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## GENERATION OF WEALTH FROM WASTAGE SUNLIGHT BEAMS(WSB) THROUGH SOLAR PUMPING IRRIGATION (SPI)

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### ABSTRACT:

The concept of generation of Wealth from Wastage (WFW). This is a process of conversion of waste to a product that can be put to primary application and can be viewed as a process of generating wealth and so-called Waste to Wealth(W2W). The W2W is the transformation of Wastage Sunlight Beams(WSB) to a valuable Solar Energy and its application towards Solar Pumping Irrigation(SPI) systems. The study examined the wastage sunlight beams(WSB) converted into Solar Energy(SE) efficiently and utilizing in pumping operation towards agricultural practices for Indian Farmers. Which identified the challenges facing its operation, proffered possible solutions necessary for the growth of the waste management and also the need to harness the inherent economic and environmental significance both for farmers and GDP growth of country. Meeting the goals of sustainable development(SD) is an outstanding global challenge. The wastage sunlight beams (WSB) management finds innovative solutions for effective management of waste and that entail saving of time, energy, and expense. Instead, it is important to view 'waste' as a valuable 'resource' that can be converted into a variety of useful application. The unwanted or unusable sunlight Beams(SB) and no idea to use for solar pumping irrigation systems.

Keywords: Wealth from Waste(WFW), Waste to Wealth(W2W), Solar Pumping Irrigation(SPI), Wastage Sunlight Beams(WSB), Solar Energy(SE), output(O/P), GDP growth, sunlight Beams(SB) .

## INTRODUCTION:

Indian farmers played a very significant role in our society as they are providing the world's population foods. The Indian farmers not only providing food but also they are providing major contribution to the growth of GDP. The energy has a direct impact on the economic development of a country. Around 90% of the world's primary energy is produced from fossil fuels and there is a limited storage of fossil fuels and resulting hampering of Indian agriculture badly due to lack of irrigations. The world is focusing on an effective utilization of renewable solar energy for agricultural practices. Around more than 90% of sunlight beams per day is going waste and from which the sufficient solar power can be generated for agricultural irrigation purposes through pumping and to fulfill other power requirements of the agriculture or if they have a surplus, resell it to power grid companies. The Solar energy is one of the easiest way for farmers to produce energy. The farmers usually having many large buildings whose roofs are directly under the sun, without being hindered by the shadows of the trees, turning them into an ideal place to settle a photovoltaic system. Therefore, the use of solar energy in agriculture is becoming increasingly popular and the energy produced from this renewable source can be used either on the farm or in the local power grid, providing the farmer with an additional income<sup>[1]</sup>.

One of the major areas in agriculture that benefits the most from solar energy is irrigation. The main reason is that using the wastage sunlight beams and converting into the wealth through solar pumping irrigation to the Indian farmers. The installation of solar pumping irrigation system by using waste sunlight beams for India farmer's agricultural practices and aiming at increasing local farmers productivity and as a consequence improving their socio-economic living status. Presently, increasing interest in solar irrigation systems in India. Just a few months ago, a mobile solar drip irrigation system from India has reached the production stage.

## OBJECTIVES OF THE PAPER:

The basic source of income of the people living is agriculture and related jobs and for application of renewable solar energy irrigation system in the small & medium holder farming systems and which is to:

1. To increase the operational horizon by expanding the Solar Energy based Irrigation to the agricultural practices.
2. To maximize the generation of Wealth from Wastage sunlight beams in the form of solar energy for Irrigation to the Indian farmers.
3. To save water, labour, time and cost through utilization solar energy Pumping Irrigation.
4. To access and measure the attitude of using solar energy pumping irrigation system by the farmers<sup>[2]</sup>.
5. To Study the solar energy conservation habits by the farmers for their agricultural practices as per non-availability of solar energy period.
6. Identify awareness of different Government schemes available for promotion of solar energy pumping Irrigation systems and their equipments towards solar energy based agricultural practices.
7. To Assess the Indian farmer's willingness to switch over to renewable energy pumping irrigation system from traditional system.

## **SIGNIFICANCE OF THE PAPER:**

The Indian power sector provides significant opportunities for reducing energy consumption by addressing existing inefficiencies of technical, operational and economic nature.

Replacement of inefficient agricultural pump sets has been identified as one of the key policy initiatives, which to date, has been limited to a few pilot projects. The policy basic focusing on

01. To replace inefficient pump sets, improve distribution grids and provide metering.
02. Adequate re-addressing of economic inefficiencies, in terms of electricity pricing, remains a long-term objective.
03. To use the solar energy pump sets efficiently, a 5 HP electric pump set costs about Rs 40,000 and a subsidy of Rs 30,000 can be provided to replace the inefficient old electric pump sets and which can be funded by Union/State/International organizations. Energy saving yields immediate results compared to energy generation. When Rs 5 lakhs is provided as subsidy out of Rs 6 lakhs for a solar pump, mere Rs 40,000 per solar energy pump set is peanuts.
04. The enormous electricity can be saved by utilizing solar pumping irrigation systems with clean and eco-friendly, safe organized and high grade energy for Indian agricultural practices.
05. The Solar Energy Pumping systems replacing more than 30 Million irrigation pump sets often end up in high promising performances with initial high investment cost towards generation of wealth from waste sunlight beams towards Indian agricultural practices.
06. Enough sunlight reaches the Earth and not utilizing, rather it is going waste, that is why solar energy is totally renewable and accessible<sup>[3]</sup>.
07. The life span of solar panels can be at least 25 years as per MNRE.
08. Compared to conventional water pumping, the solar energy water pumping required very low maintenance that allowed farmers to save time because irrigation operations are no longer done manually.
09. The Indian farmers can sell surplus energy generated from the solar panels to the grid and generated additional income as wealth from waste.
10. The solar energy pumping system is having potential to provide higher yields than rain-fed agriculture most especially in areas with less to no rainfall.
11. The paper of the topic have shown that properties with solar energy pumping irrigation systems to the Indian agricultural practices would increase the asset's resale value and makes the property attractive to buyers.

## **OPERATIONAL TECHNOLOGY FOR GENERATION OF SOLAR ENERGY FROM WASTAGE SUNLIGHT BEAMS FOR IRRIGATION:**

An independent and alternative energy system is a solution for the Indian farmer to secure a safe power source and for the public grid to avoid saturation, dependency and No-Power. The solar energy pumping systems is relatively expensive, the source of energy is free, therefore, after the amortization period, there are no longer operating costs and only meager value required towards the maintenance costs. Therefore, solar pumps turn out to be a viable long term investment and generation of wealth from waste sunlight beams.

Water for wealth and food security by accessing the water for agricultural purposes remains critical in some areas such as in arid regions of India. Most of Indian farmers fetch the water directly from the well or the rivers and irrigate their fields using buckets. If farmers of those regions could have access to a motorized pump, they would increase their yield more than double percentages.

Presently the solar pumps that are not only affordable but also acceptable in arid regions. The company called M/s. IBC SOLAR has developed the system collaboration with M/s. Siemens and resulted a solution to replace diesel engine by solar energy based engine. The complete irrigation system including the pump can remain as it is and only the diesel engine is replaced by a photovoltaic system and the named as M/s. IBC pump drive controller system<sup>[4]</sup>. The simplest definition of solar energy(SE) is the heat and light that come from the sun beam lights. The main source of energy is the sun only and that is the reason why it's the most abundant and reliable source of renewable energy on this planet and it has a huge potential that it will supply most of our power needs soon when non renewable energies, like coal, petroleum, and natural gas, will run out.

Solar Panel Cells(SPC) are made of negative and positive film of silicon which converts sunlight into electricity. These cells are placed under a thin sheet of glass. The Solar panels must be set up facing directly to the sun for maximum sunlight conversion into electricity will provide electric energy for the motor pump which delivers water either directly into an irrigation canal or to an elevated reservoir that can be used for the drip method. The Solar Energy is a reliable source of energy not only for commercial and residential purposes but also for agricultural. The agriculture provides a decent occupation to most countries of the world. They produce food for every regards and all means. That is why proper irrigation system(IE) of the fields is necessary for various crop production and generated wealth from waste sunlight beams.

### **THE IRRIGATION SYSTEM:**

1. In this drip method there is no water waste and very simple for irrigation: The principle of the drip irrigation method is quite simple. With the use of various valves, hoses and pipes, water drips slowly and at regular intervals to the roots of the plants.
2. Therefore, there is no water waste as water goes directly where it should go and drip irrigation method enables to grow more crops with less water, turning it into a highly efficient irrigation method<sup>[5]</sup>.
3. Sprinkler method of irrigation is the traditional way of irrigating for the crops: The sprinkler system in which water evaporates into the air or seeps into soils where no plants grow.

**COST INVOLVEMENT:** Every Kwh Energy saved is each Kwh generation. The Solar energy Water pumps efficiency is optimistic and fit for both open & bore wells. The solar energy pumping irrigation systems is to be replaced the old and obsolete irrigation pump sets with more efficient ones. This will save enormous money and increases reliability and on the other hand, the solar energy power tariff for small farmers in many states is nominal or nil. The Indian agriculture needs water on demand. The Farmer won't mind installing even diesel pump set so long as he gets reliable water supply for crops. A Government which is showing so much enthusiasm to promote solar pumps for irrigation now days<sup>[6]</sup>. The agricultural sector accounts for about 30 to 40% of electricity consumption in India. The largest population of inefficient pumps and systems is also to be found in this sector. Now days, basic two factors that adversely impact electricity consumption:

- a) Lack of efficient pumping system and inadequate standards for motors and pump-sets for irrigation.
- b) To Propagate the use of Solar Energy Based Efficient Motors for energy savings in farming & Industries.
- c) To Promote the use of high efficiency solar energy based motors and pumps in the Agricultural sector.



The major costing parameters factors are as follows:

- ❖ Quantity of land is to be irrigated through solar pumping systems and accordingly the price and number of kWp solar panels required to cater to the solar energy.
- ❖ Availability of water source distance from the land, depth & water layer source body.
- ❖ Quality & type of soil to be irrigated & water quantity discharge requirement for the crop .
- ❖ Capacity, rating & type of motor pump required (surface or submersible).
- ❖ Type, pattern and frequency water irrigation is being required for the crop.
- ❖ Requirement of irrigation system is manually or automatic systems.

The cost of PV panels has dramatically decreased during the last decade and is estimated to have a more significant drop in prices day by day and also other components such as pumps and configurations have decreased as parallel well due to latest technical know-how. The cost for Small-scale complete system in India with a submersible pump, 2kW with 300W panels on secured 3 m high stand with controller, filters and 1-acre drip irrigation, with planning, installation, and guarantees for the pump, panels and drip lines starts from ranging from INR Rs.250,000/- to 3,00,000/-. Generally , AC & DC solar pump system price ranging from (One) 1 HP to 10 HP @ 75,000/- upto 5lakh depending upon rating, technology and Brand + some Civil jobs are being required around one lakh rupees in addition to the above price.<sup>[7]</sup>

#### **DURABILITY OF SOLAR ENERGY PUMPING IRRIGATION :**

Panels should meet the International Electro-technical Commission's (IEC) 61215 reliability standard to be considered durable or MNRE Approved one. The solar panels are engineered to survive in extreme climatic conditions like harsh winters and strong wind velocity<sup>[8]</sup>.

#### **BARRIERS OF THE TOPIC:**

The key barrier to the large-scale dissemination of solar PV water pumps is the high capital cost incurred by farmers compared to the much lower capital cost of conventional pumps.

It is portrayed Solar PV is a competitive option in the face of diesel, its adoption being contingent on the ease of access to subsidies. Another factor to be considered is the space requirement for the installation of a solar PV pump set. This factor limits adoption by small-scale farmers to whom land availability is a major constraint. The other limitations are as follows:

- a) Low yield: Solar pumping is not suitable where the requirement is very high. The maximum capacity available with solar is very low<sup>[9]</sup>.
- b) Variable yield: The water yield of the solar pump changes according to the sunlight. It is highest around noon and least in the early morning and evening. This variability should be taken into consideration while planning the irrigation. This is taken into account in some solar pumps which are costly.
- c) Dry operation: The submersible pump has an in-built protection against dry run. However, the surface pumps are very sensitive to dry run. A dry run of 15 minutes or more can cause considerable damage to a surface pump.

- d) Water quality: As with any other pump, solar pumps work best if the water is clean, devoid of sand or mud. however, if the water is not so clean, it is advisable to clean the well before installation or use a good filter at the end of the immersed pipe.
- e) Theft: Theft of solar panels can be a problem in some areas. So the farmers need to take necessary precautions. Ideally, the solar system should insured against theft as well as natural hazards like lightning<sup>[10]</sup>.
- f) Relatively high initial investment cost: Sunlight & Solar is free from Earth. But unfortunately, because of the high manufacturing cost, the minimum earning farmers cannot afford to install panels for their irrigation system. Moreover, finance is not accessible and affordable for all.
- g) Unawareness that there is an alternative solution: Farmers, especially in far-flung areas, are unaware that there an alternative solution to irrigation problems
- h) Knowledge and information gap: Farmers need to be trained because the operation and maintenance of solar energy pumping systems require an optimal degree of technical knowledge, expertise and skill.
- i) Limited access to distributors and installation services: Distributors, extension services or private service suppliers are not available especially in rural areas<sup>[11]</sup>.

## CONCLUSION:

Well irrigated agricultural farm is the backbone of almost all local economic development, especially in developing countries.

- Wastage Sunlight Beams is replaceable by artificial energy form as generation of Wealth.
- But there is no substitute for water and Water irrigation is very important in case of a lack of rain. In India, which suffer from high temperatures and scarce water resources, the drip irrigation system could contribute to an efficient water management. This is all the more important as farmers have to face three challenges: save water, money and energy.
- Mobile solar drip pumping irrigation systems shall turn out to be the perfect substitute to face these challenges of water scarcity.

There are some crucial factors to consider to attain a well-irrigated farm such as reliability, affordability, and access to irrigation water. Farmers, especially in rural areas have no access to a reliable source of irrigation water. And if there is access, they cannot afford it. One promising solution to the problem, considering these factors is the Solar Energy Pumping Irrigation System. Solar Energy Pumping Irrigation System is an automatic irrigation system where the irrigation pump is operated by electricity from the sunlight which is converted by solar panels or photovoltaic cells. Installing a Solar Energy Pumping Irrigation System is an expensive initial investment but it's actually a money-saver in the long run compared to traditional water pumps that use nonrenewable fossils like diesel and gas that contribute to further damage of the environment. This technological option becomes recognizable due to a substantial decrease in panel prices and the cooperation of governments and technical extension services. Solar Energy-Irrigation System has a certain significance not only in a nation's economy for growth of GDP but most especially to the environment as Eco-Friendly based agricultural Country like INDIA. The mobile solar energy pumping system with photovoltaic modules (up to 3kW) is connected to a wheeled pump systems and which can pump from wells or rivers. The solar powered pump then distributes the water through the hoses, directly to the crops. Although this system is still quite expensive and complicated to settle for which, many R&D projects are

working on the democratization of the use of solar power in agricultural practices in the future (and even now), could play a vital part in the management of the food and energy crisis of the country.

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