Chapter - 4

RESEARCH METHODOLOGY APPLICABILITY
Walliman (2005) argues that many of these everyday uses of the term ‘research’ are not research in the true meaning of the word. Author highlights ways in which the term is used wrongly: Collecting information or facts with unclear purpose; Reassembling and noting facts with relevant information without interpretation; is term researchers should consider. Based up on this brief discussion, researcher can say that research has a number of characteristics:

- Data are collected systematically.(For green marketing strategy)
- Data are interpreted systematically.(by statistical analysis)
- There is a clear purpose: to find things out.(To develop a model and meaning)

Therefore, define research as something that researcher undertakes in order to find out things in a systematic way, thereby increasing their knowledge. Two phrases are important in this definition: ‘systematic way’ and ‘to find out things’. ‘Systematic’ suggests that research is based on logical relationships and not just beliefs (Ghauri and Gronhaug 2005). As part of the study, researcher feels responsibility for providing an explanation of the methods used to collect the data and argue why the results obtained are meaningful, and will explain any limitations that are associated with them.

‘To find out things ’it is suggested there is a multiplicity of possible purposes for the research study. These may include scribing, understanding, criticising and analysing (Ghauri and Gronhaug 2005). However, it also suggested and understood that, study research has clear purpose or set of things that researcher want to find out, like in this study, the answer to a question or number of questions associated with green marketing strategy variables.

### 4.1 The nature of green business and management

Research using above definition of research it would be sensible to define management research as a systematic research extracting things about business and management of green marketing.
Easterby-Smith (2008) argued and highlighted four things combine to make business and management a distinctive focus for research:

- The way in which green companies managers and researchers draw on knowledge developed by other disciplines;
- The fact that green companies managers tend to be powerful and busy people. Therefore they are unlikely to allow research access unless they can see personal or commercial advantages.
- The fact that green company's managers are well educated. Many now have postgraduate degrees and qualified, tend often to be as well educated as those conducting research about them.
- The requirement for the research to have some practical consequence. This means the needs to contain the potential for taking some form of action or needs to take account of the practical consequences of the findings.

Using knowledge from a array of disciplines enables (Green Marketing Strategy Management) research to gain new insights that cannot be obtained through all of these disciplines separately. Another feature of management research highlighted in the debate is a belief that it should be able to develop ideas and relate them to practice. In particular, that research should complete a virtuous circle of theory and practice (Tranfield and Starkey 1998).

Today green business and management research needs to engage with both the world of theory and the world of practice. Consequently, the problems addressed should grow out of interaction between these two worlds rather than either on their own. In the past decade debate about the nature of management research has focused on how it can meet the double hurdle of being both theoretically and methodologically rigorous, while at the same time embracing the world of practice and being of practical relevance (Hodgkinson 2001).

More encouragingly, according to (Huff 2006), academic management research can be seen as a design science and its mission being to develop valid knowledge to support thoughtful, designing practitioners. From the design science perspective, the main purpose of green marketing academic management research
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is to develop valid knowledge to support environmentally concern organizational problem solving in the fields. That support can be direct, instrumental or more indirect giving general enlightenment on the type of problem at hand.

Rousseau (2006) has drawn attention to ways of closing, which terms the prevailing ‘research-practice gap’ –the failure of organizations and managers to base practices on best available evidence. She extols the virtues of ‘evidence-based management’, which derives principles from research evidence and translates the mind to practices that solve organisational problems. Rousseau’s argument is that green research findings do not appear to have transferred well to the workplace. Instead of a scientific understanding of human behavior and organisations, managers, continue to rely largely on personal experience, to the exclusion of more systematic knowledge.

According to (Tranfield and Denyer, 2004) the most telling comment on the so-called ‘relevance gap’ is from who assert that ignoring such a gap would be ‘un think-able in management and other professional fields. The article by Hodgkinson (2001) offers a useful four-fold taxonomy for considering this in relation to managerial knowledge. Using the dimensions of theoretical and methodological rigour and of practical relevance they identify four quadrants.

Within these boundaries of advancing knowledge, addressing green business issues, solving managerial problems and promoting the common good. For some research studies purpose may be to understand and explain the impact of something, such as a particular green policy. Scholars may under take this research study with in an individual organization and suggest appropriate action on the basis of their findings. For other research studies, researchers may wish to explore the ways in which various green or non-green organizations do things differently. In such studies, purpose may be to discover and understand better the underlying processes in a wider context, providing greater understanding for practitioners. For yet other research studies, researcher may wish to place an in-depth investigation of an organization within the context of a wider understanding of the processes that are operating.
Despite this variety, I as researcher argued and believe that all business and management research studies can be placed on a continuum according to their purpose and context. At one end, researcher undertake purely to understand the processes involved in outcomes of business and management. Such undertaken researches largely in universities and attributed majorly as a result of an academic scope. Its key consumers are the academic community, with relatively little attention being given to its practical applications.

This is often termed basic, fundamental or pure research. Through doing this, the research would start to move towards the other end of the continuum. At this end is research that is of direct and immediate relevance to green managers, which addresses issues that they see as important, and is presented in ways that they understand and can take action. This is termed applied research. In my view applied research is very similar to consultancy in many cases, where concluding is shown in a comprehensive manner.

The research as a way of depicting the issues underlying researchers choice of data collection method or methods and peeled way the outer two layers—research philosophies and research approaches. For understanding, uncover the next three layers: research strategies, research choices and time horizons. These three layers focus on the process of research design that is, turning research questions in to research study (Robson2002).
4.2 The research process

Research is a multi-stage process, which researcher must follow to complete research study. The precise number of stages varies, but they usually include formulating and clarifying a topic, reviewing the literature, designing the research, collecting data, analyzing data and writing up. In the majority of these the research process, are rationalized, is a sequential series of stages. Some articles suggest that the research process is rational and straightforward. Unfortunately, this is very rarely true, and the reality is considerably messier, with what initially appear as great ideas sometime having little or no relevance (Saunders and Lewis 1997).

Formulating and clarifying the research topic is the starting point of any research study (Ghauri and Grønhaug 2005; Smith and Dainty 1991). Once researcher have clear understanding about it, then will be able to appropriately choose the most suitable research strategy and relevant data collection and pinpointing analysis techniques. The formulating and clarifying process is time consuming and will probably take researcher up blind alleys (Saunders and Lewis 1997). However, without spending time on this stage researcher are far less likely to achieve a successful study (Raimond 1993).

The importance of theory in drafting research (questions and objectives)

The role of theory is helping researcher to decide appropriate approach to research design. However, researcher consideration of theory should begin earlier than this; thus should inform definition of research questions and objectives.

Theory is defined by (Gill and Johnson 2002) as ‘a formulation regarding the cause and effect relationships between two or more variables, which may or may not have been tested’. The definition demonstrates that ‘theory’ has a specific meaning. It refers to situations where, if A is introduced, B will be the consequence. Sutton and Staw (1995), Whetten (1989) contends in a similar contribution that, if the presence of theory is to be guaranteed, the researcher must ensure that what is passing as good theory includes a plausible and coherent explanation for why certain relationships should be expected in data.
Every purposive decision taken is based on theory: that certain consequences will flow from the decision. It follows from this that every manager's meeting that features a number of decisions will be a meeting that is highly theory dependent (Gill and Johnson 2002). (Kerlinger and Lee 2000) reinforce Gill and Johnson's definition by noting that the purpose of examining relationships between two or more variables is to explain and predict these relationships.

In present research study, the necessity to be theory dependent that researcher will have to develop a ground-breaking theory that will lead to a whole new way of thinking about green strategic management. And for such cases researcher should take heart from the three fold typology and Contrasts of these grounded on 'middle-range theories', which usually lack the capacity to change the way in which managers think about the world but are none the less of significance in real world. Some of the theories of human motivation well known to managers would be in this category. However, most of today's firm's managers are concerned with 'substantive theories' which are restricted to a particular time, its research setting, group or population or problem (Creswell 2002).

**Exhibit: 19 – Theory building approach**

Theory does assume that a clear theoretical position is developed prior to the collection of data (the deductive approach). This will not always be the case. It may be that researcher study is based on the principle of developing theory after the data have been collected (the inductive approach). This is a fundamental difference in two research approaches. Sharp (2002) highlighted, two major reasons exist for reviewing the literature. The first, the preliminary search that helps researcher to generate and refine their research ideas, the second, often referred to as the critical review or critical literature review, is part of proper research study. Study
assessment criteria usually require researcher to demonstrate awareness of the current state of knowledge in concern subject, its limitations, and how research fits in this wider context (Gill and Johnson 2002).

Guba and Lincoln (1994) argued that questions of research methods are of secondary importance to question of which paradigm is applicable to research. Here for study are with the first two of the circle layers concerned principally: research philosophy and approach of research. Which examine "known as research strategy and choice sand time horizons".

Exhibit: 20 - Holistic frame

The philosophy researcher adopts will be influenced by practical considerations. However, the main influence is likely to be researcher particular view of the relationship between knowledge and the process by which it is developed. The researcher who is concerned with facts, such as the resources needed in a green marketing process, is likely to have a very different view on the way research should be conducted from the researcher concerned with the feelings and attitudes of the marketers towards their managers in that same marketing process. Not only will their strategies and methods probably differ considerably, but their views on what is important and, perhaps more significantly, what is useful. In support, I as researcher agree with Clark and Johnson (2006) strongly suggested that the important issue; 1) study research should be philosophically informed, 2) reflect upon researcher philosophical choices and defend them in relation to the alternatives adopted.
4.3 Research approaches

The extent clarity about the theory at the beginning of study, researcher raises an important question concerning the research design of the study. This is, whether present research should use the deductive approach, in which study develops a theory and hypothesizes and design a research strategy to test the hypothesis, or the inductive approach, in which study would collect data and develop theory as a result of conducted data analysis. In so far as it is useful to attach these research approaches to the different research philosophies, deduction owes more to positivism and induction to interpretivism, although I believe that such labeling is potentially misleading and of no real practical value. Therefore according to researcher understanding, any study can focus on inductive or deductive reasoning.

4.3.1 Deductive theory testing approach

Deductive theory testing approach involves the researcher thoughts and development of a particular theory, which is subjected to a rigorous statistical testing. It is usually treated as dominant research approach where the basis of explanation presented on the foundation of certain laws, which further allows the anticipation of phenomena observed, predict their occurrence and therefore permit them to be controlled (Collis and Hussey 2003).

Robson (2002) extended the knowledge by listing five sequential stages through which deductive research will progress for any study:

1. Deducing hypothesis testing approach, is a testable proposition about the relationship observed between two or more concepts, phenomena or variables evolved from the theory;
2. Further requires expressing the study hypothesis in its operational terms which is, indicating exactly how the concepts phenomena or variables are to be measured, and which propose a relationship between two specific concepts or variables;
3. Relevant testing these operational hypothesis will involves one or more of the strategies for obtaining study conclusions;
4. Further examining the specific outcome of study, will either tend to confirm the proposed theory or indicate towards the need for its modification in correction;
4.3.2 Induction theory building approach
Research using an inductive approach is likely to be particularly concerned with the context in which such events were taking place. Therefore, the study of a small sample of subjects might be more appropriate than a large number as with the deductive approach. Researchers are more likely to work with qualitative data and to use a variety of methods to collect these data in order to establish different views of phenomena (Easterby and Smith 2008).

4.3.3 Combining research approaches
It would be misleading to understand that there are rigid divisions between deduction and induction. Combine deduction and induction within the same piece of research may be advantageous. (Below Table-05) summarizes the major differences between deduction and induction.

Table: 05 – Theory Approach Emphasis

<table>
<thead>
<tr>
<th>Deduction emphasizes</th>
<th>Induction emphasizes</th>
</tr>
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<tbody>
<tr>
<td>Adopts scientific principles</td>
<td>• gaining an understanding of the meanings</td>
</tr>
<tr>
<td>theory to data movement</td>
<td>• humans attach to events</td>
</tr>
<tr>
<td>need to explain causal relationships between variables</td>
<td>• close understanding of the research context</td>
</tr>
<tr>
<td>collection of quantitative data</td>
<td>• collection of qualitative data</td>
</tr>
<tr>
<td>application of controls to ensure validity of data</td>
<td>• a more flexible structure to permit changes</td>
</tr>
<tr>
<td>operationalization of concepts to ensure clarity of definition</td>
<td>• research emphasis as the research progresses</td>
</tr>
<tr>
<td>a highly structured approach</td>
<td>• realization that the researcher is part of the research process</td>
</tr>
<tr>
<td>researcher independence of what is being researched</td>
<td>• less concern with the need to generalize</td>
</tr>
<tr>
<td>necessity to select samples of sufficient size in order to generalize conclusions</td>
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</table>
Creswell (2002) suggests numeral practical criteria. The most important of these are emphasis of the research and the nature of the research topic. A topic on which there is ample literature from which researcher can define a theoretical framework and a hypothesis lends itself more readily to deduction. With research into a topic that is new and with little existing literature, it may be more appropriate to work inductively by generating data and analyzing and reflecting upon what theoretical themes the data are suggesting.

Deductive research can be quicker to complete this present study. Suitable time is devoted to setting up the study prior to literature review, data collection, analysis and drawing inference. On the other hand, inductive research can be much more protracted. Often the ideas based on a much longer period of data collection and analysis has to emerge gradually, which is not appropriate for undertaken study. In this study data collection is based on 'one take'.

4.4 Research design for study
Research design is the general plan of how researcher will go about answering the research questions. It will contain clear objectives derived from undertaken research questions, specify the sources from which are intend to collect data, and consider the constraints that will inevitably have (e.g. access to data, time, location and money) as well as discussing ethical issues. The classification of research purpose most often used in the research methods literature is the threefold one of exploratory, descriptive and explanatory. However, in the same way as study research question can be both descriptive and explanatory, so research study may have more than one purpose.

Multiple methods choices in green research
The terms quantitative and qualitative are used widely in green business and management and thus in green research to differentiate both data collection techniques and data analysis procedures. One way of distinguishing between the two is the focus on numeric (numbers) or non-numeric (words) data. Quantitative is predominantly used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics analysis) that generates or uses numerical data. In contrast, qualitative is used predominantly as synonyms for any data collection technique (an
Tashakkori and Teddlie (2003) doing work for referring to multiple methods used the more generic term ‘research design’. Individual quantitative and qualitative techniques and application procedures do not exist in isolation to the total research. While choosing research methods, researcher therefore either use a single data collection technique and corresponding analysis procedures (mono method) or use more than one data collection technique and analysis procedures (multiple methods) to answer research question. This choice is increasingly advocated within green business management research also where a single research studies may use quantitative and qualitative techniques and procedures in combination as well as use primary and secondary data (Blackburn and Curran 2001). In present study majorly qualitative techniques and procedures are applicable.

Numerous Green Researcher will combine by choosing mono method either a single quantitative data collection technique, (Example questionnaires), with quantitative data analysis procedures; or a single qualitative data collection technique, (such as in-depth interviews), with qualitative data analysis procedures. In contrast, by choosing combine data collection techniques and procedures using some form of multiple methods design, there are four different possibilities observed.

Tashakkori and Teddlie (2003) also argued that multiple methods are useful if they provide better opportunities to answer research questions and where they allow researcher to better evaluate the extent to which research study findings can be trusted and inferences made from them. The term multi-method refers to those combinations where more than one data collection technique is used with associated analysis techniques, but this is restricted within either a quantitative or qualitative world view.

Thus in present study researcher has chosen to collect quantitative data using, both questionnaires and structured observation analyzing these data using statistical (quantitative) procedures, a multi-method quantitative study. And researcher have avoided choosing to collect qualitative data using, in-depth interviews and diary accounts and analyse these data using non-numerical (qualitative) procedures, a multi-method qualitative study.
4.4.1 Exploratory Research

Under Research domain, an exploratory study design is a valuable method of finding out 'what is happening actually; to seek new insights about a particular phenomenon; or to ask logical questions and to assess s observe phenomena in a new light' Robson (2002). It is particularly beneficial if researcher wish to clarify his own understanding of undertaken problem. Generally there are three principal ways adopted for conducting exploratory research: a search of the literature;(In present study, literature of Green Marketing, Green Strategy); interviewing ‘experts’ in the subject; (For developing green marketing Strategy, obtaining views from public and experts); and conducting focus group interviews. (For developing green solutions by new products and offering to customers). Adams and Schvaneveldt (1991) argued and highlighted that the flexibility characteristic in exploratory research should not be treated as absence of direction of study about some of enquires.

4.4.2 Descriptive Research

The descriptive research under any research study make an attempts to describe characteristics, explain phenomena and interpret conditions of the present time i.e. “what is". The primary purpose of a descriptive research is to examine a phenomenon that is occurring at a specific place and time. A descriptive research is concerned with some conditions, practices followed, observed structures, differences or relationships that exist in some phenomena, opinions held processes in business that are going on or trends that are evident in real world. The sometimes object of descriptive research is ‘to expose an accurate profile of persons, events or situations’ Robson (2002). This probably is an addition or extension of a piece of exploratory research or, more often, a piece of explanatory research. It is necessary to have a clear and full picture of the phenomena on which you wish to collect data, prior to the collection of the data.

4.4.3 Experiment Research

Experiment Research is a distinctive form of research that originates and comes from natural sciences. However, it features strongly helps in social science research also, particularly in the field of psychology. The main purpose of an experiment research is to study causal links between phenomena or variables;
whether a change in one independent variable produces a change in another
dependent variable Hakim (2000). The simplest experiments in any study are
concerned with whether there exists a link between two variables. More complex
experiments can take consideration about the size of the change, and the relative
importance of two or more independent variables. Therefore Experiments
Research tends to be used in exploratory and explanatory research to answer ‘how
tything change’ and ‘why things change’ questions and similar. (Below Exhibit-21)

In an experiment, two groups are established and members assigned at random to
each. This means the two groups will be exactly similar in all aspects relevant to
the research other than whether or not they are exposed to the planned
intervention or manipulation. In the first of these groups, the experimental group,
some form of planned intervention or manipulation, such as a ‘buy two, get one
free’ green product promotion, is made subsequently. In the other group, the
control group, no such intervention is made. The dependent variable, in this
example is green product sales, is measured before and after the manipulation of
the independent variable (the use of the ‘buy two, get one free’ green product
promotion) for both the experimental group and the control group. This means
that a before and after comparison can be undertaken. On the basis of this
comparison, any difference between the experimental and control groups for the
dependent variable (green product marketing) is attributed to the intervention, in
present example the ‘buy two, get one free’ green product promotion.

**Action research**

Lewin first used the term action research in
1946. It has been interpreted subsequently
by management researchers and thus by
green product managers in a variety of
ways, but there are three common themes
within the literature.

![Exhibit-22](image-url)
The first focuses upon and emphasizes the purpose of the research: research in action rather than research about action (Coghlan and Brannick 2005). Here, research is concerned with the resolution of organisational issues. The second relates to the involvement of practitioners in the research and, a collaborative democratic partnership between practitioners and researchers, other practitioners consultants. (Eden and Huxham 1996). The findings of action research result from involvement with members of an organization over a matter which is of genuine concern to them. The third theme emphasises it creative nature of the process of diagnosing, planning, taking action and evaluating. The action research spiral commences within a specific context and with a clear purpose (Coghlan and Brannick 2005).

Thus action research differs from other research strategies because of its explicit focus on action. The strengths of an action research strategy are a focus on change, the recognition that time needs to be devoted to diagnosing, planning, and taking action and evaluating, and the involvement of practitioners throughout the process. An action research combines both data gathering and facilitation of change (Schein 1999).

Case Study
Robson (2002) defines case study as 'a strategy for doing research which involves an empirical analysis of a particular contemporary phenomenon within its real life context using multiple sources of evidence'. Yin (2003) also highlights the importance of context, adding that, within a case study, the boundaries between the phenomenon being studied and the context within which it is being studied are not clearly evident. The case study research strategy will be of particular interest to researcher, if researcher wish to gain a rich understanding of the context of the research and the processes being enacted (Morris and Wood 1991).

4.5 Nature, Scope and Sources of Data Collection
Data collection is one of the most important steps in the process of conducting a management or any research. Data collection in present research study is a detailed process in which a planned search for all relevant data’s is attempted by researcher. While dealing with real life problems, it is often found that data purposefully gathered are insufficient and inappropriate, and hence to complete a correct study, it becomes
necessary to collect data that are appropriate and sufficient. There are several ways of collecting the appropriate data which differ considerably, mainly in involvement financial costs, time span requirements and other valuable resources requirement of the researcher for study. Data collection is considered as puzzling activity which needs methodical planning of predictor and constructs, hard work of researcher and surveyors, mental patience for understanding, persistence and more to be able to complete the research activity task successfully.

First step of data collection starts with determining what kind of data required and later followed by the selection of an appropriate sample from a considered certain population. Data and information can be separated into two distinctive characteristics types, specifically quantitative data or information and qualitative data or information. Usually, collected date for study can be from two sources, primary sources and secondary sources. Data collected from primary sources, is called primary data and data collected from secondary sources are called secondary data.

**4.5.1 Secondary data**

Secondary data include both raw data and published summarize by any means. Quality daily newspapers contain an affluence of data, including reports about merger, acquisitions, bids and companies’ value worthiness. Government departments undertake many surveys and publish them as official statistics covering social, demographic and economic topics. Consumer research organizations collect data that are used afterward by different clients. Trade organizations collect data from their members on topics such as sales that are subsequently aggregated and published. For certain types of research studies, such as those requiring national or international comparisons, secondary data will probably provide the main source to answer to research questions and to address study objectives.

Researcher mandatorily required collecting primary data for this study research. Most research questions are answered using some combination of secondary and primary data. Where limited appropriate secondary data are available, researcher will have to rely mainly on data collected him-self for the study, thus it applies to resent Green Product Marketing Strategy.
4.5.1.1 Types of secondary data and uses in research

Secondary data include both quantitative and qualitative data and are used principally in both descriptive and explanatory research. The data researcher use may be raw data, or compiled data that have received some form of selection or summarizing (Kervin 1999). Within green business and management research such data are used most frequently as part of a case study or survey research strategy. However, there is no reason not to include secondary data in other research strategies, including archival research, action research and experimental research. For this study large amount of information is already available & used for green product marketing strategy.

Different researchers (Bryman 1989; Dale 1988; Hakim 1982, 2000; Robson 2002) have generated a variety of classifications for secondary data. According to their ideas created three main sub-groups of secondary data: documentary data, survey-based data, and those compiled from multiple sources.

1. **Documentary secondary data** are often used in research study that also use primary data collection methods. Documentary secondary data include written materials such as notices, correspondence (including emails and letters), reports to shareholders, transcripts of speeches and administrative and public records. They could also be used to generate statistical measures such as data on absenteeism and profitability derived from company records. (Bryman 1989).

2. **Survey-based secondary data** refers to data collected using a survey strategy, usually by questionnaires that have already been analysed for their original purpose. They are made available as compiled data tables or, as a downloadable matrix of raw data for secondary analysis. Survey-based secondary data will have been collected through one of three distinct sub-types of survey strategy: censuses, continuous/regular surveys or ad hoc surveys (Hakim 2000).

3. **Multiple-source secondary data** can be based entirely on documentary or on survey secondary data, or can be an amalgam of the two. The key factor is that different data sets have been combined to form another data set prior to your accessing the data.

For study research with the intention of analysing some specific secondary data primarily done data approaching, locating, availability & Finding of secondary and later step will
be to ascertain the data needed for study are available. As part of green literature review, researcher had already read books and journal articles on chosen topic. Where these have made use of secondary data, they had provided with an idea of the sort of data that are available. References for unpublished and documentary secondary data are often founded less specific. And founded be insufficient to locate or access the actual secondary data, they still provide useful clues about the sort of Primary data that might be found within organisations/public and which might prove useful.

More recently, Government websites such as the Indian government’s direct gov (websites with gov.in) and the European Union’s (European databases) provide useful gateways to a wide range of statistical data, reports and legislative environmentally concern documents. However, although data from such government sources are usually of good quality, those from other sources may be neither valid nor reliable. Therefore it is important and responsibility of researcher to re-evaluate the suitability of such secondary data for research, through primary data validation.

4.5.2 Primary Data
An interview and sharing of thought is a purposeful discussion between two or more people (Cannell and Kahn 1957). Within the business and management research, the maximum use of questionnaires is made within the survey study. In general, Researcher use questionnaires in all the techniques of data collection for research study, in which respondents are asked to, respond to the same set of questions in a predetermined order, as suggested by De-Vaus (2002). For primary data collection, the questionnaire is one of the most widely used techniques within the survey strategy. Oppenheim (2000) & Bell (2005) argued in their work that it is extremely difficult to construct a good questionnaire, which ensures collection of accurate data that is required to answer research questions and study objectives.

Perhaps, for any study, the research design and questionnaire will affect the response rate and the reliability and validity of the data. Therefore, respondents response rates, instruments validity and reliability is maximized by careful constructed design of individual measuring instrument; clear and pleasing draft of the research questionnaire; appropriate explanation about the purpose of the questionnaire and study; pilot testing of questionnaire; carefully planned and executed supervision was adopted for present study.
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Questionnaires are usually not particularly good for exploratory or other research that requires large numbers of open-ended questions. They work best with standardized questions that researcher is confident and will be interpreted the same way by all respondents.

According to (Gill and Johnson 2002), Descriptive research using attitude, opinion and questionnaires of organizational practices, enable researchers to identify and describe the variability in different phenomena of study. Whereas, explanatory or analytical research will enable researcher to examine and explain relationships between variables, in particular cause and effect relationships. These two purposes have different research design requirements. Further Dillman (2007) distinguished three types of data variable that can be collected through questionnaires: opinion; behavior; and attribute which are not in scope of present study.

4.5.2.1 Questionnaire

The design of a questionnaire differs according to how it is administered and the amounts of contact researcher have with the respondents. Self-administered questionnaires are usually completed by the respondents. Such questionnaires are circulated by electronic mode using the Internet or posted to respondents (questionnaires by mail), or optionally delivered by hand to each respondent and collected later. Responses to interviewer-administered questionnaires are recorded by the interviewer on the basis of each respondent’s answers.

Questionnaires administered using the telephones are known as telephone questionnaires. The final category, structured interviews refers to those questionnaires where interviewers physically meet respondents and ask the questions face to face. Witmer (1999) said, those questionnaires administered in conjunction with email on internet, offer greater control and carry importance because today users read and respond to their own mail frequently at their personal computer/gadgets.

By contrast, interviewer-administered questionnaires enable researcher to ensure that the respondent is wanted. This improves the reliability of data. Sometimes, respondent have insufficient knowledge or experience they may deliberately guess at the answer, a tendency known as uninformed response. This is particularly likely when the
questionnaire has been incentivized. Dillman (2007) Respondents reaction to self-administered questionnaires are comparatively unlikely to answer actual, or to please researcher, or because they believe certain responses are more socially desirable.

Explanatory research requires data to test a theory or theories. This means that, in addition to those issues rose for descriptive research, researcher needs to define the theories researcher wish to test as relationships between variables prior to designing study questionnaire. Therefore researcher will need to have reviewed the literature carefully and conceptualized research clearly prior to designing questionnaire (Ghauri and Grønhaug 2005).

4.5.2.2 Measurement Scale
Measurement scales classified into four general types: rating, ranking, categorization, and sorting. A rating scale is used to score an object or indicant without making a direct comparison to another object or attitude. Ranking scales constraint in making comparisons and determining order among two or more properties or objects. Categorization asks respondent/participants to put themselves or property indicants in groups or categories, which they find relevant. Sorting requires that participants sort cards into different heads using criteria established by the researcher.

Decisions about the choice of measurement scales are made with regard to the data properties generated by each scale instrument in any particular study. Classifying these scales in increasing order of influence is; 1) nominal, 2) ordinal, 3) interval, or 4) ratio. Nominal scales classify data into subjected categories without indicating order, mutual distance, or about uniqueness of origin. Ordinal data highlight relationships of less than or more than but have no indication of their mutual distance or uniqueness of origin. Interval scales posses both their order and mutual distance but no uniqueness of origin. Ratio scales possess all four properties features in data measurement.

The fundamental assumption of scale determines the way in particular measurement scale’s data values will be mathematically and statistically analyzed for study. In this study researcher had used with a one-dimensional scale, which measure only one attribute of the participant or object at a time.
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4.5.2.3 Likert scale
The most popular Scale in management research, "Likert Scale" developed by Rensis Likert is the most commonly used variation of the summated rating scale. A summated rating scale comprises of researchers developed statements that express either a favorable or an unfavorable attitude toward the particular object of respondent interest. The participant is requested to show his view in dimension of agree or disagree with each made available statement. A numerical score is given to each response which reflects its degree of attitudinal favorableness toward the statement, and the obtained scores may be summed to measure the participant’s overall attitude toward particular attribute. The Likert scale has many advantages in management studies that account for its popularity. It is easy and quick to construct the statement/instruments. Likert scales are probably more reliable and provide a greater volume of data than many other scales. The scale produces interval data. Thus, Likert scale is considered appropriate for current management study.

4.5.2.4 Variables
In research, attribute is a characteristic of an object (person, thing, weightage etc.) Attributes are closely related to variables. Variable is a logical set of attributes. Variables can "vary" be high or low and determined by the value of the attribute. Thus researcher needed to be clear about which relationships are likely to exist between variables. Present study was conducted by identifying variables associated for Green Product, Green marketing, Green marketing strategy, which falls under three identified categories.

4.5.2.4.1 Types of variable
For the purpose of present study: the three category variables are: Independent variable; dependent variable and extraneous variable.
Independent variable causes changes in a dependent variable;
Independent factors which majorly contribute to Green Product Marketing Strategy are-
1. Product variable
2. Price variable
3. Place variable
4. Promotion variable
5. (For some Sector- People, process, Physical Evidence, factor is also collectively taken in consideration) as variable.
Extraneous variable might also cause changes in a dependent variable, thereby providing an alternative explanation to independent variable or variables. Extraneous factors which majorly contribute to Green Product Marketing Strategy are:
1. Core Values of Buyer,
2. Tangible specification offered by competitors
3. Augmented Feature offered by competitors and

Dependent variable changes in response to changes in other variables; Dependent factors which majorly contribute to Green Product Marketing Strategy are:
1. Market Share in its segment
2. Growth Rate in its category/area
3. Brand Building
4. Effect on Ecology and Environment
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Exhibit: 23 – GPMS Empirical investigation layout
GREEN PRODUCT MARKETING STRATEGY: A STUDY

Detailed Expression of Null Hypothesis

First Level

H₀₁: There is no significant Impact by Marketing Mix Strategy on Green Deployment in Indian market.

H₀₂: There is no significant impact by Exogenous Effects on Green Deployment in Indian market.

Second Level

H₀₁ᵃ: There is no significant impact by Product on Green Deployment in Indian market.

H₀₁ᵇ: There is no significant impact by Price on Green Deployment in Indian market.

H₀₁ᶜ: There is no significant impact by Place on Green Deployment in Indian market.

H₀₁ᵈ: There is no significant impact by Promotion on Green Deployment in Indian market.

H₀₁ᵉ: There is no significant impact by People-Process-Physical Evidence on Green Deployment in Indian market.

H₀₂ᵃ: There is no significant impact by Government Influence on Green Deployment in Indian market

H₀₂ᵇ: There is no significant impact by Core value of buyer on Green Deployment in Indian market

H₀₂ᶜ: There is no significant impact by Tangibility offered by competitors on Green Deployment in Indian Market

H₀₂ᵈ: There is no significant impact by Augmented Feature offered by competitors on Green Deployment in Indian Market

Third Level

H₀₃ᵃ: There is no significant impact by Product on Market Share of Green Products

H₀₃ᵇ: There is no significant impact by Price on Market Share of Green Products.

H₀₃ᶜ: There is no significant impact by Place on Market Share of Green Products.

H₀₃ᵈ: There is no significant impact by Promotion on Market Share of Green Products.

H₀₃ᵉ: There is no significant impact by People-Process-Physical Evidence on Market Share of Green Products.

H₀₃ᶠ: There is no significant impact by Government Influence on Market Share of Green Products.
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H_{03G1}: There is no significant impact by Core value of buyer on Market Share of Green Products.
H_{03H1}: There is no significant impact by Tangibility offered by competitors on Market Share of Green Products.
H_{03H1}: There is no significant impact by Augmented Feature offered competitors on Market Share of Green Products.

H_{03A2}: There is no significant impact by Product on Business Growth Rate of Green Products.
H_{03B2}: There is no significant impact by Price on Business Growth Rate of Green Products.
H_{03C2}: There is no significant impact by Place on Business Growth Rate of Green Products.
H_{03D2}: There is no significant impact by Promotion on Business Growth Rate of Green Products.
H_{03E2}: There is no significant impact by People-Process-Physical Evidence on Business Growth Rate of Green Products.
H_{03F2}: There is no significant impact by Government Influence on Business Growth Rate of Green Products.
H_{03G2}: There is no significant impact by Core value of buyer on Business Growth Rate of Green Products.
H_{03H2}: There is no significant impact by Tangibility offered competitors on Business Growth Rate of Green Products.
H_{03I2}: There is no significant impact by Augmented Feature offered competitors on Business Growth Rate of Green Products.

H_{03A3}: There is no significant impact by Product on Brand Image of Green Products.
H_{03B3}: There is no significant impact by Price on Brand Image of Green Products.
H_{03C3}: There is no significant impact by Place on Brand Image of Green Products.
H_{03D3}: There is no significant impact by Promotion on Brand Image of Green Products.
H_{03E3}: There is no significant impact by People-Process-Physical Evidence on Brand Image of Green Products.
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H₀³F₃: There is no significant impact by Government Influence on Brand Image of Green Products.

H₀³G₃: There is no significant impact by Core value of buyer on Brand Image of Green Products.

H₀³H₃: There is no significant impact by Tangibility offered competitors on Brand Image of Green Products.

H₀³I₃: There is no significant impact by Augmented Feature offered competitors on Brand Image of Green Products.

H₀³A₄: There is no significant impact by Product on Ecology and Environment.

H₀³B₄: There is no significant impact by Price on Ecology and Environment.

H₀³C₄: There is no significant impact by Place on Ecology and Environment.

H₀³D₄: There is no significant impact by Promotion on Ecology and Environment.

H₀³E₄: There is no significant impact by People-Process-Physical Evidence on Ecology and Environment.

H₀³F₄: There is no significant impact by Government Influence on Ecology and Environment.

H₀³G₄: There is no significant impact by Core value of buyer on Ecology and Environment.

H₀³H₄: There is no significant impact by Tangibility offered competitors on Ecology and Environment.

H₀³I₄: There is no significant impact by Augmented Feature offered competitors on Ecology and Environment.

Future study Scope: Fourth Layer-Control Variable

H₀⁴A: There is no significant impact by Age on Green Deployment in Indian market.

H₀⁴B: There is no significant impact by Income on Green Deployment in Indian market.

H₀⁴C: There is no significant impact by Occupation on Green Deployment in Indian market.

H₀⁴D: There is no significant impact by Education on Green Deployment in Indian market.

H₀⁴E: There is no significant impact by Gender on Green Deployment in Indian market.
4.6 Sampling

Considering research questions and objectives of green marketing strategy, it needs to consider use sampling. For present study it is not possible to collect and analyze data from every possible case or group member; which is termed a census access. Today's Sampling techniques provide variety of suitable methods that empowers researchers to reduce the total amount of relevant data needed to obtained by considering accurate data from a sub-group instead of all possible elements or cases. The full set of cases from which a sample is taken is called the population. Below is overview of sampling technique.

![Exhibit: 24 - Sampling frame]

Although it is known and understood from previous researches that population of green customer are increasing, but still with all said and done it has not widely accepted by society, especially in the unawareness of harmful effect by conventional products and in lower income group people in India. The sampling techniques available to researcher can be divided into two types:

- Probability or representative sampling;
- Non probability

![Exhibit: 25 - Sampling method Selection chart]
With probability samples the chance, or probability, of each case being selected from the population is known and is usually equal for all cases. Probability sampling is often associated with survey and experimental research strategies for research studies. Probability sampling also knows as representative sampling, and is most commonly associated with survey-based research strategies. Researcher needs to make inferences from study sample about a population to answer study research questions or to meet study objectives. The process of probability sampling can be divided into four stages:

- Identify a suitable sampling frame based on research questions or objectives.
- Decide on a suitable sample size.
- Select the most appropriate sampling technique and select the sample.
- Check that the sample is representative of the population.

The probability of each and every element being identified and selected from the considered total population is not always known and practically it is next to impossible under non-probability sample techniques. Therefore, to address objectives or to answer specific research questions require researcher to make statistical inferences about the characteristics of the population.

### 4.6.1 Deciding on a suitable sample size

Generalizations about populations from data collected using any probability sample is based on statistical probability. The larger the sample’s size the lower the likely error in generalizing to the population. Probability sampling is win win situation between the findings accuracy and the amount of time and finance invested in collecting, checking and properly analyzing the desired data.

Choice of sample size with in this compromise is governed by: The confidence needed—(the level of certainty that the characteristics of the data collected will represent the characteristics of the total population); The margin of error that can tolerated—(the accuracy required for any estimates made from drawn sample); The types of analysis
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going to undertake—(the number of categories into which researcher wish to sub divide data); The size of the total population from which sample is being drawn.

Statisticians guided that a sample size of 30 or more will usually result in a sampling distribution for the mean that is very close to a normal distribution. Stutely (2003) advice of a minimum number of 30 for statistical analyses provides useful rule of thumb for the smallest number in each category with in overall sample. Where the population in the category is less than 30, and researcher wish to undertake analysis at this level of detail, researcher should normally collect data from all cases in that category.

This process of coming up with conclusion about a population on the basis of data describing the sample is called statistical inference. Researchers normally work to a 95 percent level of certainty. This means that if sample was selected 100 times, at least 95 of these samples would be certain to represent the characteristics of the population. The confidence level states the precision of estimates of the population as the percentage that is within certain range or margin of error. For most green business management research, researchers are content to estimate the population’s characteristics at 95 percent certainty to within plus or minus 4 percent of its true values.

de-Vaus (2002), highlights that it is for this reason that many marketing search companies limit their samples sizes to approximately 1000. Estimating the likely response rate from a sample to which researcher will be sending a questionnaire or interviewing is more difficult. Baruch (1999) advices for most business studies involving top management or organization’s representatives, a response rate of approximately 35 percent is reasonable.

Neuman (2005) & Dillman (2007) suggest response rates of between 10 and 50 percent for postal questionnaire surveys and up to 90 percent for face-to-face interviews. The former rate concurs with a questionnaire survey we under took for a multinational organisation that had an overall response rate of 52 percent. With regard to telephone administered questionnaires, response rates have fallen from
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70 to 80 percent to less than 40 percent, due principally to people not answering the phone.

Fortunately a number of different techniques, depending on research study data collection method, can be used to enhance respondent’s response rate. Presented study focused on questionnaire surveys & face-to-face interviews

4.6.2 Selecting the most appropriate sampling technique and sample size

Having chosen a suitable sampling frame and established the actual sample size required, researcher need to select the most appropriate sampling technique to obtain are present active sample. Five main techniques can be used to select a probability sample are: Simple random; systematic; stratified random; cluster; multi-stage sampling.

1. **Simple random sampling** (random sampling) involves researcher selecting the sample at random from the sampling frame.

2. **Systematic sampling** involves you selecting the sample at regular intervals from the sampling frame.

3. **Stratified random sampling** is a modification of random sampling in which researcher divide the population into two or more relevant and significant strata based on one or a number of attributes.

4. **Cluster sampling** is similar to stratified sampling as you need to divide the population in to discrete groups prior to sampling (Henry 1990). The groups are termed clusters and can be based on any naturally occurring grouping.

5. **Multi-stage sampling** is a development of cluster sampling, to overcome problems normally associated with a geo-graphically dispersed population.

Non-probability sampling provides arrange of alternative techniques to select samples based on researcher subjective judgment. In the exploratory stages of some research studies, a non-probability sample may be the most practical. Subsequent, probability sampling techniques may be used. The ranges of non-probability sampling techniques available today are: Quota sampling;
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Judgemental sampling; Snow ball sampling; Self-selection sampling; Convenience sampling.

1. **Quota sampling** is entirely non-random and is normally used for interview surveys. Quota sampling is a type of stratified sample in which selection of cases within strata is entirely non-random (Barnett 1991). Quota sampling has an advantage that it is less costly and can be set up very quickly.

2. **Purposive or Judgemental sampling** enables researcher to use own judgment to select cases that will best enable you to answer research question and to meet study objectives. This form of sample is often in case study research and researcher wish to select cases that are particularly informative (Neuman 2005).

3. **Snow ball sampling** is commonly used when it is difficult to identify members of the desired population, for example people who are working while claiming unemployment benefit.

4. **Self-selection sampling** occurs when researcher allow each case, usually individuals, to identify their desire to take part in the research. Therefore; 1) Publicise your need for cases, either by advertising through appropriate media or by asking them to take part. 2) Collect data from those who respond.

5. **Convenience sampling** involves selecting haphazardly those cases that are easiest to obtain for study. The sample selection process is continued until study required sample size has been reached. Although this technique of sampling is used widely, it is prone to bias and influences that are beyond researcher control.

### 4.6.3 Population Consideration for Green Product Market

The estimation of total market in Indian context is considered finite, and thus the total population consideration for Green Product Market is also finite, and can be stated as part of conventional product market. The total market of green product is approximately TEN lacs purchaser, therefore, twenty percent of the total (approximately two lac purchaser including all categories like (Electrical & Electronics, Automotive, Pharmacy, Chemical, FMCG, Energy and others.)
4.6.4 Sample Frame and Size

For present study, (Green Product Marketing Strategy: A Study) imperial investigation was carried out though data obtained from total 1012 responses were studied for data analysis. And the following proposed matrix designs & correlation Matrix i.e. (5x4) and (5 x 5) were used for present study.

Purposive Quota Sampling

Primary Matrix-01: For studying relationship between core Independent and Dependent

<table>
<thead>
<tr>
<th>Dependent/Independent variable matrix*</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Marketing Mix Strategy - Component</td>
</tr>
<tr>
<td></td>
<td>Product</td>
</tr>
<tr>
<td>Green Deployment in Indian Market</td>
<td>Market Share</td>
</tr>
<tr>
<td></td>
<td>Growth Rate</td>
</tr>
<tr>
<td></td>
<td>Brand building</td>
</tr>
<tr>
<td></td>
<td>Eco-Env Effect</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>

Secondary Matrix-02: for studying relationship through Control Variable in later stages for detailed cluster analysis.

<table>
<thead>
<tr>
<th>Study Control Variables</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Marketing Mix Strategy - Component</td>
</tr>
<tr>
<td></td>
<td>Product</td>
</tr>
<tr>
<td>Gender</td>
<td>40</td>
</tr>
<tr>
<td>Age</td>
<td>40</td>
</tr>
<tr>
<td>Education</td>
<td>40</td>
</tr>
<tr>
<td>Income</td>
<td>40</td>
</tr>
<tr>
<td>Occupation</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>

*Note: Mediating variable is not shown in this matrix. (As they were influential variables but taken in calculation) and ‘a’=other Marketing Mix elements.
Approximating the sample size for study based on a proportion: To calculate the sample size based on a proportion with an approximation of 95% confidence level, following formula was used:

\[ n_r = \frac{4pq}{d^2} \]

More accurately the formula is:

\[ n = \frac{(1.96)^2pq}{d^2} \]

Where \( n_r \) = required sample size, \( p \) = characteristic having population proportion of the study, Secondly \( q = 1-p \) and \( d \) = the degree of desired precision. The proportion of the population (\( p \)) may be known from prior research conducted in literature or other relevant documented sources available in institutions. However if this parameter is unknown use \( p = 0.5 \) which principally assumes maximum heterogeneity (i.e. a 50/50 split). The degree of precision (\( d \)) is the margin of error that is approximately acceptable. Setting \( d = 0.02 \), for present study, would give a margin of error of plus or minus 2%.

\[ n = \frac{4pq}{d^2} = \frac{4 \times 0.5 \times 0.5}{0.05^2} = \frac{1}{0.0025} = 400 \]

For initial consideration approximate **minimum sample size should be 400 respondents**; however researcher was able to gather more than double the size of respondent’s responses for data analysis in present study.