

Vishvakarma Yojana Project an Approach of Electrical Needs in the Village of Mordungra and Motal

Burhanuddin. S. Electricwala, Bhoi Hasmukh, Prof. A. K. Shah, Prof. L. G. Padwal

Electrical Department, Government Polytechnic, Godhra, Gujarat, India

ABSTRACT

The main intent of Vishwakarmayojna is make village to smart village by providing to villagers all facilities and quality of life which enjoyed city people. The aim of the project is "Developing village with a 'rural soul' but with all urban amenities that a city may have". In Gujarat state for the development rural area considering the basic Physical infrastructure facilities like sewerage system, water supply, village roads, network of electricity, sewage disposal system & other. Smart infrastructures like solar panel, solar Street light, biogas output plant, public toilet & rain water harvesting system etc. Social infrastructure facilities like education facilities like school, collages Anganvadi, hospital, sanitation facilities etc. And cultural facilities like community hall, library building, panchayat building & other.

KEYWORDS: *electricity needs in vilages*

How to cite this paper: Burhanuddin. S. Electricwala | Bhoi Hasmukh | Prof. A. K. Shah | Prof. L. G. Padwal "Vishvakarma Yojana Project an Approach of Electrical Needs in the Village of Mordungra and Motal" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-3, April 2022, pp.1036-1042, www.ijtsrd.com/papers/ijtsrd49661.pdf URL:



IJTSRD49661

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INTRODUCTION

Rural areas are the heart of our country. The feeling of living in a clean environment and nature is something different. The main occupation of the people in rural areas is agriculture as well as animal husbandry. In the village, the houses are located very far from each other, and there is a green environment and large fields of crops. There are villages in the rural area which connect the surrounding small and big villages with each other. The people of the village are noble and go along with the policy. The village is managed by the sarpanch of the gram panchayat, the sarpanch takes care of all the affairs of the village and makes representations to the government. The village has primary school, gram panchayat, Anganwadi, primary hospital, public toilet etc.

Ours is nation having 75% population in rural area. If technology does not reach them, they may move to urban centers that is creating a problem. This project gives optimum utilization of technology at doorstep of rural area. This in hand will improvise life style of

rural people. Best use of technology will make better living in form of environment, health and employ ability. As student provide design to deliver solution for development there will be less remaining to be done for implementation. This will make implementation faster.

After a recent visit to the village most of the people in the village are engaged in farming and animal husbandry and a small number of people work in the city. There is a well-educated person in the village. Talking about the facilities of the village, there is a primary school, panchayat house, public toilet, Anganwadi etc. in the village. But the sad thing is that the village does not have paved roads, water tank, sewer line, bus stop and electricity shortage and the village.

Introduction about Villages

Mordungara village is located in Godhra taluka, Panchmahal district. It is 11 KM away from Godhra city. The pin code of Mordungara village is 389120.

The population of the village is 3074, with 509 houses. Female Population is 49.0%. Village literacy rate is 41.3% and the female literacy rate is 15.5%. The main occupation of the people living in this village is agriculture and most of their land is also due to agriculture. Most of the population in this village is uneducated as well as using mostly old system for farming. Talking about the infrastructure facilities available in the village, primary-secondary school, Anganwadi, gram panchayat, PHC center, library, community hall, wells and borewells have been constructed by the government to provide drinking water to the villagers. But most of the roads in the village are unpaved, proper drainage system, 24x 24 hours electricity, insufficient water for irrigation, post office, bus stop etc. facilities are not in the village.

Motal is a village in Godhra taluka of Panchmahal district in the Indian state of Gujarat. It is 14 km from the city. Motal village is managed by an elected sarpanch every five years. The name of the Sarpanch of Motal village is Ajaysinh Narendrasinh Solanki. According to the 2011 census of India, the population of Motal village is 1460. The number of houses in Motal village is 226. The main occupation of the people living in this village is agriculture and animal husbandry. The village has wells, taps, hand pumps and borewells for drinking water but the village does not have facilities like irrigation, post office, bus stop, proper sewerage system etc. The important question is that there is no water system in the village mainly for irrigation. Due to lack of irrigation system, farming cannot be done in all the three seasons.

Justification/ need of the study

- We have collected information for the development of the village,
- Proper drainage facilities, education, health care, roads and transportation are studied first for the development of any village.
- Vishwakarma Yojana is a government assistance project designed to accommodate facilities that are not available in the Allocated Village.
- The design of any infrastructure will help the village financially as well as the country financially.
- In Mordungara village we make design post office, bus stop, proper drainage as well as paved roads with the help of our engineering skills as well as nodal officer which we will complete in these two semesters.
- m. Motal village has a primary health center and a gram panchayat, but its condition is very bad. It can break at any time. If there is any work due to

such condition, it is done sitting outside in the open. So we create a new basic requirement. Poverty and unemployment have been eradicated through the Rural Development Program.

- To provide infrastructural facilities in the village under this scheme and to alleviate unemployment as well as poverty.

Study of the Area

Mordungara is a Village in Godhra Taluka in Panchmahals District of Gujarat State, India. It is located 9 KM towards North from District headquarters Godhra. 11 KM from. 131 KM from State capital Gandhinagar. Mordungara Pin code is 389120 and postal head office is Sant Road. Nasirpur (2 KM), Chanchopa (3 KM) , Sampa (3 KM) , Vansiya (4 KM) , Govindi (4 KM) are the nearby Villages to Mordungara. Mordungara is surrounded by Godhra Taluka towards west, Shehera Taluka towards North, Morvahadaf Taluka towards East, Kalol Taluka towards South. Mordungara Local Language is Gujarati. Mordungara Village Total population is 3074 and number of houses are 509. Female Population is 49.0%. Village literacy rate is 41.3% and the Female Literacy rate is 15.5%.



Motal is a village in Godhra taluka of Panchmahal district in the Indian state of Gujarat. Motal village is 20 km away from the district headquarters Godhra. It is 140 km away from the state capital Gandhinagar. The pincode of Motal village is 389001 Richrota (2 KM), Dungarpur (4.3KM), Demli (4.1KM), Dhanitra (5.9KM), Bahi (5 KM) etc. Motal is bounded on the north by Shehera taluka, on the south by Panchmahal taluka, on the west by Balasinor taluka, on the south by Kalol taluka. Godhra, Lunawada, Shehra are the cities closest to Motal . The local language of Motal is Gujarati. The total population of Motal village is 1460 and there are 226 houses. Females constitute 46.6% of the population and males 51%. The literacy rate is 72.2% and the female literacy rate is 29.0%.



Fig MAP OF MOTAT

Geographical Detail

Mordungara village total area is 205.33 hectares, Forest area is 52.11 hectares, Non-Agricultural area is 42.94 hectares, Total irrigated area is 40.51 hectares and Total Water fall area is 0 hectares.

The total geographical area of village is 579.18 hectares. The total geographical area in which this village is expanded in 579.18 hectares / 5.7918 Square Kilometers (km²) / 1431.184 acres.

Economic generation profile

The main economic pursuits of tribal and non-tribal living in Mordungra are agriculture and animal husbandry. The people in village grow maize, paddy, bajra etc. in kharif season. The bullocks for farming while cows, buffaloes, goats etc. are reared for milking (dairying) by tribal farmers. The people of Mordungra migrate to nearest towns like Godhra in search of employment. They stay for about half a day as they go back home when the sun sets.

The main occupation of the people of Motal village is animal husbandry and farming. And others move to Godhra and the city for jobs. The village cultivates wheat, tur and maize during winter while crops like maize and paddy are grown during winter. In this village cows and buffaloes are reared among the cattle.

Actual Problem faced by Villagers

The people living in Mordungra village do not have access to irrigation water which is essential for agriculture. In addition, there is no post office facility for communication. Drainage system is also not available for wastewater disposal in the village. In addition, there must be a bus stop in the village. The above problem has to be face by the villager.

The Motal has a post office facility for people living in villages but it is rented. The village does not have drainage system for water disposal. There is a gram panchayat but since it is in a dilapidated condition, the villagers have to sit outside. There is no irrigation facility for farming so farmers cannot harvest in all

the three seasons. Therefore, there should be sufficient availability of water for cultivation. There is a bus stop in Motal Magam but the condition is bad. The villagers of the Motal face the above problem.

Migration Reasons / Trends Migration

People who want to have better lives better opportunities from which they are not having it here, they want to achieve at that place where there is more employment, good education, low crime, better climate, etc., these are the reason most of the people migrate from one place to other. There are many reasons for migration. These reasons can be classified as political migration, economic migration, social migration, environmental migration.

Migration is the cause of urbanization. Migration is a major cause of overpopulation. If relocation occurs, in addition to population density, there is the problem of slums. People do not like to leave their homeland. This process is mainly done to meet the money and needs.

Village Electrical Concept Electricity Arrangement

The electricity in Mordungra is not easy. When I got there in Mordungra there were no street light, in absence of street light I asked the locals whether they go out at night, there response were that "They (the villagers) had to go out with battery torches to go around the village premise", and they don't do that very often as there are many wild animals living near village .Electricity in the house is a different case as there are 509 houses according to 2011 census data and, when i asked the villagers how many house hold does have electricity they replied "only 50 percent house hold have electricity and from that 40 percent have electrical meter and pay electricity bills, rest 10 percent does not have meter they connect wires directly through poles. But hope is not lost we can improve village by providing them through government scheme such as Solar Energy Scheme. Its aim is to mitigate the problem of power cut/shortage faced by decentralized power loom units in the country so as to improve utilization, efficiency and productivity. Its features are:

- To provide financial subsidy to village to small power loom units, for installation of solar photo voltaic (SPV) plant.
- The Government of India will provide financial assistance/ capital subsidy to the extent of 50%, 75% and 90%of the basic cost of the solar energy plant to the applicants of General, SC&ST category respectively.

Motal village has very few electric problems. This causes more lighting problems in rural areas. The village does not have irrigation facilities so farming is done only during 2 seasons. So water should be arranged or bored. The village has many problems ranging from light problem. The village does not have a solar system, if there is such an electrical system, people can come to light from darkness. Solar subsidy 50% subsidy is available from the government. Due to which the villagers get a lot of benefits. Which is why we have given the design of solar wind mill.

Electrical Usage

- Electricity usage in Mordungra village is very low as they don't rely much on electricity in day time rather, they need only at night for light, as I have mentioned before only 50 percent household has electricity and they don't use that much they only use electricity on flourmill (Atta chakki) to make flour from wheat, corn, bajra, etc.
- They use electricity for pumping water out from well, bore well, submersible, and canal etc. The pump they use are mostly motors or submersible. All people from Mordungra are farmers and they rely on these electrical items to get water to the fields easily with much effort.
- The farmers in Mordungra need electricity for farming purpose, but due to their geographical location they receive less electricity, less than 6 hours, as they are far from any PowerStation or any electrical grid system or a substation, we need to give them they own power station so that every house hold has electricity in the village for 24 hours.
- Electricity consumption is good in Motal village and excess electricity is used there. Because the villagers use it at the same time both day and night. The village consumes 95% of the electricity, and everyone has access to electricity at home, so they use more. In this village some people use electricity on house bells or flour mills like drought mills to grind wheat, millet, sorghum, paddy, rice flour, maize, flour. The village uses electricity from wells, borewells or canals for pumping water to farms. Some farmers get water through electricity in this way.
- Farmers of Motal village irrigate their fields two or three times a week. Due to their efforts and condition, they only get electricity for 5 hours. During this time, they water the fields. The village has no substation or electrical grid. So that more electricity gets less. So, we should have 24 hours electricity facility in the village.

Reason for recommending this design

1. Solar wind mill hybrid power system:

This electrical method makes a lot of use in the village. In which electricity can be obtained from the sun and free light can be obtained in it. The village needs to have such a plant. Because the population living in some villages like hill or forest does not turn on the light so that they have to use this technology, through this technology the light is available in the village according to the time and they use it more.

There are many different methods in cities and villages. All the technology is available in the city. And it is very important for the village to have such technology. So that the people of the village can stay in the dark, if someone falls ill in an emergency, the facility of 108 is not available and there is no light in the village so that this technology can be used.

2. Biogas plant:

- Due to less availability of the LPG gas the village people are burning the woods to cook their food. This destroys the forest area that is near the village.
- And the cattle over there can produce the good amount of dung so it gets used in the proper place for generating the gas.
- So, as the part of the Vishwakarma Project we suggest the biogas plant to the villagers for their daily use and make their life easy.

Electrical Design

Introduction of Bio gas,

The generation of a combustible gas from anaerobic biomass digestion, is a well-known technology. There are already millions of biogas plants in operation throughout the world. Whereas using the gas for direct combustion in household stoves or gas lamps is common, creating power from biogas is still generally uncommon in most agricultural nations. The transformation of biogas to power has turned into a standard innovation.

Biogas or bioenergy is obtained from biomass which consists of decaying animal waste, crop residues, household solid waste, food waste, agricultural waste, and other similar by-products. The gas emitted on the decomposition of such matter is what is meant by biogas.

The Technology

Biogas is the gas resulting from an anaerobic digestion process. A biogas plant can convert animal manure, green plants, waste from agricultural industry and slaughterhouses into combustible gas. Biogas can be utilized in comparable manners as flammable gas in gas ovens, lights or as fuel for motors. It comprises

of 50-75% methane, 25-45% carbon dioxide, 2-8% water fume and hints of O₂ N₂, NH₃ H₂ H₂S. Contrast this and gaseous petrol, which contains 80 to 90% methane. The energy content of the gas relies mostly upon its methane content. A specific carbon dioxide and water fume content is unavoidable, yet sulfur content should be limited - especially for use in motors. The biogas yield of a plant depends not only on the type of feedstock, but also on the plant design, fermentation temperature and retention time. Maize silage for example - a common feedstock in Germany - yields about 8 times more biogas per ton than cow manure. In Germany, cow manure and energy crops are the main forms of feedstock. Around 2 live-stock units (relating to around 2 cows or 12 raising pigs) in addition to 1 ha of maize and grass are relied upon to yield a consistent yield of around 2 kw (48kWh) each day. In the South Asian setting, ESMAP (Energy Sector Management Assistance Programmer) utilizes a regular explicit information yield connection of around 14 kg of new steers excrement (the rough creation of one cow on one day) in addition to 0.06 l diesel fuel to deliver 1kWh power. Gas Production Figures If the everyday measure of accessible fertilizer (new weight) is known, gas creation each day in warm tropical nations will around relate to the accompanying qualities:

- 1 kg cattle dung 40 liters biogas
- 1 kg buffalo dung 30-liter biogas 1 kg pig dung 60-liter biogas
- 1 kg chicken droppings 70-liter biogas

Conversation to Electricity:

Theoretically, biogas can be converted directly into electricity by using a fuel cell. However, this process requires very clean gas and expensive fuel cells. Subsequently, this choice is as yet a matter for research and isn't at present a useful choice. The conversion of biogas to electric power by a generator set is much more practical. As opposed to flammable gas, biogas is portrayed by a high thump obstruction and consequently can be utilized in ignition engines with high pressure rates.

Advantages of biogas as a fuel

- High calorific value
- Clean fuel
- No residue produced
- No smoke produced
- Non polluting
- Economical
- Can be supplied through pipe lines
- Burns readily

Uses of biogas

- Domestic fuel
- For street lighting
- Generation of electricity
- If compressed, it can replace compressed natural gas for use in vehicles

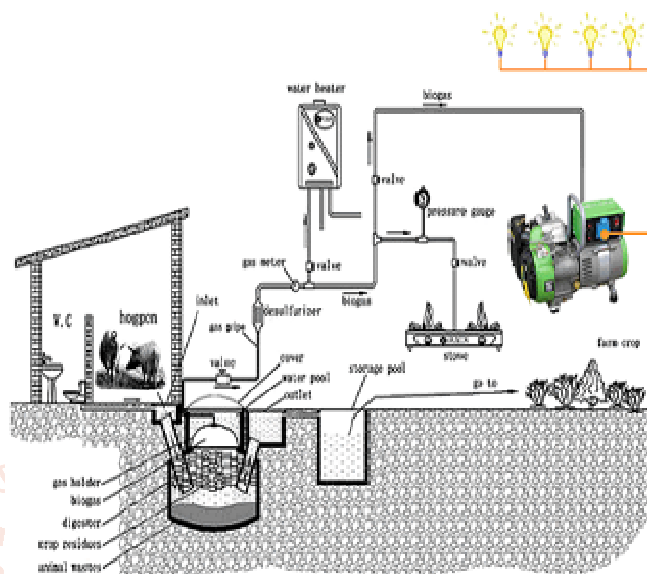


Table 1: Different type of animal waste and their potential

S.NO.	Type of Fuel	Comparative potential of bio gas production	Average excreta fresh wt (kg/day)	Average excreta dry wt (kg/day)
1	Cow dung	100	15.0	3.00
2	Buffalo dung	100	20.0	4.00
3	Goat droppings	308	1.0	0.35
4	Horse dung	258	10.0	3.5
5	Poultry droppings	606	0.07	0.025

Table 2: Requirement of dung and number of animals for different size of biogas plants

S.NO.	Capacity of Bio Gas Plant(m ³)	Number of animals required	Quantity of dung required(kg)	Cooking per number of person
1	2	3-4	50	4-5
2	3	5-6	75	7-8
3	4	7-8	100	10-11
4	6	10-12	150	14-16

Table 3: Required quantity of biogas for different purposes

S.NO.	Purpose	Use	Required quantity of bio gas
1	Cooking	per person/day	0.34-0.42
2	Light	100 candle power lamp	0.13
3	Engines	1 HP	0.45-0.51

Table: 4 Initial cost of Bio gas Plant

S.NO.	Particulars	Amount
1	85 Cu.Mt. two Digesters	Rs. 12,00,000
2	Bio Gas distribution pipelines	Rs. 4,45,000
3	Bio Gas collection Tank, Blowers, PRESSURE REGULATION SYSTEM	Rs. 3,55,000
4	Vermicompost Unit	Rs. 1,50,000
	Total Cost	Rs. 21,50,000

Table:5 Source of fund

S.NO.	Source	Amount
1	Government subsidy	Rs. 10,00,000
2	SUMUL contribution	Rs. 8,00,000
3	Public contribution	Rest of the amount
	Total	Rs. 21,50,000

Table:6 Operational Costs of the Plant Yearly (Source: SUMUL)

S.NO.	Particulars	Amount
1	Daily 4.5 MT Dung x 365 Days = 1643 MT 1643 MT X Rs. 250/MT	4,10,750
2	Labor Cost 5 Employees	Rs. 1,37,450
3	Maintenance (Painting Gas Tank , oil, diesel etc)	Rs. 8,000
	Total operation cost	5,56,200

Table: 7 Revenue of the CBP Yearly (Source: SUMUL)

S.NO.	Particulars	Amount
1	Bio Gas Distribution 121 Connection X Rs.150 X 12 Month	Rs. 2,17,800
2	Vermicompost from Slurry Input dung- 1643 MT yearly from which 60 % obtained as Dry Slurry i.e. 986 MT which produces 592 MT vermicompost which is sold @ rate of Rs. 3000 /MT yearly	Rs. 17,76,000
	Total revenue Yearly	Rs. 19,93,8000

Table:8 Benefits in the terms of rupees (Source: SUMUL)

S,NO	Particular	Amount
1	Fuel saving 121 Family X 5 Person = 605 X 5 Kg of Woods for Cooking @ 2 Rs. Of Kg. X 365 Days.	Rs. 22,08,250
2	After using vermicompost 25 % more in come from Crops due to improved Quality and Production i.e. 121 Families get Rs. 20000.00 more per Annum.	Rs. 24,20,000
3	Revenue Generation from Carbon Credit Yearly Rs. (Expected)	Rs. 2,66,076
	Total Other benefits in the terms of rupees.	Rs. 48,94,326

Conclusion

From all above survey and design, it was concluded that the village was also as important as urban areas. It must also get all those facilities and importance which urban peoples. By providing “Design and Delivery system of bio-gas” which was solution for

development of villages in Urban areas. The developmental work in villages that could undertake as per the need of the village in particular includes community bio-gas plant as renewable energy for Sustainable development. This enhances facilities in village to increase the life style of people with the rural soul.

Solar windmill hybrid energy system.

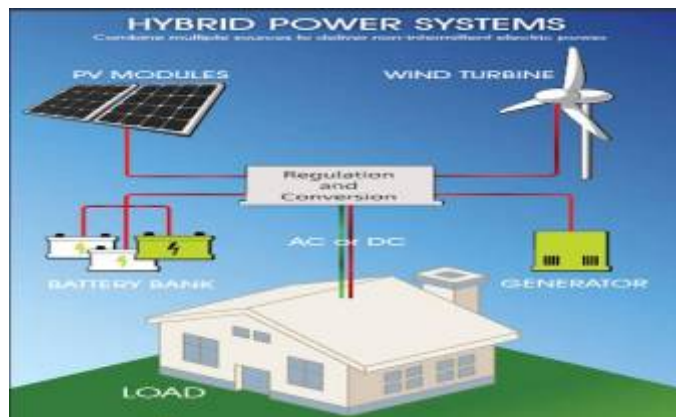
INTRODUCTION

The Combinational energy system and wind energy system. The solar panels and wind turbines are used for power generation. Of solar wind mill renewable energy sources, solar & Wind used for to generation power called and wind solar hybrid system. The solar small wind turbines generation for in generating electricity. The solar wind hybrid system we know the working of solar energy system and wind energy system. The solar panels and wind turbines are used for power generation.

TECHNOLOGY

The modern wind turbines in tower above one of their ancestors the solar wind mill used for pumping water. Have been the wind energy harnessing for hundreds of years. In the United States, windmill have been is used by pumping water grinding grain. The windmill used the winds energy to generate electricity. The like wind turbines, and like windmills, on a capture to towers the most energy. At 100 feet (30 meters) or more above ground. They can be taking the advantage of the faster and less turbulent wind.

The wind energy technology is office (WETO) Work with industry partners to performance and reliability of next generation wind technology and lowering the cost of wind energy. The research effort has helped increase to the capacity factors form 22% for wind turbines installed before 1998 to an average of nearly 35% today. Up from the 30% in 2000. The wind energy cost has been from over 55 cents per Kilowatt-hour (KWH)In 1980 an average of under 3 cents per kwh in the United State today.



ADVANTAGE OF SOLAR WIND MILL

- Both wind and solar power wind system use natural.
- Renewable resources.
- It is cost-affordable in the long run.
- While the turbines will be a bit pricey to install.

USE OF SOLAR WIND MILL

- From old Holland to farms in the United State.
- Wind mill have been used for pumping water.
- Wind mills modern equivalent-a wind turbines.
- Use the wind energy to generate electricity.
- Are amounted on a tower to capture the most energy.

SOURCE OF FUNDS

Sr. NO	SOURCE	AMOUNT
1.	Government	2,50,000
2.	SJMUL Contribution	4,50,000
3.	Public Contribution	Rest of the amount
4.	Total	7,69,833

CHARACTERISTIC OF THE VERGEMENT 275KW WIND TURBINE

Sr. NOs	Area	Power generation
1	Rated power	275
2	Swept area(m ²)	804
3	Rotor diamtre (m)	32
4	Cut on wind speed(m/s)	3.5
5	Cut off wind speed (m/s)	25
6	Rated wind speed (m/s)	12

INITIAL COST OF SOLAR WIND MILL

Sr. NO.	PARTICULARS	
1	Module Cost	208,300
2	Inverters Cost	220,660
3	Batteries Cost	420 , 310
4	Land Cost	45,000
5	Total cost with cost.	853,770

CONCLUSION

The looking at the data we have come to the conclusion that wind energy is far more superior than solar energy for numerous reasons. Wind turbines emits a significantly lower amount of carbon dioxide for each kilowatt-Hour produced than solar panels. The solar energy balance of 3.2 years, wind turbines only have an energy balance of 6.6 month.

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