4. RESEARCH METHODOLOGY

4.1 RESEARCH DESIGN
Research design is a framework or blueprint for conducting the marketing research project. It gives the procedure necessary for obtaining the information needed to structure or solve the marketing research problem. This study had adopted descriptive research design. With objectives clearly set for the study, it used a large sample size and survey method to gather information from respondents, thus descriptive research was adopted for the study. Under descriptive research design this study has used cross-sectional design method as the sample of respondents is drawn from the target population from Trichy and south Chennai market and information is obtained from this sample only once.

4.2 AREA OF STUDY
The study area for the research work is Trichy city area and South Chennai area in Chennai city.

4.3 DATA AND SOURCE OF DATA
The data for this study includes primary data and secondary data.

Primary Data: The primary data for this study is collected with a structured questionnaire using interview method.

Secondary Data: This study had collected secondary data from Journals, books, magazines, survey reports, authentic websites, etc

4.4 SAMPLING METHOD
Sampling Method adopted for this study is Purposive Sampling. The sample for this study is chosen in such a way that it should have purchasers and non-purchasers of natural personal care and home care products. The retailers of natural products are interviewed for their customer location and based on their information residences in and around 10 kilometres range of natural product retailer is chosen for the study, so that the respondents will include purchasers of natural personal care products along with non-purchasers to satisfy the research purpose.

4.5 SAMPLE SIZE
A total of 885 respondents had been surveyed for this study from 2 cities.

Chennai City: The sample size surveyed in South Chennai region of Chennai city is 440. The population of Chennai city as per census of 2011 was 46,81,087. Using the sample size
calculator at confidence level of 95%, confidence interval of 5 for the population of 46,81,087 the sample size to be surveyed that will adequately reflect the population is 384. The sample size surveyed for the study is 440 in south Chennai region. Thus the sample size will reflect the population in the region.

Trichy city: According to the Government of India 2011 census Trichy city population was 8,46,915. Using the sample size calculator sample size is calculated with 95% confidence level and confidence interval of 5. The sample size arrived at 384. For this survey a total of 445 respondents including purchasers and non-purchasers were surveyed in Trichy city. Thus the sample size adequately reflects the population of Trichy city.

Formula used in sample size calculation in survey system:

Sample size for Finite population:
\[ \text{Sample size (ss)} = \frac{Z^2 \times p \times (1-p) \times \frac{1}{\text{pop}^2}}{C^2} \]

X=Z value(1.96 for 95% confidence level)
p=percentage picking the choice expressed as decimal(.5 for sample size needed)
c=confidence interval expressed as decimal(.05)
Chennai population=4681087 Trichy population=846915

For Finite population \[ \text{ss}= 384.16 \]

Chennai Sample Size=384 Trichy Sample Size=384
Chennai Sample Size surveyed=440, Trichy Sample Size surveyed=445
4.5A RESPONDENTS FOR THE STUDY

The respondents for the study are classified into 2 categories Purchasers and Non-purchasers.

**Purchasers:** These are respondents who purchased at least one of the natural products mentioned in product category *(see Table 4.8.1)* for the study.

**Non-Purchasers:** These are the respondents who do not buy any of the existing natural products mentioned above. Their buying intention if present product used was introduced as eco-friendly variant (line extension) was assessed in this study.

Out of the 885 samples surveyed the total number of purchasers for the study is 484 and the total number of non-purchaser is 401.

| TABLE 4.5.1 PURCHASER /NON-PURCHASER NUMBERS IN TRICHY-CHENNAI CITY |
|-----------------|-----------------|----------------|
|                  | Trichy | Chennai | Percentage |
| Purchaser       | 180    | 304     | 484         | 54.7% |
| Non-purchaser   | 265    | 136     | 401         | 45.3% |
| Percentage      | 50.3%  | 49.7%   |             |

**TABLE 4.5.1A PURCHASER/NON-PURCHASER PERCENTAGE**

<table>
<thead>
<tr>
<th></th>
<th>Trichy</th>
<th>Chennai</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchaser</td>
<td>40.4%</td>
<td>69.1%</td>
</tr>
<tr>
<td>Non-purchaser</td>
<td>59.6%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.5.1/4.5.1A shows that Trichy city has maximum number of non-purchasers of natural products 59.6 % and minimum number of purchasers of natural products that is 40.4%, Chennai city has maximum number of purchasers 69.1% and minimum number of non-purchasers 30.9 %. This is because Chennai region has more natural product retailers when compared to Trichy city at present.

4.6 CONSTRUCTION OF TOOL AND PILOT STUDY:

**Questionnaire:** The main study questionnaire for this research has 2 components namely purchaser’s questions and non-purchaser’s questions. In the beginning of the questionnaire, 14 questions comprising personal questions and awareness questions are common for all respondents. Based on reply for 14th question respondents are classified as purchasers and non-purchasers of personal care and home care products. Separate questions for purchasers and non-purchasers were given to the respondents to elicit information to fulfil the objectives.
of the study. Purchaser component has 14 questions and Non-purchaser component has 13 questions.

PILOT STUDY

Pilot study was conducted with a sample size of 75. The questionnaire was developed based on the objectives of the study and administered within 10km radius where natural product retailer was located. This questionnaire was tested for reliability. Based on the findings of the pilot study the questionnaire was further refined. Thus the final questionnaire was arrived based on the objectives and field survey of the pilot study so that it would accurately gather the required information.

4.7 RELIABILITY OF QUESTIONNAIRE:

Reliability: of a measure is an indication of the stability and consistency with which the instrument measures the concept and helps to assess the goodness of a measure.

Inter-item consistency Reliability: The most popular test of inter-item consistency reliability is the Cronbach’s coefficient alpha. This test is used for multipoint-scaled items. The higher the coefficient the better the measuring instrument. Crobach’s alpha is used for this study to test Inter-item consistency:

The Purchasers questionnaire has used Linkert scale items in the following questions and was tested using Cronbach’s alpha. The scales are also tested for normality

TABLE 4.7.1 RELIABILITY FOR PURCHASER’S SCALES

<table>
<thead>
<tr>
<th>Q.No</th>
<th>SCALE PURPOSE</th>
<th>Cronbach’s Alpha Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Basis for respondent’s belief that natural product will perform well</td>
<td>0.788</td>
<td>The Cronbach’s value is 0.788. The Scale is not normally distributed as One-Sample Kolmogorov-Smirnov Test proved that the test value is significant(less than .05).</td>
</tr>
</tbody>
</table>
The non- Purchasers questionnaire has used Linkert scale item in the following questions and was tested using Cronbach’s Alpha and was also tested for normality

**TABLE 4.7.1A RELIABILITY FOR NON-PURCHASER SCALES**

<table>
<thead>
<tr>
<th>Q.No</th>
<th>SCALE PURPOSE</th>
<th>Cronbach’s Alpha Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Respondents’ expectation in eco-friendly variant of present product</td>
<td>0.6722</td>
<td>The Cronbach’s value is 0.6722. In this scale 21h &amp; 21k are removed to get the value of 0.6722. The Scale is not normally distributed as One-Sample Kolmogorov-Smirnov Test proved that test value is significant(less than .05).</td>
</tr>
<tr>
<td>23</td>
<td>Price expectation in an eco-friendly variant</td>
<td>0.6637</td>
<td>The Cronbach’s value is 0.6637. The Scale is not normally distributed as One-Sample Kolmogorov-Smirnov Test proved that the test value is significant(less than .05).</td>
</tr>
</tbody>
</table>
4.8 PRODUCT CATEGORY OF THE STUDY

TABLE 4.8.1 PRODUCT CATEGORY FOR THE STUDY

<table>
<thead>
<tr>
<th>SNO</th>
<th>PRODUCT CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural Personal Care Product category</td>
</tr>
<tr>
<td>1</td>
<td>Natural bath soap</td>
</tr>
<tr>
<td>2</td>
<td>Natural Shampoo</td>
</tr>
<tr>
<td>3</td>
<td>Natural toothpaste</td>
</tr>
<tr>
<td>4</td>
<td>Natural face wash</td>
</tr>
<tr>
<td>5</td>
<td>Natural Detergent</td>
</tr>
<tr>
<td>6</td>
<td>Natural Surface cleaner</td>
</tr>
</tbody>
</table>

Natural Home Care Product category

Thus mentioning of natural products in the entire study means natural personal care products and home care products mentioned above. The term ‘green’ or ‘natural’ or ‘herbal’ before personal care, home care products imply same meaning it is ‘eco-friendly’ personal care and home care product.

‘Natural bath soap’ mentioned in natural personal care product category means ‘Natural toilet soap’. The use of term ‘bath soap’ in the entire study means ‘toilet soap’.

4.9 PERIOD OF STUDY

The survey for research for collecting primary data was carried out from January 2012 to January 2013 in Chennai and Trichy cities.

4.10 STATISTICAL TOOLS USED FOR THE STUDY

1. Chi-square test
2. Correlation
3. Multiple Regression
4. Kruskal Wallis test
5. Friedman Test
6. Discriminant analysis
7. Arithmetic mean
8. Radar Chart
1. **Chi-square test**: This test can be used as test of independence, test of homogeneity and test of goodness of fit. As test of independence it is used to find out the relationship between two variables. In this research work chi-square is used as a test of independence to find out relationship between two variables such as type of gender and marketing mix reasons that motivate purchasers to buy natural product and similar relationships.

2. **Correlation**: Karl Pearson’s Coefficient of Correlation statistical tool is used to find out the strength of association between two metric variables i.e. to what extent two variables are related and to what extent variations in one variable implies corresponding variation in the other. The value of correlation will lie between $-1.0$ and $1.0$.

3. **Regression**: Regression analysis is a powerful and flexible procedure for analyzing associative relationship between metric dependent variable and one or more independent variable. It will determine whether the independent variables explain a significant variation in the dependent variable and whether a relationship exists. It determines the strength of relationship by explaining how much of variation in the dependent variable can be explained by independent variable. It will also determine structure or form of relationship and predict the values of the dependent variable.

4. **Kruskal Wallis test**: It is a non-parametric test for multiple independent samples that are useful for determining whether or not values of particular variable differ between two or more groups. This is especially true when conditions for ANOVA are not met. Kruskal Wallis test is one-way analysis of variance by ranks. It tests the null hypothesis that multiple independent samples come from same population. The population need not be normally distributed like Anova. If the K populations are same, the group should be similar in terms of ranks within each group. The rank sum is calculated for each group. From these the Kruskal-Wallis H statistic, which has a chi-square distribution, is computed.

5. **Friedman Test**: It is a non-parametric test for testing the difference between several related samples. This test is non-parametric equivalent for two-way analysis of variance with one observation per cell. It tests the hypothesis that k related variables
came from the same population. For each case k related variables are ranked from 1 to K. The test statistic is based on this rank. This test is used in this research work to rank various product categories by non-purchasers for their buying intention of eco-friendly variant of present products. The test gives high rank to low rank for various product categories based on buying intention.

6. **Discriminant Analysis**: It is a technique for analyzing data when dependent variable is categorical and the independent variable is measured in interval scales. This technique develops discriminant functions which will best discriminate between the categories of dependent variable (groups). It examines whether significant difference exists among the groups in terms of independent variables. The tool further determines which independent variables contribute to most of intergroup differences and classify the cases to one of the groups based on values of Independent variables.

7. **Arithmetic Mean**: It is considered as arithmetic average, it is the sum divided by number of cases. In this research work mean is used to find average scores for Linkert scales used in the study. Linkert scales have a range of 1-5. If the mean of the scale calculated is near the average of 3.0 the aspect measured will be accepted positively by the respondents and it holds true.

8. **Radar chart**: It is also called as spider chart or star chart based on its appearance. It plots the values of each category along separate axis, it starts in the centre of the chart and ends at the outer ring. In this study radar chart with markers for individual data point is used. Radar displays the changes in values relative to a centre point. It is used to show the marketing reasons for purchase of natural products.

4.11 RESEARCH GAPS

Newman, Karen A (2006) shares the view of Darrin-Duber-Smith, president of green marketing that one of the challenges of marketing natural personal care industry is the term ‘natural’ had never been adequately defined making it impossible for the industry to draft a common standard and certification process for the purpose of enforcement and consumer
understanding. Nancy Jeffries (2007) found that the term ‘natural’ is ambiguous, natural product cannot be defined till natural ingredients are defined, organic is mostly defined but the term ‘organic’ rarely crosses in personal care products. These reviews imply because of information through advertisements knowledge regarding environmental issues had increased among the public, but knowledge level regarding natural products among consumers is to be assessed as term ‘natural’ is still ambiguous for industry itself. After failed methods of green marketing there is reshaping of marketing thoughts product and promotion wise these leads to research gap to understand the knowledge level and performance level of natural products available in the market among purchasers. This includes awareness of natural product in the market, method of identification, performance level of natural products and environmental concern have influence on awareness of natural products.

Laroche, M., Bergeron, J. and Barbaro-Forleo, G. (2001) studied about willingness to pay(WTP) and identified that a segment of consumers is willing to pay premium for green products. Female is highly environmentally concerned when compared to male. There is large group of undecided consumers who provide opportunity for green marketers as they should be converted into purchasers by adopting suitable marketing strategy. Clare D’ Souza, Mehdi Taghian and Rajiv Khosla (2007) in their study found that green marketers should find ways to motivate non-purchasers of green products and demographic segmentation of purchasers is needed to effectively target this segment. Durmaz Yakup and Zenginsevill(2011) in their research paper find that green marketing ensures sustained long-term growth with profitability for green marketers and helps in accessing new markets enjoying competitive advantage and most employees feel proud and responsible to be working for environmentally responsible company. These reviews imply that there is a larger non-purchasing segment of natural products in market. Market opportunity is there for green marketers if they identify marketing strategy to convert non-purchasers of natural products into purchasers. The strategy may be attracting non-purchasers by introducing a new product or identify ways to make them purchase the existing natural products with modification in marketing mix.

Johri, Lalit M; Kanokthip Sahasakmontri(1998) based on study of Thailand consumers found green aspect expected by consumers in natural personal care products and reason for purchase of natural personal care products. Reputed manufacturing brands leads to purchase of natural personal care products. Ken Peattie(2001) using his product perception matrix focused on why green products should be purchased and found out the importance of
increasing the green product purchasers’ confidence by reducing the compromises for consuming green products. Sanjay K. Jain & Gurmeet Kaur (2004) based on the study of India green market found that Indian consumers are purchasing green products mainly for health reasons than environmental concern and they also found that research should be done to find what motivates the consumers to go for green products and what inhibits them to do so. Proper segmentation, targeting and positioning should be developed for green products in India. Horne (2009) raised the question surrounding green marketing (i) what is getting consumers interested (ii) what is getting them to act on these interests which needs to be found out?. All the studies done abroad and one in India leads to wider gap what is actual purchase reason for natural products?. Majority of studies reveal that natural products are purchased not only for environmental reasons but also for other reasons. This area need to be researched for throwing light to green marketers.

Kaman Lee (2008) view based on study of Hongkong adolescent consumers is Green marketing found social influence as major predictor of adolescent green purchasing behaviour. Green marketers should use word of mouth advertising for promoting green products by adolescent to their friends. Josephine Pickett-Baker, Ritsuko Ozaki (2008) found that consumers who are environmentally concerned are more willing to buy from manufacturers whose product and process is environment-friendly as this enhances the desired self concept results in feel good factor for consumers. But an important qualification is green products should function as equally as non-green products and evade quality/cost tradeoffs. Erica Valor, C. (2008) in his study found consumers are willing to pay premium for green products if the products are of high quality. Katherine T. Smith (2010) focuses on Millennial consumers or Young generation of consumers. ‘Eco-friendly’, ‘recycled’ and ‘green’ should be the words used for communicating environmentally friendly products. ‘Natural’ and ‘Unprocessed’, these two words were not effective for communication. Nancy E. Furlow (March 2010) says that green washing consumers may become confused about which products actually do help the environment. Green washing reduces competitive edge that companies have because of manufacturing green products. Environmental claims used in products must be honest and should reflect organization mission. Sourabh Bhattacharya (2011) The research work finds that Indian consumers are indecisive whether to spend more on green products, consumers are not sure about quality of green products. Indian consumers are highly suspicious about real greenness and could not trust green
products fully. These studies highlight the green washing, eco-labelling and its role, price of natural products and consumer willingness to pay, belief in natural products, suitable name to call natural products and lead to research gap in marketing mix area for particular product category. These raise research questions (i) What will be appropriate method to promote natural products evading green washing? (ii) What is consumer willingness to pay (WTP)? (iii) Do eco-labelling enhances trust and leads to purchase of natural products? (iv) Name preferred by non-purchasing segment to become easily aware and buy natural products? (v) Consumer belief in natural products?. Addressing these questions will result in arriving at a suitable marketing strategy and aid policy formulation for green marketing for a particular market area.

Majority of green marketing research studies are done in abroad and a few studies are done in India. Research study focused on particular product category such as personal care and home care products in particular geographic location is done by very few researchers in India, thus application of the above research gaps and finding a solution will provide much needed clarity for all stakeholders such as government, green marketers, non-governmental organization and the public.

4.12 RESEARCH OBJECTIVES FOR STUDY AND HYPOTHESIS

Objective 1: To assess the knowledge level and performance level of natural products among purchasers.

Hypothesis 1: There is no significant relationship between purchaser’s willingness to contribute to reduce global warming and awareness of various natural products.

Objective 2:

2A. To determine the buying intention of natural products by non-purchasers if eco-friendly variant of present product is introduced.

2B. To determine the buying intention of non-purchasers towards existing natural products.

Objective 3: To assess the reasons behind purchase of natural products by purchasers and reasons behind positive buying intention by non-purchasers if eco-friendly variant of present products is introduced.
PURCHASERS

**Hypothesis 2**: There is no significant relationship between satisfaction of doing good to society and purchase of various natural products.

**Hypothesis 3**: There is no significant relationship between satisfaction of developing good health and purchase of various natural products.

NON-PURCHASERS

**Hypothesis 4**: There is no significant relationship between non-purchaser’s age and purchase reason of eco-friendly variant of present products.

**Hypothesis 5**: There is no significant relationship between non-purchaser’s gender and purchase reason of eco-friendly variant of present products.

**Hypothesis 6**: There is no significant relationship between non-purchaser’s income and purchase reason of eco-friendly variant of present products.

**Objective 4**: To formulate marketing strategies and suggest policy measures to augment consumption of natural products among purchasers and non-purchasers for adopting green marketing based on the study.