Abstract of the Thesis

A Study On Consumers’ Buying Behaviour For Solar Energy Equipments And Responses Towards Use Of Solar Energy Equipments In Maharashtra”

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(Under the Faculty of Management)

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1. **INTRODUCTION**: The global financial slowdown has created an impact in energy market. The demand for the energy decreased during the economic recession, but demand for the energy has increased again with the pace of economic recovery. In the World Energy report 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.

Energy is basic requirement for economic development of the country. Every sector like agriculture, industry, transport, commercial, and domestic – needs energy in various forms. With fast developments taking place, consumption of energy in all forms has been steadily rising all over the country. This growing consumption of energy has also resulted in the country becoming increasingly dependent on fossil fuels such as coal, oil and gas. The stocks of all these are depleting rapidly and prices of oil and gas are rising. India's power sector has a total installed capacity of approximately 1,46,753 Megawatt (MW) of which 54% is coal-based, 25% hydro, 8% is renewable and the balance is the gas and nuclear-based. The sufficient and secured energy supply is needed to sustain economic growth. Increased use of fossil fuels causes environmental problems both locally and globally. Global warming is one of the serious bi-product of uncontrolled use of these fuels. Changing life style is resulting in increased electricity consumption. Against this background, the country urgently needs to promote energy conservation and increase use of Non conventional and Renewable Sources of Energy. Renewable energy sources are those from which energy is derived from natural processes that are replenished constantly.

**Non conventional and Renewable Energy Sources -**

a) **Wind power**

This uses the power in the wind to rotate blades and that movement can be used for either pumping water from well or revolving generator turbine to generate electricity. In India wind power programme was started during 1983-84.
b) Bio Energy
India is an agricultural country and huge quantity of biomass is available in the form of husk straw, shells of coconut, wild bushes etc. Approx. production of agricultural waste is 350 million tons every year, this would be sufficient for supplementing coal for production of power. The biomass resources including cattle dung can be used in bio energy technologies like biogas, gasifier, biomass combustion etc to produce Thermal energy or Electricity.

c) Geo-Thermal Energy
Geo thermal energy is renewable heat energy from underneath the earth. The heat underneath the earth is brought near to surface by thermal conduction and by intrusion into the earth’s crust. This heat can be directly used for power generation and other direct heat applications.

d) Tidal Energy
Oceans cover nearly three fourth of the earth. The seas and oceans contain energy in the form of temperature gradients, waves and tides which can be used for generation of electricity.

e) Bio Fuels
In view of the depleting reserves of the fossil fuel and the concern for the environment there is a need to search for the alternatives to petrol and diesel. The Govt. of India has permitted the use of 5% Ethanol with petrol which is produced from molasses or cane juice. The R & D activities are going on for using Non edible oil from vegetables or shrubs as bio diesel.

f) Solar Energy
Solar energy is experienced by us as heat and light and can be used in two ways i.e. to produce the thermal energy and to produce electrical energy. The thermal application uses the heat for water heating, cooking, drying, water purification, power generation, and other applications. The photovoltaic application converts the light energy into electrical energy, which can then be used for number of purposes such as lighting, pumping, communication, and power supply in un-electrified areas.

2. RATIONALE OF THE STUDY:
India is blessed with a variety of renewable energy sources, the main ones being Biomass, Biogas, Solar Energy, Wind, and Small hydro power. Municipal and industrial wastes can also be useful sources of energy, but are basically different forms
of biomass. India lies in sunny regions of the world. Most parts of India receive 4 - 7 KWh of Solar radiation per square meter per day with 250-300 sunny days in a year. India has abundant solar resources, as it receives about 3000 hours of sunshine every year, equivalent to over 5,000 trillion kWh. India can easily utilize the solar energy or Solar Power. Today the contribution of solar power with an installed capacity of 9.84 MW is a fraction (< 0.1 percent) of the total renewable energy installed (as on 31st October 2008 by MNRE). For expanding energy supply and meeting decentralized energy needs the Govt. implements various strategies through India's Ministry of New Renewable Energy (MNRE), Energy development agencies in the various States, and the Indian Renewable Energy Development Agency (IREDA). These nodal agencies take various measures to promote use of non conventional energy resources by individual customers, industries, public enterprises and state govt. agencies.

The current situation of Renewable Energy in Maharashtra is not encouraging and needs some extra efforts to boost the use of renewable sources. The study covers only the solar energy applications of Non Conventional Energy Resources. It is quite clear that utilization of solar energy is very less compared to geographical spread and population of India. Apart from high initial costs there are many other reasons to it. Penetration level for the utilisation of non-conventional energy resources is low in Maharashtra. Preliminary study also reveals that the awareness for the utilisation of solar products also very low. Government also provides subsidies and tax incentives for promoting solar products in India. So, this present study attempt to evaluate the level of awareness for the solar energy based products in Maharashtra state. Find out the perceptions for buying solar products with reference to various entities in Maharashtra state like Individual household, Industries, Hostel and hospitals. This study will be useful to understand the government to frame policies for promoting the solar energy products. It is useful to understand the manufacturer of solar products for understanding the need of the consumers.

3. OBJECTIVES OF THE STUDY:

The study has following objectives-

- To study the consumers’ buying behaviour and perceptions about solar energy equipments.
- To know and analyse the causes of poor response to solar equipments.
• To study the marketing efforts of the organizations to attract the consumers.
• To make suggestions for enhancing the use of solar equipments.
• To study the reasons of failure of marketing communication by various agencies.

4. HYPOTHESES OF THE STUDY:

A hypothesis is a statement of tentative supposition or a possible solution to a problem based on judgment and/or documentary evidence. As these tests are conducted based on evidence thrown up by a sample, errors cannot be totally eliminated.

For this study following hypotheses are set-
• The initial investment in the solar systems is the key criteria while selecting the solar equipments.
• The effective marketing communication of the organization has impact on buying behaviour of the customers of solar equipments.
• The social status of the consumer has impact on buying behaviour of the consumers of solar equipments.
• Despite of knowing the benefits of solar equipments customers are not willing to buy solar equipments.

5. RESEARCH METHODOLOGY:

This is descriptive and exploratory study; researcher had planned for a systematic study of the situations, problems and phenomenon and attempted to find out the relationship between various aspects of the study. Descriptive study aims to describe the phenomena about the about the variables being studied. Exploratory study used to find out the cause and effect relationship among the variables in the study. A structured approach was used in this study.

5.1 DATA COLLECTION

The study is based on the survey of the respondent. The data required for the research purpose was obtained from both primary and secondary sources.

The Primary Sources
The feedback from the respondents is the major source of information. This was collected by using various tools like -

a) Questionnaire-
Structured questionnaire was prepared for each category of the respondents and information (data) was collected. Questionnaire comprises of both demographic and functional variables related to the study.
b) Personal Interviews

Personal interviews of respondents, who are actively involved in the various promotional programmes belonging to either private or government aided organisations, were conducted for data collection. Personal interview were conducted for industries (both rural and urban), hospitals (both public and private sector) and hostel in various category. Interviews were conducted with open-ended questions.

The Secondary Sources

Renewable energy is on the international agenda and has become the priority in the country; various reports on renewable energy, non-conventional energy will be of use to get secondary data. Various other sources of information are:

- Newspapers and Magazines
- Company Literatures
- Reports and Publications of National and International organisations.
- Reports of Government and NGOs.
- Various Research Journals & Periodicals.
- Various web sites on Internet.
- E journals and reports available on Internet.

5.2 SAMPLING UNIT

Individual houses those who have already installed solar systems and are using them and those who have potential to install the various solar equipments. Industries which are using various Non-Conventional Renewable Energy Sources and Solar Equipments and those who have planned to use some Non-Conventional Energy Sources were included. Same criteria are used for other sample categories i. e. for Rural Industries, Hospitals and Hostels.

5.3 SAMPLING TECHNIQUE

Groups are formed by using stratified random sampling method. Stratified random sampling is the representative sampling. Strata were constructed on the nature of the population viz., Individual household, Industries, hospitals and hostels. Beside the each strata, individual household data were collected by using proportionate stratified random sampling technique (sample size distributed to the population in each city), hospitals, industries, and hostel data collected by using snowball sampling method.
5.4 SAMPLE SIZE

Various sampling units are defined based on the categories and approx. sample size of each category is explained in Table-1.

Table-1

Sample Category and Sample Size

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Individual houses. (Distributed all over state)</td>
<td>1000</td>
</tr>
<tr>
<td>2</td>
<td>Industries (urban &amp; rural)</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Hostels of various categories</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Hospitals (Govt. run &amp; Private)</td>
<td>100</td>
</tr>
</tbody>
</table>

Pilot study has conducted with the trail sample of 50 individual household for this research study. Trail sample estimates the standard deviation of the population is .649. It is used to determine the sample size in 95% of confidence level and 5% of significance level is 996.8. So, researcher decides to collect 1000 sample in individual household.

Table-2

Individual household distribution to the major cities in Maharashtra

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Large cities of Maharashtra</th>
<th>Population</th>
<th>% of population to the total population of cities</th>
<th>Req. Sample</th>
<th>Actual sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mumbai (Municipal Corporation)</td>
<td>1,24,78,447</td>
<td>47.35</td>
<td>473.51</td>
<td>470</td>
</tr>
<tr>
<td>2</td>
<td>Pune (Municipal Corporation)</td>
<td>31,15,431</td>
<td>11.82</td>
<td>118.22</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>Nagpur (Municipal Corporation)</td>
<td>24,05,421</td>
<td>9.13</td>
<td>91.28</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>Thane (Municipal Corporation)</td>
<td>18,18,872</td>
<td>6.90</td>
<td>69.02</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>Pimpri and Chinchwad (Municipal Corporation)</td>
<td>17,29,359</td>
<td>6.56</td>
<td>65.62</td>
<td>70</td>
</tr>
<tr>
<td>6</td>
<td>Nashik (Municipal Corporation)</td>
<td>14,86,973</td>
<td>5.64</td>
<td>56.43</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>Aurangabad (Municipal corporation)</td>
<td>11,71,330</td>
<td>4.44</td>
<td>44.45</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>Solapur (Municipal Corporation)</td>
<td>9,51,118</td>
<td>3.61</td>
<td>36.09</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>Amravati (Municipal Corporation)</td>
<td>6,46,801</td>
<td>2.45</td>
<td>24.54</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>Kolhapur (Municipal Corporation)</td>
<td>5,49,283</td>
<td>2.08</td>
<td>20.84</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2,63,53,035</td>
<td>100.00</td>
<td>1000.00</td>
<td>1000</td>
</tr>
</tbody>
</table>
5.5 SCOPE OF THE STUDY:
The topic titled “A Study On Consumers’ Buying Behaviour For Solar Energy Equipments And Responses Towards Use Of Solar Energy Equipments In Maharashtra” has vast scope at the national and state level. The findings through this study will help State Government and Manufacturers & Marketers of the solar equipments to understand consumer buying behaviour pattern and reasons for poor response towards the solar equipments. This will help everyone in contributing towards energy conservation and environment.

5.6 LIMITATIONS OF THE STUDY:
The subject indicates wide geographic spread and national priority therefore it is bound to have some limitation on research by an individual. Therefore the scope of the subject is restricted to selected sample size of respondents and their categories. If there is any change in location and sample size, results may or may not vary.

Due to wide geographic spread of Maharashtra, researcher had collected the primary data from ten major cities where there is a scope for utilization of solar energy. Rural area is not covered in terms of the individual houses but covered in case any industry or organization uses Non Conventional Energy Resources. In rural area maximum energy is used for agriculture purpose where energy is required for irrigation. SPV Water pump is the only product in solar category which at this stage is very costly and cannot be afforded by Farmers. Due to its very limited scope this is not considered by the researcher in while selecting sample category.

6. REVIEW OF LITERATURE:

a) Dr. R. Ganapathi in his paper on “ Consumer Awareness and Satisfaction towards Solar Heater System “ Published in “Pravara Managaement Review “ States that , Energy conservation and environmental protection have today emerged as pressing issue and are being accorded top most priority companies all over the world . The consumers are not much satisfied with performance of the system. Satisfied respondents like to perform good communication to friends, relatives, and others about the system. Satisfaction of the consumer about the solar heater system is seen more in all level in each and every company that are providing with solar water heater system.

b) Dr. Neeraj Kaushik in his paper on “A Study on Consumer’s Buying Pattern of Cosmetic Product In South Haryana” Published in “ Indian Journal of Marketing” examined that, impact of demographic variable on consumer’s preference for the cosmetics and found that age, occupation and family income have significant influence
on the selection of cosmetic. Further, it was also found that brand loyalty does not have a significant influence on buying behavior of consumer when brand of their choice is not available.

c) Dr. P. R. Sumangala on his paper on “Purchasing Practices of Food, clothing and Consumer Durable Among Farm Families of Gadag District” Published by “Indian Journal of Marketing” Stated that, Maximum Number of Household of all the categories purchase the groceries, perishable, ready mixes and bakery and confectionaries on a weekly basis from the nearby town. Daily wear of women, men and children regular wear purchase once in six months whereas occasional wear were purchase during the festival from the shop located in the nearby town. Neighbours and friends were the common source of information for purchasing of food, clothing and consumer durable from the families of different landholdings.


e) Mr. Sanjeev Verma in his paper on “Do Consumer Respond Differently to Advertising Stimuli : An Empirical Study” Published by “South Asia Journal of Management” examined that, The customer in their old age become more conservative and less interested in outside trigger while young customer want to experience more new thing an enjoy watching advertisements. Not many advertisers in India routinely collect demographic data response of customer belonging to different demographic profile towards their advertised product. Findings indicate that it is useful to understand demographic which aids in assigning customers to different segments that differ in their response to the same advertised product. Once segment membership is determined, the advertisers would know the relative importance of benefits in terms of perceptions of the segment members and thus can strategize advertisement technique specially for the target segment for enhancing the attractiveness of advertising Stimuli.

7. ANALYSIS OF RESEARCH DATA:
After data collection; tabulation, analysis & interpretation of the data in meaningful manner was made. For the interpretation of the data on statistical platform, Chi Square
test was applied. On the basis of the study following conclusions were derived & recommendations are made.

**Satisfaction level for the Price of the product**

<table>
<thead>
<tr>
<th>Satisfaction for Price of the product</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Dissatisfied</td>
<td>482</td>
<td>78.2</td>
</tr>
<tr>
<td>Somewhat Dissatisfied</td>
<td>22</td>
<td>3.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>67</td>
<td>10.9</td>
</tr>
<tr>
<td>Somewhat Satisfied</td>
<td>20</td>
<td>3.2</td>
</tr>
<tr>
<td>Highly Satisfied</td>
<td>25</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>616</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Intention to buy solar energy equipment in future**

<table>
<thead>
<tr>
<th>Intention to buy solar product in future</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>454</td>
<td>73.7</td>
</tr>
<tr>
<td>No</td>
<td>162</td>
<td>26.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>616</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
The first hypothesis for this study is “The initial investment in the solar systems is the key criteria while selecting the solar equipments”. The researcher had collected data from individual respondents for testing this hypothesis. The resulted data has been summarized in following table

**CONTINGENCY TABLE 1**

<table>
<thead>
<tr>
<th>Satisfaction level of the Price of the product</th>
<th>Intension to buy solar energy equipment in future</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Highley Dissatisfied</td>
<td>373</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>(355)</td>
<td>(127)</td>
</tr>
<tr>
<td>Somewhat Dissatisfied</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>(16)</td>
<td>(6)</td>
</tr>
<tr>
<td>Moderate</td>
<td>32</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>(49)</td>
<td>(18)</td>
</tr>
<tr>
<td>Somewhat Satisfied</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(15)</td>
<td>(5)</td>
</tr>
<tr>
<td>Highly Satisfied</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>(18)</td>
<td>(7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>454</strong></td>
<td><strong>162</strong></td>
</tr>
</tbody>
</table>

*Values without brackets are observed frequencies

**Values in brackets indicate theoretical value

Chi Square Test:

\[
\text{Chi-square test} = \frac{\sum (Oij - Eij)^2}{Eij}
\]

\[
= \frac{(373-355)^2}{355} + \frac{(109 -127)^2}{127} + \frac{(15 -16)^2}{16} + \frac{(7- 6)^2}{6} + \\
+ \frac{(32-49)^2}{49} + \frac{(35 -18)^2}{18} + \frac{(14 -15)^2}{15} + \frac{(6-5)^2}{5} + \\
+ \frac{(20-18)^2}{18} + \frac{(5 -7)^2}{7}
\]
\[ \chi^2 = 27.635 \]

Degree of Freedom (df) \[ = (c-1) \times (r-1) \]
\[ = (2-1) \times (5-1) \]
\[ = 1 \times 4 \]
\[ = 4 \]

The researcher had tested the above data at 5% significant level. The critical value \[ \chi^2 \] at 0.05 level of confidence for 4 degree of freedom is 9.488, which is less than calculated value of \[ \chi^2 \] i.e. 27.635, hence the hypothesis accepted. Thus, the variables are strongly dependent or there is significant relationship between the variables.

8. CONCLUSIONS AND RECOMMENDATIONS:

A. HYPOTHESIS TESTING (individual consumers)
   I. The first hypothesis for the study is “The initial investment in the solar systems is the key criteria while selecting the solar equipments.” For testing this hypothesis researcher had collected data from respondents across Maharashtra state randomly.

   1. The researcher had tested the above data at 5% significant level. The computed Chi-square value for above data 27.635 is greater than table value 9.488 for 4 degree of freedom. Thus, there is an association between variables or there is significant relationship between the variables. Hence hypothesis is accepted.

   II. The second hypothesis for the study is “The effective marketing communication of the organization has impact on buying behaviour of the customers of solar equipments.” For testing this hypothesis researcher had collected data from respondents across Maharashtra state randomly.

   1. The researcher had tested the above data at 5% significant level. The computed Chi-square value for above data 3.415 is lesser than table value 3.841 for 1 degree of freedom. Thus, the variables are not dependent or there is no significant relationship between the variables. Hence hypothesis is rejected.
III. The third hypothesis for the study is “The social status of the consumer has impact on buying behaviour of the consumers of solar equipments.” For testing this hypothesis researcher had collected data from respondents across Maharashtra state randomly.

1. The researcher had tested the above data at 5% significant level. The computed Chi-square value for above data 15.177is greater than table value 7.815 for 3 degree of freedom. Thus, the variables are dependent or there is significant relationship between the variables. Hence hypothesis is accepted.

IV. The fourth hypothesis for the study is “Despite of knowing the benefits of solar equipments customers are not willing to buy solar equipments”. For testing this hypothesis researcher had collected data from respondents across Maharashtra state randomly.

1. Most of the non-user respondents (70.1%) were aware of the benefits of solar-equipment and 29.9 % of the respondents were not aware of the benefits of solar-equipment. It also seen that most of the respondents (92.2%) had not thought of installing solar system in near future and only few of the respondents representing 7.8% had thought of installing solar system in future.

2. Researcher had divided respondents in two categories as those who were aware about the benefits of solar energy equipments and those who did not know the benefits of solar energy equipments. Data was then tabulated in table no. 6.53. It inferred from the table no 6.53 that maximum of respondents i.e. 89.6% from those who were aware about the benefits of the solar equipments are not willing to buy solar systems in future.

3. All above observation and analysis of the data clearly supports the statement that despite knowing the benefits of solar energy equipments customers are not willing to buy solar energy equipments. Hence hypothesis is accepted.

B. HYPOTHESIS TESTING (institutional consumers)

1. The first hypothesis for the study is “The initial investment in the solar systems is the key criteria while selecting the solar equipments.” Researcher had formed a table no. 7.26 with the help of table no. 7.23
showing intention to buy solar products in future and table no. 7.24 showing the respondents opinion for not purchasing solar equipments in future. From the total institutional respondents 50% of the respondents are not willing to purchase solar energy equipments in future. Table no. 7.26 and the graph no. 7.26 give the analysis of the reasons for not purchasing solar energy equipments.

Table No. 7.26  
CONTINGENCY TABLE 1

<table>
<thead>
<tr>
<th>Reason Not purchasing solar equipments in future</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High initial price</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Needs large space for installations</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>No scope for alterations</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Other than these</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Graph No. 7.26  
Reasons for not purchasing solar equipments in future

Initial expenses for buying and installing solar energy equipment are its price and cost of installation. Maximum institutional respondents i.e. 60% are giving high initial price as a reason for not buying solar energy equipments and 42% respondents from industry, 36% respondents from hostels and 33% respondents from hospitals are highly dissatisfied about the cost of installation (w.r.t. table no. 7.19, page no. 191).
The above data analysis shows that the hypothesis “The initial investment in the solar systems is the key criteria while selecting the solar equipments” is true and hence hypothesis is accepted.

II. The second hypothesis for this study is “The effective marketing communication of the organization has impact on buying behaviour of the customers of solar equipments.”

1. The researcher had collected data from institutional respondents i.e. industries, hostels and hospitals for testing this hypothesis. The researcher had considered two things that is usefulness of the information given by the manufacturer and intention to buy solar energy equipments in future. The resulted data has been summarized in table no 7.27.

2. 66% of the respondents from industry, 54% of the respondents from hostels, 68% of the respondents from hospitals feel that information given by marketing executive was not useful

3. The researcher had tested the above data at 5% significant level. The computed Chi-square value for above data 22.22 is greater than table value 3.841 for 1 degree of freedom. Thus, the variables are dependent or there is significant relationship between the variables. Hence hypothesis is accepted.

III. The third hypothesis is not applicable to institutional consumers.

IV. The fourth hypothesis for this study is “Despite of knowing the benefits of solar equipments customers are not willing to buy solar equipments.”

1. The researcher had tested the above data at 5% significant level. The computed Chi-square value for above data 10.382 is greater than table value 3.841 for 1 degree of freedom. Thus, the variables are dependent or there is significant relationship between the variables. Hence hypothesis is accepted.

C. Consumer buying behaviour:

1. Amongst the users of solar energy equipment it was observed that maximum respondents were from 31 to 40 yrs age group (table no. 6.2). This is the high time in life where a person starts thinking about settling in life and tries to buy a house hold or utilise earnings very carefully so that maximum benefits are achieved. Investment in buying solar energy
equipment gives lot of benefits in long term; as the energy utilised is free of cost and results in direct saving of energy. Maximum number of non-users i.e. 80.7% belongs to 21 to 30 yrs age group (table no. 6.38). This is the age when a person is at the beginning of career, planning for marriage and searching for a permanent job. There is more of instability which might be the major cause for having more non users in this age group. Hence it can be said that age of the consumer affects in buying solar energy equipments.

2. It is found out that amongst users; graduates i.e. 30.4% and undergraduates 31.2% (table no. 6.3) constitute large part and in non-user also graduates i.e. 39.6% and undergraduates 30.2% (table no. 6.39) constitute large part. Hence it can be concluded that educational qualification does not affect the buying of the solar energy equipments.

3. The ultimate outcome of the buying behaviour is the last stage; decision to buy or not. Table no. 6.51 shows various income groups’ data from income point of view for users and non-users. It shows that low income group i.e. up to Rs. 2,00,000. has maximum i.e. 69.9% non-users whereas all other higher income groups have maximum users i.e. 70.4% for income between Rs.2,00,001 to Rs.4,00,000 , 87.1% for income between Rs.4,00,001 to Rs.6,00,000 and 82% for income above Rs.600001.

4. Researcher had selected two thermal application and two photovoltaic applications. It was found that maximum i.e. 67% of users are using Solar Water Heaters, 20% are using Solar Cooker, very less i.e. 12.8% combined are using photovoltaic applications. This shows that consumers prefer thermal applications over photovoltaic applications.

5. While buying any product the features of the product plays vital role in consumer decision making process. Researcher had considered some attributes of the solar energy equipments which may influence in buying decision process. Following are the attributes considered for the study-
   a. Energy saving
   b. Cost effectiveness
   c. Long Life span
   d. Operating safety
Maximum respondents i.e. 89.3% highly agree that solar energy equipment has energy saving attributes. 79.5% respondents highly agree that solar energy equipments are cost effective and 10.9% respondents somewhat agree for the same. Maximum respondents i.e. 51% highly agree that solar energy equipments have long life span and 18.8% respondents highly disagree on long life span of the solar energy equipments. Maximum respondents i.e. 66.1% highly agree that solar energy equipments are safe while operating.

6. Researcher had tried to indentify major causes for buying solar energy equipment. Following are the causes / reasons on which researcher had focused and collected responses-

   a. Government schemes like loans, subsidies and rebate on tax.
   b. Influence of relatives and friends.
   c. Shorter payback period.
   d. Affordability.
   e. Suggestion by the architect.

The options were asked to respondents separately so that they could give separate thought on each reason deeply. It can be concluded from the data that –

   a. 31.8% respondents highly disagree and 26.8% respondents disagree (total 58.6%) that Government schemes such as – loans, subsidies and rebates are the reasons for their buying of solar energy equipment.
   b. 22.7% respondents highly agree and 19.2% respondents agree (total 41.9%) that their friend and relatives have solar energy equipment and that is the reason they also took decision for buying solar energy equipment.
   c. Responses are almost distributed equally over the range of agreeing and disagreeing. 16.6% respondents highly agree that they thought about this reason while buying and 17.7% respondents highly disagree for the same reason. The consumers of solar energy equipments are not thinking much about payback period of the solar energy equipments.
   d. In case of this study it is observed from the collected data and data
analysis that 26.8% respondents highly disagree and 27.1% respondents disagree (total 53.9%) that affordability was the reason for taking buying decision.

e. Suggestion by the Architect was the reason considered by the researcher due to the trend in the market. Now a days architect gives full and final design of a house to be constructed in which he recommends solar energy equipments as a part of contribution towards environment conservation and to get some rebate to his client from house tax. Maximum respondents i.e. 41.6% highly disagreed on this reason.

D. Responses of consumers

1. 36.7% respondents were highly dissatisfied and 22.1% respondents were somewhat dissatisfied (total 58.8%) regarding various finance scheme available for buying solar energy equipments. It generally observed that the procedure and time taken are the reasons for dissatisfaction.

2. There is mixed reaction regarding satisfaction about various subsidies available for the users of solar energy equipments.

3. Researcher had found out that 80% of the respondents were not satisfied with the tax benefits given to individual users.

4. Almost all manufacturers have same design except for colour combination. 17.5% respondents are highly satisfied and 24% are somewhat satisfied (total 41.5%) about the features of the product. This indicates that there is a need to work on design aspect to add more features and glamour to the solar energy equipments.

5. Price is one of the important criterions for purchase of any product. It is found that maximum i.e. 78.2% respondents were highly dissatisfied about the prices of the solar energy equipments. This is mainly due to high initial cost of the solar energy equipments.

6. 37.8% respondents were highly satisfied and 19.8% were somewhat satisfied about the performance of the product. Only 8.1% were highly dissatisfied and 3.2% were somewhat dissatisfied about the performance of the product.

7. After sales support from company / dealer is considered as important aspect by the researcher. 34.3% respondents were highly satisfied and 11.9% were
somewhat satisfied regarding after sales support given by the dealer. Only 8.3% respondents were highly dissatisfied about dealers’ after sales services.

8. Maximum respondents i.e. 67.4% were highly satisfied and only 6% respondents were highly dissatisfied regarding the easy utilisation of the solar energy equipments.

9. Maximum i.e. 62.2% respondents were highly satisfied about the maintenance cost which means they agree that it is low or it is within their considered limits. Only 0.6% respondents were highly dissatisfied about the maintenance cost required for solar energy equipments.

10. Maximum respondents i.e. 80.7% were highly dissatisfied regarding the space required for installation of solar energy equipments.

11. Durability of the product is one of the desired qualities. Solar energy equipments have very high durability; this is true as 66.9% respondents were highly satisfied about the long operating life of the solar energy equipments. Only 9.3% consumers are highly dissatisfied about durability of the solar energy equipments.

12. The solar energy equipments have very less aesthetic appeal, it does not add to looks of the site where it is installed. This is true as 89.8% respondents were highly dissatisfied regarding appeal of the solar energy equipments. Only 0.5% respondents were highly satisfied about the appeal of the products.

13. Despite of various causes of dissatisfaction maximum respondents i.e. 73.7% have intention to buy other solar energy equipment in future.

14. Maximum respondents i.e. 36.7% faced problem regarding glass breakage. This is generally a toughened glass placed over a collector panel. Solar energy equipments are generally installed on the terrace of the house or building and due care is not taken glass panel breaks. 24.4% respondents faced problem of scaling of salts in the water heating system. 21.4% respondents faced problem of air locking or no water at the tap problem. This happens when there is no water at the cold water storage tank and due to malfunction of NRV (non-return valve). 17/5% respondents had reported problems in the performance in monsoon season. In monsoon season availability of sunlight is poor which causes lower levels of performances
in case of solar energy equipments.

15. Majority of the respondents i.e. 59.6% had purchased solar products only on cash. 24.7% of the respondents purchased the solar products on loan with government subsidy. This shows that less number of consumers are availing government schemes which are designed for promoting sale of solar energy equipments.

E. Reasons for poor responses

1. Most of the non-user respondents (70.1%) are aware of the benefits of solar-equipment and 29.9 % of the respondents are not aware of the benefits of solar-equipment. It also seen that most of the respondents (92.2%) haven’t thought of installing solar system in future and few of the respondents representing 7.8% are having thought of installing solar system in future.

2. Researcher had divided respondents in two categories as those who were aware about the benefits of solar energy equipments and those who did not know the benefits of solar energy equipments. It inferred from the table no 6.53 that maximum of respondents i.e. 89.6% from those who are aware about the benefits of the solar equipments are not willing to buy solar systems in future this supports the fourth hypothesis “**Despite of knowing the benefits of solar equipments customers are not willing to buy solar equipments**”. Hence the hypothesis is accepted.

3. Researcher had tried to identify the reasons for not buying solar energy equipments. Following reasons were listed out after discussion with research guide, manufacturers and dealers –
   a. High initial price
   b. No space for installations
   c. Spoils the looks of house
   d. No scope for alterations
   e. Not suitable for my life style.

4. Most of the respondents (48.2%) not buying solar energy equipment’s because of its High initial price followed by 34.1% of the respondents not buying solar energy equipment’s because of not having installation space. Some of the respondents (7%) not buying solar energy equipment’s
because there is No scope for alterations and 5.7% of the respondents not buying solar energy equipment’s because it is spoils the looks of house. and few of the respondents (4.9) not buying solar energy equipment’s because it is not suitable for their life style.

5. Researcher had tried to find out the reasons for not availing the government subsidy or loan. Most of the respondents i.e. 42% had no reason and did not know about the loan or subsidy. 24% respondents did not have required documents hence not availing government subsidy or loan, 22% respondents were not availing government subsidy or loan because it needs lot of documentation and 12% respondents were not availing government subsidy or loan because it needs lot of time.

E. Marketing efforts of the organizations

1. Spreading awareness regarding use of solar energy equipments is the main objective in government’s promotion campaign. They are using mostly print media like newspapers and magazines. Indian government through MNRE conducts various energy conservation workshops and seminars. Information of these workshop and seminars is put on the official websites and few prominent personalities and manufacturers are informed. Other nodal agencies like MEDA for Maharashtra are asked to conduct programs at their level. Akshay Urja Divas is celebrated to spread awareness about nonconventional energy resources. Only 18% of the respondents came to know about the solar energy equipments through advertising from Government sources and few i.e. 5.8% respondents came to know through energy conservation programs. This clearly shows that marketing communications by government is not much effective.

2. Manufacturers / dealers / installers are using print media, demonstration through exhibitions. They use local newspaper advertising, information brochures and hoardings. Only 13.8% respondent came to know about the solar energy equipments through advertising from Manufacturers / dealers / installers.

G. Consumer buying behaviour:

1. The institutional customers’ will make purchases when requirement is justified. It is seen that 64% of the hostels and 71% hospitals are having 75% of occupancy of customers and patients respectively. Maximum
respondents have 75% occupancy in their respective units of hostel or hospitals.

2. Most of the industries i.e. 54% are using solar lighting systems followed by 30% of the industries are using solar water heater and 16% if the industries are using solar inverter. Most of the hostels i.e. 72% are using solar water heater followed by 16% of the hostels are using hybrid solar inverter and 12% of the Hostels are using solar lighting system. Most of the hospitals i.e. 69% are using solar water heaters followed by 21% hospital are using solar lighting system and 10% of hospital are using hybrid solar inverters. It can be concluded that maximum hostels and hospitals are using solar water heater for providing hot water to their occupants and maximum industries are using solar lighting systems.

3. 40% of industries got information about solar products by the advertisement given by manufacturer, 38% of hostels got information about solar products by the articles in newspapers and 42% of hospitals got information about solar products by the advertisement given by MEDA or government. This shows that different type of customers got information from different sources.

4. Most of the respondents i.e. 66% from industry, 82% from hostels and 78% from hospitals thought that the response given by the dealer or installer was delayed and uninformative. This shows that maximum institutional customers got delayed and uninformative response from the dealers. This is one of the most important thing for products where initial investment is high.

5. 66% of the respondents from industry, 54% of the respondents from hostels and 68% of the respondents from hospitals felt that the information given by marketing executive was not useful. It can be concluded that maximum of the respondents from all institutions did not get useful information from marketing executive.

6. 72% of the industrial respondents, 62% of the respondents in hostels and 59% of the respondents in hospitals knew the benefits of solar energy equipments. It is inferred that maximum of respondents from all categories know the benefits of the solar energy equipments.

7. More than 60% of the respondents from all types of institutional customers
agree on energy saving ability of the solar energy equipments. 36% industrial respondents strongly agreed about the energy saving ability of solar products followed by 30% of industrial respondents agreed about the energy saving ability of solar products. (total 66%). 38% respondents from hostels strongly agreed about the energy saving ability of solar products followed by 30% of respondents from hostels agreed about the energy saving ability of solar products (total 68%). 38% respondents from hospitals agreed about the energy saving ability of solar products followed by 31% of respondents from hospitals strongly agreed about the energy saving ability of solar products (total 69%).

8. Most of the (30%) industrial respondents strongly agreed and 30% of industrial respondents agreed that the solar products are cost effective. 42% respondents from hostels agreed and 34% of respondents from hostels strongly agreed that the solar products are cost effective. 47% respondents from hospitals agreed and 39% strongly agreed that the solar products are cost effective. Hence it can be concluded that total 60% of respondents from industry, 76% from hostels and 86% from hospitals strongly agree and agree that solar products are cost effective.

9. Most of the (24%) industrial respondents disagreed and 18% strongly disagreed on the durability of solar products. 22% industrial respondents agreed and 20% industrial respondents strongly agreed on the durability of solar products. Total of 42% agree and 42% disagree on the durability of solar products. No respondent from hostel and hospital strongly disagreed on the durability of solar products. Maximum of the respondents agree that solar product are durable.

10. Most of the (32%) industrial respondents strongly agreed and 32% agreed about the environmental friendly nature of solar products. Most of the (28%) respondents in hostels strongly agreed and 26% of respondents in hostels agreed about the environmental friendly nature of solar products and. Most of the (40%) respondents from hospitals agreed and 32% of respondents from hospitals strongly agreed about the environmental friendly nature of solar products. It clear that maximum respondents agree that solar energy equipments are environment friendly.
11. Most of the consumers agreed that the government is taking initiative for promoting use of solar energy equipments. 40% of the respondents from the industry strongly agreed and 32% agreed that the government is taking initiative for promoting use of solar energy equipments, 44% from the hostel strongly agreed and 24% of the respondents agreed that the government is taking initiative for promoting use of solar energy equipments and 49% from the hospital strongly and 32% of the respondents agreed that the government is taking initiative for promoting use of solar energy equipments. Hence, it can be concluded that government is taking initiative for promoting solar energy equipments.

12. 34% of the respondents from industry are highly satisfied, 20% of the respondents are satisfied towards the information provided by the manufacturer, 34% of the respondents from hostels are highly satisfied, 26% of the respondents are satisfied towards the information provided by the manufacturer and 39% of the respondents from hospitals are highly satisfied, 22% of the respondents are satisfied towards the information provided by the manufacturer. Hence it can be concluded that institutional consumers are satisfied by the information provided by the manufacturer.

H. Responses of consumers

1. 28% of the respondents from industry were highly satisfied, 20% of the respondents were satisfied towards the various finance schemes, 32% from hostels were highly satisfied, 28% of the respondents were satisfied towards the various finance schemes and 36% of the respondents from hospitals were highly satisfied, 34% of the respondents were satisfied towards the various finance schemes. Maximum respondents are satisfied towards various finance schemes.

2. 22% of the respondents from industry were highly satisfied and 24% were satisfied for subsidies and schemes on purchase of solar energy equipments, 18% of the respondents from hostels were highly satisfied and 32% of the respondents were satisfied for subsidies and schemes on purchase of solar energy equipments and 33% of the respondents from hospitals were highly satisfiedand30% of the respondents were satisfied for subsidies and schemes on purchase of solar energy equipments. Hence
3. 30% of the respondents from industry were dissatisfied and 44% of the respondents from industry were highly dissatisfied about the tax benefits available with the solar products, 22% of the respondents from hostels were dissatisfied and 38% of the respondents were highly dissatisfied about the tax benefits available with the solar products while purchasing and 27% of the respondents from hospitals were dissatisfied and 30% of the respondents were highly dissatisfied about the tax benefits available with the solar products. This concludes that maximum institutional respondents are dissatisfied about the tax benefits available with the solar products.

4. 74% of the respondents from industry, 62% of the respondents from hostels and 67% of the respondents from hospitals feel that the solar products were not having good appearance. This means that solar energy equipments are not having good looks, shape and colors.

5. 24% of respondents from industry are highly satisfied, 16% of respondents are satisfied, 30% of respondents from hostels are highly satisfied, 18% of respondents are satisfied and 30% of respondents from hospitals are highly satisfied, 15% of respondents are satisfied about the features available with the solar product. 20% of respondents are dissatisfied, and 28% of respondents are highly dissatisfied about the features available with the solar product. It can be concluded that maximum respondents from industry are dissatisfied about the features available with solar energy equipments and maximum respondents from hostels and hospitals are satisfied about the features available with solar energy equipments.

6. 22% of respondents from industry are dissatisfied, and 52% are highly dissatisfied28% of respondents from hostels are dissatisfied, and 40% are highly dissatisfied about the price of solar product and 31% of respondents from hospitals are dissatisfied, and 34% of respondents are highly dissatisfied about the price of solar product. This shows that maximum respondents from all the institutional categories are dissatisfied about the price of the solar energy equipments.
7. 30% of respondents from industry are dissatisfied, and 42% are highly dissatisfied about the cost of installation of solar product, 22% of respondents from hostels are dissatisfied, and 36% are highly dissatisfied about the cost of installation of solar product and 29% of respondents are hospitals dissatisfied, and 33% are highly dissatisfied about the cost of installation of solar product.

8. There are mix responses regarding the after sale support by the company/dealer. The percentage of satisfied and dissatisfied respondents is almost equal hence it is not possible to conclude about it. More detailed study in this regard will have to be carried out.

9. 50% of respondents from industry are highly satisfied, 20% of respondents are satisfied, 42% of respondents from hostels are highly satisfied, 28% of respondents are satisfied and 35% of respondents from hospitals are highly satisfied, 39% of respondents are satisfied about the maintenance cost. It is concluded that maximum institutional respondents are satisfied about the maintenance cost for solar energy equipments.

10. 32% of respondents from industry are dissatisfied, and 54% are highly dissatisfied towards the space for installation of solar products, 28% of respondents from hostels are dissatisfied, and 62% are highly dissatisfied towards the space for installation of solar products and 24% of respondents are dissatisfied, and 61% of respondents are highly dissatisfied towards the space for installation of solar products. Hence it can be concluded that maximum institutional respondents are dissatisfied about the space required for the installation of solar energy equipments.

11. 58% of the respondents from industry are not having intention to buy solar products in future, 52% of respondents are not having intention to buy solar products in future and 45% of respondents are not having intention to buy solar products in future. It can be concluded that 50 % of the total institutional respondents are not ready to buy solar energy equipments in future.

12. 55% of the respondents from industry, 69% of the respondents from hostels and 58% of the respondents from hospitals will not be purchasing solar products due to high initial price. 41% of the respondents from
industry, 23% respondents from hostels and 22% respondents from hospitals will not be purchasing solar products due to large space requirement for installation. Hence it can be concluded that maximum respondents will not be buying solar energy equipment in future because of high initial price. Space required for installation is the next reason for not buying.

13. 70% of the respondents from industry had problem of performance in monsoon. As the maximum respondents from industry have solar lighting system they have problem of performance in monsoon as availability of sunlight is very less in monsoon. 58% of the respondents from hostel and 44% respondents from hospitals had problem due to glass breakages. As maximum respondents from hostels and hospitals have solar water heating systems installed at the terrace and many times students in hostel or inpatients’ relatives in hospitals use terrace which results in breakage of glass of the collector panel. 38% of the respondents from hostel and 41% of the respondents from hospitals had problems due to scaling of salts. This is mostly due use of hard water from bore wells.

I. Consumer buying behaviour model for solar energy equipments

   Researcher had developed a structural model to graphically explain the relation between factors influencing for consumer buying behaviour for solar energy equipment. Model explains various external factors affecting the basic processes consisting of need recognition, information search and evaluation of alternatives. Then the black box, consisting of psychological factors gives output. The model is based on study conducted by the researcher. Researcher had tried to generalize model to increase the scope of applicability.

   There are three inputs major factors influencing the buying decision process, they are as follows:

   Marketing communication by manufacturer and dealers: Manufacturer and dealer communicate with consumers through their promotional activities. It is observed that mainly three ways are used advertisements, articles and brochures. These are basically giving the information about the benefits of the product and are published in Newspapers. During winter hoardings are also used to generate
awareness and reminding consumers about the need of hot water. Sometimes a road show or canopy displays are used to attract consumers.

**Figure No. 8.1**
*Consumer buying behaviour model for solar energy equipments*
**Marketing communication by Government agencies:** Government had set up agencies like ‘IREDA’ – Indian renewable Energy Developing Agency. IREDA is a Public Limited Government Company established in 1987, under the administrative control of Ministry of New and Renewable Energy (MNRE) and MEDA in Maharashtra state. These agencies communicate with consumers with the help of advertisement and various celebrations like Akshay Urja Divas August 20th and promote usages of renewable energy equipment’s by launching various schemes.

**Demographical Factors:** Various demographic factors also have impact on consumer decision process. Environmental aspects such as social and cultural factors affect on consumer decision making process.

**Need Evaluation and Justification:** Consumers of solar energy equipment’s evaluate the need based on various factors and justify their need with the help of factors shown in the diagram. The factors shown in the diagram from outer circle to inner part of the circle have importance in decreasing order. Energy saving being the highest weighed factor followed by safety, long life, shorter pay back and affordability respectively.

**Information Sources:** Consumers of solar energy equipment try to collect information through various sources. As per the diagram family and friends in the society contribute as the most sought information source followed by government and nodal agencies, advertisement by manufacturer and various publicity activities carries out by government agencies and manufacturer.

**Evaluation of Alternatives:** When Consumer decide to buy solar energy equipment’s the first thing which needs to be decided is the type of solar equipment for which consumer is thinking about e.g. solar water heater, solar lighting system, solar cooker, or solar inverter (hybrid), then the decision about price and make is taken after comparing the available information in the market.

**Consumer Evaluation (Black Box):** In the stage of consumer decision making process the factors which contribute are the psychological factors such as motivation, attitude, personality etc. This stage give the output which leads to final decision of the consumer which leads to stage where consumer takes and experience of the product and gathers additional information about the product functioning and features of the products. After this the final decision of buying/purchasing is taken by the consumer. The next stage after buying is a repeat
purchase and post purchase behavior which includes consumer’s perceptions and feedbacks to the manufacturer, dealers and the government and its nodal agencies for further corrective actions.

8.1 RECOMMENDATIONS

I - Recommendations for Individual consumers

1. “The initial investment in the solar systems is the key criteria while selecting the solar equipments.” Prices of solar energy equipment’s are high compared to the electrical energy based products e.g. a electrical water heater cost very low compared to solar water heater. Initial investment also includes installation cost. Hence researcher recommends following
   a. Manufacturing companies should focus on more research and development and develop new technique and technology which will bring down the production cost. It can be on the material cost reduction also. Value addition through new techniques in designing the solar equipment’s may improve efficiency and increase the value of the product.
   b. Individual consumer may be given exemption from the income tax on price of the solar energy equipment for buying solar products. This facility is provided to institutional consumers.
   c. Government should provide the subsidies for the purchase of solar energy equipments. This will reduce the initial investment for the consumers.
   d. All corporations while passing building plan may make it compulsory to make provisions for installing solar energy equipments especially solar water heater in future.
   e. Rebate in house tax / property tax for the houses with solar water heater installed may be given. Nashik Municipal Corporation has already implemented the same. This will motivate consumers to use solar energy and help energy conservation.

2. “The effective marketing communication of the organization has impact on buying behavior of the customers of solar equipment’s.” Though the study had rejected the hypothesis; following are the recommendations based on data collected:
   a. Manufacturers and installers can carry out promotional campaign with proper planning with set of objectives and may be done frequently in newspapers.
b. The Manufacturers and installers may carry out demonstrations at various locations with the help of live systems installed on small trucks. This will help people to experience the functioning of the system and will get proper information.

3. “The social status of the consumer has impact on buying behavior of the consumers of solar equipments.” The high income group has the dominance in the consumers of solar energy equipment’s. Following are the recommendations:
   a. To facilitate purchase of solar energy equipments by middle or low income group, the co-operative banks and private financial institutions may be authorized to provide loan at subsidized rate.
   b. The dealers or installers who offer instalments to the consumer should be given some financial incentive in terms of more discounts in dealer price.
      This will encourage dealers or installers to sell more.

4. The dealer, installers and all sales executives of all dealers should be trained compulsorily by the proper authorities. This will enable them to demonstrate the benefits of solar energy equipment’s to the consumers. This will reduce the percentage of consumers not knowing the proper use of solar energy equipments.

5. The manufacturer can use innovative designs for the hot water storage tanks; within the financial constrains to improve appeal of the product. Trendy colors can be used for outer cover instead of conventional colors.

6. The procedure for availing subsidized loan for purchasing may be made simple to encourage more and more consumers to approach for loan.

7. Nodal agency MEDA should increase activities to promote domestic use of solar energy equipments. Various competitions like essay, debate, poster making competition at college level on renewable energy sources, sponsoring various events and setting up stalls at various exhibitions may be increased.
      This will spread the awareness amongst the consumers.

8. Manufacturers must increase the channels of distributing solar products. Conventional type of distribution may not come up with increasing the level of penetration. So, the organization must introduce personal selling, online sales...etc.
9. Manufacturers must provide proper attention for solving the queries raised by the consumers. Due to that manufacturer must provide toll free number for solving the consumer queries and arrange a separate desk for helping consumer for solving their problems / queries.

II - Recommendations for Institutional consumers:
1. “The initial investment in the solar systems is the key criteria while selecting the solar equipments.” Basically institutional consumers invest the money with the intention of benefits to business they are into. The prices and long breakeven period forces them one step back towards accepting solar energy equipments. All recommendations are same as mentioned in Part-I, sub point 1.

2. “The effective marketing communication of the organization has impact on buying behavior of the customers of solar equipments.” MEDA and other central nodal agencies should reach maximum potential consumers through the properly designed approach.

3. “Despite of knowing the benefits of solar equipment’s customers are not willing to buy solar equipments.” Initial investment in purchasing and installing solar energy equipment is the major cause. More tangible benefits should be passed on to the institutes using solar energy equipment’s. Organization using solar energy equipments or renewable energy equipment’s may be given special status and preference in processes like sanction of a loan, extension of a license etc.

4. There should be special marketing executive for industrial marketing who has some knowledge in industrial energy utilization, energy saving techniques, various benefits that are extended to organizations using solar energy equipments.
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