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CHAPTER 3

RESEARCH METHODOLOGY

Introduction

Research methods are specific procedures for collecting and analysing data. The methodology section allows readers to evaluate the overall validity and reliability of study and gives important insight into two key elements of research: Data collection and Analysis processes and rationale for conducting the research. The purpose of this study is to examine consumers' environmental attitudes and purchasing behaviour of green products in relation to selected household appliances using the following criteria: Attitude, Awareness, Consumer Readiness, Subjective Social Norm, Moral Norm, Environmental Self Identity, Warm Glow, Perceived Barriers, and Green Purchase Behaviour. Researchers related to the subject field were given in the preceding chapter. Based on the assessment of the literature, hypotheses were developed, which resulted in a conceptual model that can be empirically evaluated. This chapter discusses how those hypotheses were tested. The methodology section comprises research design, measures, and data analysis dynamics.

The section opens with an overview of rationale of the study, problem statement, and models that were taken into consideration. The research's objectives are then presented, along with the best methods for achieving them by framing necessary hypothesis. The process for designing the research and gathering the data is then discussed. This chapter also gives a brief description of the dependent and independent variables under study, as well as the study's limitations and delimitations. The scope of future research is discussed at the end of the chapter. It showcases the use of statistical programmes, tools, and strategies for testing developed hypotheses.

3.1 KEY TERMS OF RESEARCH STUDY:

3.1.1 Green Products:

Green products are typically durable, nontoxic, made of recycled materials, or minimally packaged. Of course, there are no completely green products, for they all use up energy and resources and create by-products and emissions during their manufacture, transport to warehouses and stores, usage, and eventual disposal. So

green is relative, describing products with less impact on the environment than their alternatives.

Following are some definitions given by different authors:

1. *Liu and Wu (2009)*, “Products whose function or ideals deal with the process of material retrieval, production, sales, utilization and waste treatment is available for recycling, reduced pollution and energy saving.”
2. *Albino, Balice and Dangelico (2009)*, “product designed to minimize its environmental impacts during its whole life-cycle. In particular, non-renewable resource use is minimized, toxic materials are avoided, and renewable resource use takes place in accordance with their rate of replenishment.”
3. *Wagner (2009)*, Environmental innovations: measures of relevant actors (firms, private households), which: (i) develop new ideas, behaviour, products and processes, apply or introduce them, and; (ii) contribute to a reduction of environmental burdens.

3.1.2 Green Consumption:

Gilg, Barr, and Ford (2005) developed the term "green consumption" to refer to buying goods that have a lower environmental impact. The act of consumption has multiple dimensions, including social, economic, and physical factors. Individuals' behaviour is influenced by their personality, environment, psychology, legal framework, political atmosphere, and social institutions of their community (Sarigollu, 2009). "Green consumption" refers to minimising negative environmental impact through product purchases, usage, and disposal. (Carlson and Kangun, 1993). Green consumerism is an important part of sustainable living since it entails selecting ecologically friendly products that help to conserve resources. Consumers can help safeguard the environment by choosing green products, which generally incorporate recycled materials, save energy and water, and reduce waste and pollution.

3.1.3 Green Marketing:

Green Marketing refers to the process of selling products and/or services based on their environmental benefits. It may be packaged or produced in an environmentally

friendly way. Concept of green marketing concerns with the protection of ecological environment. Modern marketing has created a lot of problems. Growth in marketing activities resulted into rapid economic growth, mass production with the use of advanced technology, comfortable and luxurious life style, competition, use of unhealthy marketing tactics and techniques to attract customers, creation of multinational companies, etc.

According to the American Marketing Association, green marketing is the marketing of products that are used to be environmentally safe. Going by alternative names such as sustainable marketing, environmental marketing, green advertising, eco marketing, organic marketing, all of which point to similar concepts though perhaps in a more specific fashion, green marketing is essentially a way to brand your marketing message in order to capture more of the market by appealing to people's desire to choose products and services that are better for the environment.

3.1.4 Green Household Appliances:

The idea of green household appliances refers to any energy-efficient home equipment that is designed to improve the energy efficiency of an electric device and lower utility expenses. There are numerous green household appliances, including air conditioning, water heaters, lighting, washing machines, refrigerators, ovens, televisions, and many others. The more efficient the appliance, the less energy it consumes.

The main advantage of green household appliances is the capacity to considerably cut energy usage. They accomplish this by utilising sophisticated technology such as enhanced insulation, better control systems, and optimised components. For example, an energy-efficient refrigerator can keep a lower temperature while using less electricity, saving energy and lowering your utility expenses.

3.1.5 Energy Efficient Appliances:

Energy-efficient appliances are designed to use less electricity, water, or fuel while maintaining or improving the performance of traditional models. As concerns over environmental sustainability and rising energy costs grow, these appliances have become increasingly important in both residential and commercial settings. Energy-efficient appliances minimize the amount of energy they consume during

use. This efficiency is typically achieved through advanced technology, improved materials, and smart design. For example, energy-efficient refrigerators use better insulation and advanced compressors to reduce electricity consumption, while modern washing machines optimize water usage and spin cycles to minimize energy expenditure.

Energy-efficient appliances play a crucial role in modern households and businesses by reducing energy consumption, lowering costs, and minimizing environmental impact. As technology advances and consumer awareness grows, the adoption of these appliances is likely to increase, contributing to a more sustainable future. Whether through smart sensors, advanced materials, or innovative design, energy efficiency is becoming a cornerstone of appliance manufacturing, offering both economic and environmental benefits to users worldwide.

3.1.6 Green Purchase Behaviour:

Green purchasing behaviour can be translated to the act of consuming products that are conservable, beneficial for the environment, and responding to environmental concern (Lee, 2009). Webster (1975) found that the socially conscious customer feels strongly that he/she can do something about pollution and tries to consider the social impact of his/her buying behaviour.

A green consumer can be identified to be one who avoids any product which may harm damage to any living organism, cause deterioration of the environment during process of manufacturing or during process of usage, consume a large amount of non-renewable energy , involves unethical testing on animals or human subjects (Elkington, 1994).He also states that “According to Wiener and Sukhdial (1990), one of the main reasons that stop individuals from engaging in ecologically favourable actions is their perceived level of self-involvement toward the protection of the environment”.

3.1.7 Pro-Environmental Behaviour:

The phrase "pro-environmental behaviour" (PEB), often known as "green," "sustainable," or "environmentally friendly behaviour," refers to actions people take to reduce their environmental impact. Pro-environmental conduct refers to actions taken by people to protect the environment. PEBs can be adaptive responses

to the effects of climate change, such as buying sustainable products (e.g., local food, green cleaning products), conserving water or energy, or changing one's mode of transportation (e.g., from driving to walking or cycling) to purchasing an electric vehicle or building an off-grid home. PEBs also include responsibly enjoying the outdoors or recycling household waste and recycling.

3.1.8 Sustainable Development:

To ensure that the requirements of current and future generations are met, sustainable consumption entails consuming goods and services in the most environmentally friendly way possible. Strong sustainable consumerism is demonstrated by the consumption of efficient and renewable goods and services (such as electric automobiles, bicycles, and renewable energy). Sustainable consumption and production are frequently used interchangeably; consumption refers to the use and disposal (or recycling) of resources by entities other than individuals and houses, such as businesses, governments, and households. Sustainable production and lifestyles are inextricably linked to sustainable consumption.

3.2 RATIONALE OF THE RESEARCH STUDY:

With time, green products and marketing are becoming more and more popular. As more green products reach store shelves and information regarding eco-friendly lifestyles becomes increasingly prevalent, making sustainable choices is getting easier. Green products are growing more and more popular as people become more health conscious. However, a systematic approach has not been made in India for buying behaviour. So, this research tries to identify and study the factors that affect green buying behaviour in household appliances.

As stated above, green products are gaining popularity due to green marketing, which in turn creates a lot of awareness among consumers. Household appliances are directly related to Energy Efficiency consumption. Still, there are many barriers such as environmental consciousness, environmental sensitivity, price of green products, availability of green products etc.

White goods are the product category chosen for the study. AC, dishwasher, clothes dryer, drying cabinet, freezer, refrigerator, kitchen stove, water heater, washing machine, trash

compact, microwave ovens, and induction cookers are examples of white goods/major appliances. Because white goods consume the most electricity, it was critical to investigate consumers' perceptions and attitudes towards such products. In this study we are considering buying behaviour of four household appliances which are Refrigerator, Air Conditioner, Television and Washing Machines. In this context consumers' perception about each demographic variable was studied and analysed.

3.3 RESEARCH GAP:

Many scholars have contributed to the empirical works of green marketing and its importance. But, after conducting a complete review of the literature, the researcher observed that only limited empirical studies exist that focused on analysing customer purchasing behaviour towards energy-efficient home appliances. No specific study has been conducted in particular area of selected green household appliances included in this study. This is a critical topic that has yet to be investigated. The present study incorporates the relationship between two main variables – Pro Environmental behaviour with the extended Theory of Planned Behaviour and Sustainable Consumption. The conceptual framework was created using the extended TPB approach and hypotheses are framed. Furthermore, this research will contribute not only to its practical applications to manufacturers as well as certain green companies but will also add to the current scholarly literature on the subject, particularly in the Indian context.

3.4 STATEMENT OF PROBLEM:

Consumer attitudes towards a greener way of life have somewhat evolved in the modern period as a result of increased awareness of numerous ecological challenges. Reducing the detrimental impact on the environment is something that many consumers are very interested in. However, not many people are still aware of this fact. Numerous businesses have noticed improvements in the attitudes of their clientele. Additionally, businesses are attempting to capitalise on the underlying opportunity and positively define the environmentally friendly market structure. Previous studies have shown that consumers are willing to pay more for environmentally friendly products. Because many consumers place greater value on eco-friendly features than those found in traditional products, they are ready to make the necessary sacrifices. On the other hand, some research indicates that

premium cost is a major factor contributing to consumers' disinclination towards green products. When this kind of observation is examined, evaluating green marketing becomes a crucial problem for academics and researchers. The goal of the current study is to analyse consumer purchasing patterns for particular eco-friendly home appliances. The statement of problem therefore is *“An Empirical Study on Pro-Environmental Behavior Towards Selected Green Household Appliances for Sustainable Consumption: Special Reference to Gujarat, India.”*

3.5 RESEARCH OBJECTIVES:

One of the important aspect of our awareness towards environment, accounts the buying behaviour in relation to eco-friendly products. Given what has been said, it is felt important to research study and analyse the various issues / factors contributing to energy saving and leading towards sustainable consumption. Research objectives have evolved from research problem statements, research gaps and by in depth study of domain and review literature.

The main goal of this study, according to this citation, is to examine how pro-environmental behaviour could influence customer purchasing decisions for particular green home equipment. In addition to the primary goal, the research aims to achieve the following secondary goals:

1. To investigate the relationship between pro-environment behaviour and energy saving.
2. To study the behaviour pattern of selected green household appliances among Indian households.
3. To study consumers' overall level of awareness, attitude and influence/readiness towards green purchase behaviour.
4. To determine the level of recognition of eco-labels used in selected green household appliances.
5. To determine the factors and their impact on consumers' green purchase behaviour.
6. To determine the impact of consumers' level of green product/brand awareness and green product/brand image on the perceived quality and purchase intention towards selected green household appliances.

7. To determine the relationship between green marketing tools and green purchase behaviour.
8. To determine the relationship between consumer demographics and sustainable consumption behaviour.

3.6 RESEARCH HYPOTHESIS:

To achieve the above-mentioned objectives, a set of 11 hypotheses have been formulated, which were tested and conclusions were drawn based on the test results. The hypotheses are mentioned below:

- | | |
|--------------------------|---|
| H₀₁ | There is no significant relationship between pro-environment behaviour and energy saving. |
| H₀₂ | There is no significant relationship between environmental awareness and consumers' green purchase behaviour. |
| H₀₃ | There is no significant relationship between eco-labels and consumers' green purchase behaviour. |
| H₀₄ | Consumers do not believe that star rating means more energy saving for them. |
| H_{04(a)} | Consumers do not consider "star rating" as a significant criterion during purchase of Air Conditioner. |
| H_{04(b)} | Consumers do not consider "star rating" as a significant criterion during purchase of Refrigerator. |
| H_{04(c)} | Consumers do not consider "star rating" as a significant criterion during purchase of Television. |
| H_{04(d)} | Consumers do not consider "star rating" as a significant criterion during purchase of washing machines. |
| H₀₅ | There is no significant relationship between Green products /brand awareness and their perceived quality. |
| H₀₆ | There is no significant relationship between Green products /brand awareness and their purchase intention. |
| H₀₇ | There is no significant relationship between Green products /brand image and their perceived quality. |

- H₀₈** There is no significant relationship between Green products /brand image and their purchase intention.
- H₀₉** There is no significant relationship between Green marketing tools and consumers' green purchase behaviour.
- H_{09(a)}** There is no significant relationship between Green Perceived Product and consumers' green purchase behaviour.
- H_{09(b)}** There is no significant relationship between Green Perceived Price and consumers' green purchase behaviour.
- H_{09(c)}** There is no significant relationship between Green Perceived Place and consumers' green purchase behaviour.
- H_{09(d)}** There is no significant relationship between Green Perceived Promotion and consumers' green purchase behaviour.
- H₀₁₀** There is no significant relationship between selected influencing factors and green purchase behaviour.
- H_{010(a)}** There is no significant relationship between consumers' knowledge and green purchase behaviour.
- H_{010(b)}** There is no significant relationship between consumers' attitudes and green purchase behaviour.
- H_{010(c)}** There is no significant relationship between consumers' Readiness and green purchase behaviour.
- H_{010(d)}** There is no significant relationship between consumers' subjective social norms and green purchase behaviour.
- H_{010(e)}** There is no significant relationship between consumers' moral norms and green purchase behaviour.
- H_{010(f)}** There is no significant relationship between consumers' environmental self-identity and green purchase behaviour.
- H_{010(g)}** There is no significant relationship between Warm Glow and green purchase behaviour.
- H_{010(h)}** There is no significant relationship between consumers' perceived barriers and green purchase behaviour.
- H₀₁₁** There is no significant relationship between consumer demographics and sustainable consumption.

- H_{011(a)}** There is no significant relationship between age of consumers and sustainable consumption.
- H_{011(b)}** There is no significant relationship between Gender consumers and sustainable consumption.
- H_{011(c)}** There is no significant relationship between Income of consumers and sustainable consumption.
- H_{011(d)}** There is no significant relationship between Education of consumers and sustainable consumption.

3.7 SIGNIFICANCE OF THE STUDY:

The significance of this study lies in its potential to guide the development and marketing of eco-friendly home appliances, particularly in the context of Gujarat and India. By uncovering the factors that influence consumer acceptance and the obstacles to adoption, the research will help stakeholders create more effective strategies to promote sustainable products. This study also aims to enhance consumer awareness and contribute to the broader academic understanding of green consumer behaviour, offering a foundation for future research in this field.

The study's conclusions and findings will give manufacturers and marketers of certain eco-friendly home appliances valuable information on what aspects influence consumers' acceptance of their eco-friendly products in Gujarat and other parts of India. Additionally, it will assist everyone involved in determining the obstacles preventing the widespread adoption of green products and in taking the necessary steps to remove them. By increasing the clients' awareness of the benefits of the chosen green household appliances, you may get them to accept them for everyday usage. Moreover, more efficient marketing initiatives might be created to raise consumer awareness of environmentally friendly products. Additionally, this study offers reputable literature that researchers and academicians can use to advance their investigations.

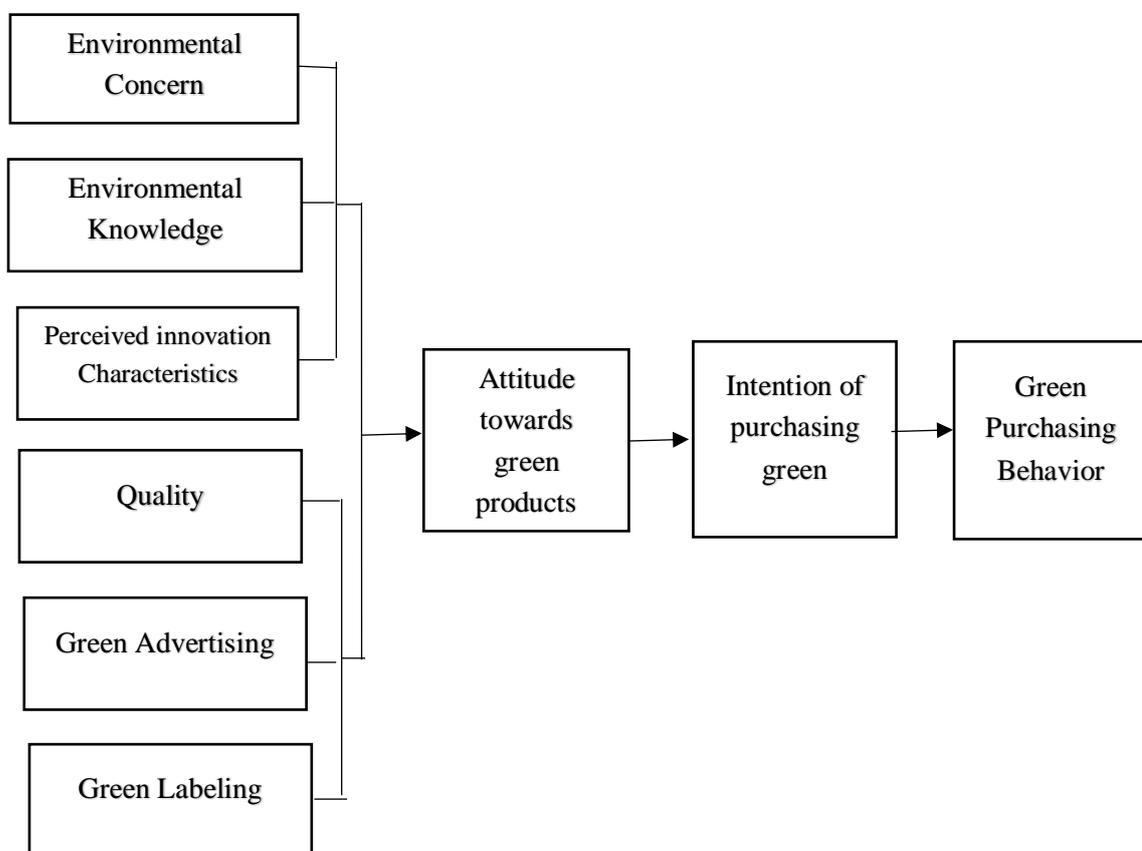
3.8 SCOPE AND COVERAGE OF THE RESEARCH STUDY:

The study attempts to better understand customer behaviour in regard to green household appliances. Consumers from Ahmedabad, Gandhinagar, and Vadodara were

chosen. Furthermore, an attempt was made to determine their level of awareness and attitude towards energy savings. The following elements influenced green purchasing behaviour: awareness, attitude, consumer readiness, subjective norms, moral norms, environmental self-identity, and perceived barriers. In addition, the study investigates the influence of green marketing tools on green purchasing behaviour.

3.9 CONCEPTUAL FRAMEWORK OF THE RESEARCH STUDY

Fig 3.1: Conceptual Model of Green Purchase Behaviour proposed by Kaufmann



Source: Kaufmann

The Kaufmann Model of Green Purchase Behaviour provides a framework for understanding the factors that influence consumers' decisions to buy environmentally friendly or "green" products. Developed by Hans Ruediger Kaufmann, this model integrates several key psychological and contextual factors to explain why and how individuals make sustainable purchasing choices.

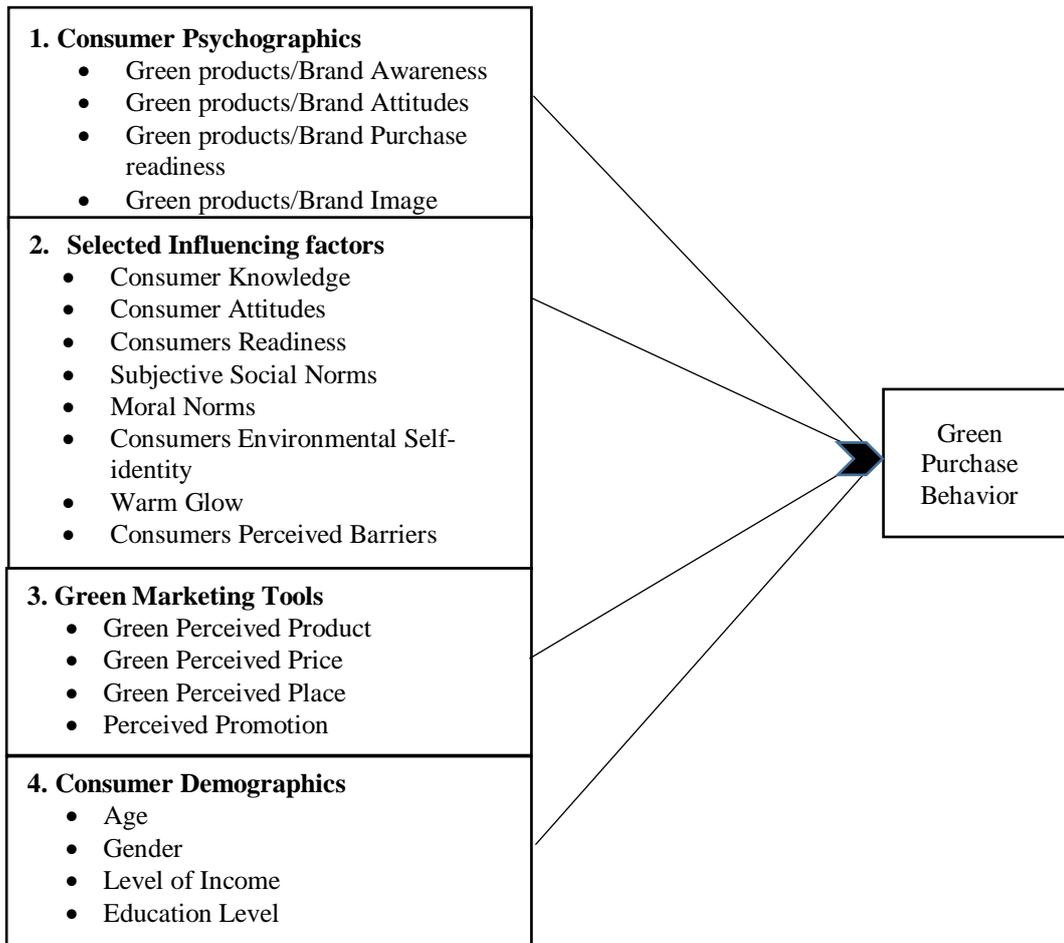
At its core, the Kaufmann Model suggests that green purchase behaviour is influenced by a combination of individual values, environmental awareness, and social norms. Individuals who prioritize ecological well-being and possess a strong sense of environmental responsibility are more likely to engage in green purchasing. This is further shaped by their level of awareness and knowledge about environmental issues and the impact of their consumption choices.

The model also emphasizes the role of social influence and normative beliefs. Social norms, or the behaviours and attitudes that are perceived as acceptable or expected within a society, can strongly affect green purchase behaviour. If environmentally friendly behaviour is valued and promoted within a person's social circle or community, they are more likely to adopt such behaviours themselves.

Additionally, Kaufmann's model incorporates the perceived effectiveness of green products and the availability of alternatives. Consumers are more inclined to purchase green products if they believe these products are effective and if there are convenient and accessible options available. Price sensitivity and the perceived quality of green products also play crucial roles in the decision-making process.

The Kaufmann Model of Green Purchase Behaviour provides a holistic view by considering both internal psychological factors and external influences, making it a comprehensive framework for analysing consumer behaviour in the context of sustainability. It is widely used in marketing and consumer behaviour studies to devise strategies that promote environmentally conscious consumption.

Fig. 3.2: Proposed Conceptual Framework of the Research Study



Source: Developed by the Researcher

To achieve the research objectives, a brief view of the available literature was undertaken by the researcher and a conceptual model was developed as given in Fig 5. The model has incorporated independent and dependent variables. Consumer Psychographics, Selected Influencing Factors, Green Marketing tools and Consumer Demographics are included in Independent variables. Along with that under dependent variables, Green Purchase behaviour is used. The main aim of conceptual framework is to identify the influence of Independent variables on Green Purchase Behaviour.

3.9.1 Consumer Psychographics:

Consumer psychographics consist of green product brand awareness which is the ability of a buyer to recognize whether the product is environmentally friendly or not. The next aspect under this is green product brand attitude. It relates to consumers' attitude toward

their overall evaluation of a brand's green performance. Further, Green Product Brand Purchase is when consumers believe in making decisions that are environmentally friendly and use products that are sustainable and cause very less or no pollution. Lastly, Green Product/ Brand Image is when customers are actively aware of a brand's eco-friendly products and actions, which are usually stronger than their competitors' environmental measures.

3.9.2 Green Product Brand Awareness:

Green brand awareness is defined as 'the ability for a buyer to recognise and recall that a brand is environmentally friendly'. Customers who are concerned about the environment find that green products, pricing awareness, and brand image awareness influence their purchasing decisions positively. It is the responsibility of marketers to provide information on green products, eco-labelling, and the use of green messaging content in order to familiarise people with green brands. If there is a higher degree of brand equity, customers will buy a brand with a higher level of brand awareness, and a strong association of brand awareness has a beneficial influence on consumer purchasing behaviour for green products (Keller K. L., 1993).

3.9.3 Green Product Brand Attitude:

According to Lee (2008), customers' attitudes towards green brands stem from their appraisal and reasonable judgement. According to Rios et al. (2006), companies that communicate environmentally friendly attributes to consumers can help them choose between different brands. Consumers' attitudes towards green brands are heavily influenced by their understanding of environmental protection.

3.9.4 Green Product Brand Purchase:

The purchase of items and services that have a lower impact on human health and the environment than competing products or services that fulfil the same goal. Examples of green purchases include: Purchasing energy-saving light bulbs, selling organic food in the cafeteria, printing with non-toxic ink toner, and providing exclusively post-consumer

recycled paper goods in the facilities are all examples of green procurement decisions that may be made by any company.

3.9.5 Green Product Brand Image:

Brand image influences consumer perceptions and associations with the brand. It may be described as "a collection of perceptions about a certain brand in the minds of consumers which related to the brand's commitment in protecting the environment" (Chen, 2008). Brand image is shaped by marketing communication strategy. When a company promises to offer eco-friendly items, consumers perceive higher quality and a greener brand image. A strong brand image is associated with superior quality and worth, resulting in a favourable brand image.

3.9.6 Consumer's Knowledge:

It is a form of consumption that is compatible with environmental protection for both current and future generations. A consumer who is concerned about environmental protection when making a purchasing decision. Is a person who supports environmental causes and prefers green products.

Environmental understanding is required while developing green products (Li et al., 2019). Based on this, managers must have knowledge of the environment, which includes systemic knowledge, knowledge of action, and knowledge of benefits (effectiveness) (Geiger et al. 2018).

3.9.7 Consumer Attitudes:

Consumer attitude is a collection of emotions, behavioural intentions, and beliefs that a consumer has about a behaviour or product. It can be altered by changing one or more of its three components: behavioural, affective, and cognitive. Heyl et al. (2013) define green attitudes as the tendency to respond consistently favourably or unfavourably to environmental issues. The more positive a consumer's attitude towards green products, the more willing they are to pay for them.

3.9.8 Consumers' Readiness:

Consumer readiness refers to if consumers believe and promote green appliances. How easily consumers persuade themselves to buy energy efficient appliance or product. The main promotor of consumers' readiness to purchase such products are consumers' attitude and knowledge/awareness.

3.9.9 Subjective Social Norms:

According to Fishbein and Ajzen (1975), the subjective norm refers to the opinions and motivations of significant others in a consumer's life, such as family or friends. Subjective norms, including comments from friends, family, government, environmentalists, and changing lifestyles, might affect customer behaviour towards eco-friendly items. Subjective norms refer to a concept that most people accept or disapprove of a behaviour (LaMorte, 2019). This refers to a person's ideas about whether their peers and significant others believe they should engage in a particular behaviour.

3.9.10 Moral Norms:

The current study used the concept of environmental knowledge from Kaiser et al. (1999) which states that the term "environmental knowledge" refers to individuals' factual knowledge of the environment.

3.9.11 Consumers Environmental Self-identity:

Green self-identity is an expansion on the concept of self-identity that involves the use of green or sustainable items. Self-identity is defined as "the salient aspect of an actor's self that is related to a specific behaviour." As people relate to their behaviour in a different environment, the concept of self-identity becomes increasingly important in interpreting it. Green identity has been identified as a significant predictor of consumers' intentions to purchase environmentally friendly products.

3.9.12 Warm Glow:

As per the theories, "warm glow" refers to the satisfaction people get from "doing their part." According to James Andreoni's initial warm-glow concept (1989, 1990), people feel the pleasure and satisfaction after "doing their part" to aid others. Warm-glow theory is an economic paradigm that discusses the emotional satisfaction that an individual may feel when engaging in pure altruistic behaviour, such as donating to others. Previous

research indicates that consumers may have a personal feeling of fulfilment when they commit to not only ethical behaviours, but also environmental consciousness.

3.9.13 Consumers Perceived Barriers:

Green products are not widely accepted by consumers, indicating limitations to their use. Perceived barriers can prevent environmentally conscious buyers from demonstrating their commitment. Some of the barriers include premium price for its payment, distinguish between energy efficient appliance and conventional appliances, trusting he credibility of energy rated appliances, lack of awareness and availability of green products and lack of proper promotion.

3.9.14 Green Marketing Tools:

This study considers the three green marketing tools, such as eco-labels, eco-brands, and environmental advertisements, to be an enrichment to a consumer's understanding of environmentally friendly items. These tools will facilitate perception and raise knowledge of green product traits and features, hence influencing consumers to purchase environmentally friendly items. Under this study, perceived pricing, perceived place, perceived product, and perceived promotion are all included in marketing tools.

3.9.15 Green Perceived Product:

The term "Green Product" refers to products or services that are not harmful to the outdoor environment. Nevertheless, for more than a decade, the U.S. Federal Trade Commission (FTC) has issued warnings about products or services marketed as environmentally friendly or environmentally safe. A green product is defined as a product that was manufactured using toxic-free ingredients and environmentally-friendly measures, and which has been recognised as such by an acknowledged organisation.

The product is the centre of the green marketing mix and the most important factor of the overall green marketing strategy. In business, the terms "green product" and "environmental product" refer to products that strive to conserve or improve the natural environment by conserving energy and/or resources and decreasing or eliminating the usage of noxious agents, pollution, and waste.

3.9.16 Green Perceived Price:

The price is the amount paid for a product. It is a key component of the marketing mix. The majority of buyers will only pay a premium if they believe the product offers more value (Eric, 2007). This value could include improved performance, functionality, design, visual appeal, or taste. Green pricing balances people, earth, and profit in a way that protects employee and community health while ensuring efficient output. A higher price than the standard alternative might be a deciding factor for certain clients, confirming the accuracy of the product's green features. Others do not consider the price at all and chose the environmentally friendly option.

3.9.17 Green Perceived Place:

Green Place refers to the location where a product can be purchased. It can refer to both real and virtual stores. Product distribution should follow satisfactory channels and be visibly and accurately positioned in an environmentally safe location with no contamination. Green place is about managing logistics to reduce transportation emissions, thereby reducing the carbon footprint (Shil, 2012). It is related to the use of distribution gates that deal with green products that are suitable for customers, in terms of facilitating their delivery, and to secure cycling procedures that take place within environmental conditions and requirements. Green distribution is an extremely sensitive job. Customers must be assured of the product's 'ecological nature'. The green environment is constantly controlled, and hence a high level of compliance is required when distributing green products.

3.9.18 Green Perceived Promotion:

This relates to presenting genuine information about the products in a manner that does not harm the materialistic and moral consumers' interests (Hashem and Al-Rifai, 2011). Green promotion entails configuring promotional tools such as advertising, marketing materials, signage, white papers, websites, public relations, sales promotions, direct marketing, on-site promotions, videos, and presentations with people, the earth, and profits in mind (Shil, 2012). Green promotion is the process of disseminating information to consumers about companies' environmental goals and initiatives. According to Fan and Zeng (2011), the green marketing mix comprises activities such as paid advertising, public relations, sales promotions, direct marketing, and on-site promotions.

3.9.19 Consumers' Demographic:

In order to understand customer demographics, the researcher examined four variables: Age, Gender, Education, and Income. According to different surveys, Generation Z and Millennials are more willing to pay higher prices than Generation X (1965-1980). Gender, on the other hand, plays an important impact because males base their decisions on facts and statistics. However, women tend to be hedonists and prefer to make emotional decisions such as hunting. Finally, income determines the purchasing power of each household. As a result, the better people's personal financial status, the more they expressed a desire to purchase goods that are environmentally friendly.

3.9.20 Green Purchase Behavior:

Green purchase behaviour can be translated to the act of consuming products that are conservable, advantageous for the environment, and responding to environmental concern (Lee, 2009). Webster (1975) found that the socially conscious customer feels strongly that he/she can do something about pollution and tries to consider the social impact of his/her buying behaviour.

A green consumer can be identified to be one who avoids any product which may harm damage to any living organism, cause deterioration of the environment during process of manufacturing or during process of usage, consume a large amount of non-renewable energy, involves unethical testing on animals or human subjects (Elkington, 1994). He also states that "According to Wiener and Sukhdial (1990), one of the main reasons that stop individuals from engaging in ecologically favourable actions is their perceived level of self-involvement toward the protection of the environment.

3.10 RESEARCH DESIGN:

Research design refers to the overall strategy utilized to carry out research. A well-planned research design helps ensure that your methods match your research aims, that you collect high-quality data, and that you use the right kind of analysis to answer your questions, utilizing credible sources. This allows you to draw valid, trustworthy conclusions. The research design is defined by different authors differently. (Creswell, 2014) defines research design as a procedures used in collecting and analysing the measures of the variable as specified in research problems. (E.Spector, 1981) defined that any scientific investigation, be it in the social or natural science, must begin with some

structure or plan, which defines the number and types of variables to be studied and their relationship to one another this structure is termed as Research Design.

Since the study focuses on identifying and analysing factors influencing consumer behaviour towards the purchase of green household appliances, a descriptive research design is deemed to be the most appropriate. *Descriptive design* defines and describes the researches who, what, when, where, why and how, which are some of the questions raised in this study. It involves a sound and scientific analysis of data with the help of measure of central tendency, measures of variation, hypothesis testing, correlation and the regression analysis. Thus, it is also an *analytical design* of research.

3.11 SOURCES OF INFORMATION:

3.11.1 Primary data:

Primary data required to achieve the research objectives listed earlier was collected through Non-Disguised Close-ended Questionnaire. A structured questionnaire containing a scale chosen from available literature was developed to assess the awareness amongst consumers about green household appliances, their desire to use and major factors contributing on such purchases. Appropriate five-point Likert scales ranging from 1 (strongly agree) to 5 (strongly disagree) was used for obtaining responses on various parameters of the study. The questionnaire was pre-tested through a pilot study. Based on the outcomes of the pilot study, necessary changes were made before administering the final questionnaire. Appropriate Likert scales were used depending upon the parameters/variables under study.

3.11.1.1 Questionnaire Design:

The questionnaire used for present study is divided into 10 parts:

1. Section I – Demographic Details
2. Section II – Appliance Ownership and Usage
3. Section III – Eco-Friendly Products and Consumerism
4. Section IV – Pro-Environment Behaviour and Energy Saving
5. Section V – Factors Determining Green Purchase Behaviour
6. Section VI – Sustainable Development Practices

7. Section VII – Awareness and Recognition of Green Eco-Label System
8. Section XII – Behaviour Pattern of Selected Green Household Appliances
9. Section XI – Green Brand Awareness, Perceived Green Brand Image, Perceived Quality and Purchase Intention
10. Section X – Green Marketing Tools

The first part of the questionnaire was regarding the demographic profile of the consumers. They were asked about their personal detail after consent was obtained to fill the questionnaire. Information consisting of their Age, Educational Qualification, Income, Household Size, Marital status and City of residence were included.

The second section of the questionnaire had questions regarding the appliance ownership and its usage. The frequency of purchase of eco-friendly products in the last three months were asked. Further, perception and reasons of eco-friendly product purchase were asked. In the next part of the questionnaire, statements relating to environmental pre-disposition, attitude towards environmental protection and Energy saving behaviour were questioned. Factors determining green purchase behaviour were examined in the next part. Factors included – awareness about GHA, attitude towards GHA, consumer's readiness for GHA, subjective social norms, moral norms, Environmental Self-identity, warm glow, perceived barriers and Green Purchase Behaviour. Additionally, various issues related to 'Sustainable Development Practices/Consumption Behaviour' were analysed. Consumers were inquired about awareness and recognition of Eco-friendly products. Behaviour pattern of selected Green Household Appliances were asked to consumers. In the next section of the questionnaire questions were related to Green Brand Awareness, Perceived Green Brand Image, Perceived Quality and Purchase Intention. Finally, statements were asked relating to green marketing tools and their actual green purchase behaviour.

Following is the list of selected references used for drafting the questionnaire. Appropriate scales were used from these selected references for achieving the research objectives. Based upon the findings of the pilot study, certain scales were modified to suit the conceptual framework and the reliability and validity of the constructs used, were found to be highly reliable and valid.

Table 3.1: References used for drafting the questionnaire

Perception towards Eco-Friendly products	Morel, M., and Kwakye, F.	2012
Reasons for Purchasing Eco-Friendly Products	Morel, M., and Kwakye, F.	2012
Attitude towards Environmental Protection	Bhutto, et al and J Gardner, P. Ashworth	2007; 2020
<u>Factors Determining Green Purchase Behaviour:</u> Knowledge/Awareness of GHA Attitude towards GHA Green Purchase Behaviour Subjective Social Norms Moral Norms Environmental Self-Identity Warm Glow Perceived Barriers	Nguyen, T. N., Lobo, A., and Nguyen, B. K.	2018
Consumers' readiness for GHA	Srivastava, M., Malik, K., and Kumar, R.	2016
Sustainable Development Practices	Srivastava, M., Malik, K., and Kumar, R.	2016
Behaviour pattern of selected GHA	Banerjee, T., and Banerjee, A.	2015
Significant parameters while selecting star rated appliance	Banerjee, T., and Banerjee, A.	2015
Significant parameters while selected star rated Television	Banerjee, T., and Banerjee, A.	2015
Significant parameters while selected star rated Refrigerator	Banerjee, T., and Banerjee, A.	2015
Significant parameters while selected star rated Air-Conditioner	Banerjee, T., and Banerjee, A.	2015

Significant parameters while selected star rated Washing Machine	Banerjee, T., and Banerjee, A.	2015
Level of happiness with the purchase of star rated appliance	Banerjee, T., and Banerjee, A.	2015
Green Brand Awareness	Doszhanov, A., and Ahmad, Z. A.	2015
Green Brand Image	Doszhanov, A., and Ahmad, Z. A.	2015
Purchase Intention	Doszhanov, A., and Ahmad, Z. A.	2015
Green Perceived Product	Shulov Shrestha	2016
Green Perceived Price	P. Ansu-Mensah	2021
Green Perceived Place	P. Ansu-Mensah	2021
Green Perceived Promotion	P. Ansu-Mensah	2021
Actual Green Purchase Behaviour	Banerjee, T., and Banerjee, A.	2015

3.11.1.2 Household Appliances selected for study:

Mainly four products were targeted for this study which includes (i) Television, (ii) Air Conditioner, (iii) Washing Machine and (iv) Air Conditioner. But except these, research has also incorporated Entertainment appliances, Utility Appliances, and Kitchen Appliances. They are:

Table 3.2: Classification of Household Appliances

Entertainment Appliances	a. LCD/Plasma TV
	b. Computer (desktop/laptop)
	c. Home Theatre
	d. Over Head Projector
Utility Appliances	a. Dishwasher
	b. Air Conditioner
	c. Washing machine
	d. Tumble dryer
	e. Steam iron
	f. Electric shower
	g. Electric hot water system

Kitchen Appliances	a. Microwave
	b. Electric oven
	c. Mixer/Grinder
	d. Juicer
	e. Kettle
	f. Refrigerator
	g. Deep freezer

Table 3.3: Household Appliances Selected for the current Research Study

Entertainment Appliances	LCD/Plasma TV
Utility Appliances	Washing machine
	Air Conditioner
Kitchen Appliances	Refrigerator

Table 3.4.: Identified features of Selected Green Household Appliances for the current Research Study

Television	<ol style="list-style-type: none"> 1. Label and brand name 2. Look and Feel 3. Recommendation from relatives and friends 4. Persuasion from salesman 5. Personal research from website and newspaper before purchase 6. Cost incentive attached like easy EMI, festival offer, free gifts 7. Energy saving 8. Star Rating 9. Convenient to use 10. Health reasons
Refrigerator	
Washing Machine	

Air Conditioner	11. Latest and smart technology 12. Price 13. Space
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3.11.1.3 Pilot Testing:

A pilot study of the preliminary draft of the questionnaire was undertaken to test and evaluate the survey questionnaire's clarity, relevance, and content accuracy. The pilot study sample was drawn through convenient sampling. The preliminary draft of the questionnaire was administered personally (in case of offline interaction) and/or through online mode (by sending it through Google link). Language issues, spelling errors, phrasing and re-phrasing of words, etc. was done. The pilot study helped the researcher in finalising the flow/ sequence of the questions, language, question clarity, time required to complete the questionnaire.

Prior to the distribution of the final questionnaires, preliminary draft of the questionnaires was administered in order to evaluate respondents' understanding and response to the preliminary draft of the questionnaire's statements. Pilot testing was done on 120 respondents, equally from Ahmedabad, Vadodara and Gandhinagar. Each respondent was given a time constraint of 10 minutes to complete the questionnaire. There are two reasons for the time restraint. The objective was to determine whether the words/ statements in the surveys are unambiguous or too technical/ complex to comprehend. The second objective was to determine whether or not the questionnaire was easy to understand. Respondents were also questioned if they understood the directions for completing the questionnaire and if were to follow. (Fink, 2003). Later, the researcher and the respondent will continue the discussion while taking notes for future questionnaire development. The overall conclusion regarding the majority of questions/ items took reasonable time to complete. The researcher conducted the pilot testing by taking the respondents' suggestions into consideration when finalising the questionnaire.

The reliability test was performed to determine whether the scale used in the survey can offer consistent and reliable results or in case if the same scale was used repeatedly. In the present study, the Cronbach's Alpha values were between 0.702 to 0.897, i.e. within the acceptable threshold. The highest Cronbach's Alpha value was for the construct on

Sustainable Development Practices/ Consumption Behaviour (0.897) and the construct with lowest Cronbach's Alpha values (0.707) is for Readiness for Green Household Appliances.

3.11.2 Secondary data:

The secondary data was collected from authentic and reliable sources like published research papers, published articles, research reports, newspapers, and various authentic websites. The other data used for the purpose of the study were taken from reference books, e-books, literatures available on internet, magazines, journals and electronic media through both, online and offline modes.

3.12 SAMPLE DECISIONS:

The sample design for this study was determined by the adequacy and accessibility of the necessary sampling frame. Here, the researcher has identified targeted respondents from the selected cities using *the convenience sampling* approach.

3.12.1 Target Population:

Target population for present research is population under consideration that possess the information and basic level of awareness that is required for the research and from the information on which the inferences are to be drawn in relation to usage of household appliances. In the present research, the target population for the survey consists of people living in Gandhinagar, Ahmedabad, and Vadodara.

3.12.2 Sampling Frame:

Sampling frame consist of the list, published list of sampling unit or group of consumers identified as target population. The total population of the selected three districts of Gujarat would consist the sampling frame. Hence, *purposive sampling* can be used decide upon the final sample size.

3.12.3 Sampling Unit:

Primary data were collected from individual respondents.

3.12.4 Sampling Size:

Formula for determining sample size:

$$n = \frac{n(1-n)z^2}{D^2}$$

n = required sample size

n = the estimated population (based in researcher's judgment and estimates that 65% (0.65) of the target population were considered)

z = suppose the level of confidence is 95% than associated z value is 1.96

D = the level precision and desired precision is such that the allowable interval is set as $D = p$ (sample proportion) – n (population proportion) = + or -0.05

This below formula was used by Naresh K. Malhotra (2007) 'Marketing Research – An Applied Orientation' 6th Edition, Pearson, Page number 364.

Calculation of Sample Size:

$$n = \frac{n(1-n)z^2}{D^2}$$

$$n = \frac{0.65(1-0.65)(1.96)^2}{(0.05)^2}$$

$$n = \frac{0.65(0.35)(3.8416)}{0.0025}$$

$$n = \frac{0.8740}{0.0025}$$

n = 349.58 so, Sample size is **350**

Based on total 350 sample size we can determine the total sample size, considering three selected cities as three strata, by multiplying 350 with three strata (I.e. $350 \times 3 = 1050$)

Total Sample size for three cities is given in the following table. As the size of population is different in all three cities, the Stratified Random Sampling method is used and city wise allocation of sample is calculated as follows. Thus, the sample size was fixed as 1050 consumers.

Stratified random sampling:

$$n_1 = \frac{n N_1}{N}, \quad n_2 = \frac{n N_2}{N}, \quad n_3 = \frac{n N_3}{N}$$

Where,

n = Total Sample size (1,050)

n_1 , n_2 and n_3 = required total sample size for each group. N_1 , N_2 and N_3 = Size of population for each group (208762, 836691, 624843), N = Sum total of population of all four groups (1670296).

By applying the formula sample size is calculated as follows: (Figures rounded off)

$$n_1 (\text{Gandhinagar}) = \frac{1050 \times 208762}{1670296} = 131.23$$

So, n_1 is 131 Sample Size for Gandhinagar.

$$n_2 (\text{Ahmedabad}) = \frac{1050 \times 836691}{1670296} = 525.96$$

So, n_2 is 525 Sample Size for Ahmedabad.

$$n_3 (\text{Vadodara}) = \frac{1050 \times 624843}{1670296} = 392.79$$

So, n_3 is 393 Sample Size for Vadodara.

Table 3.5: City-wise distribution of Sample Size

Sr. No.	Name of the cities in Gujarat	Total population as per census of India, 2011	Extent of penetration (15% of total population)	Calculated sample size (Figures Rounded off)
1	Gandhinagar	1,391,753	2,08,762	132
2	Ahmedabad	55,77,940	8,36,691	525
3	Vadodara	4,165,626	6,24,843	393
	Total Estimated Sample Size	1,11,35,319	16,70,296	1,050

Source: <https://www.census2011.co.in>

The target population for this study is majorly divided into three sets. The study was done in three major selected districts of Gujarat namely Gandhinagar, Ahmedabad and Vadodara. The total sample size of respondents for the current study is 1,050.

3.12.5 Statistical Tools:

The primary data collected from online as well as offline mode of research were analysed by the use of suitable descriptive and inferential statistical tools and techniques such as Descriptive Statistics (Mean and Standard Deviation), Frequency counts, ANOVA, Co-relation, Regression, Cronbach's Alpha (Test for Reliability) and mean scores comparison (for Validity), Factor Analysis, etc. were applied.