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Impact of Education and Income on Awareness Creation and Buying Decision in case of Solar Products in Visakhapatnam, India

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Consumer buying behavior for Solar Products is a typical phenomenon, since the attributes that drive 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 need 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 of negative word of mouth from the current consumers on future (potential) demand.

Keywords: Solar Energy, Consumer Behavior, Buying Decision, Awareness, Consumer perception

Field of Research: Economics and Marketing Management

1. Introduction

The Global financial crisis and recession have created an impact on the energy markets and its outlook. Though the demand for world energy is decreased during the economic contraction, it is an indication that energy demand increases again with the pace of recovery. As per the World Energy report (2009) at the 15th conference of parties (COP) to the United Nations Framework Conference on Climate Change (UNFCCC) in Copenhagen in December 2009 expressed the GHGs emission is the concern due to increasing demand for energy and the need for a truly sustainable energy path. Households and businesses are largely responsible for such an initiative, with a focused policy initiation. One such an initiative at the micro level individuals can contribute for a sustainable energy path is the consumption of Non-conventional Energy resources like solar energy, the freely available energy source for all the nations on the globe.

1.1 Solar Energy based Products

Solar energy is the most readily available source of energy. Three of the fastest-growing sun-based technologies are solar thermal, concentrating solar power (CSP) and photovoltaic. Solar-thermal devices use direct heat from the sun to do everything from heating swimming pools to creating steam for electricity generation. As per the trends in USA, China, Europe, Japan, etc, in coming years it is expected that millions of households in the world will be using solar energy Even in India, the Indian Renewable Energy Development Agency and the Ministry of Non-Conventional

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Energy Sources are formulating a program to have solar energy in more than a million households in the next few years. But what is most important in this context is the people's initiation to make such programs or initiatives successful. The important way for a successful implementation of such initiatives is creating an environment for mass consumption.

This energy can be used in many ways, such as

- Domestic Lighting/heating/cooking
- Street lighting
- Village electrification
- Water pumping
- Drying/Timber seasoning
- Electricity/Power generation
- Desalination of salty water
- Powering of remote telecommunication
- Cold storage and Refrigeration
- Railway lighting, etc

Some products that are available in the market for using both domestically and industrially are Solar cooker, Flat plate solar cookers, Concentrating collectors, Solar hot water systems (Domestic and Industrial), Solar pond, Solar hot air systems, Solar Dryers, Solar timber kilns, solar stills, Solar photovoltaic systems, Solar pond, Concentrating collectors, Power Tower, Air conditioning, Solar collectors, coupled to absorption, Refrigeration systems, Railway Signals, etc.

1.2 Research Problem

Solar energy in terms of thermal Solar Hot Water systems and electricity producing Photovoltaics contribute at present only to the global energy supply at a fraction of 1 %. However, the potential for solar energy is immense: the earth receives in 1 hour from the sun the equivalent of the present annual global energy supply. Solar energy is one of the emerging renewable energy technologies still not competitive.

Consumption of solar energy based goods will pave way to a green society and reduce the stress on earth's non-renewable energy sources. If the means to make efficient use of such solar energy products could be found and if it can create demand, it would reduce the dependence on non-renewable sources of energy and make environment cleaner and development sustainable. So it is the responsibility of the producers to leave the scope for consumer surplus over the usage of its substitute like electricity. Current study made an attempt to understand the behavior of the people who intend to buy solar products and their buying decision with a special focus on one of the most revealing demand determinant i.e., Income and another equally important factor which has an indirect impact on demand or induced demand, when it comes to new innovative products like solar products as against its substitutes like electricity, i.e., Education. Because education is the most important source for creating awareness for new and unfamiliar products like solar products and further leads to increase the demand. The study also made an attempt to find

what factor contributes more in creating the demand for solar products and determines the buying decision for a substitute to non-renewable energy?

1.3 Purpose

A study, by scientists at the World Health Organization (2008) determined that 154,000 people die every year from the effects of global warming, from malaria to malnutrition, children in developing nations seemingly the most vulnerable. These numbers could almost double by 2020. This shows a trend of worsening casualties associated with destructive Climate Change. A problem of this magnitude of the globe can be addressed only when there is a drive in the masses. Until the mass consumption or campaign takes place, it is not possible to address the issue with right quantum of seriousness. Especially problems like Global warming can be addressed on one side through a small but an effective way by promoting the consumption of solar products not as a service to society but by as a rational decision of a consumer and on the other side by understanding the buyer's behavior towards such non familiar products to convert as rational consumption. It is important to understand the relevance of human needs and the categories that effect buyer behavior, before attempting to analyze the influencing factors of consumption of solar products.

There are three major categories which affect the consumer buying decision process other than the human needs as observed in the review of literature such as personal, demographic , and psychological factors like motives, perception, attitude, knowledge, personality, lifestyles and Social factors like reference groups, culture social classes etc. For these reasons there is a need to understand the buying process of products like solar products as against its substitutes which are easily and abundantly available in the market.

1.4 Objectives

The survey on awareness levels of solar energy-based products consumption and its influence on buying behavior of people in Visakhapatnam have been conducted with a twin objective.

Primary objective is to know the number of people who are aware of Solar Products and also bought. And then to study the demand attributes especially income and education on solar products. And to compare, the influencing attributes of solar products with its substitutes like electronic/electrical products.

Secondary objective is to know the willingness of the respondents to buy Solar Product as a social responsibility or a better consumer product over the substitutes. With this trigger, researcher identified a city by name Visakhapatnam, a tier two city in India, for conducting the present study, where majority of upcoming/emerging income earners are relocating in search of better lifestyles with reasonable amenities.

The entire paper is presented in 5 sections with relevant sub heads, tables and charts. Section one about introduction followed by review of

literature, methodology, results and conclusions and suggestions. At the end references are presented in alphabetical order.

2. Review of Literature

The literature review done by the researcher on consumer buying decision and demand determinants of solar-energy based products by various researchers of different countries since mid 1970s to till date has been presented in the following paragraphs of the paper.

The broad research outline of many of the studies under review revolved around consumer behavior with special reference to adoption of environmental products as an alternative to the regularly consumed products and found that major influencing factors are psychological, financial, demographic factors. Few others studied the influence of distribution channels, financial consequences and role of government initiatives role in promoting the consumption of solar energy based products at household level. Few studies studied the early buyers of solar products behavior in line with their social concern behavior the Majority of studies done in UK and US where the adoption of solar based energy products took place way back in mid 1970s. The abstracts of these studies are drawn mainly from proquest online journals, emerald online journals and few other online sources. Following are the brief description of abstract of each study and its results. To start with, a study on the *demand of solar products* was (Scott1976) found out that the acceptability of solar products is more accepted by the people who are aware of solar technologies and It was also found that the socioeconomic and attitudinal characteristics of individuals more likely to purchase a solar product. A study done (Patricia 1980) on *Consumer acceptance of Passive Solar* in Lubbock, Texas observed that the demographic characteristics affects passive solar energy and prior knowledge of passive solar energy does not affect consumer's choice of buying it.

Another study conducted on consumer experience on solar energy in US (Yarosh & Connor 1980) observed that early adopters profess to be well satisfied with their solar experience, major problems are present in a majority of systems like warranties, operating and maintenance instructions and service are widely lacking or inadequate.

Another study (Jerald & Scott 1981) on consumer behavior about Consumer acceptance of solar products examined from a distribution channel perspective and says new channels of distribution are presented, along with the variables that will facilitate their adoption. And also found that one of the primary causes of the slow rate of adoption of solar heating and cooling is inadequate and ineffective distribution of the products. Neslin and Gert (1983) on *the response of consumers to information that presents a range of possible performances levels for a new product like Solar* found out that People were less likely to change their prior beliefs toward the financial viability of solar water heaters and financial risk.

According to a study (Soutar, Ramaseshan & Molster 1994) about Determinants Of Pro Environmental Consumer Purchase Behaviour there has been a rise in the availability of "environmentally friendly" consumer products, at present, little is known about the nature and level of pro-environmental point of purchase consumer behaviour. Results of a refereed paper on environmentally friendly products: Factors that influence their adoption (Seema & Kevin 1997) indicate that the psychological and situational variables studied are important as far as environmentally friendly behaviour is concerned. It is seen that environmentally friendly behaviour correlates significantly with innovativeness. Availability of these products has been rated much higher than price.A study on *influence of environmental concern on consumer behavior* (Mainieri et al. 1997) observed that those variables that predict green buying are awareness about environmental impacts of products, specific environmental beliefs of consumers, several general environmental attitude scales, demographic variables, and several pro-environment behaviors other than buying behavior and they found one interesting influencer is Woman consumer influence on improved consumption of green products.

A research study done by (Ian, Paul & Daniel 2002) on *the willingness of potential customers to pay a premium for green power* found that only 3 out of 11 respondents are willing to pay a premium for green energy. A study (Stefan et al. 2004) was conducted on awareness of environmental issues and willingness to change to green power products among students found that students are highly positive towards green power products Faires & Neame (2006) studied householder attitudes towards characteristics of solar systems and identify some of the barriers to adoption and finds that the early adopters demonstrate a positive perception of the environmental characteristics of solar power than assumed early adopters and its financial, economic and aesthetic characteristics are limiting adoption.

One more study on demand for solar products (Garett & Tomas 2008) found that lack of demand represents not disinterest, but rather lack of easy availability of solar products in the market. Conventional homeowners are not familiar with solar design, but are predisposed to favor it, especially if it can be incorporated into traditional housing styles. As per the report on Demand, Technology, Tax Credits Drive Global Solar Power Growth (Cheryl 2008) found out 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. 37 states have nonresidential direct incentives or commercial tax credits for solar and other renewable energy projects. This is a move from state to improve the consumption of solar based energy options.

Another study on Attitude towards the Environment and Green Products: Consumers' Perspective (Booi-Chen & Teck- Chai 2010) and result from the independent sample t-test shows that there were no significant differences between gender in their environmental attitudes and attitudes on green products. Results from the multiple linear regression analysis revealed that consumer attitudes on the government's role and their personal norm towards the environment contributed significantly to their attitude on green product. Further investigation revealed that personal norm was the most important contributor to the attitude towards green

product. They have also observed that the aspect of environmental protection did not contribute significantly to consumers' attitudes on green product."
Thus in most of the above mentioned studies it is observed that the problem pertaining to consumption of solar energy-based products is mainly revolving around of 3Ns and they are non-awareness, non-availability and non-adaptability. With this cue the current study designed in such a way to elicit the opinions regarding the buying decision and the product attributes that influence a buyer and/or non buyer of solar products from a representative sample of 200 from the city of Visakhapatnam after more than four decades of the existence of solar products in global markets.

3. Methodology

3.1 Research Design

For the purpose of this study a cross sectional data from a simple random sample of 200 representative respondents of various income levels and education levels belongs to Visakhapatnam was collected during the year 2010. A well structured questionnaire was designed in two parts as a tool for collecting data from buyers and non buyers of solar products. The collected data was categorized and tabulated on the basis of awareness levels and further on the basis of buyers and non-buyers of solar products. The tabulated data analyzed on the basis of income levels (less than one hundred thousand, one to three hundred thousand, three to 5 hundred thousand and above 5 hundred thousand per annum) and education level ((less than graduation, graduation and post graduation) of the respondents in each category by using percentage method to understand the influence of education and income on awareness and then their influence on buying decision of solar products. Once the data had been analyzed, the hypothesis testing was exercised by using chi-square test and correlation coefficient.

3.2 Hypotheses

- Education is not the influencing factor to create awareness about solar products
- Income is not the influencing factor to create awareness about solar products
- Income is not the influencing factor to own solar products

3.3 Tools of Analysis - Chi Square and Correlation Coefficient

- Chi Square is used to test that 'education is not the influencing factor to create awareness about solar products' and 'income is not the influencing factor to create awareness about solar products' with two degrees of freedom at 5% level of significance.
- Correlation coefficient is used to test the correlation between income and demand for solar products.

$$Correl(X,Y) = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sum (y-\bar{y})^2}}$$

Where x is income and y is demand of solar products

4. Analysis and Results

The results of the survey of 200 respondents are presented In this section, which details the results of the study through used methods of analysis and the resulting attributes to buy or not to buy solar products in the light of awareness levels and the influencers like education and income. All tables and charts are drawn from primary data sources.

4.1 Awareness Levels among the Respondents

The responses of the respondents about the awareness levels of solar energy-based products 130 (65%) out of 200 are aware of solar energy based products and remaining 70 (35%) respondents are unaware. The corresponding figures are presented in table 1.

As shown in the charts 1.1 and 1.2, respondents who are aware of solar product are more seen in Post Graduate level of education with 86% and having income more than 3 hundred thousand and less than 5 hundred thousand have 76% and 89% of more than 5 hundred thousand income level respondents aware of solar products. So Education and Income have their influence on awareness levels of respondents. The same is also proved statically significant through Hypothesis Testing at 5% level of significance in table 1.1 and 1.2.

Hypothesis 1:

H0: Education is not the influencing factor to create awareness about solar products

H1: Education is the influencing factor to create awareness about solar product

Table 1.1

Awareness level with compare to education				
Education	<=12	Graduate	Post graduate	Total
Aware	31	43	56	130
Not aware	39	22	9	70
Total	70	65	65	200

A degree of freedom::2 and Level of significance is at 5%. The table value is 5.991 which is less than calculated value i.e. 26.03.

So from the above calculations it is inferred that the calculated value lies in the accepted region so the study rejects null hypothesis because the table value is less than the calculated value and accepts the alternate hypothesis and that says 'Education is the influencing factor to create awareness about solar product'.

Hypothesis 2:

H0: Income is not the influencing factor to create awareness about solar products

H1: Income is the influencing factor to create awareness about solar product

Table 1.2

Awareness level with compare to income					
Income (in hundred thousand)	>1	1-3	3-5	<5	Total
Aware	13	46	55	16	130
Not aware	23	28	17	2	70
Total	36	74	72	18	200

Degrees of freedom: (r-1)*(c-1)
: (2-1)*(4-1)
: 3
Level of significance: 5%
The table value is 7.815 which is less than calculated value i.e. 22.09

So from the above calculations it is inferred that the calculated value lies in the accepted region and study rejects null hypothesis and accepts alternate hypothesis that Income is the influencing factor to create awareness about solar products.

Chart 1.1

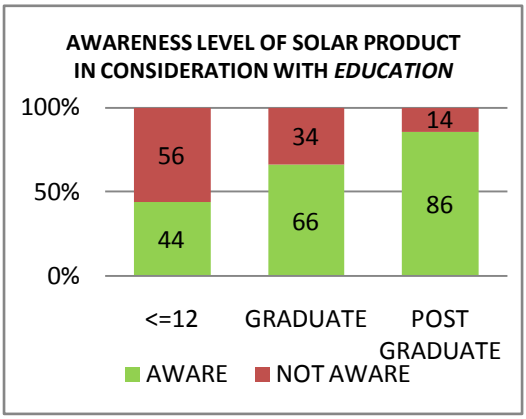


Chart 1.2

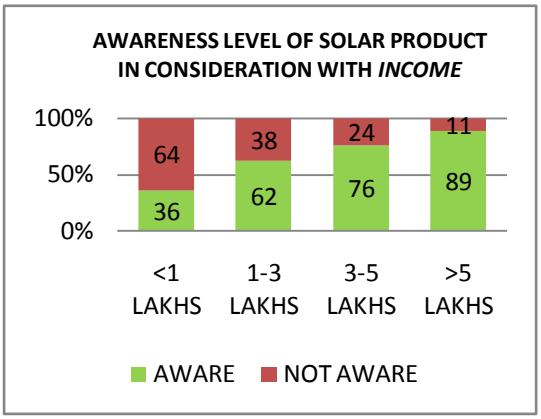


Table .1 : Awareness levels of Solar Products with reference to education and income

Education	Income (in hundred thousand)	Awareness of solar products					
		Aware		Not aware		Total	
		No.	%	No.	%	No.	%
<=12	<1	5	22	18	78	23	33
	1.1-3	7	37	12	63	19	27
	3.1-5	13	65	7	35	20	29
	>5	6	75	2	25	8	11
Total		**31**	**44**	**39**	**56**	**70**	**100**
Graduate	<1	2	33	4	67	6	9
	1.1-3	12	52	11	48	23	35
	3.1-5	27	79	7	21	34	52
	>5	2	100	0	0	2	3
Total		**43**	**66**	**22**	**34**	**65**	**100**
Post graduate	<1	6	86	1	14	7	11
	1.1-3	27	84	5	16	32	49
	3.1-5	15	83	3	17	18	28
	>5	8	100	0	0	8	12
Total		**56**	**86**	**9**	**14**	**65**	**100**
Grand total		**130**	**65**	**70**	**35**	**200**	**100**

* All the tables and charts of the paper are drawn from the primary data sources.

4.2 The Number of Buyers of Solar Products Among the Respondent

As per the behavior of consumers, whoever are aware of the products are not necessarily owners of it, so to observe this aspect the data in table 2 tabulated as owners and non owners of solar products from the list of respondents who are aware of solar products. To measure the demand more intricately present study not included the solar calculators and solar watches in the flip card of solar products during the data collection to elicit the response of respondents corresponding to this question. Since if the list includes these two then respondents who are using solar products list will go up and the study may end up by not exhibiting the true meaning of solar energy based products consumption. According to the survey results only 24% respondents are aware of solar products who actually the owners of these products, other than solar calculators and watches. As per table 2 and charts 2.1 and 2.2 those respondents who have an income of near about 3 Hundred thousand per annum are the owners of Solar Products with 93% of a total of 31 buyers.

Table 2: Owners and Non Owners of Solar Products

Education	Income (in hundred thousand)	Owners and non owners of solar products					
		Owners		Non owner		Total	
		No.	%	No.	%	No.	%
<=12	<1	0	0	5	100	5	16
	1-3	0	0	7	100	7	23
	3-5	3	23	10	77	13	42
	>5	1	17	5	83	6	19
Total		**4**	**13**	**27**	**87**	**31**	**100**
Graduate	<1	0	0	2	100	2	5
	1-3	3	25	9	75	12	28
	3-5	15	56	12	44	27	63
	>5	0	0	2	100	2	5
Total		**18**	**42**	**25**	**58**	**43**	**100**
Post graduate	<1	1	17	5	83	6	11
	1-3	7	26	20	74	27	48
	3-5	1	7	14	93	15	27
	>5	0	0	8	100	8	14
Total		**9**	**9**	**47**	**84**	**56**	**100**
Grand total		**31**	**24**	**99**	**76**	**130**	**100**

CHART 2.1

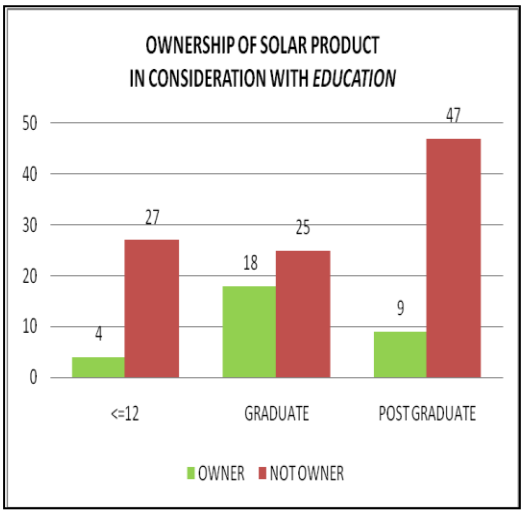
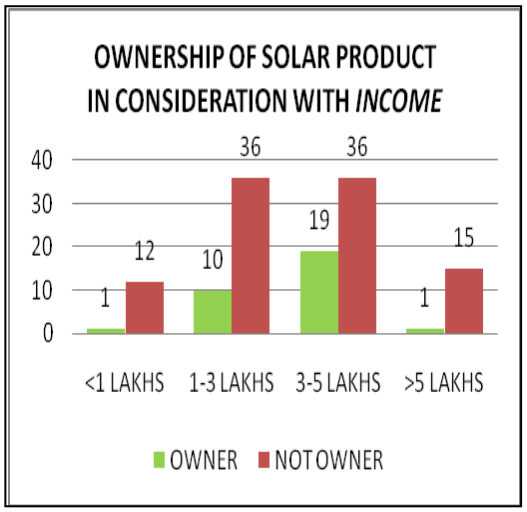


CHART 2.2



Hypothesis:3

H0: Income is not the influencing factor to own Solar Products
H1: Income is the influencing factor to own Solar Products

Table 2.1

INCOME	OWNERS	NON OWNERS	TOTAL
<1	1	12	13
1-3	10	36	46
3-5	19	36	55
>5	1	15	16
TOTAL	31	99	130

$$Correl(X,Y) = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sum (y-\bar{y})^2}}$$

The Correlation coefficient is 0.96. So the study rejects null hypothesis and accepts alternate hypothesis. So, on the basis of hypothesis tests we can say that there is a strong correlation between income and buying decision of Solar Products.

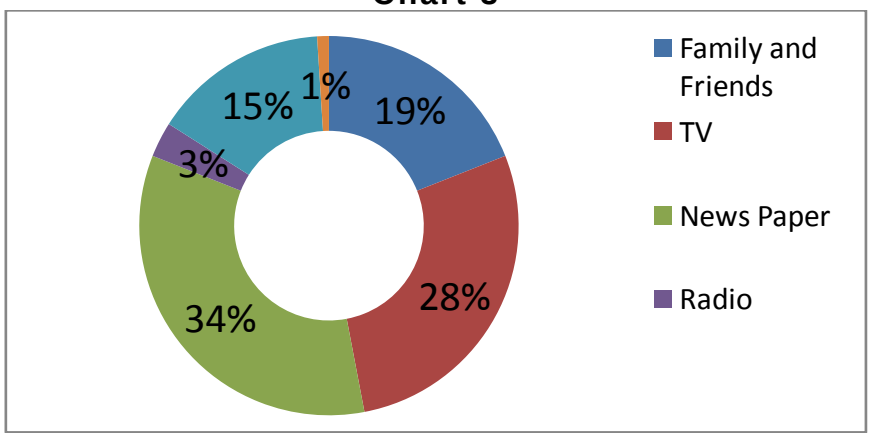
4.3 Sources of Awareness

Out all the people who are aware of solar products there are certain sources through which they came to know about these products like friends, family, television, newspaper, radio, books and other sources. And the study found that news papers (34%) are the most effective source to create awareness about solar energy based products and this has followed by television for about 28% respondents came to know about these products. Family and friends and books are the sources contributed for about a range 15% to 19%. The same information is presented in the following table 3 and chart 3.

Table 3
Sources of awareness for both Buyers and Non Buyers

Education	Income (in hundred thousand)	Source of awareness					
		Friends & family	Television	Newspaper	Radio	Book	Others
<=12	<1	-	2	4	1	-	-
	1-3	1	5	5	-	1	1
	3-5	7	5	10	-	1	-
	>5	-	4	5	-	-	-
Total		**8 (15%)**	**16 (31%)**	**24 (46%)**	**1 (2%)**	**2 (4%)**	**1 (2%)**
Graduate	<1	1	1	-	-	1	-
	1-3	4	6	7	1	4	-
	3-5	15	14	22	2	11	-
	>5	-	1	2	-	-	-
Total		**20 (22%)**	**22 (25%)**	**31 (33%)**	**3 (3%)**	**16 (17%)**	**0**
Post graduate	<1	-	2	4	-	1	-
	1-3	6	16	7	2	8	2
	3-5	6	8	14	1	6	-
	>5	6	5	5	-	5	-
Total		**18 (17%)**	**31 (30%)**	**30 (29%)**	**3 (3%)**	**20 (19%)**	**2 (2%)**
Grand total		**46 (19%)**	**69 (28%)**	**85 (34%)**	**7 (3%)**	**38 (15%)**	**3 (1%)**

Chart 3



4.4 Analysis of Factors Influencing Buying Decision

As it is observed in the above sub section to buy a product firstly one has to be aware of the products then the buying decision may go in favor or not to buy the product. So the current sub section presents the factors those influence the decision of the buyer to own the product and they are family, friends, media and society. Out of these factors the strongest influencer of buying solar products is family (51%) followed by friends (31). Media occupied a portion of 13%. It clearly indicates the influencers who create awareness are not necessarily the strongest influencers to buy or own a product, especially products like solar products. Though majority of buyers are educated and belongs to better income brackets.

Table 4
Influencing factors for buying Solar Products

Education	Income (in hundred thousand)	Owners	Influencing factors for buying solar			
			Family	Friends	Society	Media
<=12	3-5	3	3	-	-	1
	>5	1	1	1	-	-
Graduate	1-3	3	1	2	-	-
	3-5	15	11	4	1	1
Post graduate	<1	1	-	-	-	1
	1-3	7	3	4	1	1
	3-5	1	1	1	-	1
Grand total		**31**	**20 (51%)**	**12 (31%)**	**2 (5%)**	**5 (13%)**

4.5 Influencing Attributes for buying Solar Products

In the process of consumer buying decision the factors which influence are of two categories one is external to the product and the other one is internal to the product in other words it can be described as attributes of the product. These are like price, safety, usage, overhead cost /maintenance cost, health impact, societal image, environmental friendly, etc. As per the data analyzed it is the usage (42%) of the product that plays a major role in the buying decision followed by low maintenance or low over head costs. With reference to solar products safety and pollution free are also relatively important attributes of the product. Price of the product comes only after these attributes; this observation can be substantiated by the income-demand elasticity aspect of any product as the buyers are mostly belongs to high income brackets as seen in table 5.

Table 5
Influencing attributes of Solar Products on the buying decision

Education	Income (in hundred thousands)	Owners	Influencing attributes of the product for buying solar product						
			Price	Safety	Usage	Low overhead cost	Health	Pollution free	Social Responsibility
<=12	3-5	3	2	1	2	-	-	-	-
	>5	1	-	-	1	1	-	-	-
Graduate	1-3	3	1	1	3	-	-	-	-
	3-5	15	-	2	11	7	3	5	2
Post graduate	<1	1	-	1	-	-	-	-	-
	1-3	7	1	1	5	1	-	1	-
	3-5	1	-	-	-	1	-	-	-
Grand total		31	4	6	22	10	3	6	2
			(8%)	**(11%)**	**(42%)**	**(19%)**	**(6%)**	**(11%)**	**(3%)**

4.6 Product attributes and its influence on buying decision of Solar Products vs. Electrical and Electronic Products – a buyer vs non-buyer perspective

As per the buyers view, products like solar products are bought due to certain specific attributes which are preferred over the electrical and electronic products. Few among those to with buyers are strongly agreeing are, environmental friendly (71%) long lasting (52%), good quality (48%), maintenance free (32%) and have low electricity bills (74%) in comparison with electronic or electrical products. Whereas, E-products were preferred strongly over the solar products due to the reasons like stylish (52%), easily available (74%) and better levels of awareness (42%) among the consumers.

Table 6
Product attributes and its influence on buying decision of Solar Products (S) vs. Electrical and Electronic Products (E) A buyer and non buyer perspective

PERCEPTION / ATTRIBUTES	STRONGLY AGREE				AGREE				CANT SAY				DISAGREE				STRONGLY DISAGREE			
PRODUCTS	S		E		S		E		S		E		S		E		S		E	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
LONG LASTING	16	52	0	0	9	29	15	48	5	16	5	16	1	3	11	35	0	0	0	0
GOOD QUALIY	15	48	2	6	13	42	11	35	1	3	2	6	2	6	11	35	0	0	5	16
CHEAP	0	0	2	6	7	23	19	61	5	16	0	0	13	42	10	32	6	19	0	0
STYLISH	0	0	16	52	5	16	15	48	2	6	0	0	16	52	0	0	8	26	0	0
MAINTAINANCE FREE	10	32	1	3	16	52	6	19	2	6	7	23	3	10	16	52	0	0	1	3
HIGHLY AWARE	2	6	13	42	11	36	18	58	2	6	0	0	15	49	0	0	1	3	0	0
EASILY AVAILABLE	0	0	23	74	6	19	8	26	3	10	0	0	14	45	0	0	8	26	0	0
ENVIRONMET FRIENDLY	22	71	1	3	8	26	7	23	1	3	5	16	0	0	6	19	0	0	12	39
EASILY REPAIRABLE	0	0	4	13	3	10	16	52	24	77	3	10	3	10	5	16	1	3	3	10
LOW ELECTRICITY BILL	23	74	0	0	7	23	4	13	0	0	1	3	1	3	17	55	0	0	9	29

4.7 Reasons for not buying the solar products- Non Buyers Perceptions

As per the table 2 there are 99 respondents out of 200 who are aware of solar products but did not buy them. And the reasons mentioned by them on an average are non availability (23%), costly (23%) and not necessary (21%) apart from being not aware where these products are available other than solar calculators and watches about the products (24%) which is the important aspect of the study.

Table 7
Reasons for not purchasing Solar Products

Educa-tion	Income (in hundred thousands)	non owners	Reasons for not purchasing solar product						
			Costly	Not availabl e	High maintain-ance cost	Not aware	Not useful	Not necessar y	Others
<=12	<1	5	5	-	-	-	-	1	-
	1-3	7	1	3	-	2	-	1	-
	3-5	10	2	3	-	2	-	4	1
	>5	5	3	1	-	2	-	1	-
Total			**11 (34%)**	**7 (22%)**	**0**	**6 (19%)**	**0**	**7 (22%)**	**1 (3%)**
Graduat e	<1	2	1	-	-	1	-	1	-
	1-3	9	2	2	-	3	1	3	-
	3-5	12	1	7	-	4	-	3	2
	>5	2	-	-	-	1	1	1	-
Total			**4 (12%)**	**9 (26%)**	**0**	**9 (26%)**	**2 (6%)**	**8 (24%)**	**2 (6%)**
Post graduate	<1	5	-	-	1	1	-	2	1
	1-3	20	5	7	2	6	1	5	1
	3-5	14	3	7	1	8	-	4	2
	>5	8	4	2	1	3	-	3	2
Total			**12 (17%)**	**16 (23%)**	**5 (7%)**	**18 (25%)**	**1 (1%)**	**14 (19%)**	**6 (8%)**
Grand total			**27 (20%)**	**32 (23%)**	**5 (4%)**	**33 (24%)**	**3 (2%)**	**29 (21%)**	**9 (7%)**

4.8 Willingness to Purchase Solar Products in Future

Willingness to buy Solar Products in future is high with the respondents whose income level is more than 3 hundred thousand per annum and also has higher education levels with an average of 59%. The major reasons for buying solar products are increased environmental concerns and social responsibility.

Table 8
Willingness to purchase Solar Products in Future

Education	Income (in hundred thousand)	non owners	Willingness to purchase		
			Yes	No	Total
<=12	<1	5	0 (0%)	5 (100%)	5 (19%)
	1-3	7	3 (43%)	4 (57%)	7 (26%)
	3-5	10	3 (30%)	7 (70%)	10 (37%)
	>5	5	2 (40%)	3 (60%)	5 (19%)
total		27	8 (30%)	19 (70%)	27 (27%)
Graduate	<1	2	1 (50%)	1 (50%)	2 (8%)
	1-3	9	6 (67%)	3 (33%)	9 (36%)
	3-5	12	8 (67%)	4 (33%)	12 (48%)
	>5	2	2 (100%)	0 (100%)	2 (8%)
Total		25	17 (68%)	8 (32%)	25 (25%)
Post graduate	<1	5	2 (40%)	3 (60%)	5 (11%)
	1-3	20	15 (75%)	5 (25%)	20 (43%)
	3-5	14	10 (71%)	4 (29%)	14 (30%)
	>5	8	6 (75%)	2 (25%)	8 (17%)
Total		47	33 (70%)	14 (30%)	47 (47%)
Grand total		99	58 (59%)	41 (41%)	99 (100%)

Chart 8.1

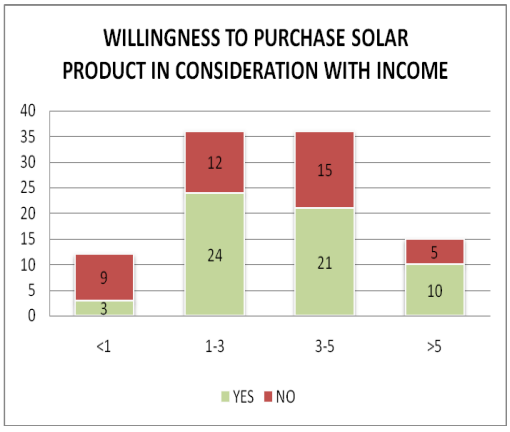
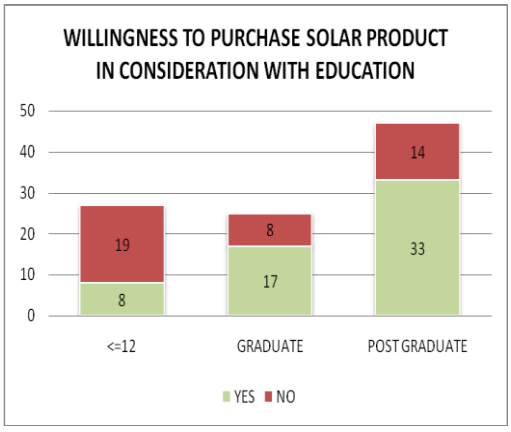


Chart 8.2



5. Conclusion and Suggestion

The results of the study indicate that the psychological, demographic and economic variables studied are very important as far as environmentally friendly products like solar products are concerned. It is seen that buying of solar products correlates significantly with income and education. Awareness levels among the respondents in relation with education and income has been very high and is statistically significant. Consumers are willing to pay a slightly higher price for environmentally friendly products but are not ready to go out of their way to look and search for such products. It is mostly due to the problems like availability and after sales service facility and it is observed from the study that these factors have become major hurdles for future purchase. Availability of these products has been prioritized much higher than price to induce potential demand.

The study concludes that people who are educated and have high income are aware of Solar Products. The early adopters and even non-buyers of solar products show a positive sign of buying Solar Products in future, but were little apprehensive about the availability and after sales service . As it is observed from the analysis that family and friends being the strong influencing factors in buying decision, with word-of-mouth and as an opinion leaders it is possible that future would be bright for solar products if some attributes are taken care of like size of the product, cost, awareness and availability, especially after sales service and number of service centers.

Findings of the study might be limited by unrealistic responses by educated respondents to show and project themselves as socially responsible customers. In such a case the number of buyers who are aware/ consumers of solar products could be different than the findings.

Further to this study, research can be carried out on the satisfaction level of the users of solar product, as there is a chance of not using the products by the owners of these products due to non-availability, usage problems, etc to understand the extent of the spread of negative word of mouth. Mass production can be one of the ways to pave way for mass consumption of such products. And this in turn resolves the confusion of who bells the cat.

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