Awareness, attitudes, and perceptions of electronics consumers towards green purchase in Saudi Arabia

Background and Research Context

Environmental problems and availability of "green" products is the subject of several consumer discussions, and has lately become an important part of consumer decisions. Green products currently occupy a global market size of over $4.5 trillion and has an annual growth rate of 13% (Goh and Balaji, 2016). The number of consumers who have never purchased a green product has steadily decreased over the last decade (Zhang and Dong, 2020). However, countries in the Gulf Cooperation Council (GCC) such as Saudi Arabia, the United Arab Emirates, Bahrain, Kuwait, Qatar, and Oman do not seem to be participating in this trend despite their high population, high income, and political efforts to decrease energy consumption in households. This is evident from the fact that very few green products are available in the Arab countries with minimal green marketing efforts. This is a vicious circle as without the availability and marketing of green products in the region, consumers are not well-aware of green product options and do not have the knowledge that can empower them to purchase green products.

Saudi Arabia has 33 million consumers which is increasing rapidly along with an annual GDP per capita of $48,908 (World Bank, 2019). It is shifting its economic dependence from oil, and branching out to several other markets, based on an ambitious transformation program known as Vision 2030 (Khan & Khan, 2020). Along with this transformation, Saudi Arabia now has a novel opportunity to focus on environmental and sustainable growth of the industries that are expected to flourish in the upcoming years (Alshuwaikhat & Mohammed, 2017). Despite the growing population and increasing opportunities for brands in Saudi Arabia, limited research exists regarding the knowledge and attitudes of consumers towards availability of environment-friendly products.

The Saudi Arabian Context

In Saudi Arabia, 45% of the population is younger than the age of 25, which makes the country a ripe market for the sale of consumer goods. The rapid growth in population also

increases housing, infrastructure, and transport needs which places the environment at risk of deterioration (Sohail, 2008). Currently, Saudi Arabia is facing a lot of environmental problems such as desertification, land degradation, and air pollution due to excessive industrial and domestic energy consumption. Furthermore, the country also faces problems related to the quality and supply of water, and solid waste management (Sowers, 2014). The country uses fossil fuels for producing 99% of its energy intended for local consumption (CIA Facebook, 2017). It consumes around 50% of the energy that is produced and the demand is increasing due to its growing population. As a result, the government of Saudi Arabia has started advocating green products and practices, and a number of programmes have been initiated to raise awareness about sustainable consumption and encourage consumers to purchase green products (Environmental Protection Programme, 2013). For example, the Saudi Green Initiative (SGI) has three targets and 77 initiatives such as afforestation, protection of biodiversity, reduction of emissions, and establishment of new protected areas to achieve the sustainable development goals under the Saudi Vision 2030 (Saudi Green Initiatives, 2022). Incentives are provided to consumers for environmental shopping, for instance, if a consumer purchases residential solar panels, free installation is provided. Also, a lot of research is underway in the fields of clean production technology, energy efficiency, and renewable energy (Raouf, 2008). However, the extent to which these initiatives have led to positive changes in consumerism and environmental issues in the country is unclear and limited research exists in this regard.

Electronic Products and the Environment

The use of electronics has significantly simplified modern life and has become an indispensable part of daily existence. Nevertheless, certain materials employed in electronic devices pose genuine risks to human health and the environment. To address this, corporations are transitioning towards the production of eco-friendly electronics. In contemporary market dynamics, consumers occupy a preeminent position as their awareness and preparedness levels have risen. These individuals are equipped with comprehensive information, and they conscientiously choose environmentally sustainable products as a crucial step towards a better future (Chhabra and Trivedi, 2020).

The production of environmentally sustainable electronics necessitates the elimination of harmful and toxic chemical components and the subsequent reprocessing of electronic devices. Lead, cadmium, mercury, and polybrominated diphenyl ethers (PBDE) are among the deleterious substances commonly found in electronics. A case in point is the burning of a

cable's coating to gain access to its copper interior, thereby releasing hazardous chemicals into the atmosphere. This specific process also causes acid rain and irreversibly damages the environment by contributing to air pollution (Danish et al., 2019).

Green Purchase

Sustainable consumption has become a trend in recent years as more people have increased awareness about global warming and climate change. Therefore, more and more people are choosing to make environment-conscious purchase decisions and buy products that do not harm the environment. As a result, many companies are trying to produce green products which are environment-friendly giving rise to a phenomenon known as green consumerism (Gleim et al., 2013). It has become a matter of pride for people to drive "green" vehicles, calculate the carbon footprint of the products they purchase, and install solar panels in their houses. To make use of this revolution for the benefit of the environment, companies have started using awareness campaigns, eco-labels, energy efficiency certifications, and recycling activities for promoting their green products (Akenji et al., 2011).

In light of heightened consumer awareness of contemporary environmental concerns, there has been a discernible shift in consumer behavior towards the purchase of environmentally sustainable products. Consequently, in order to secure a first-mover advantage and augment their market share, it is necessary for all businesses to take the initiative and pioneer the development and dissemination of eco-friendly goods (Chhabra and Trivedi, 2020). Green advertising pertains to the promotion of products and services that are designed to minimize their impact on the environment. As environmental concerns continue to garner greater attention, more individuals are willing to pay a premium for environmentally responsible goods, reflecting an upsurge in the demand for green advertising. Such endeavors entail diverse undertakings, including the development of products that are eco-friendly, biodegradable, and can be easily recycled. Businesses also adopt eco-friendly practices and packaging methods, while prioritizing marketing initiatives that inform consumers about the benefits of environmentally sustainable products (Sitepu, 2018).

Research Aims

Electronic brands in Saudi Arabia have a novel opportunity to re-strategize environmental corporate social responsibility (CSR) and add significant firm value making use of the recent "green revolution" (Ammer et al., 2020). They have it in their best interest to invest in environmental CSR strategies not only because of rising global environmental concerns, but

because corporate environmental sustainability can provide brands with a competitive advantage (De Dominicis et al., 2017). Customers have a growing demand for brands to be more environmentally conscious, and to have active board members who are advocates of green initiatives as environmental CSR strategies (Alagarsamy et al., 2021).

An explanation of individual behaviour as the product of an individual's purpose to behave is provided by the theory of planned behaviour (Ajzen, 1991), a social psychology theory. It is predicated on the idea that people make rational decisions (Fishbein and Ajzen, 1973) and holds that knowing someone's intentions can be used to predict their behaviour since someone who makes rational decisions will act in accordance with those intentions. Several variables, including attitudes or personal components, subjective norms or social components, and perceived behavioural control, influence behavioural intention (Ajzen, 1991).

This study will apply the theory of planned behavior to understand the awareness levels, attitudes, and perceptions of electronics consumers in Saudi Arabia and how these impact on their intention to purchase green products. It will also help uncover the efforts taken by electronics companies in marketing the advantages of their green products in a way that encourages purchase of green products by environmentally conscious consumers. The main research question of this proposed study is as follows:

"What are the awareness levels, attitudes, and perceptions of environmentally conscious consumers towards green electronics products in Saudi Arabia?"

The overall aim of the research will be to understand the intention to purchase green electronic products in Saudi Arabian consumers based on their attitudes and perceptions towards electronics brands in the country. This aim is supported by the following hypotheses:

H1: Consumers who are more aware of green electronic products are more likely to purchase them.

H2: Consumers who have more positive attitudes towards green electronic products are more likely to purchase them.

H3: Consumers who perceive green electronic products more positively are more likely to purchase them.

H4: Consumers are more likely to have positive attitudes towards green electronic products if brands market them effectively.

H5: Consumers are more likely to have positive attitudes towards green electronic products if they are exposed to government awareness campaigns regarding these products.

Literature Review

In order to encourage consumers to adopt budget-friendly energy-efficient consumption measures, several strategies and policies have been proposed, one of which is the Green Deal in the United Kingdom. This strategy pays the upfront costs of installing energy-efficient systems in the house and the owner of the house can pay it back at a rate based on the savings in energy bills as a consequence of the newly installed system. A survey carried out by Pettifor et al. (2015) aimed to identify the attitudes of people thinking about renovating their homes towards adoption of energy efficiency measures under strategies such as the Green Deal. The results demonstrated that most people are slow in accepting financial benefits offered by these strategies as they are uncertain about the returns of energy-efficient systems. Also, the Green Deal targets only those renovators that are specifically looking for energy-efficient home improvement measures thereby limiting the target audience.

In some industries, customer's perception of environmental CSR is able to be observed more easily because of how CSR strategies reflect in the services provided by the company. For instance, a study conducted by González Rodríguez & Díaz Fernández (2020) in the Spanish hospitality industry, the researchers were able to study the impact of environmental CSR awareness among customers on the perception they have of the hotels' CSR stance on which their repeat behaviour intention were determined. This research employed a quantitative research methodology to analyse environmental CSR awareness, CSR perception and Repeat Behaviour Intention.

Environmentally conscious consumers tend to use different approaches in assessing a brand's environment-friendly initiatives. Anderson & Claxton (1982) explored two such approaches, appliance energy labels and energy information provided by sales staff, when purchasing refrigerators while also investigating the barriers that affect consumer choices. The study was carried out in 18 stores across 10 cities in Western Canada for a period of six weeks and analyzed the effect of energy labels indicating energy consumption in either dollars or kilowatt hours, and sales staff providing in-depth information about energy consumption as opposed to not focusing on energy consumption at all. The study found that energy labels had a limited impact for the buyers of frost-free refrigerators whereas it played a role in the purchase of small-size refrigerators where consumers preferred manual over frost-free refrigerators due to their low cost as well as energy efficiency. The barriers identified that prevent people from making environment-conscious choices are limited cognitive capabilities

of consumers, limited salience of energy information, lack of support from sales staff, and provision of information on energy labels.

A study by Ritchie et al. (1981) explored the energy-consumption behaviours of environmentally conscious consumers to understand their expectations from corporations. This behavioural energy research study used a questionnaire to acquire self-reported energy consumption behaviours of participants. Energy consumption in houses was found to be dependent on temperature, size of the house, type of dwelling, availability of electric space heating, family size, employment status, and income. Gasoline consumption in automobiles was found to be dependent on number of vehicles, type of vehicles, fuel efficiency, living conditions, age of the vehicles, amount of commuting required, employment status, and income. Similarly, another study by Heslop et al. (1981) found that price of energy consumption, and size of the family were important factors which determined the energy consumption of a household. These studies show that while environment-conscious consumers may choose to purchase products from brands that have energy labels, they may not be aware of the best ways to minimize their energy consumption.

Environmentally conscious consumers are more likely to be prejudiced against corporations which can result in companies finding it difficult to gain their trust (Zinkhan & Carlson, 1995). The most prominent way for companies to convey to their customers that they are green in their initiatives is through their marketing strategies, which can include corporate advertising and delivering messages to customer to influence their purchase decisions (Hamann & Kapelus, 2004). While being environmentally conscious should be the socially responsible motive for corporations, environmentally conscious consumers are skeptical that corporations' ulterior motives are to mislead them and gain their trust through greenwashing (Pomering & Johnson, 2009).

Saudi Arabia has received very little attention with regards to the awareness, attitudes, and perceptions of consumers towards green purchase, especially of electronic products. Almulhim (2022) explored the consumer awareness levels of electronic waste, and its proper management and disposal. Based on responses to an online questionnaire, around 70% of consumers were not aware of electronic waste and around 88% were ready to participate in electronic waste management provided that they received proper guidance. Most people stated that they either stored the waste in their houses or disposed them with other wastes simply because they didn't know how to dispose electronic waste.

A study by Almohammadi and Abdulghaffar (2022) aimed to explore Saudi Arabian consumers' purchase intention towards green products by exploring factors such as attitudes towards green products, environmental concerns, perceived behavioral control, environmental knowledge, and subjective norms. This study found that positive attitudes of consumers, concern for the environment, and environmental knowledge were the main factors that influenced green purchase intention of Saudi Arabian consumers. Another study by Abunar and Alam (2020) sought Saudi Arabian consumers' opinions regarding green product packaging and found that people generally have a negative attitude towards green packaging and consider product labels to be the major source of information about environment-friendliness of a product.

Very little research exists with regards to consumer attitudes, perceptions, and purchase intention towards green products in Saudi Arabia, much less for green electronics products. With a large consumer base and increasing environmental problems, it is imperative to identify the attitudes of consumers towards purchase of green electronics products in Saudi Arabia.

Proposed Methodology

This research will adopt a quantitative research methodology using a questionnaire as the research instrument. Quantitative research methodology is ideal for establishing a correlation between dependent and independent variables. The proposed study's overall objective is to measure the awareness, attitudes, and perceptions of Saudi Arabian consumers towards purchase of green electronics products. Therefore, a quantitative research methodology along with a statistical analysis component in the form of linear regression, univariate analysis, and multivariate analysis will help identify the extent to which one variable changes with a single unit change in another variable.

A structured questionnaire based on the extended theory of planned behavior for understanding purchase behavior of green products (Kamalanon et al., 2022) will be used as the research instrument. The questions in the survey will use a 5-point Likert Scale system and will comprise of four parts – 1) Knowledge and concerns about the environment, 2) Purchase of green products, 3) Consumer traits, and 4) Background information. Willingness to purchase green products will be used to measure purchase intention whereas frequency and tendency of action will be used to measure purchase behavior. Attitudes towards green purchase will be identified by the overall outlook towards sustainable and environment-

friendly products and perceptions about a brand will be measured based on their perceived reputation in offering green products and services.

Participants for the study will include residents of Saudi Arabia above the age of 18, to avoid ethical misconduct in involving minors in the study. Suitable participants will be identified by sending out invitations on social media platforms. Close contacts and acquaintances will be encouraged to share the survey invitation with their contacts as well in order to ensure maximum and diverse participation. Care will be taken to include participants residing in different geographical locations and belonging to different socio-demographic groups.

The survey will be conducted online. An information sheet will be provided to the participants and a signed consent form will be obtained prior to the start of the survey. It must be taken into account that participants' knowledge regarding green products may be limited; therefore, advertisements and/or short video clips regarding green products (especially those available in Saudi Arabian markets) will be shown to participants before the survey. The data analysis of this research would be conducted using the statistical analysis software SPSS, which has been frequently used in academic settings to establish statistical correlations. The quality of the measurement model will be determined using SPSS and Smart PLS. The convergent and discriminate validities of the model will be assessed using confirmatory factor analysis (CFA). Cronbach's alpha and composite reliability will be computed to measure the internal reliability of the model. Following this, the model will be tested using structural equation modeling. Analyses conducted will include descriptive statistics, correlation analysis, regression analysis, and ANOVA.

Expected Research Plan

It is expected that this research plan would undertake the format of most other research plans, where first a literature review would be conducted to understand the existing scenario of green electronics product purchase globally, and for Saudi Arabia. Based on the findings of the literature review, the theoretical framework of the study would be established, where a model that can apply theory of planned behavior to explain green product purchase intention can be used. Based on the model and the literature review, the independent and dependent variables can be identified. The items that make up the independent and dependent variables would be identified next, following which a pilot study would be developed. The pilot study would then be conducted, and based on the feedback, the main survey would be developed. The survey would then be deployed to social media platforms, and the data collection

procedure would begin. During the data collection procedure, the methodology section writeup would commence.

The data collection procedure is expected to take a significant portion to ensure a large enough sample size. Once the data collection is completed, the data analysis procedure would begin, during which time, the methodology section would also be completed and written. After data analysis, the discussion section writeup would begin. Finally, the introduction chapter and conclusion chapter would be completed to finish the writeup of the research in order for it to be presented. The estimated research plan is presented in the table below.

Table 1 Potential Research Plan

Year	Quarter	Activity
1	1	Literature Review
1	2	Literature Review + Theoretical Framework
1	3	Literature Review+ Theoretical Framework + Pilot study questionnaire design
1	4	Conduct Pilot Study
2	1	Pilot study feedback + Main survey questionnaire design
2	2	Deploy main survey + Research Methodology (Philosophical Underpinnings)
2	3	Data collection + Research Methodology (Methods & Materials)
2	4	Data Collection + Data Analysis
3	1	Data Analysis + Research Writeup
3	2	Data Analysis + Discussion
3	3	Discussion + Introduction + Conclusion
3	4	Discussion + Introduction + Conclusion

The research implications of the proposed study are presented in the next section

Research Implications

This research has novelty values as no other research has been conducted from the Saudi Arabian perspective before regarding purchase of green electronics products. Therefore, this research is expected to have significant managerial implications especially for companies in Saudi Arabia undergoing transformation under their Vision 2030 strategy. It will provide insights to the government as well as companies regarding Saudi Arabian consumers' attitudes and intention to purchase green products. This research is expected to have academic contribution as it will adapt and apply a model for measuring green electronics

product purchase intention for the Saudi Arabian market, based on which future academic research can be conducted.

References

Abunar, S., & Alam, M. Z. (2020). Sustainable / green product packaging from the shoppers' perspective: A case of Saudi Arabia. Research in World Economy.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749- 5978(91)90020-T

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. Journal of Personality and Social Psychology, 27(1), 41–57. https://doi.org/10.1037/h0034440

Akenji, L., Hotta, Y., Bengtsson, M., & Hayashi, S. (2011). EPR Policies for Electronics in Developing Asia: An Adapted Phase in Approach. Waste Management and Research, 29, 919-930.

Alagarsamy, S., Mehrolia, S., & Mathew, S. (2021). How Green Consumption Value Affects Green Consumer Behaviour: The Mediating Role of Consumer Attitudes Towards Sustainable Food Logistics Practices. *Vision: The Journal of Business Perspective*, *25*(1), 65–76. https://doi.org/10.1177/0972262920977986

Almohammadi, H. G., & Abdulghaffar, N. A. (2022). The Influencing Factors of Consumers' Purchase Intention toward Green Products: A Case of Consumers in Saudi Arabia. *Journal of Sustainable Development*, *15*(4).

Almulhim, A. I. (2022). Household's awareness and participation in sustainable electronic waste management practices in Saudi Arabia. *Ain Shams Engineering Journal*, *13*(4), 101729.

Alshuwaikhat, H., & Mohammed, I. (2017). Sustainability Matters in National Development Visions—Evidence from Saudi Arabia's Vision for 2030. *Sustainability*, *9*(3), 408–424. https://doi.org/10.3390/su9030408

Ammer, M. A., Aliedan, M. M., & Alyahya, M. A. (2020). Do Corporate Environmental Sustainability Practices Influence Firm Value? The Role of Independent Directors: Evidence from Saudi Arabia. *Sustainability*, *12*(22), 9768. https://doi.org/10.3390/su12229768

Anderson, C. D., & Claxton, J. D. (1982). Barriers to consumer choice of energy efficient products. *Journal of consumer research*, *9*(2), 163-170.

Chhabra, T., & Trivedi, P. (2014). A Study on the Attitude and Purchase Intention of Consumer Regarding Green Electronics.

CIA factbook. (2017). Middle East :: Saudi Arabia — The World Factbook - Central Intelligence Agency. https://www.cia.gov/library/publications/the-worldfactbook/geos/sa.html

Danish, M., Ali, S., Ahmad, M. A., & Zahid, H. (2019). The influencing factors on choice behavior regarding green electronic products: based on the green perceived value model. *Economies*, *7*(4), 99.

De Dominicis, S., Schultz, P. W., & Bonaiuto, M. (2017). Protecting the Environment for Self-interested Reasons: Altruism Is Not the Only Pathway to Sustainability. *Frontiers in Psychology*, *8*(12), 17–19. https://doi.org/10.3389/fpsyg.2017.01065

Enviromental Protection Program. (2013). Saudi - National Portal - Environmental Protection in KSA. https://www.saudi.gov.sa/wps/portal/snp/pages/environmentalProtection

Gleim, M. R., Smith, J. S., Andrews, D., & Cronin Jr., J. J. (2013). Against the Green: A Multi-method Examination of the Barriers to Green Consumption. Journal of Retailing, 89 (1), 44-61.

Goh, S. K., & Balaji, M. S. (2016). Linking green skepticism to green purchase behavior. Journal of Cleaner Production, 131, 629–638. https://doi.org/10.1016/j.jclepro.2016.04.122

González-Rodríguez, M. R., & Díaz-Fernández, M. C. (2020). Customers' corporate social responsibility awareness as antecedent of repeat behaviour intention. *Corporate Social Responsibility and Environmental Management*, *27*(3), 1294–1306. https://doi.org/10.1002/csr.1884

Hamann, R., & Kapelus, P. (2004). Corporate social responsibility in mining in Southern Africa: Fair accountability or just greenwash? *Development*, *47*(3), 85–92.

Heslop, L. A., Moran, L., & Cousineau, A. (1981). "Consciousness" in energy conservation behavior: an exploratory study. *Journal of Consumer Research*, *8*(3), 299-305.

Kamalanon, P., Chen, J. S., & Le, T. T. Y. (2022). "Why Do We Buy Green Products?" An Extended Theory of the Planned Behavior Model for Green Product Purchase Behavior. *Sustainability*, *14*(2), 689.

Khan, M. K., & Khan, M. B. (2020). *Research, Innovation and Entrepreneurship in Saudi Arabia Vision 2030*. Routledge. https://doi.org/10.4324/9781351040020

Pettifor, H., Wilson, C., & Chryssochoidis, G. J. E. P. (2015). The appeal of the green deal: Empirical evidence for the influence of energy efficiency policy on renovating homeowners. *Energy Policy*, *79*, 161-176.

Pomering, A., & Johnson, L. W. (2009). Advertising corporate social responsibility initiatives to communicate corporate image: Inhibiting scepticism to enhance persuasion. *Corporate Communications: An International Journal*.

Raouf, M. (2008). Climate Change Threats, Opportunities, and the GCC Countries. Middle East Institute. https://www.mei.edu/publications/climate-change-threatsopportunities-and-gcc-countries

Ritchie, J. B., McDougall, G. H., & Claxton, J. D. (1981). Complexities of household energy consumption and conservation. *Journal of consumer research*, *8*(3), 233-242.

Sadiq Sohail, M. (2008). Shopping Behavior and Evaluation of Store Features: Perspectives from a Food Market in the Arabian Peninsula. Journal of International Food & Agribusiness Marketing, 20(3), 5–27. https://doi.org/10.1080/08974430802157580

Sitepu, Edy. (2018). Green Purchase Intentions Model on Electronic Products in Medan City.

Sowers, J. (2014). Water, energy and human insecurity in the middle east. Middle East Research and Information Project (MERIP), 44, 271

World Bank,2019. (2019). GDP per capita, PPP (current international $) - Saudi Arabia | Data. https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?locations=SA

Zinkhan, G. M., & Carlson, L. (1995). Green advertising and the reluctant consumer. *Journal of Advertising*, *24*(2), 1–6.