

Public Opinion On Solar Photovoltaic Energy Utilization-A Survey Based Study

A. D. Suryawanshi¹, A.S. Padampalle², D.D.Suryawanshi³

¹Dept. of Physics, B. J. College, Ale (Pune) (M.S.) 412411

²Dept. of Physics, S. C.S. College, Omerga (Osmanabad)

³Dept of Chemistry, S. C.S. College, Omerga (Osmanabad)

Abstract: This paper investigates the outcome of a survey related to solar photovoltaic energy utilization. Here public opinion on the use of solar photovoltaics for energy generation is collected in the form of different questions which were framed covering the entire concept of solar photovoltaics and its benefits. This survey targeted the people from eight different villages of Pune and Ahmadnagar district.(Ale, Alephata, Wadgaon Anand, Belapur, Alkuti, Belha, Ane, Ambi Dumala). The outcome of this survey is grouped together and further analyzed for understand the public view in accepting and the awareness they have in utilizing the solar photovoltaic energy. Results includes the various opinions of villagers, among those mostly people does not have a clear cut idea of solar energy, their applications, what would be the system components, does the system have any influence over pollution reduction etc.

Keywords: Solar energy; photovoltaics; public awareness; public opinion; solar survey.

1.Introduction

Sustainability in engineering is an emerging theme for the twenty-first century, and the need for environmentally benign electric power systems is a critical part of this new thrust. Renewable energy systems that take advantage of natural energy sources that won't diminish over time and are independent of fluctuations in price and availability are playing an ever-increasing role in modern power systems [1].

The Indian power industry continues to struggle to meet power generation goals, and the coal being the conventional source cannot cope up with the country's ever-increasing demand. According to Mercom India, 49% of commercial, and 45% of residential, responds that it is "very important" for India to develop and use solar power [2]. To become global leaders of solar energy, Ministry of New and Renewable Energy (MNRE), Govt. of India, initiated the Jawaharlal Nehru National Solar Mission (JNNSM) with a target of 20,000 MW by the end of 2022 [3,4]. Awareness, accessibility, and affordability of renewable energy technologies are three significant challenges that a rural India is facing. Income generating activities are required for rural beneficiaries to afford these energy systems over the long term in sustainable manner. So to make them aware regarding the solar technology we have to interlink with the basic needs of society with the technology in economical and environmentally friendly way. Children in rural areas spend significant portion of their time in household's activities and outside working in day time. Very few children are exposed to education and socio wellbeing activities. It is also well known fact that most of the rural areas around world are not completely electrified and suffers a lot with power shortages. Hence such areas to be studied and electrified with the possible option of solar energy in terms of domestic lighting, street lighting, and community water pumping [5, 6]. These three would be the basic needs of rural communities that depend on electricity.

Few scientific works were clearly described about the usage of solar technology in various application. (Orville Damaso Cota & N. M. Kumar, 2015), proposed the use of solar energy for street lighting and water pumping for rural communities in Nigeria. The study describes the use of technology and its design in a simple way [5].

Another study by (N. M. Kumar et al. 2016) clearly investigates the techno-economic and environmental feasibility of solar street lights for fugar city revealing that solar energy will be best solution for lighting the darker street of a rural community [6].

A study by (G. D. Kamalapur & R. Y. Udaykumar, 2011) suggest that "rural electrification is an integral component of poverty alleviation and rural growth of a nation". Hence by promoting rural electrification with the usage of solar photovoltaic systems in India, would benefit in the socio-economic growth of village [7].

(James Cust et al. 2007) describes the "demand for rural electricity services and contrasts it with the technology options available for rural electrification". Authors suggested that distributed generation of electrical power with the help of renewable energy sources would be much more beneficial [8].

However, so called scientific community suggest so many feasible technologies for rural areas, but whether the rural community is having an awareness of that particular technology is the question [9, 10]. Hence making an awareness, and knowing the public opinion on the specific technology is needed. This paper, tries to bridge that gap of technology awareness to technology adoption by conducting suitable survey.

2. Objective of the paper:

In this paper, an attempt is made to investigate knowledge of rural India related to solar technology and its utilization. A survey was conducted at different villages located near Alephta (Pune district) of Maharashtra state in India. For this survey different questions were formed to assess the knowledge level of rural people regarding solar photovoltaic for energy generation and components. These are the eight villages that were considered for the public opinion survey: (Ale, Alephata, Wadgaon Anand, Belapur, Alkuti, Belha, Ane, Ambi Dumala).

2.1. Methodology

This survey was carried out by S.Y.B.Sc. (Physics) students of Hon. B. J. College, Ale (Pune) in Nov-Dec.2021 to collect data from 8 villages located near Alephata (Pune district) of Maharashtra State in India. Fourteen well structured questionnaires were developed to check the basic knowledge level related to solar energy, During the survey in each village, questions were asked to 25 randomly selected villagers under different age groups and gender,

3. Survey Result

During survey it was found that most of the villagers know about solar energy and solar technology because of the awareness program lead by Government of India. But still they are unaware about the different government policy regarding solar up gradation in rural areas. During our survey we also note down different install capacity solar projects in the villages. The solar projects were basically the solar street lights and at some places small solar power plant was also present.

4. Conclusions:

The present survey shows that still villages in rural India were not having sufficient information regarding solar technology and different policies that Government of India launches specially for rural peoples. Though, a limited number of households are using solar powered electricity in private mode. But still major population depends on other sources like fossil fuels and grid supply which is not reliable for rural areas.

References :

1. Nallapaneni Manoj Kumar, M. Rohit Kumar, P. Ruth Rejoice, Mobi Mathew. Performance analysis of 100 kWp grid connected Si-poly photovoltaic system using PVsyst simulation tool, Energy Procedia, vol. 117, pp. 180-189, June (2017). <https://doi.org/10.1016/j.egypro.2017.05.121>.
2. Mercom India: India Clean Energy. <https://mercomindia.com/>
3. Nallapaneni Manoj Kumar, Bhogula Navothna, Manisha Minz. Performance Comparison of Building Integrated Multi-Wattage Photovoltaic Generators Mounted Vertically and Horizontally. In: Proceeding of 2017 IEEE International Conference on Smart Technology for Smart Nation (SmartTechCon), 17th–19th August 2017, REVA University, Bangalore, India, (2017).
4. Jawaharlal Nehru National Solar Mission (JNNSM), Ministry of new and renewable energy (MNRE), Govt. of India. <http://www.mnre.gov.in/solar-mission/jnnsms/introduction-2/>
5. Cota, O. D., & Kumar, N. M. Solar Energy: A Solution for Street Lighting and Water Pumping in Rural Areas of Nigeria. In Proceedings of International Conference on Model-ing, Simulation and Control (ICMSC-2015) (Vol. 2, pp. 1073-1077). <https://doi.org/10.13140/rg.2.1.4007.8486>
6. Nallapaneni Manoj Kumar, Anup Kumar Singh, K. Vinay Kumar Reddy. Fossil Fuel to Solar Power: A Sustainable Technical Design for Street Lighting in Fugar City, Nigeria. In Procedia Computer Science, vol. 93, pp. 956-966, (2016). <https://doi.org/10.1016/j.procs.2016.07.284>.
7. G.D. Kamalapur, R.Y. Udaykumar, Rural electrification in India and feasibility of Photovoltaic Solar Home Systems, In International Journal of Electrical Power & Energy Systems, Volume 33, Issue 3, 2011, Pages 594-599. <https://doi.org/10.1016/j.ijepes.2010.12.014>.
8. Cust, James, Anoop Singh, and Karsten Neuhoff. "Rural electrification in India: Economic and institutional aspects of renewables." (2007).
9. S. Patel and K. V. S. Rao, "Social acceptance of solar energy technology in India," 2016 International Conference on Energy Efficient Technologies for Sustainability (ICEETS), Nagercoil, 2016, pp. 142-147. doi: 10.1109/ICEETS.2016.7582914
10. K. H. Solangi, A. Badarudin, S. N. Kazi, T. N. W. Lwin and M. M. Aman, "Public acceptance of solar energy: The case of Peninsular Malaysia," IEEE 2013 Tencon - Spring, Sydney, NSW, 2013, pp. 540-543. doi: 10.1109/TENCON Spring.2013.6584503