



An Economic effect of solar power project on agriculture sector

Dr. Rohit J. Desai

M.A, Ph.D. Department Of Economics
D.D Thakar Arts & K.J.Patel Commerce
College, Khedbrahma, Dist - Sabarkantha

Maganbhai Prajapati

Ph.D scholar H.N.G.U Patan

Abstract:-

Solar energy is a very important source of renewable energy that is available in abundance as compared to any other resource. The large magnitude of solar energy available makes it highly appealing for different applications across diverse verticals such as residential homes, industrial, manufacturing, agriculture, technology, etc. By employing a solar-powered heating system, farmers can easily save costs incurred on electricity bills. These systems use solar panels that effectively power the temperature control systems as required. Using sunlight to dry crops and grains is one of the oldest applications of solar energy used by farmers.

Key Word:- Solar drying, Energy consumption, Drying applications, Agriculture

Introduction:-

The concept of economic development has changed radically today. Economic development in the early 19th century was synonymous with industrialization or urbanization. Then, after the 1990s, the concept of Mavikanav development was developed. In modern times, the concept of sustainable development has become accepted all over the world. The concept of sustainable development is based on achieving a balance between economy, environment, society and culture. This requires harmonizing environmental balance with efficient production, social equity and respect for cultural diversity.

Sustainable Development Goal No. 7 Affordable and Clean Energy has been adopted as a goal. Energy is an important tool for achieving economic development goals. Primary energy sources in the world are limited.

Climate change, deteriorating air quality, and the subsequent urgency to shift to increasingly clean and sustainable energy use are slowly coming to the forefront of policymakers' concerns. The alarming levels of air quality in Indian cities and many cities around the world have highlighted the deteriorating environment, and the resulting negative impact people are paying on their health. Needless to say, it has set in motion the desperate quest for clean energy. Solar energy is a very important source of renewable energy that is available in abundance as compared to any other resource. The large magnitude of solar energy available makes it highly appealing for different applications across diverse verticals such as residential homes, industrial, manufacturing, agriculture, technology, etc. Since agricultural farms involve many energy-intensive practices and therefore, using the sunlight to work makes sense as a

practical solution to lowering farming energy use and expense. And, of course, solar energy can also benefit the environment by utilizing natural, renewable energy and also contributes to organic farming. Nowadays, solar energy is transforming agricultural farming lands and easing farmers of problems such as drought. Solar power can benefit agriculture farms in several ways, and the following are a few of the advantages or benefits of utilizing solar power. The use of solar energy can be a revolutionary advancement for the agricultural sector, by adding value in many ways like saving precious water resources, reducing dependency on the grid, saving power costs in the long run and even becoming an additional revenue stream. Although solar energy implementation in the agricultural sector has been practiced since the beginning of civilization, there is a surge in demand for the use of this energy source in wider applications across different functions.

Solar Energy definition

Solar energy is the radiant light and heat from the sun that has been harnessed by humans since ancient times using a range of ever-evolving technologies. Solar radiation along with secondary solar resources account for most of the available renewable energy on earth.

Types of Solar Energy

Solar energy can be classified into two categories depending upon the mode of conversion and type of energy it is converted into. Passive solar energy and active solar energy belong to the mode of conversion and solar

thermal energy, photovoltaic solar power and concentrating solar power.

- Passive solar energy refers to trapping the sun's energy without using mechanical devices.
- Active solar energy uses mechanical devices to collect, store, and distribute energy.
- Solar thermal energy: This energy is obtained by converting solar energy into heat.
- Photovoltaic solar power is the energy obtained by converting solar energy into electricity.
- Concentrating solar power: This is a type of thermal energy used to generate solar power electricity.

Objectives of the study

1. To study current energy consumption
2. To study solar power project used in agriculture sector.
3. To understand the advantages and disadvantages of solar energy in agriculture

The Advantages of Solar Power for Agriculture sector

The cost of implementing and managing solar energy setup has decreased due to advancements in the industry, enabling more installations across different applications in the agricultural sector. Some of them include As the world becomes more environmentally conscious, there has been a growing interest in the use of solar power for agricultural applications. Solar power is a renewable energy source that has numerous benefits for agriculture. In this article, we will discuss the advantages of solar power for

agriculture. due to insufficient rains for cultivation, for crops water is required and it is to be lifted from wells and bore wells so number of agriculture pumps increased, consumption also increased

1. **Reduced Energy Costs:** The cost of energy is a significant expense for agricultural businesses. With solar power, farmers can reduce their energy costs and save money. By using solar panels, farmers can generate their electricity and reduce their dependence on the grid. This means that farmers can save money on their energy bills and use that money for other aspects of their business.
2. **Increased Sustainability:** The use of solar power in agriculture can help farmers become more sustainable. By using solar energy, farmers can reduce their carbon footprint and decrease their reliance on fossil fuels. This leads to a more sustainable agriculture industry, which is crucial for the future of our planet.
3. **Reliable Power Supply:** Solar power can provide a reliable source of energy for farmers. In remote areas where there is no access to the grid, solar panels can be used to provide a consistent and reliable source of energy. This is important for farmers who rely on power for their operations, such as irrigation systems, lighting, and ventilation.
4. **Improved Water Management:** The use of solar power in agriculture can also help improve water management. Solar-powered irrigation systems can be used to pump water from underground sources or from

surface water sources. These systems can help farmers optimize their water use and reduce waste.

5. **Increased Crop Yield:** Solar power can help increase crop yields. The use of solar panels can provide energy for lighting and heating systems, which can be used to extend the growing season. This can result in higher crop yields and better-quality crops.
6. **Government Incentives:** Governments around the world are offering incentives for farmers to adopt solar power. These incentives can include tax credits, rebates, and other financial benefits. By taking advantage of these incentives, farmers can save money and improve their bottom line.
7. **Long-Term Investment:** Investing in solar power is a long-term investment for farmers. Solar panels have a lifespan of 25-30 years, which means that farmers can enjoy the benefits of solar power for many years to come. In addition, the cost of solar panels has decreased significantly over the past few years, making solar power a more affordable option for farmers.
8. **Solar Energy-Powered Water Pumps:** In many places where electric supply might be limited or not available, solar water pumps are lifesavers. Solar pumps use solar energy and pump water from reservoirs, and canals to the farms which would save hours of time for farmers. Here solar panels are employed to harness the solar energy and using inverters, DC power is supplied to the power grid

or stored in batteries. This power will be used efficiently to run the pumps to supply water.

9. **Water and Space Heating:**

Livestock and dairy operations have specific space and water heating requirements around the year at different seasons. Since, in most cases, cattle farming is done in closed structures, the temperature and air quality are vital for operations. Solar power is used to manage this around the year. By employing a solar-powered heating system, farmers can easily save costs incurred on electricity bills. These systems use solar panels that effectively power the temperature control systems as required.

10. **Crop and Grain Drying:**

Using sunlight to dry crops and grains is one of the oldest applications of solar energy used by farmers. While this is a completely free, viable method that can easily be employed, it has a risk of exposing the crops to the wind, rodents, impurities, etc. contaminating them. With advancements in technology today, there are solar dryers that can help in harnessing maximum solar energy and concentrating it in a closed container where trays are used to dry the produce. These systems will also help in accelerating the process and reducing the time required.

11. **Green House Heating:**

Greenhouse heating is essential for the proper growth of certain crops and plants. Commercial greenhouses use sunlight for lighting and not for heating. Mostly, they depend on oil and

gases for maintaining the required temperatures. Solar green housing heating systems are used to feature both the lighting and heating that is required. A solar greenhouse has a solar panel to collect the energy and batteries to store the energy. It also has insulation that will help in retaining heat during cold days and nights.

12. **Remote Supply of Electricity:**

Farms might be located in remote areas where the electricity supply is limited and farmers may constantly face issues related to power outages and shortages for running their equipment, and tools on the farms. Solar PV systems are employed in the farms to produce the required electricity that is stored in the batteries and used when required. This not only helps in reducing the power consumption from the electricity supply but also saves money for farmers in the long run.

13. **Solar-powered cooling systems:**

In many cases, farmers face huge losses due to the lack of availability of proper refrigeration and cooling systems in their farms. Even if they have a refrigeration system, it becomes very difficult to power them all day with constant power cuts and outages. Solar-powered cooling systems will help in tackling this problem. The refrigeration systems used will have a continuous supply of power from the batteries hooked to the solar panels where the power is supplied directly in the morning and the backup power stored is supplied during the night.

Disadvantages:-

Solar panel systems have a number of drawbacks, including high installation and early setup expenses. According to the World Energy Evaluation study, the present cost of PV energy is comparable to conventional power plants, which is a significant barrier to large-scale PV implementation. There are also a slew of questions surrounding greenhouse manufacturing, including. Managing the Internal Climate. Changing the supply control decision. The requirement to calibrate the system in response to changing external circumstances. Setting to allow crops or plants grown on the underground surface to produce similarly to those grown on the surf. The production is low during winters and on cloudy days. Installation and the initial cost of the materials are expensive. Space consumption is more.

Conclusion:

In conclusion, solar power is an excellent option for agricultural businesses. It can help reduce energy costs, increase sustainability, provide a reliable power supply, improve water management, increase crop yield, provide government incentives, and is a long-term investment. This paper suggests that solar energy may offer a long-term solution to many of the world's current issues, including climate change, energy shortages, atmospheric conservation, and drought. Farmers in the United States, the European Union, and Asian countries are at the forefront of adopting solar energy, as evidenced by the literature. However, despite the fact that this technology has numerous advantages, as demonstrated in this article, most farmers on the African continent are

less accepting of solar systems for agriculture. The African continent also benefits from increasing solar radiation and has 60% of the world's productive land. Solar power is suitable for agricultural applications such as electrical shielding, threshing, aerating, grinding, drainage, purification, and so on. Solar energy is now widely used by Indian farmers in the water sector, especially in irrigation systems, for their agricultural. Despite this, farmers believe that the initial cost of solar water pump systems is more than the cost of a diesel water recirculating pump, but neither system considers production or maintenance expenses. The PV collection of solar water pump systems, which may be utilized to generate power if irrigation is not required, is one of the most essential features. Solar water pumping devices can efficiently meet the needs of marginal farmers in the landholding system for irrigation water. Pump sets are installed every year in India due to increasing fuel costs on a regular basis. The solar water pump system allows for better use in order to decrease fuel consumption. Solar water pumps have been available in different designs for over three decades, therefore they are not a new idea. Using up to 30% of the world's available energy will need expensive money to continue to utilize more of the power production. It claims that certain expenses are imposed on society and the environment based on the periodicity of the energy market and thermal power plants. Based on the above, we conclude that the solar pumping system is more feasible than the diesel engine pumping method for watering India's agriculture. Solar water pumps

are not more expensive on an economic level if solar energy is utilized.

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