

# Role of Renewable Energy for Upliftment of Rural development through Agripreneurship

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## **Abstract**

Today agriculture faces many challenges, including globalization and market liberalization, food price crises, natural resource depletion, climate change, rapid urbanization, changing production and consumption patterns, demographic changes, insufficient power supply, labour problem and so on. Many of these directly or indirectly lead to changing markets, and create both opportunities and risks for farmers, especially for smallholders, youth and women. With a growing recognition of role of smallholder agriculture for economic growth and rural development in many countries, market-oriented agriculture appears more prominent on the agenda. Agripreneurship is the key in this regard. Apart from this the farmer is suffering from the insufficient power supply in India and to overcome this they have to adopt renewable energy technology for the upliftment of agriculture through adoption of new agro-technology. Through renewable energy resources they can reduce labour cost, increase their yield and overcome insufficient power supply. Renewable energy will supply sufficient power for farming activities for cultivation, irrigation, harvesting and so on. This paper discusses to know about renewable energy resources that helps to supply sufficient power to agriculture and adoption of new agro-technology in renewable energy that can create agripreneur in rural areas for the upliftment of rural area and farmer's life.

**Key words:** Renewable Energy Resources, Green Houses Gases, Global Warming, Innovative Technology of Renewable Energy generation, Cost Analysis of Renewable Energy Generation.

## **Introduction**

Agripreneurship refers to entrepreneurship in agriculture. Entrepreneurship is a concept that encompasses transforming an idea or vision into a “new business or new venture creation, or the expansion of an existing business, by an individual, a team of individuals, or an established business”. Entrepreneurs are creative, take opportunities and accept risks, and can quickly change their business strategies to adapt changing environments. Entrepreneurs are usually being innovative and creative, but farmers often lack experiences, access to services, people, capital, markets, and skills to have realistic chances to succeed as entrepreneurs. In addition, agripreneurs are influenced by external and internal factors, such as economic and social barriers, policies, and regulation. These constraints affect all farmers and especially to smallholders, women and youth are particularly affected.

Rural advisory services play a crucial role in supporting farmers to become successful agripreneurs. They provide significant information and access to people, markets, financial services and training to the farmers to fulfill required managerial and other functional skills. Rural advisory services also influence policies and regulations to create an agripreneurship-friendly environment, reduce barriers, or change predominant values in societies.

## **Meaning of Agripreneurship**

Agripreneurship is generally defined as, sustainable, community- orientated, directly marketed agriculture. Sustainable agriculture denotes a holistic, systems-oriented approach to farming that focuses on the interrelationships of social, economic, and environmental processes.

## **Agripreneurship in Renewable Electrification**

There are so many areas and sub-areas in agriculture. Within each area, enormous number of commodities is available. Based on the needs, agro-climatic conditions and available resources, agripreneurs can adopt some commodities and flourish on it. On other hand, there are uncounted jobless agriculture graduates looking for jobs. Therefore, it becomes essential to train these jobless agriculture graduates, and it should also provide finance to develop their own business in agriculture. Decentralised renewable energy solutions would create jobs in rural areas along with

providing energy access to remote areas. Small-scale renewable energy technologies are well adapted to the rural context, as the bulk of skills required can be developed locally, limiting reliance on foreign expertise. *“There is considerable employment potential in the downstream linkages, particularly in the distribution, sales, installation, operation, and service of such systems, which can be enhanced if well integrated with local commercial activities,”* says Mr. Adnan Z. Amin, IRENA Director-General.

**Agripreneurship is required because:**

1. Increasing demand for organic/quality food both in India as well as abroad, this increases market growth of around 15-25 per cent per year.
2. Competitive advantages for many primary production activities in agriculture. Rain-fed farming, tropical fruits and vegetables, livestock, animal husbandry, aquaculture, wild craft, renewable energy solutions etc. are produced through real low cost production methods.
3. Private sector is willing to enter into agri-business at all levels of operations.
4. To reduce malnutrition in women and children of the country

Some of Government and Non-government agencies supporting agripreneurship development through public-private partnership. Some of them are listed as follows:

- The Ministry of Agriculture, Government of India has launched a unique programme to tap the expertise available in the large pool of agriculture graduates. Irrespective of being fresh out of colleges or not, or whether employed or not, can setup Agri-clinic or Agri-business Centre to offer paid professional services for enhancement of agricultural production and income of farmers
- “Small Farmers Agri-business Consortium (SFAC), New Delhi, is implementing agency for providing free start-up training to graduates in Agriculture, or any subject allied to agriculture like Horticulture, Sericulture, Veterinary Sciences, Forestry, Dairy, Poultry Farming, Fisheries, etc. Once Agri-entrepreneurs setup their agriclincs and agribusiness centers, it also support in establishing linkages for sustainability”.

- “National Institute of Agricultural Extension Management (NIAEM), Hyderabad, is coordinating two months training programme for agri-entrepreneurs across the country through selected institute. The course comprises of entrepreneurship, business management and skill improvement modules in the chosen areas of activity by the agri-entrepreneurs”.
- “National Bank for Agriculture and Rural Development (NABARD), will provide loans by banks for setting up agri-business centres. An individual can avail loan for the outer ceiling project cost of Rs. 10.00 lakhs and for joint/group projects, the ceiling is Rs. 50.00 lakhs, pro-rata”.
- The KrishiVigyan Kendra (PIRENS) Babhaleshwar has been designated as a recognized training center by MANAGE, Hyderabad provide vocational training for rural youths after taking knowledge of its innovative extension methodology and unique professionalism.

Energy is one of the major parameters for establishing growth and progress of the country, rather the standard of living depends directly upon the per capita energy consumption. Most of energy on the earth is received from the sun. Solar energy creates circulation of wind and ocean water, causes water evaporation and consequent precipitation. Plants use solar energy for photosynthesis and store carbohydrates, protein, fats, oils, alcohols, cellulose and lignin. In agricultural systems, energy is available from different sources such as human, animal, sun, wind, biomass, coal, fertilizer, seed, agro-chemicals, petroleum products, electricity, agro waste etc. Energy sources that release available energy directly to the system are called direct energy sources. Renewable energy and farming are a winning combination. Wind, solar, and biomass energy can be harvested forever, providing farmers with a long-term source of income.

Renewable energy can be used on the farm to replace other fuels or sold as a "cash crop." Renewable energy includes generation of power to do a number of farm tasks such as pumping water for irrigation, for livestock or for domestic use; lighting farm buildings; powering processing operations and others. These forms of renewable energy include solar, wind and water power, oil from plants, wood from sustainable source and other forms of biomass. Along, with the farming activities the farmer can involve in agri-prenurship in the area of power

generation from renewable sources to fulfill the farm tasks. From this they can earn more money and improve their rural life.

## **Sources of renewable energy in agriculture**

### **SOLAR ENERGY**

Solar energy is widely available throughout the world and plays a fundamental role in providing energy access in rural areas it is a mature and cost-competitive technology. There are a wide range of PV cell technologies on the market today, using different types of materials and in different sizes the individual can access based on their need. Widespread use of solar energy for domestic, agricultural and agro-industrial activities has been practiced since the development of civilization. Increasing shortage of the commercial sources of energy coupled with serious environmental pollution problems has accelerated interest in the scientific exploitation of renewable sources of energy. Energy available from the sun is inexhaustible and environment friendly. Therefore, the solar energy technologies are playing an important role in the future years through a variety of thermal applications and decentralized power generation and distribution systems. The power from the sun intercepted by the earth is approximately  $1.8 \times 10^{11}$  MW. This makes it one of the most promising unconventional energy sources. Solar energy is available in abundance throughout the year in most part of our country. In India, the annual average daily solar radiation received is around  $1800 \text{ J/cm}^2/\text{day}$  over the whole country. Drying of various agricultural products in sunlight is an age-old practice. Development of various solar devices for thermal applications such as water heating and space heating, drying, cooking and power generation began during the most century.

Drying of various agricultural product in sunlight is the most common application of solar energy. With the objective of increasing the drying rate and improving quality of the products, natural convection and forced convection, different type of solar dryers have been developed for various commodities. The movement of air in the forced convection solar dryer is through a power blower whereas in natural convection solar dryer air moves through the product due to natural thermal gradient. Apart from drying of various agricultural product the solar energy can

utilized in pumping of water from bore well, cooking or electricity, which is suitable for the rural areas in India

## **WIND ENERGY**

Farmers and ranchers are in a unique position to benefit from the growth of wind industry. To tap this market, farmers can lease their land to wind developers, use the wind to generate power for their farms, or become wind power producers themselves. Farmers and ranchers can generate their own power from the wind. Small wind generators, ranging from 400 watts to 40 kilowatts or more, it will meet the needs of an entire farm or it can be targeted to specific applications. Many ranchers use wind generators to pump water for cattle, electric wind generators are more efficient and reliable than the old water-pumping fan-bladed windmills. It also cheaper than extending power lines, more convenient and cheaper than diesel generators. "Net metering" enables farmers to get the most out of their wind turbines. When a turbine produces more power than the farm needs at that moment, the extra power flows back into the electricity system and it can be used for other purpose, by turning the electric meter backwards. When the turbine produces less than the farm is need, the meter spins forward, as it normally does. At the end of the month or year, the farmer pays for the net consumption to electric company or the electric company pays for the net production to farmer. In most of the state Net metering rules and laws are in place. It is possible to construct wind turbines in various sizes, it can be made for single residential use and they can be constructed on a large scale. Technology is making this mode of renewable energy more efficient and less intrusive.

## **HYDRO ENERGY**

Hydroelectric power comes from the natural flow of water. The energy is produced by the fall of water turning the blades of a turbine, it is connected to a generator that converts the energy into electricity. The amount of electricity generation depends on the quantity of water passing through a turbine (the volume of water flow) and the height from which the water 'falls'. Hydropower is a clean, domestic, and renewable source of energy, it provides inexpensive electricity and no pollution. Unlike fossil fuels, hydropower does not destroy water during the production of electricity, it is the only renewable source of energy that can replace electricity of

fossil fuels' to satisfy growing energy needs. Hydroelectric systems vary in size and application. Micro-hydroelectric plants are the smallest types of hydroelectric systems, it can generate between 1 kW and 1 MW of power and used powering smaller services such as processing machines, small farms, and communities. Large hydroelectric systems can produce large amounts of electricity, it can be used to power large communities and cities.

In global level water usage for irrigation is the largest water use, it around 70% of the water used for Irrigation of agricultural land in worldwide. In several developing countries, irrigation represents up to 95% of all water usage, and plays a major role in food production. Future agricultural development strategies of the countries depend on the possibility to maintain, improve and expand irrigated agriculture. On the other hand, the increasing pressure on water resources by agriculture faces and other water use sectors represents a threat to the environment. Water is a resource that may create tensions among countries down and upstream, because irrigated agriculture is driving much of the competition since it accounts for 70-90% of water use in many of these regions. Water used for agriculture comes from natural or other alternative sources, Natural sources include rainwater and surface water, and it must be used in a sustainable way. Rain water resources rely on the atmospheric conditions of the area and Surface water is a limited resource and normally requires the construction of dams and reservoirs. Alternative sources of irrigation water are the recycle of municipal wastewater and drainage water, but it adverse impacts on the public health and the environment. This will depend on the recycled water application, soil characteristics, climate conditions and agronomic practices. Therefore it is important that all these factors are taken into account in the management of recycled water. Hydro power project create employment opportunities for local people and Small hydro project serves processing machine in farming activities.

## **BIOMASS**

Authorities' studies reveal that the forest cover of country is depleting every year at a rate more than 1.5 million hectares, it is particular grave in rural areas. This rate of deforestation is alarming. Much of the wood felled is used as fuel for cooking. Charring and briquetting technologies reduce various problems associated with the management and utilization of biomass in domestic and industrial sectors. Briquetting of some of the crop residues has becomes cost competitive and the briquettes being used as replacement of firewood in many regions of the

country. Domestic biogas plants installed in our country use cattle dung mixed with an equal quantity of water to maintain 8-9% total solids concentration (TSC) in the influent slurry. The effluent discharged from the plants is, in general, collected into the slurry pits or spread on to the ground for drying before transportation to fields for use as organic manure. The organic manure and biomass energy production creates the agripreneurship in rural areas and increase the agriculture productivity in farm land.

## CONCLUSION

Renewable energy and farming are a winning combination. Through different renewable energy sources the farmers and youths can build agripreneurship in the rural areas for their lively hood and to improve standard of living. By adopting renewable energy resource they can fulfill farming tasks like pumping water for irrigation, for livestock or for domestic use; lighting farm buildings; powering processing operations and other. This help in both rural development and economic growth in India. It also decreases unemployment, migration of people from rural to urban area, increase entrepreneurs in rural area and reduce carbon footprint. The government as to take steps to improve installation of renewable energy resource in the rural area and encourage agripreneurship by giving incentives and literacy in renewable energy.

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