Chapter 3: Research Methodology

3.1 Overview:

The current chapter explains in detail the Research Design and Methodology used for the thesis. The approach for the study is a blend of majorly quantitative and minor qualitative approaches. The research is mainly Descriptive type of Research attempting to describe data and characteristics about population or phenomenon. Thus the concepts and models are preformed and just studied in detail for the purpose of study to find what will serve purpose of a research in consideration. The basis for the process is standard Research design and methodology recommended for the research in consideration. Implications are drawn on the basis of interpretations of the both quantitative and qualitative type of data.

The chapter systematically covers first the Nature of Research and Variables being studied. Then it provides the list of methods being used for current research. The chapter in detail covers a discussion on identification of and selection of sample followed by the rationale behind doing the same. The chapter also throws light upon the Research Instrument design and justification for the same. The systematic procedures conducted for testing reliability, validity and practicality of the Instrument have been discussed. The best practices incorporated to avoid errors and bias to the possible extent in developing the instrument, data collection strategies, statistical procedures, data analysis and limitations of these have been discussed.

3.2 Nature of Research and Variables Studied:

As mentioned before, this is descriptive type of Research attempting to describe the complex eco-conscious behavior phenomena and characteristics of green consumers. The research is an intersect of various disciplines viz., Marketing, Environmental
A study of Customers’ Eco-conscious attitude and behavior in response to Green Marketing with special reference to Nashik City

Studies, and Psychology. This intersection enriches the beauty of research by helping it to better explain the real life situations and circumstances.

**Figure 3.1 Inter-disciplinary approach for Study**

![Inter-disciplinary approach for Study](Source: Own Creation)

The study explores correlation as well as causation amongst the variables which affect Green Consumer behavior, green marketing influence being a novelty.

**3.2.1 Variables Studied:**

The hypothetical model studies the direct and mediating influences of various exogenous variables. Separate hypothetical models have been drawn for studying the antecedents and inter-correlation among attitudinal and behavioral factors.

**3.2.1.1 Exogenous Variables:**

Exogenous variables of this study are the various demographic and psychological and attitudinal factors which determine the eco-consciousness and the green behavior. The basic exogenous variables are the demographic and psychographic factors. Thus the equation of Eco-consciousness as a function of these factors can be stated as follows:

\[
\text{Eco-consciousness} = f \{\text{Demographic Factors (Age, Gender, Occupation, Education), Psychographic Factors (Personality, Collectivism)}\} 
\]
In turn in the Eco-consciousness becomes the exogenous variable along with other psychological and attitudinal measures which determine the Green behavior and Green purchase behavior as per the model B where the equation of relationship can be represented as follows:

Green behavior = f \{\text{Eco-consciousness, Perceived Customer Effectiveness, Green Purchase Attitude, Green Purchase Intention}\}

Green Purchase behavior = f \{\text{Eco-consciousness, Perceived Customer Effectiveness, Green Purchase Attitude, Green Purchase Intention}\}

As per the Model D the Green Marketing efforts become the exogenous variables and determine the Green behavior. The equation is as follows:

Green behavior = f \{\text{Green Marketing Efforts}\}

3.2.1.2 Endogenous Variables:

The study includes mainly two endogenous variables. The aim of the research to find its determinants so as to help better understand the phenomena. The endogenous variables are green behavior and green purchase behavior. The above mentioned equations explain the same.

3.2.1.3 Extraneous Variables:

None of the research can be complete without mentioning the extraneous variables due to the complexity and dynamic nature of business and real world. New constraints and possibilities are thrown upon as the system grows in terms of the number variables. So fixing the boundary of research becomes the very need of research. In the current study all the demographic, psychological and attitudinal factors other than above mentioned exogenous factors become extraneous variables. So the circumstances and situational factors can be termed as extraneous variables. Recession is an example of the extraneous variable, which does affect the green consumer behavior but is beyond the scope of this study.

3.3 Research Methods

The Research designs and methods for such studies demand flexibility in its approach to provide opportunity to the researcher to study all the possible aspects of problem
under consideration. Concurrent mixed analysis of research combining Quantitative and Qualitative approaches for the purpose of achieving complementarities and completeness for the study in concern (Happ MB, Dabbs AD, Tate J, Hricik A, Erlen J 2006). The current research has systematically covered the very early stage of Research design which is the survey of concerning literature mentioned in the chapter number 2. The survey of concerned literature served its purpose of a direct and effective method for formulating the research problem and developing hypotheses. Hypotheses stated by earlier researchers have been reviewed for their relevance in the Indian context. It was also considered whether the already stated hypotheses suggest new hypotheses.

Generally Descriptive research uses following methods in the research design for the purpose of data collection:

1. Survey Methods

2. Observation Methods.

Due to the convenience and the time involved in the process and other limitations, survey researches have been the most popular especially in the area of Psychological researches. The survey research also gives the researcher an advantage of getting insights into the thought process of the respondent which is not possible in the observation method. Apart from the major study, considering the current importance Green architecture and food products have also been studied. To have a deeper insight into these aspects, Case study method has been put to use. The survey used the two-stage stratified random sampling method to help draw random sample representative of the unit under study. Systematic questioning of respondents has been carried out but flexibility is ensured to see that they are able to share on the matters.
3.4 Discussion on Research Design

Figure 3.2 Process of Research Design

A Study of customers’ Eco-conscious attitude and behavior in response to Green Marketing with special reference to Nashik City

Research Questions → Literature Review → Hypotheses Formulation → Research Methodology → Data Collection → Statistical analysis & Testing of hypotheses → Results, Findings, Implications → Conclusion

(Source: Own Creation)

The Research design typically follows the process of descriptive type of research for hypothesis formulation and building of the model. After the initial brainstorming on the issue of Research questions has been developed, an extensive literature review has been carried (ref. Chapter 2). Based on the Meta analysis the structural research
models and working hypotheses were developed. Meta analysis is the principal method adopted to help contrast and combine the results from earlier studies for the purpose of identifying the patterns of study, disagreements if any even other interesting relationships emerging out of it (Greenland, O’Rourke, 2008).

A single method of analysis did not suit the purpose of study. This led to a combination of methods for the analysis. Majorly the hypotheses testing were done with the help of multivariate analysis carried out using Structural Equation Modeling on the basis of Partial Least Square Method. Due to the nature of multi-co linearity, a situation where X values are varying simultaneously a standard regression would fail and hence PLSM is the solution to the problem. As discussed earlier the variables have been grouped into Exogenous, endogenous and extraneous categories. Being Psychological research, for all the latent variables (Psychological, attitudinal, behavioral factors) which cannot be measured directly indicators have been developed on the basis of meta analysis. Other analytical methods like one sample test and chi square test have also been used for the purpose of hypotheses testing which could have been not analyzed using PLSM.

On the basis of results from hypotheses testing, answers to the proposed research problems shall be discussed, findings shall be listed out, interpretations shall be drawn naturally, and discussion of implications shall lead to the development of new model for the study of Green attitude and behavior in relation to Indian context in the last phase of the research.

### 3.5 Identification of Sample and Rationale for its selection:

The studies in the area Green Consumer behavior have majorly researched the individuals but in the Indian context this is not appropriate. The Indian culture differently stands out the countercultures in terms of the Family system. The decision making processes in Indian context involves the family members and not an individual. The sampling unit thus selected was Households and not individuals. Nashik is located in North-west of Maharashtra. The city lies in Tier II according to the Sixth central pay commission 2008 (Wikipedia 2013). According to Census study in 2001, Nashik district population was 61,07,187. The urban population is 42.53% amounting to 25,97,353. Since the sampling unit is household, the assumption is that there are 4 family members on an average in a family. Thus Nashik has approximately...
6, 94,338 households. Out of the total of approximately these 7 lacks household, sample size was determined with the help of a table used widely in researches.

The table for determining random sample size has been based on statistical calculations and experimentation to arrive at figures which are truly the representative sample and avoiding the useless effort of interviewing the larger samples when not needed. The inferences are drawn at 95% level of confidence. The column featured as N is the total population and S denotes the calculated representative sample.

**Table 3.1 Table determining Random Sample size for a given population**

<table>
<thead>
<tr>
<th>Population</th>
<th>Sample</th>
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<th>S</th>
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(Source: Universal Accreditation board 2003)

It is surprising to know that opinion surveys of entire United States usually includes a sample of just 1500 to 2000 individuals, considering the differences among various representative groups. In a mid-sized state with population of 30 lacks, representative
sample consists of 500-600 individuals considering breakouts. Thus for tier II city Nashik with approximately 7 lacks of households, a representative random sample of 500 households is considered statistically sufficient and complete. The rationale conclusion draws upon the fact of a need to fix sample size on statistical basis and more emphasis on quality methodologies of study would lead to less bias in the results making them precise, rather than the use of larger samples with imprecise results (Schulz KF, Grimes DA 2005).

Nashik consists of various geo clusters and 20 major geo-clusters which are socio-demographically homogenous within and heterogeneous compared to the counterparts were identified.

The sample of 500 households was randomly drawn using two-stage stratified random sampling method used by Census study nationally. After dividing Nashik into 20 major geo-clusters listed in appendices, standard maps of these geo-clusters were adopted from research agency. Each geo-cluster in turn consisted of several blocks, each on an average consisting of 100 households. In the first stage of stratified random sampling, blocks were selected using random number tables as representative block in each of the 20 geo clusters.

Each random selected block was schedule listed using a schedule which consisted of Socio-demographic information about the household including per capita expenditure. It also asked two subject related questions of whether respondents feel Environmental degradation is a problem, and whether they are aware about green products. North West rule was used to list households in a zigzag manner to ensure every household was covered in the schedule listed.

Depending upon the per capita expenditure of the households, they were classified into two strata’s. Strata I included households with per capita expenditure above Rs. 2850 and strata II with per capita expenditure from Rs. 850-2850 taking reference of Census study. A sample of 25 respondents was drawn proportionately from both the strata’s of schedule listed block using random number tables. During the schedule listing the household representatives were asked oral permission to be contacted again in case of selection for the purpose of interviewing.

3.6 The Research Instrument

For the purpose of major quantitative study a structured research instrument was used. A self administered structured questionnaire is a systematic and standardized method of collecting data. It lays emphasis not just on the measurement of the data but also
effective conversion of qualitative data into the quantitative data. Data derived with the help of such instrument is equally useful for simple counting, statistical description and inferential analysis too. The instrument is moreover simple and convenient for use in such kind of research. The questionnaire gives the insight into the thought process of respondents in relation to the research issues involved in current study. The questionnaire helps in retrieving answers to the research questions and the data helps further in testing hypotheses. A pilot study was carried on the initial sample of 100 respondents from 4 geo-clusters of Nashik. The research instrument was modified to include more relevant questions and eliminate redundancy. While finalizing the questionnaire following factors were taken into consideration:

1. Are the respondents competent enough to provide the necessary information?

2. Do the chosen item truly measure the corresponding dimension?

3. Will all respondents belonging to different socio-demographic backgrounds be able to answer the questions from the questionnaire?

The metric used for the purpose of current study is included in Appendix-III and the detailed process used for the development is discussed in the sections to follow.

For the purpose study in the area of green architecture and Green food products a semi-structured interview method was used. It was not highly structured as is the case with above mentioned questionnaire consisting of close-ended questions. It provides enough flexibility to respondents to express their ideas and opinions at the same time it does not give license to talk freely about whatever comes in their mind. The semi-structured instrument is offers topics and questions which are carefully drafted to trigger the interviewee’s ideas and opinions about the topics of interest and avoids leading to only pre-conceived choices. The method however relies heavily upon interviewer’s expertise to probe the respondent further to get deeper information on the matter.

In both the methods two fundamental principles were followed to make the process more effective:
1. Avoiding the leading of the interview or imposing meaning or answers on the respondents.

2. Creating a relaxed atmosphere by establishing a rapport. This enables the respondents to express freely the actual feeling and understanding of the matter as well as the shortcomings in regards to the matter.

3. Development of Eco-conscious attitude and behavior Questionnaire and Format of Case studies.

The integration of knowledge with regard to the philosophies, theories, principles and interventions of Consumer behavior related to Green products has yielded eight dimensions to be studied in this regard, they are as follows:

1. Personality Variable
2. Collectivism
3. Eco-consciousness
4. Perceived Customer Effectiveness (PCE)
5. Green purchase attitude (GPA)
6. Green purchase intention (GPI)
7. Green behavior (GB)
8. Green purchase behavior (GPB)

Apart from above dimensions data was collected regarding the socio-demographic background, criterion’s considered for product selection, beliefs with regard to green products and green consumers.

3.6.1 Personality Variable:

Though an important psychographic factor it has been very rarely studied in relation to green consumer behavior. Fraj et.al 2006 have attempted to measure this multi faceted complex but meaningful factor in relation to green behavior. The big five factor structure scale has been adopted for the purpose of current thesis. A bipolar 10 point scale was used for these factors viz., extroversion, agreeableness,
conscientiousness, emotional stability, and openness to experience. The above mentioned factors are the indicators of the latent personality variable.

3.6.2 Collectivism:

It is another psychological variable extensively studied in relation to green consumer behavior. It has been recognized as very important factor as compared to demographic counterparts in differentiating the green and non green consumer (Chan 2001; McCarty and Shrum 1994; Kim & Choi 2005). McCarty & Shrum (1994) designed a scale of collectivism which is popularly used mainly because of higher reliability and validity. It includes the indicators of working hard in group goals without expecting results, co-operation as a group participant, and readily helping others.

3.6.3 Eco-consciousness:

Eco-consciousness is widely used and popular measure in relation to green behavior and found to be positively related (Allen and Ferrand 1999; Arbuthnot 1977; Arbuthnot and Lingg 1975; Bratt 1999; Ellen 1994; Ellen et al., 1991; Gamba and Oskamp 1994; Gray 1985; Shrum et al. 1995, Jain & Kaur 2004). Originally the Dunlap and Van Lerie developed the New environmental paradigm scale in 1978 which has been widely used to measure pro-environmental orientation or eco-consciousness since then. The article published in 2000 mentions about a NEP scale devised as an improved version being better internally consistent. The revised NEP scale has been used for the current study to measure eco-consciousness, which includes 15 items as indicators of whether respondents feel environment is important for them (Dunlap et.al. 2000)

3.6.4 Perceived customer effectiveness:

PCE is again positively related with green behavior (Antil 1978; Ellen et al., 1991; Berger & Corbin 1992; Roberts 1996; Minton & Rose, 1997; Majláth 2010). Ellen et.al (1991) originally devised a scale for Perceived Customer Effectiveness which has been included for the purpose of current study.

3.6.5 Green purchase attitude:

In recent studies the focus has shifted to study of specific attitude and behavior viz., Green purchase attitude and behavior (Chan 2001; Kim & Choi 2005; Leonidou, Leonidou & Kvasova 2010; Tilikidou 2007; Mostafa 2007; Tan & Lau 2011). The
Taylor & Todd (1995) scale for Green Purchase Attitude has been used widely for the purpose of measuring this latent variable. The scale includes indicators measuring in turn the affect/liking for green product, favorability of green version, guilt in case of non green purchase.

3.6.6 Green purchase intention:

Though studied by many researchers, they are divided on the matter of the results of the study (Chan 2001; Kim & Choi 2005; Mostafa 2007). Taylor & Todd (1995) scale for Green Purchase Intention has been widely used for the purpose which includes the indicators measuring intention purchase less polluting products, switching brands for the ecological reasons, switching to green version of a product.

3.6.7 Green behavior:

The researches have separately measured the general green behavior ((Lee et al. 1995; Oskamp et al. 1991; Pickett et al. 1993; Tracy and Oskamp 1984). The green behavior scales were found to be insufficient for the purpose of current study. In order to measure actual green behavior a scale was adopted from Greendex survey which is a comprehensive measure of green behavior used worldwide across 17 countries (Greendex 2012). Green Behavior was measured in three major areas of Food & Beverages, Transportation, & Residence. In the area of food and beverage the indicators attempted to measure the frequency of eating non-vegetarian food, bottled water, soft drinks, imported food, organic food, and food grown by oneself. In the area of transportation, the indicators attempted to measure the frequency of travel alone by car and SUV, on a two wheeler, public transportation, bicycle. In the area of residence, indicators attempted to measure greenness of site, water management, ventilation & other indoor factors, waste management, alternative energy sources used, and vegetables grown in the house.

3.6.8 Green purchase behavior:

In recent studies green purchase behavior has been studied in relation to green purchase attitude (Chan 2001; Kim & Choi 2005; Leonidou, Leonidou & Kvasova 2010; Tilikidou 2007; Mostafa 2007; Tan & Lau 2011). The popularly used scale was found insufficient for the purpose of current study. A scale was again adopted from the Greendex survey and covered two categories of green purchases viz., High
involvement and Low involvement products. A list of 15 commonly possessed high involvement products was derived and the greenness was measured out of 5 on the basis of factors like energy rating, star rating, hybrid/fuel efficiency, eco-labeling, use of sustainable material, green energy used, etc. A list of 12 low involvement products was derived to measure the awareness regarding availability of green version and in turn purchased by the respondent. In both the cases the willingness to pay extra premium for green products was also measured.

3.6.9 Sustainability perceptions:
The questionnaire measured with indicators the perception regarding the selective important sustainability tasks in the areas of water, electricity conservation, walking short distances, switching off fans and lights, recycling, repair than throwing tendency, planting and maintaining trees, use of disposable products. The respondents whether they felt that these tasks are important to save environment and are perceived as easy or difficult.

3.6.10 Influence of Green Marketing Efforts on Green behavior
Further the questionnaire included a dimension to measure influence of green marketing efforts on the green behavior. The green marketing influence was measured by knowing whether the respondents came across any advertisement with regard to waste paper recycling, water, electricity, forest conservation, eco-certified products, etc. The green behavior in this regards was measured on a 5 point scale criteria’s being predefined e.g. use of rough paper/envelope, walking short distances, liters of water saved, trees planted, seeing eco labels, preaching about green laws to others.

3.6.11 Green Product and purchase beliefs:
The green product beliefs were measured with the help of bipolar 7 point scale designed for indicators derived on the basis of meta analysis study but not yet empirically tested like popularity, availability, costliness, worth, genuinity, choices, aesthetics, information availability. The probable reasons for use and non use of green products were measured using indicators on a bipolar 7 point scale again like convenience, liking, brand reputation, locus of control, budget constraint, advantages, ease of selection, purchase and use.
3.6.12 Criteria’s for Product selection:

A list of 8 important criteria’s considered for purchases of product were listed. Respondents were asked then to rank these according to the importance they place while making purchases. The criteria’s included were price-benefit relation, brand reputation, performance, functionality and quality, environmental benefit, green packaging, etc.

3.6.13 Green consumer personality traits

A list of 14 personality traits was provided to the respondents and they had to tick the ones they associated with the green consumer. The list will help design better green marketing strategies.

Table 3.2 Descriptive Information of the Study Variables

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Brief Description</th>
<th>Item Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Personality Variable</td>
<td>Multi faceted complex variable describing personality on the basis of 5 important factors</td>
<td>Big 5 factor scale</td>
</tr>
<tr>
<td>2. Collectivism</td>
<td>Psychological variable related to collectivistic nature/behavior of person in a group</td>
<td>McCarty &amp; Shrum (1994) scale of collectivism</td>
</tr>
<tr>
<td>3. Eco-consciousness</td>
<td>The man-nature orientation measuring the level of environmental concern</td>
<td>Dunlap &amp; Van Liere et.al’s (2000) New Environmental Paradigm Scale</td>
</tr>
<tr>
<td>5. Green Purchase Attitude</td>
<td>Specific attitude i.e. affect evaluation with regard to Green Purchases</td>
<td>Taylor &amp; Todd (1995) scale for Green Purchase Attitude</td>
</tr>
<tr>
<td>6. Green Purchase Intention</td>
<td>The measure for Intention to purchase green products</td>
<td>Taylor &amp; Todd (1995) scale for Green Purchase Intention</td>
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<tr>
<td>-------------------</td>
<td>----------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>9. Sustainability Perceptions</td>
<td>Measure for perceptions towards sustainability tasks and activities</td>
<td>Devised on the basis of work by McDonald and Oates (2006)</td>
</tr>
<tr>
<td>10. Green Marketing Influence</td>
<td>Designed to measure the influence on the basis of respondents ability to recollect green marketing efforts</td>
<td>Devised by the Researcher</td>
</tr>
<tr>
<td>11. Green Product Purchase belief</td>
<td>Measures the beliefs of consumer with regards to green product purchases</td>
<td>Devised by Researcher</td>
</tr>
<tr>
<td>12. Reason for Purchase/Non Purchase of Green Products</td>
<td>Measures beliefs regarding opportunities and hindrances in the purchase of green products</td>
<td>Devised by Researcher</td>
</tr>
<tr>
<td>13. Criteria’s for Products selection</td>
<td>Measures the preferences in terms of criteria’s considered for the selection of product</td>
<td>Devised by Researcher</td>
</tr>
<tr>
<td>14. Green Consumer Personality Traits</td>
<td>Measures perceptions regarding association of Green consumer with select personality traits</td>
<td>Devised by Researcher</td>
</tr>
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</table>

(Source: Own Creation)
3.7 Reliability, Validity, Practicality

Acceptable level of reliability, validity and practicality indicate the sound measurement is possible in case of use of instruments such as questionnaires (Kothari, 2000). Reliability indicates the accuracy and precision in the measurement procedures (Litwin 1995). A reliable instrument as questionnaire should in principal give identical responses if the questionnaire is served to respondents at different times. On the other hand Validity indicates that the questionnaire measures what we intend to measure. Even though the choice of the validity test depends upon the judgments of the researcher, the three types of validity are strongly recommended viz., content and construct which in turn includes convergent, and discriminant validity. Practicality of an instrument is the synchronization of factors such as economy, convenience and interpretability. Economy aspect of practicality gives conclusion that there is a need to have trade-off between the ideal research project and what is economically affordable. However more items in a questionnaire shall give greater reliability (Kothari 2000) but suffers drawback of time consumption and tediousness. A good questionnaire tries to balance all the factors.

3.7.1 Reliability of the Instrument

The stability aspect of the instrument demands for consistent results with repeated measurements of the same questionnaire with the same person. But for a sample size of 500, as in case of current research it is not very practical, thus the method of determination of the degree of stability, where one compares the results of repeated measurement comes as a choice. In the case of single contact with respondents the ‘Split-half reliability’ is the most common approach. In the above said method the test is split into two equivalent halves and the results of one half are correlated with the second half of the test. The difficulty in this approach is the determination of equivalent halves. Cronbach proposed the most popular coefficient ‘alpha’ (more commonly known as Cronbachs’ alpha), which is considered as mean of all the possible split half coefficients. A test with robust reliability would have Cronbachs alpha above 0.9, but the values 0.5 and above are acceptable as suggested in the literature (SPSS, 2000, Gliem & Gliem 2003). However the recent researchers criticize the Cornbach’s alpha to over or under estimate reliability, underestimates reliability of congeneric measures, and use with multidimensional measures is limited.
Thus the current research not only reports Cronbach’s alpha but at the same time considers more importantly composite reliability (Caroline 2007). The instrument demonstrates acceptable reliability with Cronbach’s alpha above 0.5 and composite reliability very high from 0.7-0.9.

3.7.2 Validity of the instrument:

The instrument used in current research has demonstrated acceptable construct validity with high convergent and discriminant validity. The convergent and discriminant validity are the subtypes of construct validity, where both of them work hand in hand, but neither one alone is sufficient. Convergent validity infers that the measures of construct that should be theoretically related are factually observed to be related. Discriminant validity suggests that the measures of construct that should be theoretically not related with each other are factually observed to be unrelated. The methods make use of correlation coefficient for the estimation of both these validities.

The instrument was subject to item validation the main purpose being to determine the validity of the internal structure of the set of given items through most accepted ‘Factor analysis’ (Pattanayak et al., 2002). Factors were determined with the help of Principal component analysis method with varimax rotation using Kaiser Variation. The method is appropriate in case of concern of researcher of predicting what minimum factors can account for maximum variance (Ghauri et al., 1995). Factors ranging from 0.5-0.8 indicate moderate to high convergent validity. The square roots of all AVE are greater than the correlation between the constructs indicating acceptable discriminant validity between each pair of construct.

3.7.3 Practicality of the Instrument:

As mentioned above the practicality is based upon the convenience, economy and interpretability of the questionnaire. Thus minimum number of items was used for the current research to strike a balance between the reliability and the practicality.

Convenience forms a key factor of practicality. The instrument was first discussed with a group of experts in the field of Environment, Statistics, and Research. Their perceptions were discussed and the experts were asked if items under each dimension did justice to the main heading of the section. The responses on different scales were also noted. The discussion revealed that for the existing scales a 7 point scale would
give more freedom to help express agreement and disagreement. So instead of a 5 point Likert scale a 7 point scale is used except for green behaviour and green purchase behaviour which has been treated separately.

Further the questionnaire was administered to a group of 5 respondents with the structured discussion as pre-decided in the methodology with initial introduction. The respondents were asked if they felt the questionnaire was simple enough to understand. A suggestion came from these respondents to help in better understanding in the form of translation of this questionnaire into local language Marathi. Thus the instrument was translated into Marathi and back translated in English to maintain the intended meaning of the same (Mc Gorr, 2000 in Mostafa 2007).

3.8 Best Practices incorporated in developing the Questionnaire:

On the basis of the comments of earlier researchers (Salant & Dilman, 1994; Erdos, 1983, Czaja & Blair, 1996; Fink, 1995; Brockett & Levive, 1984), following best practices were identified and incorporated in the current study while developing questionnaire.

1. Limiting number of pages to 8 or less.
2. Starting a questionnaire with a simple and lucid explanation about purpose of the study.
3. Pre-coding of response categories by assigning number to each possible response for the respondents to then just tick.
4. Spacing categories for the convenience and ease of comprehension.
5. Providing simple instructions from time to time for the ease of respondents.
6. Use of common plain English and Marathi used on daily basis.
7. No subjective tones introduced in the design as to lead to biased response.
8. Avoiding non-response error by designing questionnaire in a manner that it is easy to comprehend and interesting to answer.
9. Developing questions in closed format to avoid ambiguity in answering process.
10. Grouping questions logically on the basis of similarities and relevance.
11. Questions are applicable to and answerable by most of the respondents.
12. Mutually exclusive choices in order to prevent inaccurate responses.
The questionnaire was further formatted in manner that it is readable with proper layout in terms of alignments, spaces, font size and size. Thus the process of questionnaire finalization followed all the steps of development, review, and pilot testing before final dissemination. The pilot test was carried out with 100 respondents with the sampling method and all other things kept as possible as uniform as with the final study.

3.9 Data Collection Strategies:

Following systematic process was incorporated in the study procedure for the purpose of proper questionnaire distribution and collection. As per the earlier discussions from chapter 2 and present chapter, variables and indicators have been designed on the basis of Meta analysis.

Figure 3.3 The Research Process

(Source: own Creation)
3.10 Statistical Procedures and Software’s:

1. Microsoft Excel 2007 has been used to enter the data into the spreadsheet and calculate simple statistical measures.

2. SPSS has been used for One sample t-tests

3. XLSTAT 2013 has been used for Chi square tests and Friedman’s ANOVA test.

4. SMARTPLS has been used for structural equation modeling

*Types of Data Analysis:*

1. Descriptive Analysis:

   It was used to give general description of the sample on the basis of various demographic factors such as age, gender, income, education, occupation.

2. Inferential Analysis:

   One sample t-test was used in case of testing hypothetical research model A which talks about antecedents of Eco-conscious attitude.

   Structural equation modeling was used to test hypotheses from Model B and C. The SEM follows positivist epistemological approach where the researcher believes that there exists an objective, physical and social world. It is possible to characterize and measure the nature of the world, and role of researcher being neutral and not intervening the phenomenon of interest. The application of this technique demands empirically testable theories which can be confirmed or rejected for the previously fixed relationships. The reason for this choice is the simple fact that partial least square path modeling (PLSPM) is an analytic technique that runs principal component analysis (PCA) and regression analysis simultaneously. Thus, PLSPM is considered to be a more efficient analytic technique than the conventional method, in which, PCA and regression analysis are performed separately. Further, PLSPM successfully avoids multi-co linearity and measurement errors, while addressing the cause-effect relationships among the research constructs. There are two approaches, namely, covariance and PLS based approach. The covariance – based approach for SEM needs a larger sample (the definition of large size varies from one author to another viz. some define it as sample having more than 100 subjects and some others define it as a
sample having more than 200 subjects and at least three indicators). PLS path modeling (PLS-PM) is generally meant as a component based approach to SEM that privileges a prediction oriented discovery process to the statistical testing of causal hypotheses. Further, PLS does not make assumptions about the population or scale of measurement and there are no distributional requirements (Fornell and Bookstein, 1982). Another benefit of PLS over other SEM techniques such as AMOS, LISREL is that it allows both formularize and reflective indicators to be used in the model (Fornell and Bookstein, 1982). Therefore, this study used PLS technique using SmartPLS® software. The PLS analysis pursued here is a two-stage approach by first assessing the measurement model (validity and reliability), and then assessing the structural model by an estimate of the paths between the latent variables in the model and its predictive power.

**Figure 3.4 Statistical Terms used in the analysis**

<table>
<thead>
<tr>
<th>Statistical term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size (n)</td>
<td>The total number of respondents for the current study</td>
</tr>
<tr>
<td>Mean</td>
<td>Sum of all responses divided by the sample size.</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>Measure of how the values are spread along the mean (clustered or widely dispersed).</td>
</tr>
<tr>
<td>Variance</td>
<td>A measure of dispersion around the mean, equal to the sum of squared deviations from the mean divided by one less than the number of cases.</td>
</tr>
<tr>
<td>Correlation coefficient</td>
<td>A measure of strength and direction of linear relationship among two variables</td>
</tr>
<tr>
<td>Skewness</td>
<td>A measure of the asymmetry of a distribution. The normal distribution is symmetric, and has a skewness value of zero.</td>
</tr>
</tbody>
</table>
Observed Significance Level

Often called the p value. The basis for deciding whether or not to reject the null hypothesis. It is the probability that a statistical result as extreme as the one observed would occur if the null hypothesis were true. If the observed significance level is small enough; usually less than 0.05 or 0.01, the null hypothesis is rejected.

(Source: Own creation)

3.11 Limitations:

One of the main methodological limitations which apply to most of the surveys is that the data collected will represent the perceptions of the respondents though assumed to the best capacity to be reality by them. Another important aspect which has to be discussed in the matter is that the research is related to such a socially important area, and thus study suffers limitation of introduction of distortion and bias because of social desirability. The data in consideration is self-reported data and thus suffers from limitations like selective memory, telescoping, exaggerations. The pan India study is very difficult considering the budget and time constraints, hence the generalizability of the current study which covers just one city is questionable. The study covers a short time period and hence lacks the interesting longitudinal perspective of research which may be of great interest in case of scope of further research.

3.12 Summary:

The chapter attempts to give a deeper insight into Research Methodology adopted for the current research. The discussion starts with the description of nature of variables their relationships, and diagrammatic presentation in the form of hypothetical research models. Further, the complete research design has been pictorially presented and explained. A complete procedure of finalization of instrument for the purpose of study has been discussed with focus on reliability, validity and practicality. Best practices used in questionnaire design and data collection have been discussed with proper details. The chapter ends with the discussion about various data analysis methods and statistical procedures and software used for the purpose.
References- Chapter 3:

3. Gliem, Gliem (2003), Calculating, Interpreting, and Reporting Cronbach’s Alpha Reliability Coefficient for Likert-Type Scales, 2003 Midwest Research to Practice Conference in Adult, Continuing, and Community Education
7. Wishva Prakashan Publication.