

## **A field survey on Use of Solar Energy Technology in Rural Marathwada**

Energy plays crucial role in world economy through its use in agriculture, industry, service as well as in household sector. Energy is a vital infrastructure for economic development .It is a well established fact that energy and economic growth go hand in hand. Decreasing level of fossil fuels and increasing level of population and their demand for energy are the main reasons for the energy crises in the world. The problem of energy shortage has become a national and universal theme of discussion .Use of renewable energy is one of the most ancient and easy methods that can be adopted at urban and rural level efficiently. Use of renewable energy sources is essential because non renewable energy sources like coal, oil are inadequate to meet our demand for energy and we are largely dependent on these sources of energy. Among the renewable sources of energy, solar energy has a huge potential for power generation in Maharashtra. There are 250-300 days of clear sun with an available average radiation of 4 to 6 kWh/sq.metre over a day. There is a capacity to generate 1.5 million units/MW/year through solar photovoltaic systems & up to 2.5 million units/MW/ year through solar thermal systems. Due to rapid urbanization and industrialization the sources of non renewable energy has been finishing and quality of clean environment has been decreasing drastically.

### **Origin of the research problem:**

Marathwada is a backward region in Maharashtra State facing the problem of scarcity of energy due to rapidly increasing demand for energy. The major source of energy used in Marathwada is coal and oil and these sources are exhaustible. In such situation proper management of energy is important and use of renewable energy has become the need of time. Besides this it is generally observed that after 1947, there had been efforts by government for promotion of the energy. However usages of the energy hardly became a common scene in the region. It is observed that use of solar energy can be feasible; hence the study of socio-economic analysis of solar energy in Marathwada region is necessary

### **Objectives:**

1. To review the present status of solar energy technology in India, Maharashtra, and Marathwada.
2. To work out the benefit-cost analysis of solar energy technology in Marathwada.

3. To study the socio-economic factors influencing the adoption of solar energy technology.
4. To assess the operational problems faced by the solar energy technology adopters.
5. To make suggestions to formulate the policy for promoting the adoption of solar energy technology.

#### **Methodology:**

This study is confined Marathwada region in Maharashtra state in Indian union. This study is based on primary and secondary data. Interview technique was administered for collecting the primary data. Sizeable samples of solar energy technology using households were chosen from two districts from rural Marathwada. About 800 households using solar technology and 800 of non users were selected by using stratified random sampling technique from Marathwada region of solar users and non users.. The three investment criteria, namely Net Present Value (NPV), Benefit Cost Ratio (BCR), and Pay Back Period (PBP) will be used to judge the soundness of investment from the economic point of view.

Secondary data is collected from different government publications, published books, research papers, journal, magazines, etc.

#### **Important findings of the study:**

It registers the responses of the respondents regarding what made them buy the product. The respondent mainly feel that it is due to non pollution nature of the energy, load shedding issue and 24 hours availability of the water, they are encouraged to install the equipment. It registers the responses of the respondents regarding what made them buy the product. Through this question it is tried to judge how the income status of the respondents affects their decision about buying or installing the energy gadgets. It strangely becomes clear that respondents whose income ranges from 50000 to 350000 tend to install the gadgets more. However the reason they quote are mainly 24 hours availability of it, money saving, and it is always free from load shedding.

the responses of the respondents regarding source of the various banks. 498 respondents received loan for the purpose from different banks. However there are 302 respondents who did not receive loan or financial assistance for installation of such products or gadgets. Cooperative and private banks are mostly approached for the financial assistance.

765 respondents (95.6 percent) know that solar plant can save energy and only 35 respondents (4.4 percent) have the opinion that solar plant cannot save energy. That respondents (11.6 percent) did not get loan due to various reasons and the most powerful reason is it needs long approval steps to get subsidy so 44 respondents (5.5 percent) are with reasons like lack of information, lazy staff, long approval steps etc. of not getting loan.

Minimum expenditure on the installation of solar plants are Rs. 10,000 and Rs. 56,000 respectively so from the above table we can conclude that 136 respondents (17 percent) made expenditure on the installation of solar plant which is highest in number. The lowest and highest expenditure for the maintenance in solar plants are 500 rupees and 10,000 rupees respectively - so from the total respondents, 74 respondents (9.3 percent) which is maximum expenditure on the maintenance on solar plant of rupees 1000. 130 respondents which are highest in the table save 5000 rupees. Only one respondent saves rupees 600 and again another one respondent saves rupees 800 which is the lowest saving of the respondents.

### **Operational problems of Respondents:-**

In this section we have discussed the problems had by respondents. These problems are discussed in detail as follows.

#### **a) Technical Problems :-**

The major technical problem reported by almost all the respondents specially for solar water heater and solar cooker is the shortage of space. Some people who live in the apartments or rental home cannot use these instruments of solar energy plant. Tank of solar heater gets leak in very few years as a result, the life span of these important and costly components of the solar water heater is very short. In rainy season, it is not possible to use these plants. Also the solar cooker works very slowly. It was also found that solar lanterns (Solar home lighting) can be used for upto very limited time of 4 to 5 hours.

#### **b) Economic Problems :-**

There is no direct cash income from the investment in a solar energy plant. The initial investment in solar energy plant is also very high. So people are not ready to invest such a large amount in this plant.

To make investment in solar energy plants, more attractive financial incentives such as subsidies and loans by the national government, financial institution, rural development schemes and voluntary agencies.

**c) Social Problems :-**

The clustered pattern of housing particularly in poorer section, does not allow enough backward space for installation of solar water heater or solar cooker. Lack of information about subsidy or system is very big problem. very few people know about solar technology and its uses.

Users mentality is a very big problem because when they purchase freeze or T.V or washing machine at that time they don't ask about their payback period. But when the purchase solar energy plants they ask about they payback period of these systems. But due to lack of technical knowledge people are not ready to accept solar technology.

**d) Organizational Problems :-**

more than 20 percent of the sample of respondent reported the organizational problems of solar energy plants. some of the important organizational problems are discussed as below.

Proper maintenance of plant is crucial as the setting up of the solar plant. But most often after - sales and maintenance services in India are inaccessible to most plant owners. The service and with any guarantee for the repair work. most of owners facing problem of extension and training.

141 respondents suggests modifying solar technology so that it is possible to install these plants anywhere & also to reduce the maintenance cost. Secondly 160 respondents suggested that, technical facilities & guidance should be made available near place of installation of solar plant. Thirdly 60 respondents suggested increasing loans and subsidy for installing solar technology. Fourthly 40 respondents gave the suggestion that the rate of interest should be less. Fifth suggestion was that the loan should be made available easily at any time. 60 respondents gave this suggestion. According to 200 respondents the price of solar plant should be reduced. 140 respondents suggest that the publicity of solar plant is very essential for increasing use of solar energy. Solar energy is economically feasible and payback period of this instrument is near about 5 years.

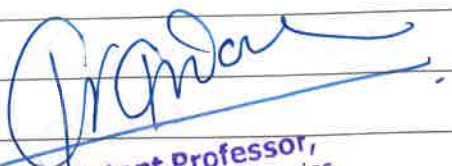
This survey was conducted by Dr.K.V.Khandare with the help of 45 students of P.G,M.phil and Ph.D.

  
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2017-18

- 1) Lawand D.S - 20, 21 Jan 2018,  
27, 28 Jan 2018  
12, 13, 14 Feb 2018  
17, 18, 19 Feb 2018
- 2) Akshay Mulate - ~~20/21/22~~  
20, 21, 22 Feb, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14 March 2018.
- 3) Kalle madhulcar - 15/07/17, 12/11/17,  
15, 16, 17, 18, 19, 20 Feb 18  
10, 11, 12, 13, 14, 15, 16, 17, 18,  
19, 20 Jan 2018.
- 4) Waghmare Mahesh - 20, 21, 22, 23, 24, 25 Jan 18  
01, 02, 03, 04, 05 Feb 18
- 5) Bapu Takale - 20, 21, 22, 23, 24, 25, 26,  
27, 28, 29 Feb, 01 March 18  
04, 05, 06, 07, 08 Jan 2018
- 6) Shailesh more - 12/03/18
- 7) Sahale J.G. 12/03/18
- 8) Gurav Baliram - 02, 17, 18 Feb, 14, 15 Jan  
2018.
- 9) Thatkar Ganesh - 20/11/17
- 10) Gavane Akshay - 03/01/18 & 14/03/18
- 11) Santosh Bhosale - 19, 20 Jan 2018

- 12) Umesh Kopurwad - 20/11/17
- 13) Kale Rajesh - 25/02/18
- 14) Lakhan Surwanshi - 15/07/17 &  
16/03/18
- 15) Kadam Anand - 01, 02, 03, 04, 05, 06,  
07, 08, 09, 10 March 18
- 16) Bhaskar Nikam - 03, 04, 05, 06, 07 Feb 18
- 17) Jere Rajaram - 15, 16, 17, 18, 19 Jan 2018
- 18) Ashrini Shahane - 13/03/18
- 19) ~~Kadam Anand~~
- 19) Gavane Akshay - 03/01/18
- 20) Garal Tomal - 20/12/17
- 21) Ganesh Rathod - 21/12/17
- 22) Subhash Surwanshi - 20/12/17

  
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