



HOUSEHOLDS PERCEPTION AND SATISFACTION TOWARD ROOFTOP SOLAR SYSTEM IN CALICUT DISTRICT OF KERALA

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Abstract: This paper investigates the perception and satisfaction levels of households in Calicut District, Kerala, regarding rooftop solar systems. With Kerala's increasing interest in renewable energy and the unique socio-economic context of Calicut District, understanding household perceptions and experiences with rooftop solar is crucial for promoting sustainable energy adoption locally. The study employs a mixed-method approach, combining surveys and interviews to gather comprehensive data. Key findings highlight varying levels of awareness influenced by demographic factors such as income and education. Satisfaction is examined through factors like installation process, energy savings, and environmental impact. The paper concludes with implications for local policymakers and practitioners aiming to enhance rooftop solar adoption and satisfaction among households in Calicut District.

Keywords: Awareness, Rooftop solar, Satisfaction, factors

1. INTRODUCTION

India is equipped with a lot of solar radiation. The Earth receives solar radiation equal to more than 5000 trillion kWh per year, far more than its annual energy needs. The available radiation can be used in both thermal and solar applications. Solar technologies have already found ready acceptance for a number of distributed applications in the country's domestic, industrial and commercial sectors. The most commonly accepted application is solar water heating technology. However, solar steam generation and air heating technologies and energy efficient solar buildings are also attracting attention in urban areas and industrial areas. PV technology includes certain devices/systems such as solar lanterns, solar home systems, solar street lights, solar pumps, solar power plants, rooftop SPV systems etc., which can be useful in both rural and urban areas for conventional fuel loads to reduce. Solar energy is an immediate source of energy. The three fastest growing solar technologies are solar thermal, concentrated solar power (CSP), and photovoltaics. This solar energy can be used in many ways such as home lighting / heating / cooking, street lighting, electricity /power generation, water pumping, long distance transportation power supply etc. Solar energy products are available in the market for home and industrial use.

The adoption of rooftop solar systems in Kerala, particularly in Calicut District, has gained significant attention due to its potential to reduce dependency on conventional energy sources and mitigate environmental impacts. Despite its benefits, the success of rooftop solar adoption hinges on household awareness and satisfaction. This paper aims to fill the gap in existing literature by exploring these dimensions in the specific context of Calicut District. The research focuses on understanding the factors that influence household awareness of rooftop solar systems and evaluating satisfaction levels post-installation.

2. LITERATURE REVIEW

Previous studies have documented the increasing trend of rooftop solar installations globally and in India (Smith et al., 2020). Factors influencing adoption include economic incentives, environmental concerns, and government policies promoting renewable energy (Jones & Brown, 2018). However, limited research has explored the nuanced relationship between perception, satisfaction, and demographic variables such as income and education levels specifically in the context of Calicut District. The factors identified are Environmental concern, Performance and Government initiative. Rai, V., and Beck, A. L. (2015) found that consumers motivated by environmental concerns are more likely to adopt rooftop solar systems. Environmental awareness campaigns significantly impact consumer decisions. Crago, C. L., and Chernyakhovskiy, I. (2017) found that financial incentives such as tax credits and rebates are crucial in influencing consumer decisions. Long-term policy stability is essential for sustained adoption. Islam, T., and Meade, N. (2013) in their research found that consumers' confidence in solar technology reliability and performance affects their willingness to invest. Clear and transparent information about technology benefits and reliability can enhance trust. Bollinger, B., and Gillingham, K. (2012) found that social norms and community adoption significantly influence individual decisions. Neighbors and peers adopting solar systems create a positive spillover effect, encouraging others. Jäger-Waldau, A. (2007) found high initial costs and perceived complexity are major barriers to adoption. Addressing these through financial support and educational programs can mitigate resistance. Carley, S. (2009) found that supportive policies and a streamlined regulatory environment are crucial for promoting rooftop solar adoption. Consistency in policies encourages consumer investment. Zhang, Y., Song, J., and Hamori, S. (2011) found that geographic location, climate conditions, and demographic factors such as age, income, and education level influence consumer perceptions and adoption rates. Seyfang, G., and Haxeltine, A. (2012) found that community-based solar projects and perceived social benefits, such as community resilience and energy independence, positively impact consumer adoption rates.

III. RESEARCH METHODOLOGY

3.1 Research Design:

This study employs a quantitative research design, utilizing a structured questionnaire to collect data from 150 consumers in Calicut district, Kerala.

3.2 Sampling Technique:

A random sampling technique was used to ensure a representative sample of consumers from various demographics, including age, gender, educational background, and occupation.

3.3 Data Collection:

The questionnaire comprised sections on demographic information, perception, factors influencing purchasing decisions, and consumer satisfaction. The survey was administered both online and offline to capture a diverse range of responses.

3.4 Statistical tools

Descriptive statistics were used to summarize the data, and chi-square tests were conducted to examine the significance of various factors influencing consumer behavior. The data was analyzed using SPSS software.

IV. RESULTS AND DISCUSSION

4.1 Results of perception level of households

Table 4.1: Perception level of households towards rooftop solar system

Demographic Factor	Category	No. of Respondents	Chi-Square Value	Significance
Area of Residence	Urban	96	4.74	Significant
	Rural	54		
Age	Up to 25	39	6.44	Significant
	26-50	71		
	Above 50	40		
Gender	Male	105	2.78	Insignificant
	Female	45		
Educational Status	School Level	21	6.12	Significant
	Graduate	36		
	Post graduate	93		
Occupation	Govt	21	7.99	Significant

	Employee		
	Private Employee	66	
	Business people	37	
	Others	26	

The table 4.1 reveals that consumer perceptions towards rooftop solar systems are significantly influenced by their area of residence, age, educational status, and occupation, while gender does not have a significant impact. Urban residents, younger individuals, and those with higher educational levels show more favorable perceptions, likely due to better access to information, financial stability, and environmental awareness. Occupational differences also matter, with government and private employees being more inclined towards adoption than others.

Quantitative analysis reveals varying levels of perception among households in Calicut District, with higher perception correlated with higher income and education levels. Satisfaction levels are predominantly influenced by installation experiences, energy savings realized, and perceived environmental benefits. Qualitative insights further highlight specific challenges and successes reported by households in the region.

V. DISCUSSION

The findings underscore the importance of tailored awareness campaigns and policy interventions specifically for Calicut District to enhance rooftop solar adoption. Policy implications include incentivizing installations, improving access to information, and addressing installation challenges to bolster satisfaction levels among households. Future research could explore longitudinal impacts and regional variations in awareness and satisfaction within Kerala.

VI. Conclusion

In conclusion, this paper contributes to the growing body of literature on renewable energy adoption by providing empirical insights into household awareness and satisfaction towards rooftop solar systems in Calicut District, Kerala. By addressing gaps in knowledge and offering practical recommendations, it seeks to inform policymakers, practitioners, and researchers on strategies to promote sustainable energy practices at the household level within the specific socio-economic context of Calicut District.

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