Vishvakarma Yojna Project an Approach of Electrical Needs in the Village of Bedhiya and Khadki

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ABSTRACT
The main Aim of the project is to provide urban amenities in rural areas and maintaining the rural soul. This will help in developing villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure.

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 Streat light, biogas output plant, public toilet & rain water harvesting system etc.

This study demonstrates the basic need of sustainable development of village with long term planning. The development study involves the provision for use of renewable energy like solar street light, Rain water harvesting and Biogas plant as making the use of available natural resources available in the respective villages. It also includes "Design to Deliver solution" for the selected village.

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: Developing Village, Need of Electricity, Solution

1. INTRODUCTION
In general, a rural area or a countryside is a geographic area that is located outside towns and cities. Typical rural areas have a low population density and small settlements. Agricultural areas and areas with forestry are typically described as rural. Different countries have varying definitions of rural for statistical and administrative purposes.

Some communities have successfully encouraged economic development in rural areas, with some policies such as giving increased access to electricity or internet, proving very successful on encouraging economic activities in rural areas. Historically development policies have focused on larger extractive industries, such as mining and forestry. Vishvakarma yajna, recent approaches more focused on sustainable development are more aware of economic diversification in these communities.

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.

2. INTRODUCTION ABOUT VILLAGES (Bedhiya and Khadki)
Bedhiya is a Village in Kalol Taluka in Panch Mahals District of Gujarat State, India. It is located 18 KM towards South from District headquarters Godhra. 4km from. 130 KM from State capital Gandhinagar. Bedhiya Pin code is 389310 and postal head office is Delol. Alali (3 Km), Su3D Conceptual

Drawing of Portable Electric Power Tiller Machine reli (3 KM), Vyasda (3 KM), Khadki (3 KM), Utarediya (4 KM) are the nearby Villages to Bedhiya. Bedhiya is surrounded by Godhra Taluka towards North, Panch Mahals Taluka towards North, Ghoghamba Taluka towards East, Halol Taluka towards South. Godhra, Umreth, Luna Wada, Vadodara are the nearby Cities to Bedhiya. According to Census 2011 information the location code or village code of Bedhiya village is 518677. Bedhiya village is located in Kalol taluka of Panch Mahals district in Gujarat, India. It is situated 10km away from subdistrict headquarter Kalol (tehsildar office) and 20km away from district headquarter Godhra. As per 2009 stats, Bedhiya village is also a gram panchayat. The total geographical area of village is 1239.47 hectares. Bedhiya has a total population of 8,348 peoples, out of which male population is 4,327 while female population is 4,021. Literacy rate of Bedhiya village is 58.31% out of which 71.00% males and 44.67% females are literate. There are about 1,658 houses in Bedhiya village. Pin code of Bedhiya village locality is 389310. Kalol is nearest town to Bedhiya for all major economic activities, which is approximately 7km away.
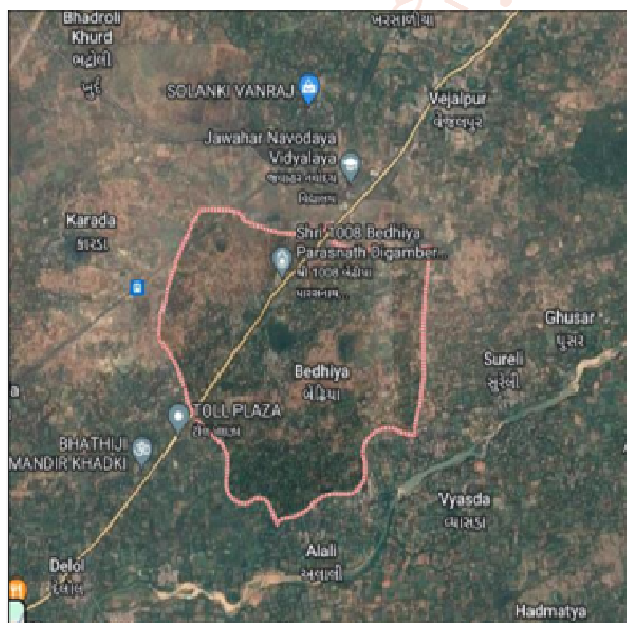
1. Base Location map of Bedhiya

Population data of Bedhiya village:

Census Parameter	Census Data
Total Population	8348
Total No of Houses	1658
Female Population %	48.2 % (4021)
Total Literacy rate %	58.3 % (4868)
Female Literacy rate	21.5 % (1796)
Scheduled Tribes Population %	0.8 % (66)
Scheduled Caste Population %	5.9 % (489)
Working Population %	43.1 %
Child (0 -6) Population by 2011	1269
Girl Child (0 -6) Population % by 2011	49.2 % (624)

Table 1 Population Data of Bedhiya Village

Census Parameter	Census Data
Total Population	3460
Total No of Houses	723
Female Population %	48.2 % (1667)
Total Literacy rate %	60.3 % (2085)
Female Literacy rate	21.7 % (750)
Scheduled Tribes Population %	0.0 % (0)
Scheduled Caste Population %	1.9 % (65)
Working Population %	53.3 %
Child(0 -6) Population by 2011	515
Girl Child(0 -6) Population % by 2011	48.3 % (249)

Table 2 Population Data of Khadki village

Khadki is a Village in Kalol Taluka in Panch Mahals District of Gujarat State, India. It is located 21 KM towards South from District head quarters Godhra. 1 KM from. 128 KM from State capital Gandhinagar Khadki Pin code is 389310 and postal head office is Delol. Nesda (3 KM), Bedhiya (3 KM), Alali (3 KM), Kandach (inami) (3 KM) , Utarediya (4 KM) are the nearby Villages to Khadki. Khadki is surrounded by Godhra Taluka towards North, Panch Mahals Taluka towards North, Ghoghamba Taluka towards East, Halol Taluka towards South. Godhra, Umreth, Vadodara, Lunawada are the nearby Cities to Khadki. Khadki Local Language is Gujarati. Khadki Village Total population is 3460 and number of houses are 723. Female Population is 48.2%. Village literacy rate is 60.3% and the Female Literacy rate is 21.7%.

2. Base Location map of kahdki

Justification/ Need of the study:
The justification and need for a study of rural villages are multifaceted and encompass various aspects. Here are some key points to consider when justifying and explaining the need for such a study.

1. Socioeconomic Disparities: 2. Agriculture and Food Security: 3. Infrastructure and Basic Services: 4. Healthcare Access: 5. Education: 6. Economic Development: 7. Cultural Preservation: 8. Migration Trends: 9. Environmental Sustainability: 10. Government Policies: 11. Community Well-Being: 12. Data for Decision-Making: 13. Human Rights and Social Justice: 14. Tourism and Rural Development: 15. Quality of Life: In summary.

2. the justification and need for a study of rural villages are grounded in the complex challenges and opportunities these communities face. Such research can inform policies, development initiatives, and interventions that enhance the well-being and sustainability of rural areas and the broader society.

3. Identify specific issues or challenges that are unique to the village or rural area. This could include access to healthcare, education, clean water, sanitation, employment opportunities, infrastructure, or environmental concerns. Explain why these issues are important to address. Emphasize how the study will directly impact the lives of the villagers. Will it lead to improvements in their quality of life, health, or economic well-being? Highlight the potential positive outcomes for the local community.

4. This ensures that the study is culturally sensitive and takes into account local knowledge and perspectives. Identify gaps in existing research or data specific to the village.

5. Participatory research approaches can build trust, enhance data collection, and ensure that the study reflects the community's needs and priorities.

Study of The Area (Bedhiya & khadki): -
Geographical Characteristics: Bedhiya village is situated in the Kalol Taluka of Panchmahal District, Gujarat State. It covers an area of approximately [mention approximate area if available]. The region boasts a predominantly flat topography with fertile agricultural land. Its climate typically experiences hot and dry weather, especially during summers, with moderate rainfall in monsoon.

Demographics and Population: Bedhiya village has an estimated population, with a diverse mix of communities contributing to its social fabric. The residents primarily speak Gujarati, and the village sustains a balanced age demographic, with significant emphasis on education and skill development.

Economic Aspects: Agriculture forms the backbone of the village's economy. The primary crops with farming practices deeply ingrained in the community's livelihood.

Analyzing the different economic activities, including small-scale industries, trade, and tourism, and their impact on the local economy.

Social Infrastructure: Bedhiya village is equipped with essential social infrastructure, including schools, healthcare centers, and access to basic amenities like potable water and electricity. Educational institutions cater to the educational needs of the younger population, while healthcare facilities serve the healthcare requirements of the villagers.

Assessing the state of transportation, road networks, and access to basic services in urban and rural areas Cultural Heritage: Exploring the cultural heritage, historical sites, and traditions of the communities in Panchmahal.

Cultural and Historical Context: The village celebrates its rich cultural heritage through festivals, showcasing traditional music, dance, and customs. Bedhiya also holds historical significance owing.

Environmental Considerations: The environmental landscape of Bedhiya village is vital to its agricultural practices. Conservation efforts focus on preserving soil fertility and sustainable farming methods. However, challenges such as water scarcity or soil erosion may impact long-term sustainability.

Challenges and Opportunities: Challenges faced by Bedhiya village may include access to modern amenities, infrastructural development, and environmental concerns. Yet, opportunities exist in

promoting agro-based industries, eco-tourism initiatives, and skill development programs.

Community Engagement and Development: The community actively engages in local development initiatives, fostering a sense of unity and collaboration. Efforts towards skill enhancement, women's empowerment, and infrastructure development showcase communal progress.

Future Prospects and Recommendations: To secure a brighter future, recommendations may include infrastructural enhancements, sustainable agricultural practices, access to better healthcare and education facilities, fostering entrepreneurship, and promoting eco-friendly initiatives to safeguard the environment.

This overview of Bedhiya village in Kalol Taluka, Panchmahal District, Gujarat State, aims to highlight its multifaceted nature, emphasizing both its strengths and areas necessitating focused attention for holistic development.

Agriculture and Farming: Investigating the agricultural practices, crop patterns, and challenges faced by farmers in the region, as well as the impact of weather and climate on agriculture.

Environmental Conservation: Studying the local ecosystems, biodiversity, and conservation efforts in Panchmahal, including forests, rivers, and wildlife.

Socioeconomic Development: Analyzing the socioeconomic conditions of the population, including income levels, education, healthcare access, and employment opportunities.

Healthcare and Public Services: Researching the healthcare facilities, availability of healthcare services, and public health issues.

Disaster Preparedness: Investigating the vulnerability of the region to natural disasters such as floods, earthquakes, and landslides, and studying preparedness measures.

Education and Literacy: Examining the state of education, literacy rates, and access to quality education in the district.

Water Resources and Management: Assessing water resources, availability, and water management practices, particularly in areas prone to drought or water scarcity.

Actual Problem faced by Villagers
Villagers face various challenges, including: Lack of Infrastructure: Inadequate access to basic amenities like clean water, electricity, roads, and proper sanitation facilities.

Limited Healthcare: Limited access to healthcare facilities, shortage of doctors, and insufficient medical supplies.

Education: Lack of quality education facilities, schools, and trained teachers.

Unemployment and Poverty: Limited job opportunities, leading to high levels of poverty and economic instability.

Agricultural Issues: Dependence on agriculture with limited modern techniques, leading to low productivity, unpredictable weather conditions, and lack of proper irrigation facilities.

Social Issues: Gender disparities, caste-based discrimination, and limited awareness about rights and government schemes.

Technological Gap: Limited access to technology and information, hindering advancements in various aspects of life.

Environmental Challenges: Deforestation, water scarcity, and inadequate waste management systems leading to environmental degradation. Efforts are being made by the government and NGOs to address these challenges and improve the living conditions in rural areas, but there's still much work to be done.

Many villagers do not have access to a reliable source of clean and safe drinking water, leading to waterborne diseases and health issues. Proper sanitation facilities are often lacking in rural areas, which can lead to unsanitary conditions and public health hazards. Villagers may have limited access to quality education due to the absence of proper school infrastructure, qualified teachers, and learning materials.

High levels of unemployment and a lack of economic opportunities can contribute to poverty within the village, hindering overall development. Villagers may lack access to healthcare facilities and medical services, which can lead to health problems and a reduced quality of life. Inadequate road infrastructure can hinder transportation, access to services, and economic development in rural areas. Villagers may face environmental challenges such as deforestation, soil erosion, pollution, and the depletion of natural resources. Many rural areas lack access to reliable electricity, limiting opportunities for education, communication, and economic development.

3. Village Electrical Concept
Electricity Arrangement
Electricity concept at Bedhiya village refers to the idea of providing access to electricity for rural areas, especially in developing countries. Electricity can be

used for various purposes, such as lighting, cooking, heating, cooling, communication, education, health, entertainment, and income generation. Electricity can also improve the quality of life and reduce poverty in rural areas.

The village has been electrified under the National Rural Electrification Policy 2006 and has basic infrastructure such as distribution transformer and distribution lines. Electricity is provided to public places like schools, panchayat office, health centers, etc.

Rural development is a strategy that focuses on the improvement of rural lives and social welfare by extending social services ie trading and commercial , infrastructures that facilitate rural development therefore This can't be done without electricity therefore rural electrification programmes are designed to extent electricity with an aim of supporting agro based industries as they are able to process raw products into finished goods thus resulting into growth of industries in rural areas the development. As industrialization happens, a number of rural dwellers will get employment opportunities for them thus improving Thier purchasing power and thus improving their standards of living as they can afford to get the basic needs of life and take their kids t better schools. Further more when electricity is extended in rural setting it will reduce rural urban migration and vice versa conclusively electricity extension pulls up other sectors and creates economic diversity as there are a no of livelihood ventures people can engage in other than agriculture only Thuus achieving of development sustainable goals for transforming rural area into a middle-income people and the development.

Electricity in a village typically involves the generation, distribution, and utilization of electrical power for various purposes. This can include powering homes, agricultural machinery, small-scale industries, and community infrastructure. Often, villages are connected to the wider electrical grid, but in some cases, off-grid solutions like solar panels or microgrids may be used to provide electricity. The availability and reliability of electricity in a village can vary widely depending on factors like location, infrastructure development, and government initiatives.

Electrical Usage

Bedhiya village is equipped with essential electrical infrastructure to cater to the energy needs of its residents. The village showcases a network of distribution lines supported by strategically placed transformers, ensuring the seamless flow of electricity to households. These transformers play a pivotal role in regulating and balancing the voltage levels, enabling the safe transmission of electricity throughout the village.

The distribution lines, spanning across the village, effectively deliver electricity to individual homes. The presence of these vital components underscores the commitment to providing consistent and reliable power supply to the local community.

Though specific details about substations, backup systems, or additional safety measures were not observed during the visit, the existing infrastructure of transformers and distribution lines forms the backbone of the electrical network in Bedhiya

Upon visiting Bedhiya village, several aspects of electricity distribution, consumption, and conservation were observed, showcasing the village's approach towards managing its electrical resources.

In summary, Bedhiya village possesses a well-established system for electricity distribution, catering to diverse consumption needs. While there were no explicit community-wide conservation programs observed, individual efforts might contribute to energy conservation within the village.

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 kahdki are farmers and they rely on these electrical items to get water to the fields easily with much effort

Electricity consumption is good in kahdki village and excess electricity is used there. Because the villagers use it at the same time both day and night.

Farmers of khadki 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.

4. Electrical Design.

Electrical Engineering	IOT Based Smart Irrigation System	Electrical Engineering	Automatic Plant Watering System Using Arduino
	Portable Electric Power Tiller Machine		Automatic Arduino Weather Station

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Bedhiya Village   **Khadki Village**

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1. Electrical Design 1: IOT Based Smart Irrigation System.
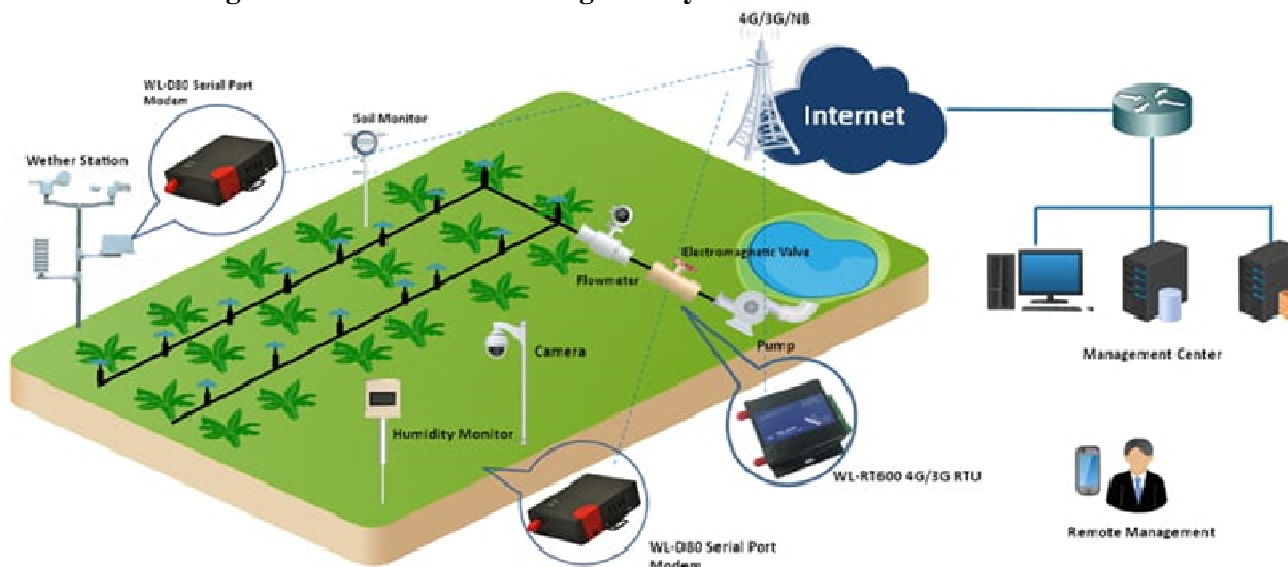
IOT Based Smart Irrigation System

A farmer should visualize his agricultural land's moisture content from time to time and water level of source is sufficient or not. IOT based smart irrigation system displays the values of the sensors continuously in smart phone or on computer's web page and farmer can operate them anytime from and anywhere.

How does this system work: - All the sensors i.e., moisture sensor, humidity sensor, temperature sensor, is connected to the microcontroller.5volts of power is supplied to the micro controller from that microcontroller a relay gets the information about the percent of the moisture in the soil. If the moisture percent 15 is low then the motor gets automatically ON and the notification is sent to the user device. Block diagram of Arduino based smart irrigation system which consist of three sensors which are connected to controller and sensed values from these sensors are send to the mobile application

Advantages of IOT Based Smart Irrigation System: -
The advantages to the villagers is IOT base smart irrigation system" is for to create an IOT base automated irrigation mechanism which turns the pumping motor ON and OFF on detecting the moisture content and sufficient water level and pass data through IOT platform. It overcome labour intensive work and also controls water management system.

This system is easy to implement and time, money and manpower saving solution for irrigating fields.

Reason for Students Recommending this Design

Design 1. IOT Based Smart Irrigation System.

India is mainly an agricultural country. Agriculture is the most important occupation for the most of the Indian families. It plays vital role in the development of agricultural country. In India, agriculture contributes about16% of total GDP and 10% of total exports. Water is main resource for Agriculture. Irrigation is one method to supply water but in some cases there will be lot of water wastage. So, in this regard to save water and time we have proposed design titled smart irrigation system using IoT. In this proposed system we are using various sensors like temperature, humidity, soil moisture sensors which senses the various parameters of the soil and based on soil moisture value land gets automatically irrigated by ON/OFF of the motor. These sensed parameters and motor status will be displayed on user android application.

2. Electrical Design 2: Portable Electric Power Tiller Machine.
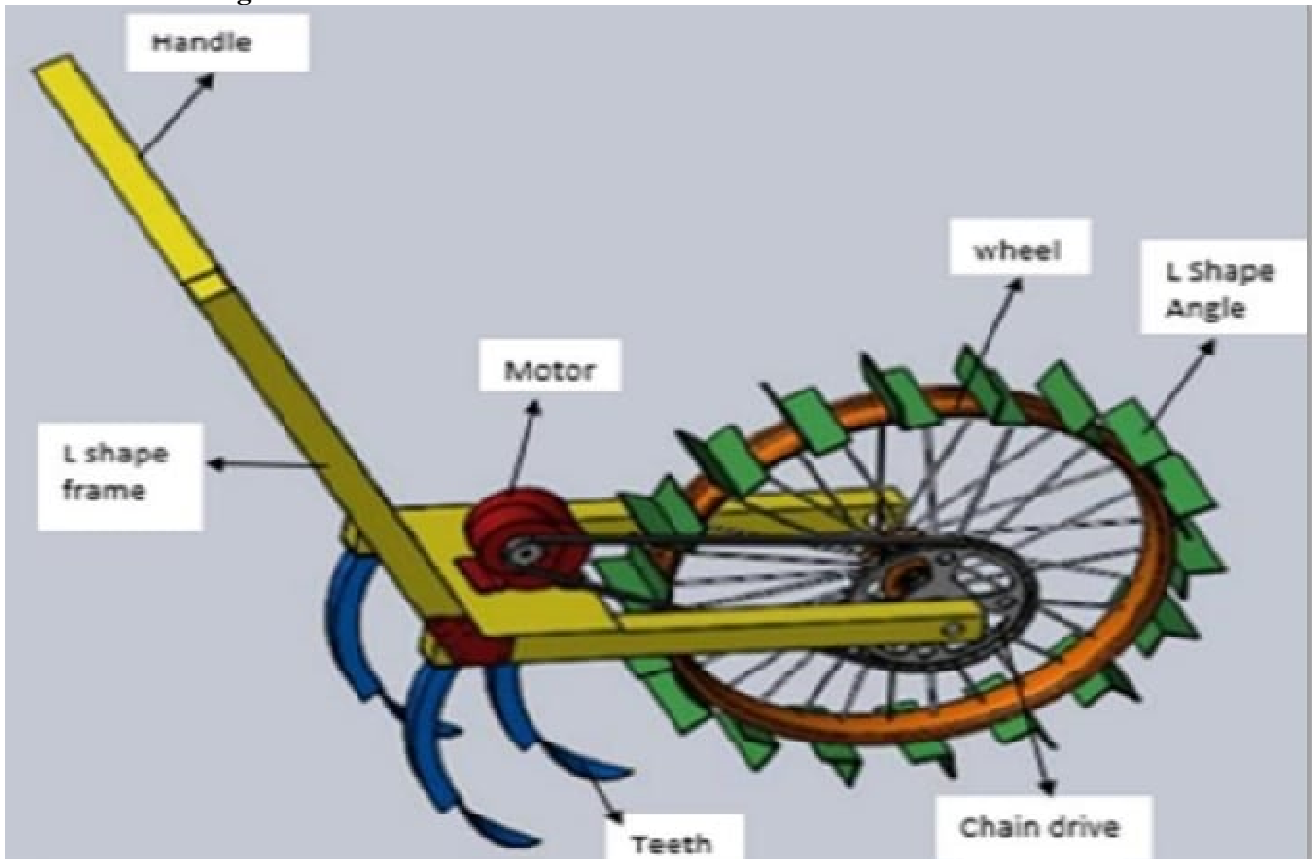
3D Conceptual Drawing of Portable Electric Power Tiller Machine

A Power Tiller a two-wheeled agricultural implement fitted with rotary tillers which gives a smooth resistance to all farm activities. In fact, it has multiple uses & advantages. Power Tiller helps in preparing the soil, sowing seeds, planting seeds, adding & spraying the fertilizers, herbicides & water.

How does this system work: -
A motorised tiller is operated by walking behind the machine. The machine consists of electric motor, battery, chain sprocket, wheel angles, bearing, electrical & wiring, mounts and joints, supporting frames, screw and fitting, two-wheeler wheel, the machine is powered by an electric motor that drives the pulling wheel using sprocket chain configuration. The motor that drives the forks into the soil is powered by a battery. The cultivator forks enable for precise and easy tilling, as required by farming. The machine is light in weight and portable. Due to easy construction of machine the maintenance is very low.

Advantage of Portable Electric Power Tiller Machine
The advantages to the villagers of Portable Electric Power Tiller Machine is automatic operation, Battery powered no fuel needed portable and easy to operate cost effective as compared to a tractor replacement for animal power & human effort. Reduces tilling time

**Reason for Students Recommending this Design**
Design 2. Portable Electric Power Tiller Machine.
Agriculture has been an integral part of the human ecosystem. However, traditional farming methods require a lot of human effort and are very time-consuming. Farm tilling is one of the most labor-intensive operations in agriculture. Manual tiling of fields is very strenuous task while tractors incur high capital along with heavy fuel consumption costs.

This low-cost portable battery charged electric power tiller machine is a one-stop modern solution to enhance the conventional agriculture methods of farming, as it reduces the human effort, at a very negligible price using motorized tilling mechanism. The electric power tiller helps reduce the time and cost involved in tilling using a smart portable design thereby increasing the productivity and efficiency in agriculture.

The electric power tiller helps reduce the time and cost involved in tilling using a smart, portable design, thereby increasing productivity and efficiency in agriculture.

Electrical Design 3: Design of Automatic Plant Watering System using Arduino
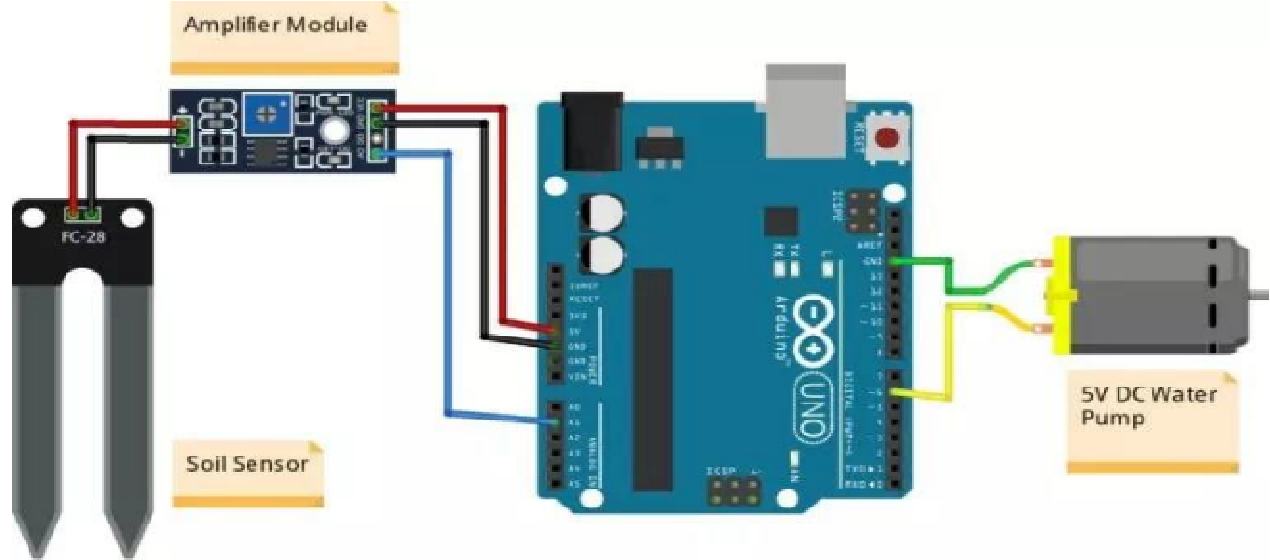
Circuit Diagram of Automatic Plant Watering System

In this project, the main two things which we are going to use our soil moisture sensor and a 5V dc water pump. We can use a pump of higher power but in that case, we will need additional components like relay modules. Next, we will need a microcontroller. For that, we are going to use Arduino UNO. But again, you can use other boards of Arduino like Nano, Mini, Mega, etc. These are the main three parts of the system. Apart from all these, we will also need a USB B type cable to upload code to the Arduino UNO board, both male to female and female to female jumper wires, and a mini rubber pipe of suitable length to connect with the water pump.

How does this system work? -
The system works on the prin- ciple of measuring the soil moisture level by means of the sensor technology which in turn controls the water pump via microcontroller in order to provide the plant enough amounts of water when necessary.

It moves the servo motor horn, along with the water pipe fixed on it, toward the potted plant, whose moisture level is less than the predetermined/ threshold level.

It starts the motor pump to supply water to the plant for a fixed period of time and then stops the water pump

Advantage of Automatic Plant Watering System
Reduced labour.

Timely irrigation — plants being watered when needed.

Management of higher flow rates.

Accurate cut-off of water compared to manual checking.

Reduced runoff of water and nutrients.

Reduced costs for vehicles used to check irrigation

Reason for Students Recommending this Design
**Design 3. Design of Automatic Plant Watering System using Arduino**
Automatic Watering systems deliver more controlled watering directly to the roots, reducing water wastage through evaporation or inaccurate watering. Not only does this save water, but it could also save you money on your water bills.

SAVE TIME: Your system will do all the watering for you.

SAVE WATER: An automatic system uses less water than watering by hand.

SAVE MONEY: Your water bills will be lower and your plants will live longer.

REST EASY: assurance of quality, value, and performance.

Electrical Design 4: Design of Automatic Arduino Weather Station
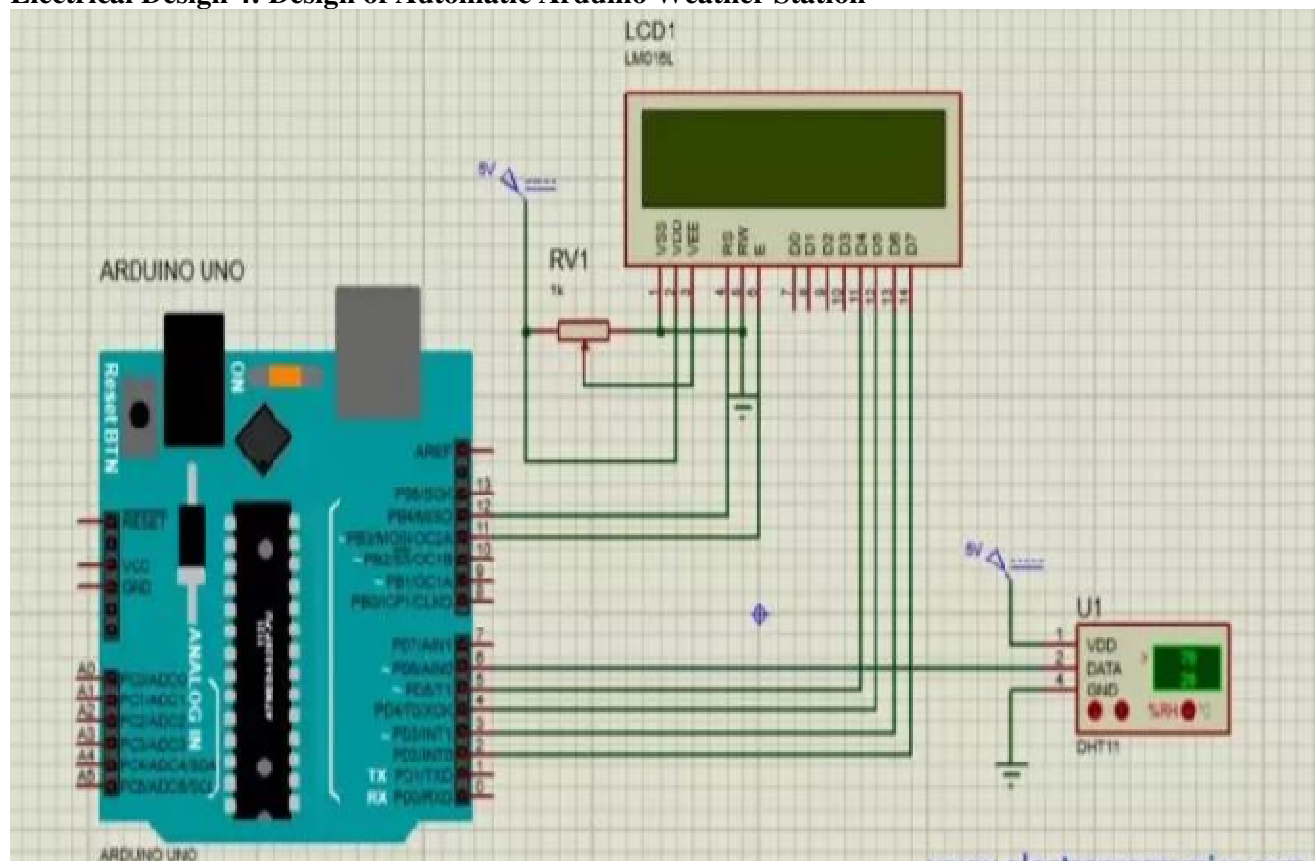
Circuit diagram Advantage of Automatic Arduino Weather Station

The weather station comprises of three parts: collecting the real-time weather data, processing the data in the Arduino board, showing the data to the user on the LCD. The sensors DHT11 and BMP-280 collect the data in real-time. That data is then converted into electrical signals.

Weather monitoring station or weather monitoring system using Arduino is the simplest Arduino project which can help us to monitoring the temperature and humidity by using one sensor. there we are using the DHT11 sensor which is easily capable to measure the temperature and humidity.

How does this system work? -
DHT 11 Sensor The sensor takes measurements from its environment using a capacitive humidity sensor and a resistive type temperature sensor. This reading is sent to the Arduino as voltage, and the Arduino converts it into readable values to display on the screen.

Advantage of Automatic Arduino Weather Station
Automated weather stations measure all the important surface weather observations. They also offer accurate forecasting options. These stations are better than traditional ones because they provide accurate and frequent readings, have low power requirements, and can operate practically anywhere.

Precise and Real-Time Measurements. One of the biggest benefits of the weather station is its ability to collect accurate data. They take measurements every few minutes and record them automatically. This means you can be sure that you're getting real-time information about current conditions.

Limited represented area of 3-5 km of sensor site. It is not possible to observe all parameters automatically. e.g., Cloud coverage and types Ongoing periodic maintenance Periodic test and calibration Well trained technicians and specialists' High cost of instrumentation and operation

Reason for Students Recommending this Design Design 4. Design of Automatic Arduino Weather Station
Automatic Arduino Weather Station for real-time weather data collection, educational opportunities, and weather-related decision-making, such as agriculture, outdoor activities, and disaster preparedness.

work under the Vishwakarma Yojana to get real work experience and applying technical knowledge in the development of villages. We are also thankful to the Villagers, Sarpanch, Talati.

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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