



PROBLEMS FACED BY THE CUSTOMERS WHILE USING OF SOLAR WATER HEATER : A STUDY IN ERODE DISTRICT OF TAMIL NADU

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ABSTRACT

Solar energy is a renewable and free source of energy. It has long been recognized that, despite the low energy density of incoming solar radiation, solar power holds significant potential as an energy source. Solar power is considered a clean, green alternative for generating electricity, primarily through devices like solar water heaters. These systems harness sunlight or solar heat to provide energy-efficient solutions. The objective of this study was to identify the problems faced by customers using solar water heaters. An Interview Schedule was developed and used for data collection. A total of 120 samples customers were taken from Erode district of Tamil Nadu, for this study. The collected data were analyzed with help of Garrett's Ranking Technique and Kendall's Coefficient of Concordance (W), and the findings reveal that the most significant problem faced by customers was the high maintenance cost associated with solar water heaters. The study concluded that High maintenance costs were the major challenge reported by users.

KEYWORDS : Solar water heater-Problems-High Maintenance Cost

INTRODUCTION

The growing demand for renewable energy solutions has led to increased interest in solar water heaters (SWHs) as an eco-friendly and cost-effective alternative to conventional water heating methods. Solar water heating systems harness energy from the sun to provide hot water, reducing reliance on electricity or fossil fuels. Despite their numerous benefits, including energy savings, environmental sustainability, and long-term cost reductions, the adoption of SWHs remains relatively low in many regions. Customers face several challenges in adopting solar water heaters, which can be categorized into economic, technical, awareness, regulatory, and behavioral factors. High initial costs, lack of financing options, and long payback periods discourage many potential users.

This study aims to explore the key problems faced by customers when considering solar water heaters, identify the underlying causes, and propose potential solutions to improve adoption rates. By understanding these challenges, policymakers, manufacturers, and service providers can develop better strategies to promote solar water heating technology and enhance consumer confidence in sustainable energy solutions.

REVIEW OF LITERATURE

In any study, the review of previous studies is considered as an important for getting and to identify the unexplored part of the field of study under consideration. In this regard, a review of the studies relating to the present study has been undertaken and presented the following section.

Bhavaya Padmini C.H (2016) made a study to identify the Problems faced by the customers with solar water heater. For which, the required primary data have been collected from 100 sample customers taken in Hyderabad city. The required data have been analyzed with Chi-square test. Solar water heater not working properly in rainy and winter season problem was focused by the maximum customers.

Ranganathan and Shanthi (2018) have made a study on Brand image among solar heater system. This study emphasized the various brand images among the solar water heaters. They have collected from 560 sample customers. and analyzed with factor analysis. They concluded that the manufacturers are taking little effort only to solve the problems of consumers and simply the manufacturers are interested in increasing the sales of solar water heater.

Ramani (2020), conducted a study on challenges faced by the customers of solar water heater. who have collected 350 sample customers of Madurai district. The energy challenges for Asia and pacific and lessons learnt from UNDP projects in achieving energy for sustainable development in the region. She suggested strategies for Millennium development goals.

Kumar (2021), made a study on gathered and reported the common

failures of water-in- glass ETCs. This study is used for Primary data from 500 sample respondents. One of the most frequently occurring problems is manifold leakages due to the failure of sealing gaskets or washers during tube installation. This sealing failure could lead further to corrosion to the manifold and the formation of algae and scaling from the leaking water. For the evacuated tubes themselves, overheating could also happen when underutilized heat from the collectors exerts more pressure and eventually causes breakage to the glass tubes. When the collectors absorb heat, there could be increased pressure caused by the steam collected in the collectors. Here, excessive heating to the flowing water could happen, and when the accumulated pressure is high enough, the glass tube starts to break and burst or explode.

Irena (2021), Despite the challenges currently faced by the SWH technologies industry, it is no doubt that water heating is an essential part of a human's daily life. Hence, SWH technologies will always be relevant to consumers in many parts of the world. To combat the increasing demands, all stakeholders in the SWH industry must dive deeper to compete with the conventional water heater markets. Policy support plays a crucial role in the government's higher deployment of solar water heaters. Direct policies such as targets, programs, obligations, and mandates fall into this category. Apart from that, to alleviate some of the loads from high initial costs, financial incentives such as subsidies and low-interest loans can be offered to prospective users. However, government support should not only be limited to the end-users. Technical experts and know-how can be molded through various standard certificates, training, and retraining policy measures. This way, the maturing of the solar water heater sector can be further developed. Policy implementation for other non-financial elements, such as marketing strategies and consumer trust, is also essential.

Based on above review, it is cleared that the present study is differ from other studies.

Statement of the Problem

It is known fact that, solar water heater is being used by various people for various reason. At the same time, practically consumers are suffering various problems. Hence, this study has been undertaken to find out the Problems faced by the customers while using solar water heater. By keeping all these in mind, this paper is an attempt to find out answer to the following research question.

- What are the Problems faced by the customers while using of solar water heater?

Objective of the study

Though the main objective of the present study is to identify the following objective:

- To identify the Problems faced by the customers while using of solar water heater.

Research Methodology

The required primary data were collected using the convenient

sampling method. The present study was conducted in the Erode district of Tamil Nadu, which is widely recognized as one of the most important districts in the state. Consequently, this district was purposively selected for the study. Erode district comprises 10 taluks: Erode, Modakkurichi, Kodumudi, Perundurai, Bhavani, Anthiyur, Gobichettipalayam, Sathyamangalam, Thalavadi, and Nambiyur. Among these, Gobichettipalayam taluk was chosen for the study. From this taluk, a sample of 120 customers was approached to collect primary data using a well-structured Interview Schedule by using convenient sampling method.

DATA ANALYSIS AND INTERPRETATION

Problems faced by the customers while using of Solar Water Heater: Kendall's Co-efficient of Concordance

To identify the Problems faced by the customers while using of Solar water heater. Finally, 10 Problems have been examined with the help of Kendall's Co-efficient of Concordance ('w') test. Findings are shown in Table 1.

Table 1 Problems faced by the customers while using of Solar Water Heater: Kendall's Co-efficient of Concordance ('w') Test.

PROBLEMS	TOTALS CORE	MEAN SCORE	RANK	KENDALL'S 'W'
Expensive	3468	5.81	4	0.060
High Maintenance Cost	3144	5.24	1	
Poor After Sales Service	3270	5.45	2	
Limited Subsidy	4110	6.85	9	

Problems	Ranks	1	2	3	4	5	6	7	8	9	10	Mean Score	Rank
	X	83	72	66	60	56	52	47	43	39	33		
Expensive	F	30	51	105	99	46	84	40	32	15	39	49.92	IV
	F _x	2490	3672	6930	5940	2576	4368	1880	1376	585	1287		
High Maintenance Cost	F	83	31	39	67	15	23	42	25	112	59	53.65	I
	F _x	6889	2232	2574	4020	840	1196	1974	1075	4368	1947		
Poor After Sales Service	F	114	22	28	39	24	60	27	26	77	81	52.16	II
	F _x	9462	1584	1848	2340	1344	3120	1269	1118	3003	2673		
Limited Subsidy	F	79	64	23	66	16	10	43	44	76	35	48.37	IX
	F _x	6557	4608	1518	3960	896	520	2021	1892	2964	1155		
Gradually Reducing the Quality	F	106	19	114	11	25	39	52	37	11	73	51.57	III
	F _x	8798	1368	7524	660	1400	2028	2444	1591	429	2409		
More Hidden Charges	F	26	39	85	38	11	85	72	78	91	12	49.59	V
	F _x	2158	2808	5610	2280	616	4420	3384	3354	3549	396		
Unavailability of Spare Parts	F	34	44	68	12	87	79	80	30	33	17	49.28	VII
	F _x	2822	3168	4488	720	4872	4108	3760	1290	1287	561		
Inadequate Safety measures	F	29	64	19	53	101	53	14	46	37	89	47.97	X
	F _x	2407	4608	1254	3180	5656	2756	658	1978	1443	2937		
Component Corrosion	F	37	84	64	41	17	57	15	63	31	90	49.29	VI
	F _x	3071	6048	4224	2460	952	2964	705	2709	1209	2970		
Pump and Circulation Problems	F	14	75	20	11	97	43	43	75	36	43	48.93	VIII
	F _x	1162	5400	1320	660	5432	2236	2021	3225	1404	1419		

From Table 2, it is evident that the primary problem identified by customers is the high maintenance costs, as reflected by its highest mean score of 53.65. This is followed by other concerns, including poor after-sales service with mean score of 52.16, gradually reducing the quality with mean score of 51.57, expensive with mean score of 49.92, more hidden charges with mean score of 49.59, component corrosion with mean score of 49.29, unavailability of spare parts with mean score of 49.28, pump and circulation problems with mean score of 48.93, limited subsidies with mean score of 48.37, and inadequate safety measures with mean score of 47.97.

CONCLUSION AND SUGGESTION

In this paper, the problems faced by customers while using solar water heaters have been examined. Ten specific problems were analyzed as part of the study. The findings indicate that high maintenance cost was ranked as the most significant problem by customers. These insights were obtained using Kendall's Coefficient of Concordance ('W') test and the Garret Ranking Technique. Consequently, it is recommended that the Government of India take all possible measures to address the challenges faced by solar water heater customers. Introduce or enhance government subsidies specifically aimed at reducing maintenance costs for solar water heaters to encourage adoption. Conduct awareness programs to educate customers about proper usage

Gradually Reducing the Quality	3324	5.54	3	0.060
More Hidden Charges	3810	6.35	5	
Unavailability of Spare Parts	3918	6.53	7	
Inadequate Safety measures	4470	7.45	10	
Component Corrosion	3840	6.40	6	
Pump and Circulation Problems	4104	6.84	8	

Table 1 shows that Problems faced by the customers while using of solar water heater. The Kendall's Co-efficient of concordance ('W') test is calculated for the above problems which is found to be 0.060. It shows that there is less similarity among the customers in assigning the ranks to the problems while using of solar water heater. Looking at the mean ranks, it is understood that the highest preference has been given to high maintenance cost (lower the rank and higher the priority) constituting the mean rank 5.24 and the lowest preference is given to Less safety the mean rank is 7.45.

Problems faced by the customers while using of solar water heater: Garrett's Ranking Technique

Garrett's Ranking Technique has been applied to decide the important problems faced by the customers while using of solar water heater. Accordingly, Table 2 has been prepared

Table 2 Problems faced by the customers while using of solar water heater: Garrett's Ranking Technique

and maintenance practices, which can help minimize costs over time.

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