of interest in obtaining technology that can be used to monitor the health of machinery and structures. In particular, the need for autonomous monitoring of structures has been ever-increasing in recent years. energy harvesting systems.

Implementation Scenario :

Design Name	Implementation Period (Months)	Total Expenditure Amount	"Implementation According to the Requirement"	Implementation (%)
ATM	1 month	₹ 104752/-	Within 1 year	0 %
Pharmacy store	1 month	₹ 118388/-	Immediately	0 %
Community hall	2-3 month	₹ 423480/-	Immediately	0 %
Super market	2-month	₹ 256327/-	Within 1 year	0 %
Cybercafé	1 month	₹ 207043/-	Within 1 year	0 %
Entrance gate	1 month	₹ 108941/-	Immediately	0 %
Rain water harvesing	1 month	₹ 51640/-	Within 1 year	0 %
Solid waste management	1 month	₹3lacto 8.5 lac	Long term (3-5 years	0 %
Bank	1 month	₹ 897878.4	Within 1 year	0 %
Skill development centre	1 month	₹ 613575.7	Within 1 year	0 %
Public garden	3-4month	₹ 200869	Immediately	0 %
Water tank	4-5 month	₹	Within 1 year	0 %
Solar pumping system	1 month	₹2200/-	Within 1 year	0 %
Street lighting	1 month	₹4987111.28/-	Within 1 year	0 %
Roof top solar	1 month	₹109445/-	Within 1 year	0 %
Home Automation system	1 month	₹108060/-	Immediately	0 %
Plant moisture monitoring	1 month	₹4078/-	Immediately	0 %
Energy harvesting	1 month	₹28674/-	Immediately	0 %

(T-15C- Implementation Scenario)

16. Survey By Interviewing With Talati And/Or Sarpanch

Gujarat Technological University,
Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	Farming, Animal husband
2	What are the chances of employment in village?		
3	What are the special technical facilities in village?	Yes	solar panel
4	Is any debt on village dwellers?		
5	Are village people getting agricultural help?	Yes	about 70% of the
6	Is women health awareness Program organized in village?	Yes	sometimes
7	Are women having opportunity to work and income?	Yes	by Making Nandli
8	Child girl education is appreciated in village?	Yes	good
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?	No	-
12	Is water scarcity in village? How many days per year?	Yes	
13	Is village under any debt?		
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.	Yes	There Many of the villages are disable
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

ગુપ શ્રામ પંચાયત
તા.સુબીર.

11

17.Irrigation / Agriculture Activites And Agro Industry, Altenate Technics And Solution

Irrigation / Agriculture Activites And Agro Industry

This article posits that the ecological and food security crisis in present-day rural Subir is caused by privatisation of landholdings, appropriation of village land by the state, and lack of technological and infrastructural investment and support to agriculture by successive governments. In earlier times farming communities created small-scale storage works for the supplemental irrigation of paddy. This development of storage works was later constrained by the rigid private property rights regime initiated in the colonial period, and by state appropriation of village land post-independence. The management of some storage works was affected by the partial land reforms enacted post-independence. Since the 1980s there have been limited efforts by the government and NGOs to develop new small-scale irrigation systems, and even less to support pre-existing systems. To limit further ecological degradation and improve the food security of households, control over natural resources within village boundaries should be returned to village communities.Farming is the main activity in Subir village, whereas several other activities such as small scale manufacturing, dairy, transport, etc. are carried out on a limited scale. These production activities need various types of resources — natural resources, man- made items, human effort, money, etc. As we read through the story of Subir, we will learn how various resources combine to produce the desired goods and services in the village.This village has about 450 families belonging to several different castes. The 80 upper caste families own the majority of land in the village. Their houses, some of them quite large, are made of brick with cement plastering and some are very kuttcha house. The SCs (dalits) comprise one third of the population and live in one corner of the village and in much smaller houses some of which are of mud and straw. Most of the houses have electric connections. Electricity powers all the tubewells in the fields and is used in various types of small business. Subir has two primary schools and one high school.

The aim of production is to produce the goods and services that we want. There are four requirements for production of goods and services.The first requirement is land, and other natural resources such as water, forests, minerals.The second requirement is labour, i.e. people who will do the work. Some production activities require highly educated workers to perform the necessary tasks. Other activities require workers who can do manual work. Each worker is providing the labour necessary for production.The third requirement is physical capital, i.e. the variety of inputs required at every stage during production. What are the items that come under physical capital?

Tools, machines, buildings*:* Tools and machines range from very simple tools such as a farmer's plough to sophisticated machines such as generators, turbines, computers, etc. Tools, machines, buildings can be used in production over many years, and are called fixed capital**.**

Raw materials and money in hand*:* Production requires a variety of raw materials such as the yarn used by the weaver and the clay used by the potter. A lso, some money is always required during production to make payments and buy other necessary items. Raw materials and money in hand are called working capital. Unlike tools, machines and buildings, these are used up in production.There is a fourth requirement too. You will need knowledge and enterprise to be able to put together land, labour and physical capital and produce an output either to use yourself or to sell in the market.

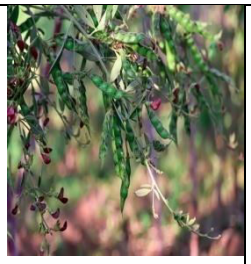
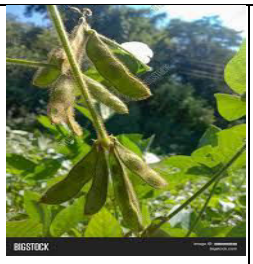
Farming or Agriculture activity in village :

Farming is the main production activity in Subir. 75 per cent of the people who are working are dependent on farming for their livelihood. They could be farmers or farm labourers. The well-being of these people is closely related to production on the farms.But remember that there is a basic constraint in raising farm production. Land area under cultivation is practically fixed. Since 1960 in Subir, there has been no expansion in land area undercultivation. By then, some of the wastelands in the village had been converted to cultivable land. There exists no further scope to increase farm production by bringing new land under cultivation.

In the kind of crops grown and facilities available, Subir would resemble a village of the western part of the state of Dang. All land is cultivated in Subir. No land is left idle. During the rainy season (kharif) farmers grow Dangar(rice),Juvar,tuver.alad,Nagali(Ragi),vari,kuet,sunflower bajra. These plants are used as cattle feed. It is followed by cultivation of peas , grams,masoor between October and December. In the winter season (rabi), fields are sown with wheat. From the wheat produced, farmers keep enough wheat for the family's consumption and sell the surplus wheat at the market at Raiganj. A part of the land area is also devoted to sugarcane which is harvested once every year. Sugarcane, in its raw form, or as jaggery, is sold to traders in Shahpur.

The main reason why farmers are able to grow three different crops in a year in Subir is due to the well-developed system of irrigation. Electricity came early to Subir. Its major impact was to transform the system of irrigation. Persian wheels were, till then, used by farmers to draw water from the wells and irrigate small fields. People saw that the electric-run tubewells could irrigate much larger areas of land more effectively. The first few tubewells were installed by the government. Soon, however, farmers started setting up private tubewells. As a result, by mid-1970s the entire cultivated area of 200 hectares (ha.) was irrigated.

To grow more than one crop on a piece of land during the year is known as multiple cropping. It is the most common way of increasing production on a given piece of land. All farmers in Subir grow atleast two main crops; many are growing potato as the third crop in the past fifteen to twenty years.

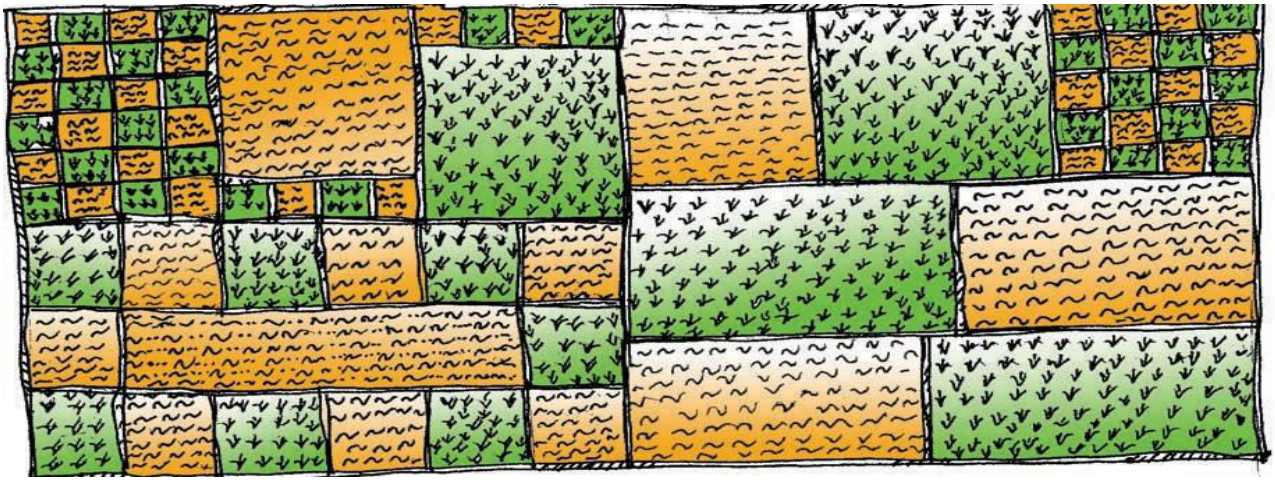
				
varay	Tuver	soyabean	Ragi	Dangar

(F- 17.A- Different types of crop)

T-17A- Different types of crop in different in Subir village

Name of crop	Month sown	Month Harvested	Source of irrigation (Rain, tanks, tubewells, canals, River,pond etc.)
Rise(Dangar), Ragi,Varay,soyabean, Tuver, maize,millet	June	Octomber	Rain
Wheat,Gram, Mustard,peas	Octomber	March	River, pond, Well
Cucumber,Pumkin,bittergurd,watermelon	March	June	Tubewells,wells .pond

Land being a natural resource, it is necessary to be careful in its use. Scientific reports indicate that the modern farming methods have overused the natural resource base.In many areas, Green Revolution is associated with the loss of soil fertility due to increased use of chemical fertilisers. Also, continuous use of groundwater for tubewell irrigation has led to the depletion of the water-table. Environmental resources, like soil fertility and groundwater, are built up over years. Once destroyed it is very difficult to restore them. We must take care of the environment to ensure future development of agriculture.



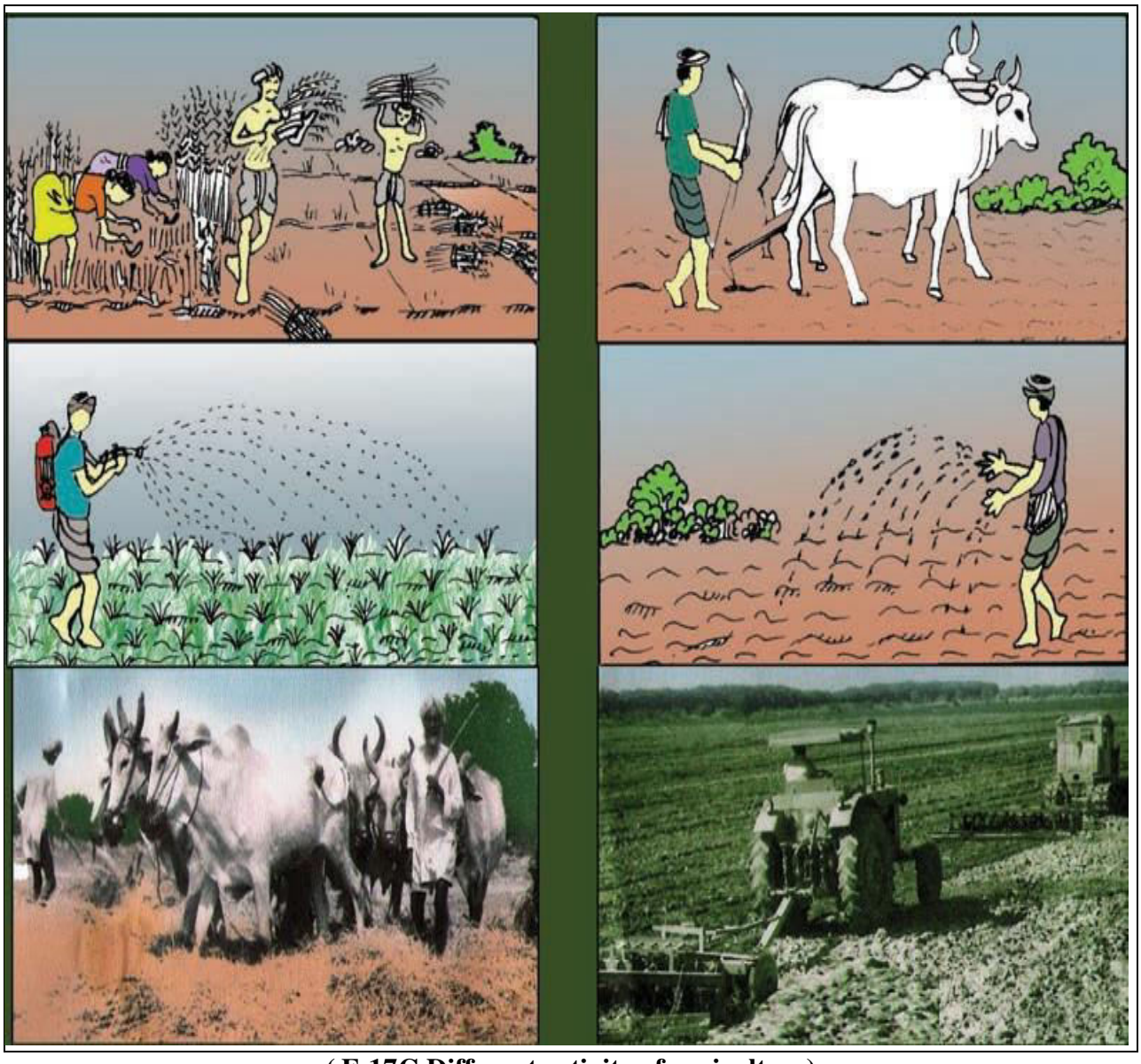
(F-17B-subir village: Distribution of cultivated land)

You can see the large number of smallplots scattered around the village in the picture. These are cultivated by the small farmers. On the other hand, more than half the area of the village is covered by plots that are quite large in size. In Palampur, there are 60 families of medium and large farmers who cultivate more than 2 hectares of land. A few of the large farmers have land extending over 10 hectares or more.

Method and Instruments are use for farming:

i. **Instruments :** Tractor,Hal,bullock cart,water pumping motor,and other accessory

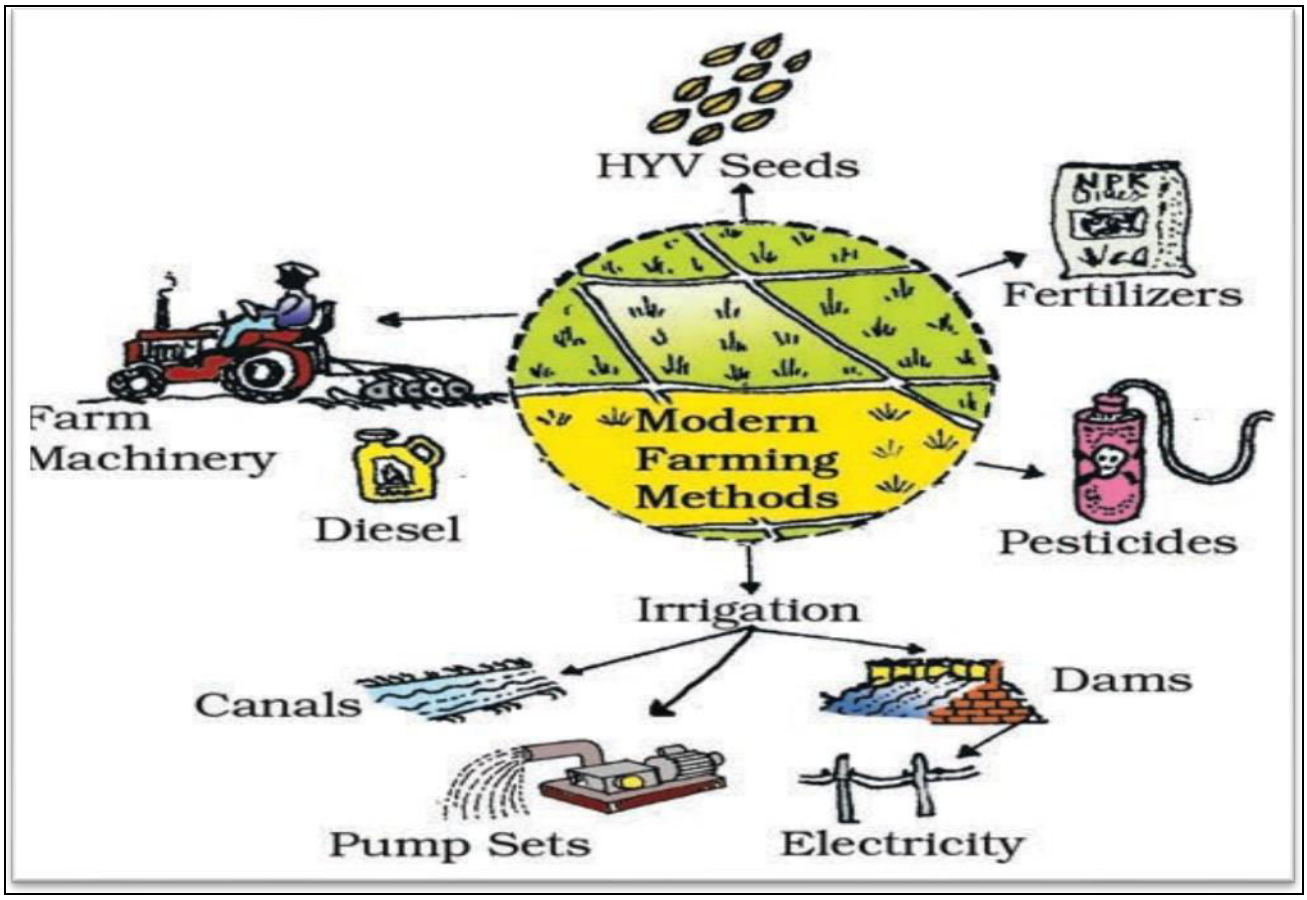
ii. **Method**: Generally in the village there are not anymethod use for irrigation people are depedent on the rain water



(F-17C-Different activity of agriculture)

Altenate Technics And Solution :

You have seen that one way of increasing production from the same land is by multiple cropping. The other way is to use modern farming methodsfor higher yield. Yield is measured as crop produced on a given piece of land during a single season. Till the mid- 1960s, the seeds used in cultivation were traditional ones with relatively low yields. Traditional seeds needed less irrigation. Farmers used cow-dung and other natural manure as fertilizers. All these were readily available with the farmers who did not have to buy them. The Green Revolution in the late 1960s introduced the Indian farmer to cultivation of wheat and rice using high yielding varieties (HYVs) of seeds. Compared to the traditional seeds, the HYV seeds promised to produce much greater amounts of grain on a single plant. As a result, the same piece of land would now produce far larger quantities of foodgrains than was possible earlier. HYV seeds, however, needed plenty of water.



(F-17D-Modern Farming Methods: HYV seeds, chemical fertilizer etc.)

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

Social Activities – Any Activates Planned By Students:

The various activity planned by student in village

I) Awareness camp of covid-19
II) Learning and teaching
III) Cleaning of village

Awareness camp of covid-19 in Subir village:

The rapid and extensive spread of the COVID-19 pandemic has become a major cause of concern for the healthcare profession. The aim of this study is to assess the awareness of COVID-19 disease and related infection control practices among healthcare students in Subir village.A total of 362 responders from the Subir completed a questionnaire-based survey on the awareness, knowledge, and infection control practices related to COVID-19 infection in the healthcare setting. The questionnaire students was adapted from the current interim guidance and information for healthcare workers published by the US Centers for Disease Control and Prevention (CDC). Convenient sampling method was used for data collection and the distribution of responses was presented as frequencies and percentages. Descriptive statistics were performed for all groups and subgroups based on the percentage of correct responses. Individual pairwise comparisons were done using the median test for the percentage of correct responses.The overall awareness for all subgroups was adequate with 71.2% reporting correct answers. The highest percentage of correct responses were from undergraduate medical students and the lowest was from non-clinical/administrative staff. Less than half of the total respondents could correctly define “close contact.” More than three-fourths of the responders were aware of the various infection control measures like rapid triage, respiratory hygiene, and cough etiquette and having a separate, well ventilated waiting area for suspected COVID-19 patients. However, only 45.4% of the responders were aware of the correct sequence for the application of a mask/respirator, and only 52.5% of the responders were aware of the preferred hand hygiene method for visibly soiled hands.

There is a need for regular educational interventions and training programs on infection control practices for COVID-19 across all healthcare professions. Occupational health and safety are of paramount importance to minimize the risk of transmission to healthcare students and professionals and provide optimal care for patients

ndia braces for the COVID-19 pandemic; healthcare workers on the frontlines are particularly vulnerable to this infection. The virus that causes COVID -19 was initially called as 2019-nCoV and was then termed as syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV) . It is a new strain discovered in 2019 which was not found previously in humans.

Previously, the severe acute respiratory syndrome-coronavirus (SARS-CoV) and the Middle East respiratory syndrome-coronavirus (MERS-CoV) have been known to affect humans. Outbreaks of respiratory disease caused by these viruses seem to have originated in animals before moving into other hosts like humans. MERS-CoV was found to be transmitted from Arabian camels to humans, whereas SARS-CoV was transmitted from civet cats to humans. SARS-CoV-2 seems to have originated from bats and first reports of cases were from Wuhan, Hubei Province in China, suggesting an animal-to-person spread from a live animal market. The virus then spread outside Hubei and subsequently, to the rest of the world via human transmission. Several countries have now reported community spread. The World Health Organization (WHO) declared coronavirus disease as a pandemic on March 11, 2020 .

With this mode of transmission, healthcare workers are among the highest risk of being infected. The highly contagious SARS-CoV-2 virus is an additional hazard for the healthcare system apart from the burden of extended work hours, physical and psychological stress, burnout, and fatigue . The objective of this study is to assess the awareness of COVID-19 disease and its related infection control practices among healthcare professionals in the Indian healthcare scenario. This was a questionnaire-based survey adapted from current interim guidelines and information for healthcare personnel provided by the US Centers for Disease Control and Prevention (CDC) and WHO.

(F-18A-awareness camp)

Learning and teaching :

During our project we observed that the education in the village area is stoped due to the covid -19 situation. So our team decided to teach the students by going home to home in Subir village this was the best activity in village for the student. Good planning can relieve stress for both children and parents. Check in with your kids about their plans and help them develop a written schedule not only for the day, but for the week as a whole. Help them prioritize and learn to create goals, tasks, and deadlines, just like adults do when they go to work. Tasks that may not have been difficult for them while attending school in person can become more challenging when learning from home, so it's important to reinforce boundaries and offer incentives for healthy behaviors. To avoid disruption, some after-school activities may be offered via online video apps, Facetime, or Skype.we teaching all the standard students by the our experience of education.

Shortage of teachers or the poor teacher-to-student ratio in villages pose another challenge towards making learning entirely digital in such areas. To make complete digitization of education in rural areas, this ratio needs to be improved and a large number of skilled and well-trained teachers are required so that each and every student receives complete attention even during an online class. While the contemporary online classroom solutions are designed to facilitate engagement and intuitiveness among students towards learning, a teacher's guidance and attention remain indispensable for learners.

(F-18B-Teaching activities)

Cleaning of village:

We have done one survey on existing condition of village regarding swachhta. The people are maintaining cleanliness of the village but in some streets there is no swachhata because there are animal and their waste , mud, etc. The village pond has to need a proper maintenance. Other than these there are clean streets, main road and approach road.We clean all the village by the use of various cleaning instruments and people of village are also help to us .we clean every street of village ,road, school, anganvadi etc..

Swachh Bharat Mission i.e. Clean India Mission, a national level campaign, recently launched by the Government of India is a major step towards the protection of degrading environmentf Swachh Bharat Mission (SBM) is implemented properly with all its stakeholders taking their respective responsibilities, there is no wonder that one day India will become an open defection free country. The cleaning Mission of the village has the following objectives:

1. Elimination of open defecation

2. Eradication of Manual Scavenging

3. Modern and Scientific Municipal Solid Waste Management

4. To effect behavioural change regarding healthy sanitation practices

5. Generate awareness about sanitation and its linkage with public health

6. Capacity Augmentation for Urban Local Bodies (ULB's)

7. To create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance)

(F-18C-Cleaning village)

19. Subir 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) Baseline Household Survey Questionnaire

Village: subir Gram Panchayat: subir Ward No. ____

Block: The Dangs District: Dang

State: Gujrat L S Constituency: ____

1. Family Identity and Size

Name of Head of Household	Pawar Bhaveshbhai indubhai							Male/ Female	Male
SECC Survey ID:		Family Size	6	Over 18	3	6 to 18	2	Under 6	1

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	yes
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]
pawar Bhavesh I	25	M	No	Maried		✓	✓	✓
pawar ajay bhai I	26	M	NO	Maried	graduate	✓	✓	✓
Gaykawad Ajaybhai	33	M	NO	Maried	10th pas	✓	✓	✓
Gaykawad satishbhai	28	M	No	Unmaried	12th pas	✓	✓	

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
pawar Josefbhai M.	15	M	NO	unmaried	10th stan	yes	10th	NO
Gaykawad vijaybhai G	13	M	No	unmaried	SSC	yes	8th	NO
pawar dineshbhai sukar	17	M	No	unmaried	HSC	yes	11th	No

4. Children below 6 years

Name	Age	Sex M/F/ O	Disability Yes/No	Going to School (Y/N)	Going to AWC Y/N	De-worming Done	Fully Immu-nised Y/N	Mother's Age at the time of Child's Birth
pawar Nitinbhai M	5	M	NO	NO	NO	NO	Yes	28
Kagde sotubhai pamyabh	3	M	NO	NO	NO	NO	yes	29
pawar Dipika M	4	F	NO	NO	NO	NO	yes	20

[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	NO	NO
Children	NO	NO

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 2
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	2 km
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	Near home
Open Well(Public / Private)	Yes / No	3 km
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	NO
Skilled Wage Worker	✓
Unskilled Wage Worker	✓
Salaried Employment in Government	✓
Salaried Employment - Private Sector	✓
Weaving	NO
Other Artisan(mention)	None
Other Trade & Business (mention)	None

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
Rice	4 to 5 tonne	4 to 5
Ragi	tonne	1 to 2
Varai	tonne	1 to 1.5

17. Livestock Numbers

Cows: 540	Bullocks: 332	Calves: 32
Female Buffalo: 300	Male Buffalo: 232	Buffalo Calves: 32
Goats/ Sheep: 200	Poultry/ Ducks: —	Pigs: —
Any other: Type —		No. —
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres):		

18. What games do Children Play
Cricket, khabadi
volleyball

19. Do children play musical instrument (mention)
NO

Schedule Filled By: Gaykawad Suraj P, Gangada S.
Principal Respondent:
Date of Survey: 22/09/2021

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: Subir

b. Block: Subir (The Dangs)

c. District: The Dangs

d. State: Gujrat

e. Lok Sabha Constituency: Valsad (Dang assembly constituency)

f. Number of Wards in the Gram Panchayat: 20

g. Number of Villages in the Gram Panchayat: 92

h. Names of Villages: Nokhamal, padalkhadi, Larchali, Daher, Kanjarda Banahpada, Bardipada, Aulda, Konkhari, sajupada, damarpade, chinchvihir, Jummer khajurna, kherindra, sawarda, Ghana, uga, Burdthadi, GavDahad, Girmal Ahirpada, chichpada, Garkhadi, Ghaniamba, Jamanya, Jarsol, Jhari, Kanvatpada Hodol, iskhadi, kadmal, kasabari, kakshala, Nishana, Bilianba, Jamla, keshband, Timerthava amsharpada, Barda, Bijurpada, Gurudiya, khambliya, Mohpada, kakad vihir, kirli, padsmal chikhali, Gargotuni, Larchali, Mahal.

Demographic Information

Number of Households	Total Population	Male	Female
517	3188	1608	1580

SC HHs	ST HHs	OBC HHs	Other HHs
0	3188	0	0

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (✓)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	yes	2km
b.	Nearest Primary Health Centre (PHC)	yes	1 km
c.	Nearest Community Health Centre (CHC)	yes	0.5km
d.	Nearest Post Office	yes	in subir
e.	Nearest Bank Branch (Any)	yes	1 km
f.	Nearest Bank with CBS Facility	No	–
g.	Nearest ATM	NO	–
h.	Nearest Primary School	yes	1km
i.	Nearest Middle School	yes	2km
j.	Nearest Secondary School	yes	8km
k.	Nearest Higher Secondary School / +2 College	NO	–
l.	Nearest Graduate College	–	–
m	Nearest ITI / Polytechnic Centre	–	–
n	Kisan Seva Kendra	–	–

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	NO	–
p	Nearest Agro Service Centre	Yes	0.7 km
p	MSP based Government Procurement Centre	NO	–
q	Milk Cooperative /Collection Centre	–	–
r	Veterinary Care Centre	–	–
s	Ayurveda Centre	–	–
t	E – Seva Kendra	Yes	1 km
u	Bus Stop	Yes	No good 1 km
v	Railway Station	No yes	–
w	Library	NO	–
x	Common Service Centre	NO	–

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres 0

Names of such villages: all the village have Aganvadi in the panchayat.

c. Schools (Number)

Primary Private: 0 Primary Govt.: 2

Middle Private: 0 Middle Govt.: 1

Secondary Private: 1 Secondary Govt.: 0

Higher Secondary Private: 1 Higher Secondary Govt: 1

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 sometime	Yes	yes by thegore	Yes	NO	–	in the village
b.	Kerosene	Yes	Yes	Yes	NO	NO	–	by the way in Mine
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 Yes / Not Covered	Subir, Mokhamal khamla, Mahal pipaldahad, singana	Daher, Hadol kesbandh, Nishana Athana,
b.	Hand Pump Coverage in Villages:	Covered Yes / Not Covered	All the village had Hand pum 92 of 92	There is no any village
c.	Coverage under Covered Drains:	Covered Yes / Not Covered	Girmal, Daher Chinchvihir, Kel Bardipada, Jamma Jam Jarsol, shinana Jamla, Ambur	vadpada Hindla piplaydevi piplpada
d.	Coverage under Open Drains:	Covered No / Not Covered	-	-
e.	Villages with Household Electricity Connection (Numbers)	Connected Yes / Not Connected	All the village have electricity 92 of 92	There is no any village of

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	342	d.	Pasture / Grazing Land	82	g.	Check Dam	5
b.	Irrigated Land	300	e.	Forests/ Plantations	900	h.	Wells/Bore Wells	70
c.	Un-irrigated Land	42	f.	Other Common Land	-	i	Tanks /Ponds	1

[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)	225
b)	Number of Households receiving pension (old age, widow, disability)	120
c)	Number of eligible Households who are not receiving pension	105
d)	Number of Households eligible for Ration Card	510
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	501
i)	Number of Job Card holders who completed 100 days of work during 2013-14	490
j)	Number of shops selling alcohol	No
k)	Number of BPL families	517
l)	Number of landless households	–
m)	Number of IAY beneficiaries	–
n)	Number of FRA[2] beneficiaries	–
o)	Number of Community Sanitary Complexes	–
p)	Number of Households headed by single women	25
q)	Number of Households headed by physically handicapped persons	30
r)	Total number of Persons with Disability in the village	04
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'

Gangoda vishal Thorat Rina Gaykawad Surat. Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	10-05-2021 Date of Survey

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

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: pipalpada
b. Ward Number: -
c. Gram Panchayat: Subir gram panchayat
d. Block: The Dangs
e. District: The Dangs
f. State: Gujrat
g. Lok Sabha Constituency: Valsad
h. Number of Habitations / Hamlets in the Gram Panchayat: 5
i. Names of Habitations / Hamlets:
Kokani, Bhil, varli, Kukna, Kolwal

Demographic Information

Number of Households 120 Total Population 516 Male 269 Female 292

SC HHs - ST HHs 98.57% of total Population 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	0km village
b.	Nearest Middle School	NO	—
c.	Nearest Secondary School	Yes	11cm
d.	Kisan Seva Kendra	NO	—
e.	Milk Cooperative /Collection Centre	Yes	In the village
g.	Health Sub Centre	Yes	10cm in vill
h.	Bank	NO	—
i.	ATM	Yes	1km Ubout
j.	Bus Stop	Yes	1km about
k.	Railway Station	NO	—

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

ii. Road Connectivity
a. Habitations connected by All-weather Roads (*1-All 2-None 3-Some*)
If 3 mention the name of the habitations where not available: some

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

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

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

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: some

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

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

vii. Education, ICDS
a. Number of Anganwadi Centres: 1
c. Schools (Number)
Primary Private: 0 Primary Govt.: 1
Middle Private: 0 Middle Govt.: 0
Secondary Private: 0 Secondary Govt.: 0
Higher Secondary Private: 0 Higher Secondary Govt: 0

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	342	d.	Pasture / Grazing Land	50	g.	Check Dam	3
b.	Irrigated Land	250	e.	Forests/ Plnatations	425	h.	Wells/Bore Wells	12
c.	Un-irrigated Land	80	f.	Other Common Land	-	I	Tanks /Ponds	1

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	120
2	Number of active Job Card holders who have completed 100 days of work	-
3	Number of shops selling alcohol	2
4	Number of BPL families	120
5	Number of landless households	-
6	Number of IAY beneficiaries	-
7	Number of FRA beneficiaries	-
8	Number of common sanitation complexes	-
9	Number of SHGs	-
10	Number of active SHGs	-
11	Existence of SHG Federation in the Village (Yes / No)	NO
12	Number of Youth Clubs	NO
13	Number of Bharat Nirman Volunteers	NO

Name and Signature of Surveyor and Respondent'

Gangoda Vishal Thorat Ring Gaykawad Suraj			10/05/2021
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

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

Gmail hetuvishal gangoda <vishalgangoda9999@gmail.com>

VYojana-VIII- Subir Village Detailed project report
2 messages

hetuvishal gangoda <vishalgangoda9999@gmail.com> 25 June 2021 at 11:04
To: collector-dang@gmail.com
Cc: vishwakarma yojana <rurban@gtu.edu.in>

We are the student of Shri Satsangi Shaketdham Ram Ashram group of institute, vadasma affiliate to Gujarat Technological university- GTU. GTU has been assigned vishwakarma Yojana-VY phase VIII under which students survey various villages and design variious amenities to deliver to the villages making them an ideal place for living a better life as per requirement andproblem statements .

As as part of vishwakarma yojanas guidelines, we have been asked to inform all the respected about the our project in whuch we will notify about 'Subir' village profile of issues for development and our design work for them which is attached in the form of a report with amount and benefits.

Contact person:-
1. Gangoda vishalbhai shivaram bhai
Number:- 9408682889
Email id:-gangodavishal9999@gmail.com

2.Thorat Reenaben Ishwarbhai
Number:-9409146447
Email id:-thoratrina51@gmail.com

3. Gaykawad Surajbhai prakasbhai
Number:- 9624026205
Email id:-gaykawadsuraj24@gmail.com

vishwakarma subir village final report.pdf
19726K

Chepter- 21: Comprehensive report for the entire village

We have visited the allocated village unai and that visit helped us to know about the type of infrastructure needed by the village. With help of techno-economic survey and gap analysis and also studying / surveying our allocated village Ahwa , we were able to broadly define requirements of development for people of Subir village. Then we have visited the smart village PUNSARI and by that visit we better understood the smart technologies and concepts as smart development of our allocatedvillageSubir.

In the Subir village, the basic requirements like community hall, any recreational area, bank, etc. were not existing. By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area which will in turn reduce pressure on cities.

The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make arealdifference.

Students who want to work towards preservation of rural soul of country can do many things for our own good and environment. By implanting given design proposals, we can say that all the missing amenities are provided will stop the migration of rural people towards the urban area. This can cause reduce the load on urban areas as well as pollution in both sector can be minimized gradually.

INTRODUCTION

Vishwakarma Yojana scheme is one of the approaches to mitigate the migration from rural areas and to overcome the urban city pressure by developing a rural soul with urban amenities provision in rural areas itself. This scheme would provide ‘Design to Delivery’ solution for development of villages in ‘Rurban’ areas. This initiative of Government of Gujarat was allotted as a pilot project to Gujarat Technological University. In this Project firstly we have visited and surveyed our allocated village subir. Then we have surveyed our ideal and smart villages unai & Punsari respectively. That visits helped us to know the type of infrastructure needed in allocated village subir. With the help of Techno economic survey , Village Gap Analysis and also studying the existing situations in ideal and smart village, we were able to broadly define the requirements of development for people of subir village and also understood the smart technologies and concepts as smart development of village. In subir village, the basic requirements like community hall, any recreational area, public healthcare, bank, etc. are not existing. By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area.

NEED OF STUDEY

The Vishwakarma Yojana Scheme aims at developing the village by providing all the urban facilities that a city may have, yet maintaining the Rural soul. This can be achieved by considering various aspects such as Physical, Social, and Renewable infrastructural facilities. The concept of Rurbanization at regeneration and revitalization of both the physical as well as social environment in villages through a judicious and economic consumption of resources is the thought for betterment of the villages. Find out the village data and survey of the whole village and improving the growth of village. The development should be Gram panchayat, Hospital, Primary school, Water tank, Anganwadi, Road & Transportation, Recreational areas, etc. The government schemes are being operated and run for rural development in rural areas of the country. The survey studies are taken up on trial basis to access the impact of important schemes as a whole in rural area development in some selected villages like this Vishwakarma Yojana.

OBJECTIVES OF STUDY

This village development scheme has been proposed to provide the benefits of real worl experience to engineering students of Gujarat Technological University and simultaneously apply their technical knowledge practically in the development of infrastructure in rural development. With this Project students can improve their communication by communicating to various stake holders in the village and also with the higher authorities of this project. The important objectives of this study are to provide infrastructures for better connectivity, civic and different infrastructures.

Physical Infrastructure Facilities :- Water, Drainage, Road, Electricity, Solid waste management,

Strom water network, Telecommunication & Other

Social Infrastructure Facilities : Education, Health, Community hall, Library, Recreational facilities & Other

Renewable Energy :- Rain water harvesting, Biogas plant, Solar street lights & Other

These infrastructure facilities should be implanted for the sustainable development of any rural area or village in the country.

Students who want to work towards preservation of rural soul of country can do many things for our own good and environment. By implanting given design proposals, we can say that all the missing amenities are provided will stop the migration of rural people towards the urban area. This can cause reduce the load on urban areas as well as pollution in both sector can be minimized gradually.

Feedback from Nodal Officer

The Government of Gujarat has launched "Vishwakarma Yojana" (a scheme) with motto of Rurbanization for the undeveloped villages. Keeping the rural soul with urban facility is the main objective of this Yojana. As we had worked for the phase IV, V, VI and VII with this project, we feel very proud and this project is very much helpful to the final year engineering students. The definition of Civil Engineering is satisfied with this project. In Project students get the experience in communication skill, technical aspects and find the problems to the villagers.The frequently arranged technical workshop by the GTU help the student to expose their knowledge and ideas. It is a great platform for the students to interact, learn and solving the problems.We really thankful to whole GTU Vishwakarma Yojana team for successful implementation of such a noteworthy project. We wish to express our sincere thanks to our HOD, Principal & Staff members for their continuous support.

Thank You.

Proff: Anand acharya Proff:Devang gajjar

NODAL OFFICER-VY

Gujrat Technological University