

Peer reviewed Journal

Impact Factor: 7.265

ISSN-2230-9578

# Journal of Research and Development

A Multidisciplinary International Level Referred Journal

July 2021 Volume-11 Issue-26

*Impact of Environment on Agriculture, Health,  
Water Resources, Social Life & Industrial  
Development*

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'Ravichandram' Survey No-101/1, Plot  
No-23, Mundada Nagar, Jalgaon

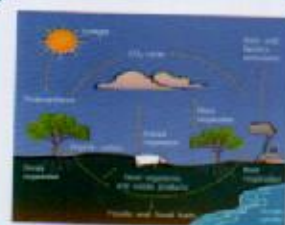
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## **Geographical Study of Solar Energy Resources In India**

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### **Abstract:**

*Sun is prime source of energy for the earth planet. On the sun surface, there is nuclear fusion in which hydrogen is converting into helium. It creates the solar radiation. When this radiation waves are coming on the earth surface it convert into the long wave radiation. It starts to generate the heat. Heat is energy; it has ability to do the work. Number of weather and atmospheric phenomena is form due to the solar radiation. In human activity solar energy is useful for the to run the different kinds of small equipment, water heater, in settlement building, as a domestic cooking, water purification, in agriculture ,horticulture and in transportation vehicle. Now a day it is more useful for the generation of electricity. Solar energy is clean energy. Today 13% of the world electricity is generated with the help of the solar radiation. In the coming next period, solar energy has more scope in the electricity field. These electricity is applied for local and global level.*

### **Introduction:**

Sun is star, because of it has ability to generate the heat and light. Sun is located in center of the solar family. As average view, age of the sun is consider as 5.5 billion year old. It is more elder than the earth planet. There is continuous process of nuclear fusion is going on the surface of the sun. Solar constant of the earth surface is approximately 1.941 calories per minute per square centimeter. (Kopp, 2011) This energy has capacity to generate the heat energy. On the equatorial region has more heat than the polar region. This is effect of the angle of the solar rays. These solar rays has right angle on the equatorial region. There are number of Geographical factors are affecting on this solar energy distribution as the coastal area, height of the region, distance from the equatorial region. As we go equatorial region to the polar region, temperature become low as latitude values become high. This phenomenon is effecting of the weather element. Wind is product of different in solar radiation. (Huang Junling; McElroy, 2015) Man has apply this solar energy in the following activity as- Thermal energy, Water heating, for human settlement, cooking activity, domestic heating, water purification, for formation of salt, agriculture and urban planning, transportation and generation of electricity. Solar energy has develops special kinds of ecosystem in the earth biosphere.

**Thermal Energy:** Earth surface convert short wave radiation in to the long wave radiation and generate the heat energy. (Huang, 2015) This kind of process made the heating process on the earth surface, which is useful for the formation of wind energy. Solar radiation are effecting on the atmospheric pressure location on the geographical region. It also effecting on the rate of evaporation. Man has used this thermal energy in the number of domestic and other agriculture activity. The another minor uses of heat energy is water heating. According to the Frank Shuman, this solar energy has more capacity to generate the energy. It is unlimited power from the solar radiation. This energy is useful for commercial profit and upliftment of all kinds of human society and culture. (Shuman, 1916) On the basis of this thermal energy, earths climatic division and classified as Equatorial region, tropical region, temperate and polar region.

**Water Heating Activity:** With the help of special kinds of the heating equipment, there are water heaters. It converts the solar radiation into the heat. This technology is useful in the industrial activity for cleaning and processing purpose. It save lots of electrical energy and the fuel in settlement, hospital and the hostel. Israel, Cyprus and Greece nation are using more solar water heater. This system is supporting for most of 40% the houses. (Chiaro, 2007)

**Human Habitation Activity:** Shelter in one of basic need of human being. Building has a need of light and energy. Solar light save lot of electricity. Today by application of different types of technology and geometrical arrangement of houses, lot of solar energy is applying. Now a day modern construction of the house made the energy audit as the maximum utilization of solar energy in regular day today activity.

**Domestic Cooking Activity:** Intensive sunlight can be generating lots of heat power. This heat energy is applicable for the cooking activity. There are three kinds of solar cookers as box cooker, panel cookers and reflector cooker. In this equipment parabolic dishes are most effective to collect the solar heat energy. The cooking equipment has made by solar energy collection mechanism. This kind of technology is most applied for the tropical nation.

**Water treatment plant Activity:** Pure water is need for human health. With the help of solar light, Water can be made more pure. Man was very familiar for this treatment from the medieval period. The first reference, 16<sup>th</sup> century Arabian people was using solar light for the water treatment. Temperature of the water is most helping for the water from the micro-organism. In the developed nation, millions of people use this method for their daily drinking water. (USAID, 2008) Pure water is prime need of human health.

**Solar Energy in Electricity Production:** Solar energy can be used for generation of electricity. There are two modes of solar electricity: photovoltaic and lens or mirror method. Generation of solar energy plants started from 1980. Solar electricity has contributed 15% of total global electricity. It has a 1.3% growth rate. (Agency, 2014) Solar energy is a new need of the world. It is an eco-friendly source of electricity.

**Solar Energy and Urban Planning:** Solar radiation is effective on human settlement. Solar energy can give light and temperature for houses. It can save a lot of electricity. That's why urban planners are applying the utilization model in their urban planning.

**Agriculture and horticulture:** Vegetation makes food with the help of photosynthesis. Modern greenhouses convert solar energy into domestic activity and other uses, such as food processing and conservation. Solar dryers are useful for food grain conservation.

**In the Transportation Network:** Now a day there is a shortage of fuel. With the help of modern technology, solar energy is useful for the transportation network. Burning of coal and petroleum made the issues of global warming. Solar and wind energy is a source of green energy. This is a source of renewable energy. In modern technology, motor vehicles, boats, and airplanes are working with the help of solar energy.

**Solar energy and fuel production:** In the process of solar chemical processes, solar radiation is useful for deriving chemical reactions. By this process, it made artificial photosynthesis. (Wasielewski, 1992) Solar energy has a lot of scope in the tropical climatic zone.

**Solar energy and Energy storage Method:** Thermal mass systems can store solar energy. This is a type of renewable thermal energy. This electricity can be stored by the battery and used as needed. In the tribal region, this function is useful for tribal zone upliftment. India is applying this technology for rural and remote area development.

**Solar energy and economic development:** Solar energy is useful for the deployment and fuel. Industrial revolution was possible due to the coal element. Developed nation USA made commercial solar water heaters began appearing in 1890 (Perlin, 1981) after 2000 world had to use of maximum solar energy than the petroleum and coal energy sources.

**Conclusion:** Hence, Sun is a prime source of heat and light on the earth's surface. This solar radiation is spread all over the earth's surface. China and USA are generating a lot of electricity for solar radiation. With the help of solar energy, developing nations can make progress as economic and social activity. In coming period, maximum instrument is run by solar energy. India is a tropical climatic nation; it has more scope in the wind energy sector. Carbon energy sources had made the issues of global warming. Now a day, it is a need to use green energy sources. As a population grows and global demand of electricity increases, solar and wind energy has more scope in regional and rural development.

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