SOLAR OPERATED PESTICIDE SPRAYER

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ABSTRACT

A Solar Operated Pesticide Sprayer is a pump running on electricity generated by photovoltaic panels or the thermal energy available from collected sunlight as opposed to grid electricity or diesel run water pumps. The operation of solar powered pumps is more economical mainly due to the lower operation and maintenance costs and has less environmental impact than pumps powered by an internal combustion engine (ICE). Solar pumps are useful where grid electricity is unavailable and alternative sources (in particular wind) do not provide sufficient energy. The solar panels make up most (up to 80%) of the systems cost. The size of the PV-system is directly dependent on the size of the pump, the amount of water that is required (m^3/d) and the solar irradiance available.

The solar sprayer has many advantages. Besides reducing the cost of spraying, there is a saving on fuel/petrol. Also, the transportation cost for buying petrol is saved. The solar sprayer maintenance is simple. There is less vibration as compared to the petrol sprayer. The farmer can do the spraying operation by himself without engaging labour, thus increasing spraying efficiency.

Keywords: Solar Panels, Solar Pump, Sprayer, Photovoltaic Cell (PV), Electricity

I. INTRODUCTION

Most of the increase in the area of irrigated land in the world has been through the increasing use of engine-driven pumps. However, the increasing price of oil-based fuel has reduced the margin to be gained by farmers from irrigation, since food prices have generally been prevented from rising in line with energy costs. Despite present short-term fluctuations in oil prices, conventional oil-based engine-driven power sources and mains electricity are expected to continue to increase in the longer term. If we are to decrease our dependence on imported oil, we have to find methods for energizing irrigation pumps that are independent of imported oil or centralized electricity.

Solar radiation as a source of energy is Of course, the epitome of the clean. Sustainable energy technology except for residues possibly arising out of the manufacture of solar component (e.g. semiconductors), solar technology have very low environmental impacts. The environmental impacts of solar system in operation are very low and the source is, for us inexhaustible.

II. CONSTRUCTION

2.1 Solar Panel

A **solar panel** (also **solar module**, **photovoltaic module** or **photovoltaic panel**) is a packaged, connected assembly of photovoltaic cells. The solar panel can be used as a component of a larger photovoltaic system to generate and

supply electricity in commercial and residential applications. Each panel is rated by its DC output power under standard test conditions, and typically ranges from 100 to 320 watts. The efficiency of a panel determines the area of a panel given the same rated output - an 8% efficient 230 watt panel will have twice the area of a 16% efficient 230 watt panel. Because a single solar panel can produce only a limited amount of power, most installations contain multiple panels. A photovoltaic system typically includes an array of solar panels, an inverter, and sometimes a battery and or solar tracker and interconnection wiring.

Fig.1 Solar Panel

2.2 DC Water Pump

For people living in remote areas, solar water pumps are usually the only solution as there is no access to diesel. If there is diesel, Solar Water Pumps are the only solution or an excellent alternative for diesel as the cost of running power lines or diesel pumping may be too great.

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Fig.1 DC water pump

A solar powered water pump differs from a regular water pump only in that it uses the sun's energy to supply electricity for the pump. The solar panels absorb the sun's energy and convert it to electrical energy for the pump to operate. All the pumped water is stored in a water tank so that there is constant supply even in bad weather conditions and during night time where there is insufficient power to generate the solar water pumps. Solar powered

water pumps represent a higher initial investment, however, over a period of 5 years they represent a cost benefit due to minimal maintenance costs compared to AC pumps run with a generator.

III. WORKING

This project operation on solar energy. The concoction is accomplished by the use of solar panel, a centrifugal pump which runs on dc supply is attached to the solar panel the solar panel generates the power that power is dc power its positive and negative charges are connected to a batter in order to save the power and use it when the sun raise are not present by using this device we can spray pest ices to the herbs and plants and any agriculture spraying it is economical as compared to the other means used like petrol/diesel pesticides sprayers. There is no much maintenance cost and no operating cost as it is using solar energy it is free of cost and there is no pollution its working principal is very simple and the it is economical of the farmers which has one more advantage that it can also generate power that power is saved in the battery and it can be used for both for spraying and well as to light in the house when there is no current supply. And where as in rainy season when the sun rays are not there that time we can charge the battery and use it to spray pesticides to the herbs and plants as compared to petrol/ diesel it is economical no efforts to human just he has to carry the device the device is light in weight so it is much feasible.

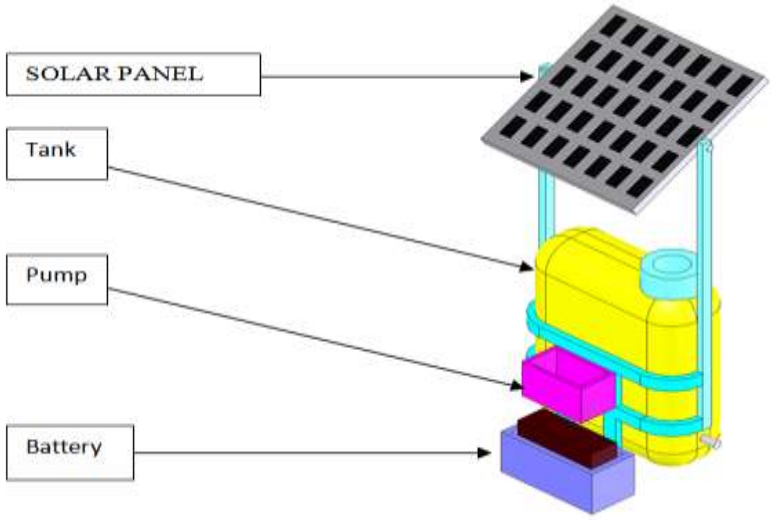

Fig. 3 Solar Operated Pesticide Sprayer

IV. LITERATURE SURVEY

[1]ABHISHEK JIVRAG, [2]VINAYAK CHAWRE, [3]ADITYA BHAGWAT [1]

ABSTRACT - This paper illustrates invention and operation of multiple granulated pesticides duster with the use of solar energy. The concoction is accomplished by the use of solar panel, impeller type centrifugal blower, gear reduction mechanism, dispensers, D.C motors and batteries. In addition, the duster has been equipped with a facility to operate on an electric supply, which serves beneficial in the absence of sunlight. The device essentially works for disbursing solid granulated (powder) form of pesticide. The operator controls the rate and discharge of different

pesticides by means of push buttons and toggle switches. The technical specifications of the device are worked and examined in a way to minimize the weight of the device and deplete the feeder unit dispenser in a span of three hours. The duster is portable, low cost device and emerges a boon for small scale agriculture, nursery, horticulture, and community services including farms.

R.JOSHUA, V.VASU & P.VINCENT [2]

Abstract:- "Energy –demand" is one of the major thread for our country. Finding solutions, to meet the "Energy-demand" is the great challenge for Social Scientist, Engineers Entrepreneurs and Industrialist of our Country. According to them application non conventional energy is the only alternate solution for conventional energy demand. Now-a- days the concept and technology employing this non conventional energy became very popular for all kinds of development activities. Solar energy plays an important role in drying agriculture products and for irrigation purpose for pumping the well water in remote village without electricity.

BART VAN CAMPEN DANELE GUIDI GUSTAVO BEST [3]

Abstract: - Solar photovoltaic (PV) systems have shown their potential in rural electrification projects around the world, especially concerning Solar Home Systems. With continuing price decreases of PV systems, other applications are becoming economically attractive and experience is gained with the use of PV in such areas as social and communal services, agriculture and other productive activities, which can have a significant impact on rural development. There is still a lack of information, however, on the potential and limitations of such PV applications. The main aim of this study is, therefore, to contribute to a better understanding of the potential impact and of the limitations of PV systems on sustainable agriculture and rural development (SARD), especially concerning income-generating activities. It is, in fact, of paramount importance to identify the potential contribution of PV to rural development in order to gain further financial and political commitment for PV projects and programs and to design appropriate PV projects. One of the main lessons learnt through this study is that success of PV programmers is significantly enhanced when an integrated strategy is followed. Solar photovoltaic systems, through their flexibility in use, offer unique chances for the energy sector to provide "packages" of energy services to remote rural areas such as for rural health care, education, communication, agriculture, lighting and water supply. It is hoped that this document contributes to the generation of ideas and discussions among the different institutions involved in providing these services to rural areas and thereby to an "informed" decision on the PV technology option.

V. CONCLUSION

The output of a solar pumping system is very dependent on good system design derived from accurate site and demand data. It is therefore essential that accurate assumptions are made regarding water demand/pattern of use and water availability including well yield and expected drawdown.

With a solar pump, energy is not available on demand, and the daily variation in solar power generation necessitates the storage of a surplus of water pumped on sunny days for use on cloudy days, solar energy needs to be reserved in

the form of either electricity in batteries of lifted water in a storage tank. The suitability of solar power for lifting water to irrigate plants is undeniable because of the complementary between solar irradiance and water requirements of crops. The more intensively the sun is shining the higher is the power to supply irrigation water while on the other hand on rainy days irrigation is neither possible nor needed.

Water pumping has long been the most reliable and economic application of solar-electric (photovoltaic, or PV) systems. Most PV systems rely on battery storage for powering lights and other appliances at night or when the sun is not shining. Most PV pumping systems do not use batteries – the PV modules power the pump directly.

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