

A Study on Consumer Awareness Towards Solar Products With Special Reference to Nilgiris District of Tamilnadu

Dr. A. Gowrishanker

Assistant Professor, Department of Commerce, PSG College of Arts & Science, Coimbatore, Tamilnadu, India.

Abstract - Consumer awareness on solar product means the awareness of consumers in different aspects of consumption activities and availability of different solar products. Solar Energy innovation emerged because of the shortage of conventional energy resources. Conventional energy utilization caused global energy crisis along with serious environmental issues. Renewable energy indicates the unexhausted energy resources from solar, wind and hydropower, etc. The purchase of renewable energy resources to fulfill the increasing demand is strongly proposed by electricity vendors and government to complete the transmission to a Sustainable economy. To motivate the purchase of renewable energy resources the customer must have awareness towards the available products. Consumer Awareness and its Expertise is the Greatest Challenge to Solar Energy as a good and unique field. This paper studies about the awareness of respondents towards solar energy products based on demographic profile such as gender, age and educational qualification in Nilgiris District of Tamilnadu. A sample of 800 questionnaires were issued and collected. The tools used for analysis are simple percentage, ANOVA test and charts.

Keywords: consumer awareness, demographic profile, Nilgiris district, solar products.

I. INTRODUCTION

In the globalization, liberalization and privatization era, most of the economic decisions are taken by the market. However, the government has pulled back itself from numerous economic activities, it interferes all the time when the market mechanism fails because of structural rigidities in the economy and further factors, to supply goods and services to the people. Consumption is one of the significant economic activities, which requires regular government mediation, as market is not capable to promote security and benefit aspects of the consumers. Then again, consumers must know not just of the business parts of offer and purchase of goods yet in addition of the health and security angle moreover. Hence there should be awareness of their rights and duties being as rational consumer.

Solar energy is easier to use as well as not harmful. However in India consumer awareness is considered to be a greatest challenge towards consumption of solar energy products. It is a great need to aware everyone about this technology so that uses of this resource of energy can be increased. The expanding costs for oil based goods, projection that petroleum resources would be depleted in a moderately brief timeframe and the utilization of fossil fuel resources for political purposes will negatively influence overall financial and social development. Moreover, the major concern is on greenhouse gas emission from fossil fuel causing global warming. These problems can be overcome by alternative sources that are renewable, cheap,

easily available, and sustainable. And the solar energy product is best promising source. But unfortunately this source of energy has been get neglected. Many companies have come in to the market in the commercial sales of solar energy products. In this view the study has been made to find the awareness and usage of solar products among respondents.

II. REVIEW OF LITERATURE

Sudha Mavuri (2011) analyzed that Consumer buying behavior for Solar Products is a typical phenomenon, since the factors to purchase solar products are slightly different as that of usual products. Here the interest comes mostly from the producers or policy makers to promote consumption of such products when compared to consumers. The driver for boosting the consumption is limited by awareness and this in turn is influenced by income and education. This study found that there is a strong influence of education and income on awareness but income has relatively more weightage on influencing the buying decision of these products. Also, there is a requirement for creating confidence in the consumers of solar products by the producers about addressing the problems of usage and after sales services to avoid the effect of negative information from the current consumers on future (potential) demand.

Angeliki N Manegaki (2012) studied the renewable energy sources and its potential in social marketing. It uses acceptability and ready to pay results from existing surveys

on renewable energy sources and generates a marketing mix for the state, organizations, business and consumers. These surveys typically claim to produce results that will be useful for policy making or marketing purposes.

Ganesh Hegde(2012), examined the potential of solar energy . The study is based on potential and availability of solar energy and geographic location in two states, Kerala and Karnataka, technical and economical analysis of the power technologies and utilization, emission reduction. They observed, both states are power deficit states where the annual energy consumption is more than the energy generated. Finally as a result they witnessed that major power crisis can be resolved through power harvesting from renewable energy source.

Dutta, B. (2009) in his article Sustainable Green Marketing The New Imperative distributed in Marketing Mastermind expresses that Green Marketing includes growing great quality items, which can address buyer issues and needs by concentrating on the quality, execution, estimating and comfort in a situation well disposed way.

K.C. Chang, et al. (2009) conducted a study on “Local market of Solar Water heaters in Taiwan: Review and Prospective”. For advancement of solar water heaters radiators in Taiwan, motivation projects were first started from 1986 to 1991 and re-started from 2000 to the present. The appropriations make a financial motivating force for the end clients and have been fairly instrumental at the underlying phase of each program yet lost their noteworthiness from that point.

Tingting Feng, et al. (2009), analyzed “Productive use of bio energy for rural households in ecological fragile area, Panam County, Tibet in China: The investigation presumed that the beneficial utilization of bio vitality around there has its capacity to discharge the present weights on biomass sources by modifying examples of country vitality utilization, and to improve the states of wellbeing, condition, economy and vitality protection.

Sowmya Suryanarayanan (2009) in her article “Exploring India's RenewableEnergy Potential states that, it is important to note that any form of energy will be sustainable only if it is used in an efficient manner. Renewable energy sector is poised to expand in the long run.

Cheryl (2008) in his report on “Demand, Technology, Tax Credits Drive Global Solar Power Growth” found that most of the growth of solar energy consumption depends on solar investment tax credits created in the 2005 Energy Bill. Some state governments offer tax incentives for solar-power projects to attract solar companies and jobs.

III. OBJECTIVES OF THE STUDY

- To study the demographic profile of the consumer in Nilgiris district of Tamilnadu.

- To study the consumer awareness towards solar energy products.

Hypotheses

H₀₁: There is no significant difference between the level of awareness among the gender of respondents towards solar energy products.

H₀₂: There is no significant difference between level of awareness among the age of respondents towards solar energy products.

H₀₃: There is no significant difference between education of the respondents and awareness towards solar energy products.

IV. RESEARCH METHODOLOGY

The present study is descriptive in nature and it has made an effort to understand the consumer awareness towards solar products in Nilgiris District of Tamilnadu. In order to attain the objective of the study, the following methodology has been made use of: A sample of 800 people of Nilgiris district has been taken for the study. The respondents are selected by using convenient sampling technique. For the analysis of study the primary and secondary data are collected and used. The data required were collected by using of questionnaire method. The secondary data for the study was compiled from websites, journals, magazines, census reports and books. For analysis purpose simple percentage method, ANOVA Test and charts are been used.

V. ANALYSIS AND INTERPRETATION

ANOVA TEST

TABLE 1 GENDER AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY IN NILGIRIS DISTRICT

Gender	No of respondents	Percentage
Male	634	78.25
Female	166	20.75
Total	800	100

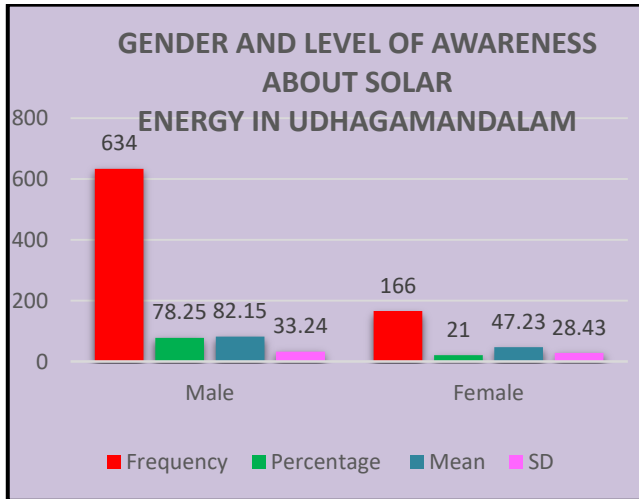
TABLE 2 ASSOCIATION BETWEEN GENDER AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY IN NILGIRIS DISTRICT

S.No	Gender	Frequency	%	Mean	SD	Range	
						Max	Min
1	Male	634	78.25	82.15	33.24	25	102
2	Female	166	21	47.23	28.43	25	102
Total		800	100				

Source: Primary Data and Computed

It is identified from table that 78.25 per cent of the respondents are male and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 82.15 and remaining 21 per cent of the respondents are female and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 47.23.

EXHIBIT – I



The analysis vividly reveals that there are more male respondents opined about Level of awareness about solar energy prevailing in the market than female respondents. With a view to find the degree of association between the gender and the Level of awareness about solar energy prevailing in the market, ANOVA table was prepared and the results are given in the table 3.

TABLE 3 ANOVA- GENDER AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

	SUM OF SQUARES	DF	MEAN SQUARE	F-VALUE	P-VALUE	S/NS
Between Groups	12957.15	1	12957.15			
Within Groups	289895.1	798	363.2	35.67	.000**	S
TOTAL	302852.15	799				

S-Significant; NS- Not Significant-Source: Primary Data and Computed

It is found from the table that the p-value is less than 0.01 ($p < 0.01$); and the results are significant. Hence, the hypothesis “there is no difference between gender and Level of awareness about solar energy prevailing in the market” is disproved. This implies that there is significant difference between gender and Level of awareness about solar energy prevailing in the market.

TABLE 4 AGE PROFILE AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

Age in years	No of respondents	Percentage
Below 25 years	88	11
26-35 years	320	40.0
36-50 years	276	34.5
Above 50 years	116	14.5
Total	800	100

TABLE 5 ASSOCIATION BETWEEN AGE PROFILE AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

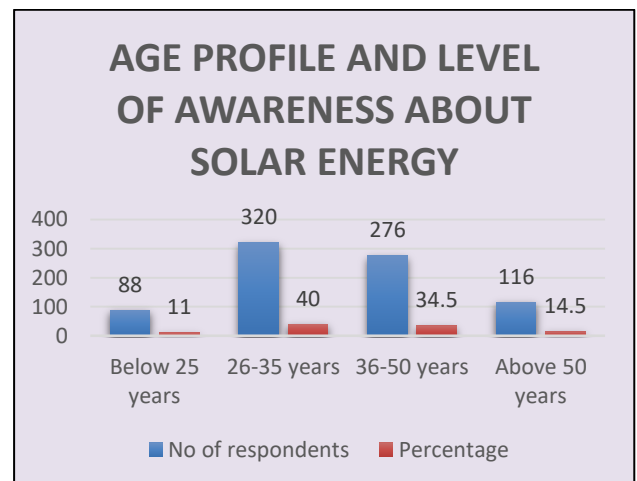
S.NO	AGE	FRE Q	%	MEAN	STD	RANGE	
						MIN	MAX
1	Below 25 years	88	11	50.55	22.61	25	102
2	26-35 years	320	40.0	94.70	28.88	25	102
3	36-50 years	276	34.5	80.49	37.36	25	102
4	Above 50 years	116	14.5	88.38	32.54	25	102
TOTAL		800	100.0				

Source: Primary Data and Computed

It is observed from table that 11 per cent of the respondents belong to age group of Below 25 years and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 50.55, 40 per cent of the respondents are from 26-35 years age group and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 94.70, 34.5 % of the respondents belong to 36-50 years of age and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 80.49.

Finally 14.5 % of the respondents belong to above 51 years of age and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 88.38.

EXHIBIT – 2



With a view to find the degree of association between the age groups and the Level of awareness about solar energy prevailing in the market, ANOVA table was prepared and the results are shown in the following table.

TABLE – 6 ANOVA – ASSOCIATION BETWEEN AGE PROFILE AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

	SUM OF SQUARES	DF	MEAN SQUARE	F-Value	P - Value
Between Groups	35342.707	3	11780.67	36.69	.000**
Within Groups	256095.5	796	321.73		
TOTAL	291426.22	799			

** P<0.01 *P<0.05 S-Significant; NS – Not Significant

It is disclosed from the table that the p-value is less than 0.01; and the results are significant. Hence, the hypothesis “there is no difference between age profile and Level of awareness about solar energy prevailing in the market” is disproved. This shows that there is difference in age profile and Level of awareness about solar energy prevailing in the market.

TABLE 7 EDUCATION QUALIFICATION AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

Education Qualification	No of respondents	Percentage
Uneducated	24	3.00
School Level	249	31.13
College Level	362	45.25
Professional	165	20.62
Total	800	100.00

TABLE 8 ASSOCIATION BETWEEN EDUCATION QUALIFICATION AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

S.N O.	EDUCATION AL QUALIFICATION	FRE Q	%	MEA N	STD	RANGE	
						MI N	MA X
1	Uneducated	24	3.00	88.519	35.385	25	102
2	School Level	249	31.13	76.848	32.404	25	102
3	College Level	362	45.25	92.004	22.019	25	102
4	Professional	165	20.62	22.310	86.170	25	102
TOTAL		800	100.00				

Source: Primary Data and Computed

It is perceived from the table that the Educational qualification and Level of awareness about solar energy prevailing in the market ranged between 25 and 102 with a percentage and an average of 3.00 and 88.51 respectively among uneducated respondents and Level of awareness about solar energy prevailing in the market ranged between 25 and 102 with a percentage and an average of 76.848 and 31.12 % respectively. Among respondents who finished

college level education Level of awareness about solar energy prevailing in the market ranged between 25 and 102 with a percentage and an average of 92.004 and 45.25% respectively finally among professionals Level of awareness about solar energy prevailing in the market ranged between 25 and 102 with an average of 22.31 and 20.62 % respectively.

EXHIBIT 3

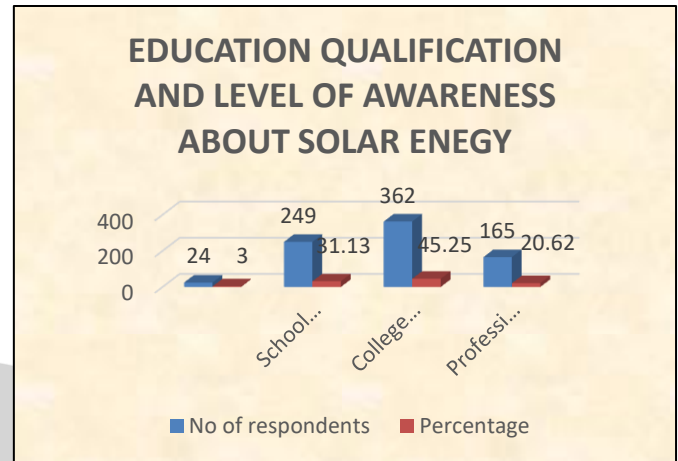


TABLE 9

ANOVA – EDUCATION QUALIFICATION AND LEVEL OF AWARENESS ABOUT SOLAR ENERGY

	SUM OF SQUARES	DF	MEAN SQUARE	F-Value	P - Value
Between Groups	17334.5	3	5778.6	15.55	.000**
Within Groups	295639	796	371.40		
TOTAL	312973.5	799			

** P<0.01 *P<0.05 S-Significant; NS – Not Significant

It is indicated from the table that the p-value is less than 0.05; and the results are significant. Hence, the hypothesis “there is no difference between education qualification and Level of awareness about solar energy prevailing in the market” is disproved. This shows that there is difference between education qualification and Level of awareness about solar energy prevailing in the market.

VI. FINDINGS

- It is identified from that 78.25 per cent of the respondents are male and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 82.15.
- 40 per cent of the respondents are from 26-35 years age group and Level of awareness about solar energy prevailing in the market ranging between 25 and 102 with an average of 94.70.

- Respondents who finished college level education and Level of awareness about solar energy prevailing in the market ranged between 25 and 102 with a percentage and an average of 92.004 and 45.25% respectively.

VII. CONCLUSION

It is of great importance to have more practical approaches to educate the consumers about energy conservations. To link the gap between availability and requirement of energy, the consumers should be urged to follow energy conservation techniques in their household energy usage. The manufacturers and producers should be more conscious in production of energy efficient products to the extent possible. Manufacturers and producers should support the development of new and innovative energy saving appliances, co-operate with retailers to make these appliances more easily and more cheaply available, or even distribute them to household consumers. Channels of creating awareness need to be appropriately worked out. Focus on one particular channel might not be effective. For all the common household consumers, television is the main source of creating awareness. While for professionals and business class people websites, internet, e-mails, multimedia messages, and other innovative sources would be the effective sources of awareness generation.

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