CHAPTER - 4

RESEARCH DESIGN
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RESEARCH DESIGN AND METHODOLOGY

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4.1 Introduction:

In the previous chapter the researcher has covered the introduction to the research topic, green marketing in Global and Indian context, remarkable practices in other than automobile industries has been covered. A comprehensive literature review by taking the broad spectrum holistic view to the research area is studied.

This chapter describes the research methodology used in the study. The chapter also describes the various aspects related to the research design.

4.2 Significance of the study:

Environmental activism has led to legislations and hence firms are now required to comply with the regulatory mechanism. Thus ecological marketing, also called “green marketing”, has today come of age and a marketing student needs to understand its
nuance. This is because of the significant stress created by an increasing population on our eco-systems and the desire of more individual and families to adopt a resource-intensive lifestyle.

Developed economies such as United States, Germany, and Japan across have been practicing green marketing for more than two decades. Indian automobile companies have started green marketing practices in recent times. There may be many issues related to green marketing practices in automobile industry in India, which need to be studied in detail hence to bridge this gap, this research has been undertaken.

Here the study will attempt to make contribution to marketing literature from both a theoretical and managerial perspective by satisfying the research objectives. It will contribute to the marketing literature by providing an empirical examination of several forces affecting initiating, implementing green marketing practices. The results of the study will also provide an improved understanding of correlation between the extent of green marketing practices implementation and various market performance factors like increased market share, customer satisfaction, competitive advantage, profitability, sales volume, brand image.

This study will benefit marketers and practitioners in widespread and cash cow automobile industries and its ancillaries industries. It analyzes the dimensionality of green marketing in terms of, implementation, competitive advantage, challenges in implementation and solutions devised by the industries. This statistical database offers huge scope and insights to green marketing. It also suggests strategic tools for marketing, production, sustainability managers. This study will be beneficial to the government as well as regulatory authorities like ARAI which is co-operative industrial research association by the automotive industry with the Ministry of Industries, Government of India, to review its environmental policy.

4.3 Research Gap and Research Problem:

- The evolution of the marketing function and a greater social awareness with respect to environment protection issues have given the concept of environmental marketing a more global perspective in relation to the firm’s economic activity, which is applicable to almost every industry. The
Automotive Industry globally is one of the largest industries and because of its deep forward and backward linkages with the rest of the industry.

- Most of the studies done so far identify the green marketing in FMCG sector or consumer behavior with focus on green marketing.
- There is considerable gap in existing research as it does not explain what are various green marketing practices in automobile and ancillary industry or what are the challenges, benefit due implementation of green marketing practices.
- This study proposes to bridge the above gap by understanding various issues and challenges in green marketing with respect to automobile and ancillary industry in and around Pune.

**Statement of Research Problem**

This study is undertaken with an objective to study, an increasing focus on green marketing practices in automobile and ancillary industries in and around Pune. Many automobile companies in developed economies have been practicing green marketing for more than two decades. Indian automobile companies have started green marketing practices in recent times. There may be many issues related to green marketing practices in automobile industry in India, which need to be studied in detail hence to bridge this gap, this research has been undertaken.

**4.4 Objectives of the study:**

**Objective 1**- To study the evolution of green marketing awareness in India in general and automobile industry in particular.

**Objective 2**- To critically study the forces affecting initiating, implementing green marketing practices in automobile industry in and around Pune.

**Objective 3**- To study the various problems for implementing green marketing practices.

**Objective 4**- To evaluate how companies are implementing green marketing practices.

**Objective 5**- To study impact of green marketing practices on market performance.
4.5 **Hypothesis of the study –**
Hypothesis is usually concerned as the prime research instrument. It helps to suggest new findings and experimental observations. Hypothesis testing can help the decision makers to get the real scenario of problem and corresponding probable solution so that they can take the appropriate decision. Based on the above objectives the researcher has designed hypothesis.

**Hypothesis 1A:** Government regulations have more influence on initiating and implementing green marketing practices.

**Hypothesis 1B:** Competitive forces increases/intensifies implementation of green marketing practices

**Hypothesis 2:** Companies which are practicing green marketing get more competitive advantage

**Hypothesis 3:** There is positive correlation between the extent of green marketing practices implementation and market performance.

4.6 **Scope of the Study:**
This research is an attempt to know whether this green marketing concept has been accepted by manufacturing industry or not. **Hence in this study focus is only on B2B** i.e. business to business and B2C i.e. Business to customer is not focused since Final customers who are actually buying the vehicles have not taken into consideration since they have more concern for price, performance style, convenience, aesthetic view and have very less concern about environment.

- This study includes OEM (Original Equipment Manufacturer) Tier 1 supplier, Tier2 supplier in automobile industry.
- Here in this study researcher has chosen automobile and its related ancillary industries in and around Pune.
- This Industrial zone comprises of, Pimpari, Chinchwad, Bhosari, Hinjewadi, Rajangaon, Urlikanchan, Chakan, Hadapasar.
- Automobile industry can be broadly divided in to five parts Passenger cars, MUV’s, 2Wheeler, 3Wheelers, LCV’s, MCV’s & HCV’s.
Why customer survey not attempted

In this research final customers who are actually buying the vehicles have not been taken into consideration since they are more concerned for price, performance style, convenience, aesthetic view and have very less concern about environment.

Many automobile companies have launched CNG variants of the vehicles which are environment friendly products. Customers are purchasing those CNG vehicles not because they are environment friendly products but with the concern of, their running cost is low compare non green product

4.7 Type of Research:

There are three research purposes; these three are exploratory, descriptive and explanatory research purpose. The purpose with exploratory research is to define and clarify the nature of a problem-to look around. Descriptive research describes the characteristics of a population or a phenomenon over a period of time. Explanatory research is a causal research, which is used to explain a certain set of events and to indicate how the investigation may apply to the investigation.

This is descriptive and empirical type of research which include survey and fact finding enquiries of various kinds. The major purpose of this research is the description of the state of affairs as it exists at present. The main characteristics of this research is that the researcher has no control over the variables, can only report what has happened or what is happening. Descriptive research does not explain why an event has occurred or why the variables interact the way they do.

Empirical research relies on experience or observation alone, often without due regard to the system and theory. This research is cross sectional in nature.

4.8 Sampling Design

Sampling design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure that would be adopted in selecting items for the sample. Sampling is that part of statistical practice concerned with the selection of individual observations intended to yield some knowledge about a population of concern. The way in which researcher select sampling unit or element is called the sampling design or strategy.
While developing a sampling design, as a researcher attention has been paid on the following points:

**Type of Universe:** The first step in developing any sample design is to clearly define the set of objects, technically called the universe, to be studied. In this study since the number of items are certain, the universe is finite.

The total number of automobile industries in and around Pune which are associated with MCCIA are 332, as per MCCIA trade directory 2010, So chosen population here is 332.

**Sampling Element:** Pune region - Automobile and related ancillaries in Pune Industrial zones (VIZ, Pimpapi, Chinchwad, Bhosari, Hinjewadi, Rajangaon, Ulrikanchan, Chakan, hadapasar).

**Sample size calculations:** Sample size was determined by using mean method since most of the variables were measured using a five point interval scale.

Sample size formula

\[ n = \frac{z^2 \times s^2}{e^2} \]

Where \( n = \) sample size

\[ z = \text{standard code associated with chosen level of confidence (95\%)} \]

hence \( z = \pm 1.96 \)

\( s = \) variability in the dataset

\( s \) is computed as the ratio of Range /6 std. Deviation

\( \text{Range} = 5-1 = 4 \) (since data was collected using a five point scale)

\( \text{Hence Std. Dev} = 4/6 \)

\( = 0.666 \)

\( e = \) tolerable error

\( = 15 \% \)
\[ n = \frac{z^2 \times s^2}{e^2} \]

\[ n = \frac{(1.96)^2 \times (0.66)^2}{(0.15)^2} \]

\[ n = \frac{3.84 \times 0.435}{0.225} \]

\[ n = \frac{1.67}{0.0225} \]

\[ n = 74.24 \]

Hence the sample size taken as 74 for tier 1, tier 2 suppliers. Questionnaire was filled from 74 respondents however four questionnaire were missing values on large variables hence were eliminated from the analysis effectively sample size available was 70. Out of the total population 11 are the OEM’s. **tier 1, tier 2 suppliers are 70 + 11 OEM’ = 81 is the final sample size**.

**Sampling Tool/Technique**

Here in this study the criteria’s for selection of companies from the chosen population, are year of establishment and turnover of the company.

Out of chosen population 332, 81 companies have been chosen on the basis of

1. Year of Establishment: Company should have its existence for minimum ten years (till 2013).

2. Turnover: Company should have turnover more than 10 US Mln $.

**Sampling method:**

Considering the above criteria’s, **Non probability judgmental sampling technique is to be used**, in this research study.

**4.9 Source and Methods of Data Collection**
Data collection is one of the most important components of research which required to solve a defined research problem. There are several ways of collecting the appropriate data which differs considerably in the context of money cost, time and other resources. Data collection will be broadly done under the following two categories namely; primary data (can be collected either through experiment or through survey and secondary data. This research utilizes both primary as well as secondary data.

**Primary data**

Primary data is collected by a survey of the above sampling elements.

**Research Instrument –Questionnaire**

For this study structured questionnaire formed and data collected through traditional questionnaire in hard copy as well as an ‘Online Questionnaire’ is prepared. As per the respondents convenience one of the above method has been used. An online questionnaire using Google docs was designed and its link was send to the respondents. Same questionnaire was used for both the methods (online as well as field survey.)

Primary data collection:

*Here the responses were taken from plant managers/operation manager in consultation with marketing manager.*

Besides this taking into account government initiatives and government control regulations tried to seek information from

1. **Directorate of Industries** –Govt. Of Maharashtra: Industrial officer: Office of the joint Director of Industries, Pune Region, Pune

2. **ARAI** ( Automotive Research Association of India) Deputy Director

**Secondary data:**
Secondary data is of crucial importance as it indicated the gap in existing research (through literature review) and thus helped in formation of statement of research problem.

For this study researcher has collected secondary data by conducting a comprehensive literature survey of books, National and International referred journals, conference proceedings, previous relevant research work, magazines, newspapers, government publications, internet websites. Researcher has also used some prime sources for secondary data like Mahratta Chambers of Commerce Industries and Agriculture (MCCIA) trade directories and its other publications, Annual Reports of companies, ACMA directories and its other publications.

**4.10 Design of Questionnaire**

**This Questionnaire contains six major sections such as**

**Section I:** Evolution and awareness of green marketing practices

Question No.1-3: were based on awareness of green marketing practices, which are the various practices implemented and to what extent it has been implemented.

**Section II:** Contained questions pertaining to review (why, what how) green marketing practices

Question No. 4: Various reasons for implementation of green marketing practices

**Section III:** Contained questions pertaining to Problems and devised solutions in implementing green marketing practices

Question No.5-6: Problems and devised solutions in implementing green marketing practices

**Section IV:** Contained questions pertaining to Green brand/product and competitive advantage

Question No. 7: Green marketing practices and competitive advantage
Section V: Contained questions pertaining to Part-1 Green marketing and corporate social responsibility and Part 2-Green marketing and sustainable development

Question No.8-11: Green marketing and corporate social responsibility, sustainable development

Section VI: Contained questions pertaining to Green marketing and Market Performance

Question No.12: Green marketing practices implementation and Market Performance

4.11 Pilot Study

A pilot study was conducted covering 50 respondents for assessing the various green marketing practices, its reasons for implementation and challenges. Based on the pilot study, the questionnaire was suitably restructured wherever required and used for collecting requisite information to meet the objectives of the study.

4.12 Reliability Analysis of Questionnaire

Reliability can be used to assess the degree of consistency between multiple measurements variables. Examining the internal consistency or homogeneity among the items is the common measurement of reliability (Cooper & Schindler, 2006). Cronbach’s Alpha is one of the most widely used measures to test internal consistency and is considered adequate if it exceeds 0.60. Churchill also notes that for the purpose of consistency, the coefficient alpha should be calculated prior to any further data analysis.

The researcher achieves reliability and credibility by conducting a number of discussions with academic and commercial specialists in the researched context. This provided the researcher with useful guidance and avoided the researcher’s failure in addressing key research themes.

The study was Cronbach’s alpha to measure the internal reliability of the questionnaire with statistical software SPSS 17.0, this research tested the reliability of the measuring scale for 66 items. As shown in Table 4.1 Cronbach’s alpha is 0.91.
Table : 4.1- Reliability Statistics

<table>
<thead>
<tr>
<th>No. of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0.911</td>
</tr>
</tbody>
</table>

Reliability over 0.80 is good; reliability in the range of 0.70 is acceptable; and reliability less than 0.60 is considered poor, and when Cronbach’s alpha is greater than 0.7, it shows the questionnaire has a relatively high internal reliability.

The results of the study show that Cronbach’s alpha is higher than 0.7. It indicates that the reliability of the questionnaire is acceptable. Taking the reliability test; it can be known that this research is reliable and it can be used in the verification of hypothetical study.

4.13 Analysis of the Data

The Friedman Chi square:

This test was judged to be appropriate, to test the hypothesis 1 and 2- A. Friedman test is the non-parametric test. It is used to test for differences between groups when assumption of normality is not made. It is nonparametric alternative of paired ANNOVA.

Binomial Test:

One common use of the binomial test is in the case where the null hypothesis is that two categories are equally likely to occur (such as a coin toss). Tables are widely available to give the significance observed numbers of observations in the categories for this case.

Bivariate Correlation analysis:

Bivariate analysis is descriptive analysis, in order to do analysis between two variables, this test is used. It is one of the simplest forms of the quantitative (statistical) analysis. It involves the analysis of two variables (often denoted as \(X, Y\)), for the purpose of determining the empirical relationship between them. In order to see if the variables are related to one another, it is common to measure how those two variables simultaneously change together. Bivariate analysis can be helpful in testing
simple hypotheses of association and causality – checking to what extent it becomes easier to know and predict a value for the dependent variable if we know a case's value of the independent variable

**Multiple Response Analysis**

It is used as the statistical technique since more than one response or measurement survey question can be answered multiple valid times, such as questions which note "Check all that apply", multiple variables are necessary to capture all the responses. This collection of variables is called a multiple response set. The variables of a multiple response set are coded as dichotomies or categories.

**4.14 Use of computer software in analysis of the data**

1. SPSS 20.0 Update version 14, 15 (Statistical Package for the social Sciences) was used for data analysis.

2. Microsoft Office Excel 2007 is used to generate graphs based on frequency distribution tables.

**4.15 Limitations of the Study:**

This study has included auto and ancillary industries which are associated with MCCIA (Maharatta Chambers of Commerce Industries and Agriculture) only. Companies are following various standards or norms like ISO 9000, ISO 14000, In case of this research doing bifurcation between green marketing, ISO 14000, and corporate social responsibility would be really difficult. Scope of this research is limited to automobile and related ancillaries in and around Pune industrial zone.

**4.16 Time Horizon:**

This research has been conducted in the period of year 2010 to 2014. However the primary data was collected through questionnaire from Jan 2012 to June 2013.

**4.17 Chapter Scheme:** The Chapter scheme for the thesis is as follows
Chapter 1: Introduction and Background

This chapter describes Introduction, background, need and the significance of the study and Concept and Evolution of green marketing, remarkable green marketing practices in various industries, automobile Industry and Environmental Problems their interrelations, reasons to select area for research.

Chapter 2: Overview of Automobile Industry In The Light Of Green Marketing

This chapter gives an overview of automobile industry in the light of green marketing, Green Marketing global perceptive, Green marketing awareness in India and specifically in Pune in automobile and ancillary industries. Government and ARAI initiatives, and challenge ahead in introducing Green marketing /In Automobile industry in India.

Chapter 3: Review of Literature

This chapter is devoted to review of literature which takes review of all the literature written so far related to the research topic. Chapter starts with importance of Green Marketing as a holistic concept gradually evolves to reasons and challenges, green marketing mix and strategy.

Chapter 4: Research Methodology

This chapter describes Research Methodology adopted for this research. This chapter put forward the objectives, hypothesis of the Study. Here the scope of the study, sampling design, sources and methods of data collection are specified. Design of questionnaire to research objectives, pilot study, and reliability analysis of questionnaire are explained. It also includes different statistical techniques used for data analysis and hypothesis testing is specified.

Chapter 5 Data analysis and Hypothesis testing

This chapter elaborates the analysis and the interpretations based on the primary data collected through questionnaire with the relevant table and supportive graphical representations wherever required. A separate section is devoted for hypothesis testing of the research.
Chapter 6 Observations and Findings

This chapter enlists the research findings of the study. It provides a clear idea about the output of the study in relevance with its objectives and hypothesis.

Chapter 7 Conclusions and Suggestions and Direction for Future Research

This chapter provides a summary of complete study in the form of conclusion. Further relevant suggestions based on findings and observations are conveyed, which will be useful OEM’s as well as ancillary industries.

Bibliography and Appendix are given at the end of the thesis