A Study on The Selection Motives and Challenges Faced by Consumers Concerning Green Packaged Products

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Abstract **- Sustainable growth is a global agenda that addresses environmental problems, climate change, resource efficiency, and the use of natural materials. As consumers play a crucial role in the success of any business or organization, it is essential to understand their preferences, buying reasons, and challenges related to sustainable products and green packaging. The study highlights the significance of green product packaging and the need to understand consumer behavior toward it. The study used convenience sampling methods for primary data collection and analyzed the responses of 232 participants using SPSS software. The chi-square values, phi, and Cramer's V were explored to test the relationship. The result has been interpreted as emphasizing the importance of green product packaging for sustainable development and a green environment. Finally, the consumers' buying behaviors have been understood from different perspectives towards a sustainable environment with particular reference to green product packaging.**

Keywords **– Sustainable environment, green packaging, eco-friendly packaging, green packaging challenges, Saudi Arabia.**

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1. Introduction

There has been a growing interest in global environmental protection in recent years. Reducing the effect of obliteration and pollution through green packaging (GP) is essential for a better economy [1]. Green packaging is also referred to as eco-green packaging (EGP), eco-friendly packaging (EFP), sustainable packaging (SP), or recyclable packaging (RP). Using ecological materials for packaging confirms that by-products are efficacious and safe for human health and the environment.[2]. According to experts, green packaging is an excellent solution for reducing the adverse effects of plastic and unecological packaging on the environment [3]. It is a crucial issue that must be considered in fulfilling the Sustainable Development Goals (SDG) [4], with social and economic implications [5]. While most research on green packaging is focused on the packaging's composition and manufacture, other studies have analyzed specific issues such as the impact of packaging on the supply chain [6], marketing [7], and consumer behavior [8].

It is realized that consumers have an essential role in maintaining a sustainable and green environment. With modern lifestyles demanding longer product shelf lives, it's necessary to analyze consumer opinions about green products and their packaging.

Understanding the consumer perspective on green packaging can help companies innovate and implement eco-design strategies that benefit their brand and the environment. [9]. Companies must invest in new filling lines that accommodate more environmentally friendly, reusable, recyclable, and sustainable packaging or collaborate with suppliers. Overall, it's clear that green packaging is an essential consideration for both companies and consumers alike in creating a more sustainable future [10].

According to Zadek [11], it is realized that incorporating responsible business practices in their strategy can give them a competitive edge and lead to long-term success.

While some companies have taken advantage of the "green market," others have improved their approaches to satisfy the demands of environmentally conscious consumers. Consumers have become more aware of their consumption's environmental impact and prioritize protecting it. However, this concern only sometimes translates into buying habits [12]. To our knowledge and review of the literature on green product packaging, it has covered different business and consumer dimensions. The aim, in particular, points towards consumer behavior through sustainable products and their packaging to the final consumer products. Very few studies have been conducted, particularly in the Saudi Arabian context; it is found inevitable. Therefore, this examination aims to fill the gap in research on consumer behavior towards sustainable packaging to assess consumer preferences for eco-packaging and reasons for purchasing it to promote sustainability. The study also evaluates consumers' difficulties using eco-packaging and whether attitudes vary demographically.

2. Literature Review

The literature review has been divided into eight parts: importance of product packaging, green packaging (GP) and purchaser behavior, type of green packaging following consumer preference, reasons behind selecting green packaging (GP) for a sustainable environment, challenges of using green packages to create a sustainable environment, demographic characteristics and GP, business strategies, and hypothesis.

2.1. Importance of Product Packaging

In today's market, packaging is crucial. According to the European Union, "packaging" includes all materials used to contain, protect, deliver, and present goods, starting with raw materials and ending with the finished products. Packing has traditionally served to safeguard, preserve, transport, handle, and store goods [13]. From a shopper's viewpoint, packaging is pivotal in purchasing, often being the first point of contact before making a final decision [14]. However, manufacturers tend to rely heavily on plastic as a packaging material without considering the impact on the environment. It has caused several environmental problems, and there has been a shift towards a new approach called the "green packaging concept" [15], [16].

2.2. Green Packaging (GP) and Purchaser Behavior

The role of GP in sales is vital to business success [17], and it is also a significant contributor to pollution. Therefore, the demand for eco-friendly packaging has increased in recent years [18]. Shoppers are now well-informed concerning the environmental consequences of packaging and prefer packaging that employs less waste materials in GP. Studies suggest that goods packed in eco-friendly materials are well-thought-out and more appreciated by consumers [19]. Both internal and external factors influence green consumers, and their attitudes toward what is green usually depend on their opinions on sustainability [20].

Moreover, packing plays a substantial part in a customer's determination to buy a product, and environmentally safe packaging determines product choice [21]. High-quality green products are perceived positively by consumers [22]. Currently, buyers' opinions about green products are limited to their design, expense, biodegradability, and recyclability of materials that can be recycled, which should be noticed [23].

2.3. Type of Green Packaging Following Consumer Preference

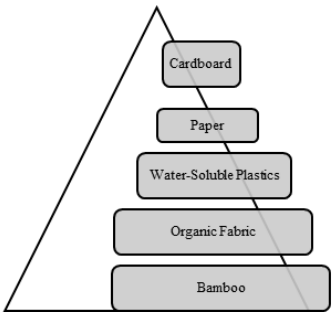

Figure 1. Type of green packaging

Several factors influence consumers' attitudes toward green/ eco-friendly packaging, including price, availability, and social influences. At the same time, social impact may play a significant role in purchasing behavior [24]. It is essential to note that sustainable packaging comes in various types, and consumers worldwide are gradually keen to pay for EFP/ GP options. Research shows that in Denmark, young consumers prioritize the material type and disposal management of packaging for liquid food. Furthermore, a study on French and Polish students' beliefs identified sustainable packaging attributes and messages that positively impact consumer behavior [25].

Eco-friendly packaging (EFP)/ GP options such as cardboard, paper, water-soluble plastics, organic fabric, and kraft paper are popular [26]. Some companies also use acid-free tissue paper and bamboo to reduce environmental impact [27]. However, by researching antimicrobial packaging strategies, it is vital to ensure that packaging processes are harmless for the atmosphere and social well-being, especially for food and cosmetics [3], [28]. Recyclable materials such as steel and aluminum for can manufacturing can be used in highly integrated packaging [29]. While paper-based packet foodstuffs were once considered an inexpensive and sustainable substitute to plastic [30], and comparatively perceived as highly valued, eco-friendly, and the most environmentally friendly products (EFP) [31]. Only a few studies have looked into custom packaging for particular products, such as using paper packaging for cereal bars, foods, and milk and experimenting with different packaging materials for tomato soup products. Additionally, it's essential to keep in mind that the lifespan of various packaging materials varies, and some companies are now turning to bamboo as a more eco-friendly and durable option [28], [29], [30].

2.4. Reasons Behind Selecting Green Packaging (GP) for a Sustainable Environment

Extensive research has demonstrated that large firms are encouraged to adopt sustainable practices due to the impact of retailers' environmental reputations and lifestyles on shopper purchasing behavior [31]. However, buyer sensitivities of GP could be distinct, mainly in developing marketplaces. Many factors influence the decision of consumers to buy products with green packaging, including the origin of the products, packaging typology, and price [32]. Customers' willingness to purchase sustainable products varies depending on the packaging format. From a business perspective, companies are embracing green packaging initiatives in response to societal pressure, environmental concerns, customer attitudes and willingness to pay, and laws and regulations [33], [34].

2.5. Challenges of Using Green Packages to Create a Sustainable Environment

Switching to green packaging offers several benefits for organizations, including consuming fewer natural resources in production and reducing negative environmental impact. Sustainable packages are often more lightweight yet robust. Their flexibility and versatility can attract consumers by observing their buying behaviors [3].

Previous studies have shown that consumer beliefs impact the purchase intent of eco-friendly packaging. Color and visual appearance are also critical factors when designing environmentally friendly packaging. It is worth noting that ecologically aware buyers are regularly keen to pay additionally for sustainable product packaging (SPP). In difference, most participants in a study on sustainable paper-based packaging were unwilling to pay more despite considering themselves ecologically conscious. The business sector in Saudi Arabia faces significant challenges in manufacturing ecological packages/ green packaging, with cost concerns being the most significant barrier. As per Moustafa et al. [3], businesses must prioritize ensuring product safety, and customer perception plays a crucial role in analyzing their willingness to pay.

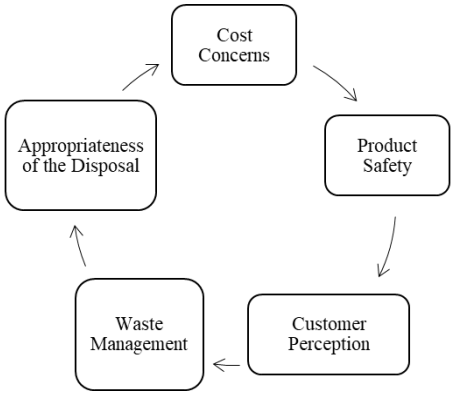

Figure 2. Potential challenges for manufacturing green packages

Figure 2 highlights the considerable barriers to constructing green packaging, including cost concerns, product safety, consumer perception, waste management, and high breakdown structure of materials used for production, which depends on their appropriate disposal. Eco-friendly/ Green Packaging (GP) solutions must be initiated with proper solutions to create a higher environmental impact, allowing Saudi Arabia to make a more significant difference in its carbon footprint [35]. Participants in a study expect sustainable packaging materials such as paper, especially for sensitive foods. However, they also feel that environmentally friendly packaging design needs to be considered [36].

2.6. Demographic Characteristics and GP

Gender can exert a notable influence on a person's persuasiveness when it comes to making purchasing choices.

Research shows that women tend to have a greater influence on their peers when buying products. However, regardless of gender, customers are increasingly concerned about environmentally-friendly purchasing behavior. This means that people are more likely to support businesses prioritizing sustainability and reducing their carbon footprint. As a result, companies that prioritize eco-friendliness are likely to see an increase in customer loyalty and sales. Likewise, the preference for economical purchases is also favorable with all educational resources, except non-educational ones. [37]. Many studies have shown significant gender differences in environmental attitudes [38], [39]. It revealed that males have further adverse attitudes towards the environment than females [39]. Females were more likely to purchase GP products [40]. In addition, an investigation indicates that gender view varies with consumption; women and men do not have identical purchasing behavior [41]. Prior study has revealed that consumption is more closely associated with ladies than gentlemen. Indeed, ladies symbolize the immediate class of shoppers worldwide [42], which must be more eye-catching and attractive to stand out from other packaging on the shelf. Demographics such as years, gender, and earnings influence consumers' ecologically friendly buying behavior [43].

2.7. Business Strategies

Legal and policy factors greatly influence consumer behavior towards sustainable consumption. Environmental protection laws should incentivize green technologies and ecological behavior through economic means such as tax cuts and subsidies [44]. To remain competitive, businesses must incorporate sustainability opportunities into their strategies by adding green elements to their products and packaging [45]. Promoting green products and green packaging must influence consumer behavior. However, the lack of internalization of sustainability has resulted in most consumers exhibiting unsustainable behavior. Therefore, new practical tools are necessary to encourage sustainable consumption behavior [46].

2.8. Hypothesis:

The following hypothesis has been revealed from the above literature, and finally, it will be tested to know the current opinion variation in the selected region.

1. Hypothesis: (Ha): There is a difference in opinion between consumers' preferences towards green packaging products, which is associated differently gender-wise.
2. Hypothesis: (Ho). There is no disparity in opinion between the consumer's preferences towards green packaging products, and it is associated differently with age.
3. Hypothesis: (Ho). There is no variance in view between the consumer's liking towards green packaging products, and it is associated differently with education.
4. Hypothesis: (Ha). There is a difference in opinion between the consumer's preferences towards green packaging products, and it is associated differently with the income of consumers.
5. Hypothesis: (Ha): There is a variation between the types of green packaging products consumers preferences, and varies cross-sectional-wise (gender, age, education, and income level).
6. Hypothesis: (Ha): There is an unbeatable connection between reasons to prefer sustainable packaging as well as the varied cross-sectional opinion of the consumer (gender, age, education, and income level)
7. Hypothesis: (Ha): There is a variation in opinion among the respondents on difficulties consumers face in using green packaging for a sustainable environment.

3. Methodology of Study

The selected study utilized primary and secondary research methods, resulting in a mixed approach. The investigator employed quantitative and descriptive research methods, employing questionnaires with close-ended questions to save respondents time and effort. A pilot test was conducted on ten participants, and little modifications were made to the questionnaire before the final survey. Primary data collection was deemed essential for authentic results, and data was gathered cross-sectionally from a single point in time [47]. To ensure reliable data collection, convenience and snowball sampling methods were used, and 232 responses were taken for the study as they were proven to be time and cost-effective [48]. The sample size was justified as it provided a comprehensive range of varied data [49], [50]. The formulated hypothesis was analyzed in the result section using descriptive statistical tools, using the Phi and Cramer's V & Chi-square test <0.05 with a 95% confidence level to test the relationship as per need.

4. Results and Discussion

The results and discussion sections are segregated into demographic information, consumer attitudes towards green packaging products, hypotheses analysis, reasons to prefer green packaging products, and challenges of using green packages to create a sustainable environment.

4.1. Demographic Information

The outcomes show a clear majority of male respondents at 67.67%, with only 32.33% of female respondents. The age range of '26-35 years old represented the largest group of participants at 59.3%, followed by '36-45 years of age (24.138%), '46-55 years (11.2%), and '56 years old and above' (6.9%). Most respondents had a 'high school education or lower' accounting for 82.6%. Regarding family income, it is notable that 41.8% reported a monthly income of 'more than 21000 SR', 39.6% had less than 10000 SAR, and 18.5% fell in the income category between '11000- 20000 SR'.

4.2. Consumer's Attitudes Towards Green Packaging Products

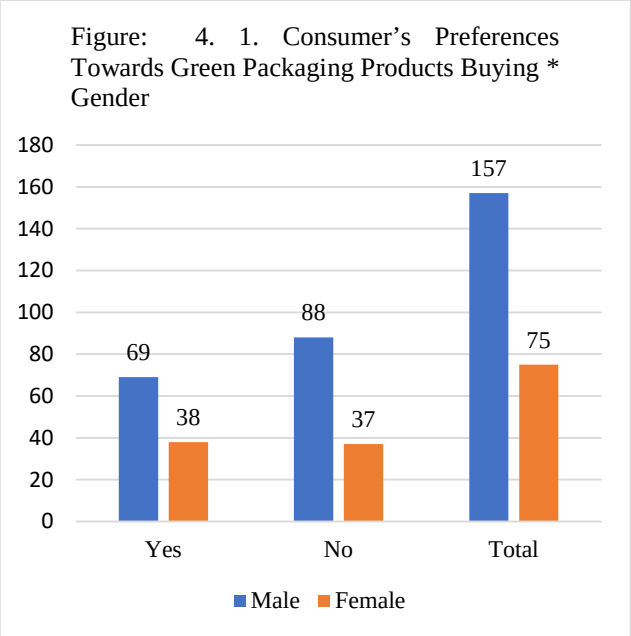

Figure 3. Consumer preferences for green packaging products in relation to gender
Source: By the Author

The results in Figure 3 show the predicted buying patterns of consumers for green packaging products. Most male 88 (37.9%) respondents stated that they did not prefer green packaging products, while 69 (29.7%) chose to buy and favored them, followed by 38 (16.4%) of female respondents.

The study revealed that male respondents had higher positive and negative preferences than female respondents, contrary to the survey conducted by Tikka et al. [51]. Additionally, most male respondents claimed they do not prefer green packaging products.

As the result indicates, Figure 4 displays respondents' buying preferences based on age. The majority of respondents 114 (49.1%) were in the age group of 26-35, followed by the age group of '36-45' 56 (24.1%), '46-65' 26 (11.2%), '18-25' 20 (8.6%), and '56 and above' 16 (6.8%) who preferred to buy green packaging products. The majority of respondents 'under the age of 35' 73 (31.10%) also chose not to purchase green packaging products. And it shows no significant differences in opinions among respondents based on age.

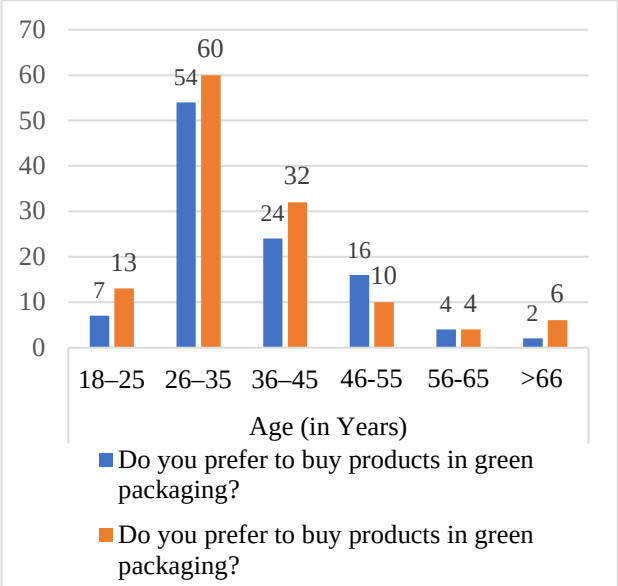

Figure 4. Consumer's attitudes towards green packaging products in relation to age (in Years)
Source: By the Author

Figure 5 highlights the buying preferences of respondents based on their education level towards consumer buying behavior and a sustainable environment through Green Packaging. Among the educated group, 101 (43.5%) of 'graduate and above' degree holders did not favor green packaging products, while 87 (37.5%) favored green packaging products. Interestingly, all four unschooled respondents (100%) claimed they dislike buying green packaging products. This indicates that educated respondents differ in opinion, while uneducated respondents prefer to avoid green packaging products.

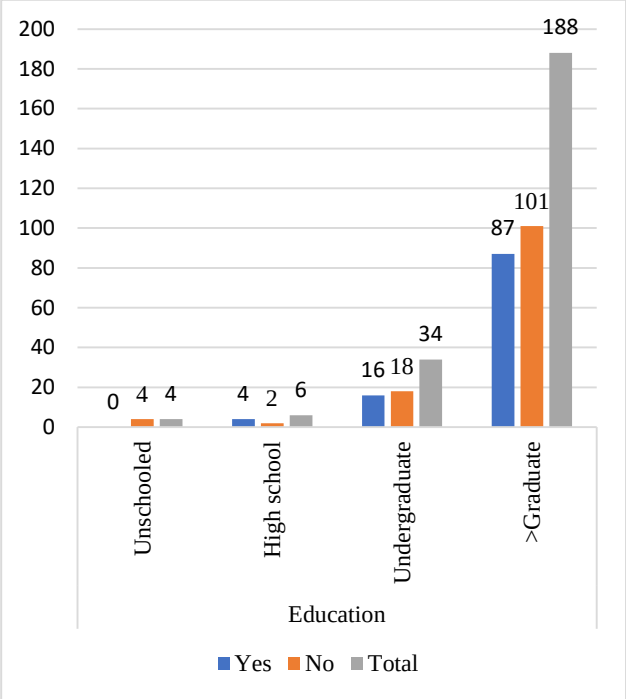

Figure 5. Buying preference of products in green packaging in relation to education
Source: By the Author

Figure 6 presents the buying preferences of green packaging products of respondents based on their monthly income.

The majority (37) of the responses belonged to the income category of '5000-10000 SR' (15.9%), followed by the income category of '11000-15000 SR' 23 (9.9%), '16000-20000 SR' 18 (7.8%), '26000 SR and above monthly family income group' 12 (5.2%), and the rest had almost the same opinion. The result suggests that respondents with less income (<5000SR monthly) have less preference for buying green packaging products as it may seem costly to them and might be more price sensitive.

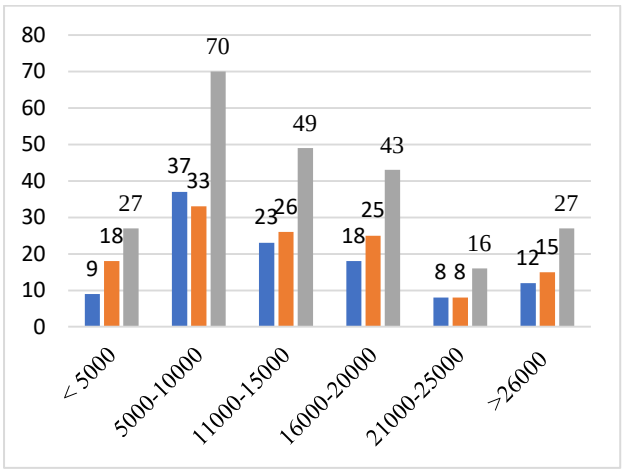

Figure 6. Buying preference of products in green packaging product in relation to monthly income (in Riyal) Source: By the Author

4.3. Hypothesis Testing (No.1 to No.4)

Table 1. Result of hypothesis testing (H1 to H4)

Cross analysis	***Chi-Square Tests***			***Symmetric Measures***			
Category		***Pearson Chi-Square***	***DF***	***Phi value***	***Cramer's V***	***Contingency Coefficient***	***No. of Valid Cases***
Ha1: Buying attitude *gender	Value	0.922	5	-0.063	0.063	0.063	232
	Approx. Sig.	0.337		0.337	0.337	0.337	
Ha2: Buying attitude *Age	Value	5.278	5	0.151	0.383	0.149	232
	Approx. Sig.	0.383		0.383	0.383	0.383	
Ha3: Buying attitude * Education	Value	4.457	3	0.139	0.139	0.137	232
	Approx. Sig.	0.216		0.216	0.216	0.216	
Ha4: Buying attitude * Income	Value	3.51	5	0.123	0.123	0.123	232
	Approx. Sig.	0.622		0.622	0.622	0.622	

Source: By the Author

The opinions of consumers towards green packaging products were tested through the hypotheses mentioned below:

- Hypothesis 1. (Ha): There is a dissimilarity in opinion between the consumers' attitudes towards green packaging products, which is associated differently gender-wise.

According to Table 1, the Chi-Square test significance is 0.337. These values are all greater than < 0.05, indicating no difference in consumers' opinions towards green packaging products based on their gender [52]. Therefore, the suggested hypothesis has been rejected; it is inferred that there is no deviation among consumers' opinions. This result is compatible with earlier investigations, which discovered a weak association between gender and green buyer behavior [53] and does not support the idea of Mainieri et al. [54].

- Hypothesis 2 (Ho): Age does not influence consumers' attitudes toward green packaging products.

The results from Table 1 reveal that the outcome of the Chi-Square and the symmetric measures used for the analysis is 0.383. These values are not significantly associated at < 0.05, indicating no variation in opinion among consumers' attitudes towards green packaging products based on age. Hence, the current theory acknowledges that age does not influence consumers' attitudes towards green packaging products.

- Hypothesis 3 (Ho): Consumers' attitudes towards green packaging products are not influenced by their level of education.

The results from Table 1 show that the significance of the Chi-Square test analyzed is 0.216. For symmetric measures, Phi Value (PV), Cramer's V (CV), and Contingency Coefficient value (CCV), the significance values are also 0.216. These values are more significant than < 0.05, indicating no difference in opinion among consumers' attitudes towards green packaging products based on their level of education. Therefore, the current hypothesis is accepted, and it can be concluded that education rank does not affect customers' mindsets towards green packaging products.

- Hypothesis 4 (Ha): Their income influences consumers' attitudes towards green packaging products.

Table 1 shows that the significance of Chi-Square is 0.622, and for symmetric measures (Phi value, Cramer's V, and Contingency Coefficient value), the significance values are 0.622. These values are more significant than < 0.05, indicating no difference in opinion among consumers' attitudes towards green packaging products based on income. Therefore, the current alternative hypothesis is rejected, and it can be concluded that payment does not influence consumers' attitudes toward green packaging products. This result agrees with the discoveries of Shamsi and Siddiqui [55].

4.4. Types of Green Packaging (GP) Preferred by Consumers

Table 2. Green packaging preferred

Category				
	Freq	%	Rank	
Glass	98	26.997	2	
Paper	71	19.559	4	
Wooden/ Cardboard	76	20.936	3	
Recyclable plastic	118	32.506	1	
Other:	4	1.1	5	
Total	363	100		
Chi-Sq Tests (Table 4.2)				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	18.781a	4	0.001	
Likelihood Ratio	19.062	4	0.001	
Linear-by-Linear Association	0.215	1	0.643	
N of Valid Cases	232			
a. The minimum expected count is 14.76.				
Symmetric Measures				
		Value	Approx. Sig.	
Nominal by Nominal	Phi	0.285	0.001	
	Cramer's V	0.285	0.001	
N of Valid Cases 232				

Source: By the Author

The research is keen to determine the preferred type of GP among consumers and to explore whether there is a good correlation between select packaging and green packaging for a sustainable environment. The results from Table 2 unequivocally demonstrate that 26.997% of participants favor glass for green packaging, whereas 32.506% prefer recyclable plastic. Most participants chose recyclable plastic, followed by glass, cardboard, and paper packets, for green packaging for environmental sustainability.

- Hypothesis 5. (Ha): There is a variation between the types of green packaging products consumers prefer.

The study found a moderate dependency between the variables, with a chi-square p-value of 18.781, Phi 0.285, and Cramer's V 0.285 having a sig value of 0.001; hence, the collected data is statistically significant. The chi-square test results also confirm the previous study and are consistent with it that there is a positive correlation between preferred packaging for a sustainable environment [56]. Thus, green packaging of products can be made sustainable by considering the consumers' preferences (See Table 2).

4.5. Reasons to Prefer Green Packaging Products

Table 3. The reasons for green packaging products (Rank the options in order)

Category		Rank Score	Rank %	Rank Order
I feel responsible for the environment		745	21.396	2
Protect the environment		755	21.683	1
Green packaging is trendy		641	18.409	4
Can be recycled/reused		712	20.48	3
Other reason		629	18.064	5
Total		3482	100	
Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	4.161a	4	0.385	
Likelihood Ratio	4.193	4	0.381	
Linear-by-Linear Association	0.401	1	0.527	
N of Valid Cases	232			
The minimum expected count is 15.22.				
Symmetric Measures				
			Value	Approx. Sig.
Nominal by Nominal		Phi	0.134	0.385
		Cramer's V	0.134	0.385
N of Valid Cases			232	

Source: By the Author

Table 3 indicates the reasons to prefer green packaging products; the respondents are more concerned about the sustainable environment and selected the number one reason was protecting the environment, followed by the rank 2 for the people who feel responsible for the environment, third rank given by them is the reason that it can be recycled/reused. The fourth reason is that green packaging is trendy.

- Hypothesis 6 (Ha): There is an unbeatable connection between reasons to prefer green packaging and a sustainable environment in Saudi Arabia.

The chi-square and Symmetric measure values were observed to obtain statistical information in the study context. The sig value is 0.385; the number is higher than the P value>0.05, which can predict no connection with selected variables of investigation. Thus, the null hypothesis will be accepted; hence, it is stated that there is no association between reasons to prefer sustainable packaging in Saudi Arabia, and the null hypothesis will be accepted (See Table 3).

4.6. Challenges of Using Green Packages to Create a Sustainable Environment.

Table 4 displays the difficulty level that consumers face when using green packaging. The most significant challenge identified is the higher cost of products packaged in organic material, and only 17.40% of respondents reported no issues with this. The third most challenging aspect is more significant recycling efforts, with 16.46%. Additionally, 11.392% of respondents believe green packaging requires more space, a substantial barrier to consumers purchasing green products [56]. This examination highlights the critical necessity to enlighten customers about the long-term advantages of utilizing eco-packaging (EP). Organizations must proactively report the favorable outcomes of green packaging (GP) through communication campaign drivers.

Table No 4. The difficulties in using green-packaged products

Category	Frequency	%	Difficulty Level
Products packaged in green packaging are more expensive.	163	51.582	1
Requires more storage space	36	11.392	4
Greater recycling effort	52	16.455	3
There are not any difficulties	55	17.406	2
Other:	10	3.165	5
Total	316	100	
Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.733a	16	0.008
Likelihood Ratio	39.426	16	0.001
Linear-by-Linear Association	8.754	1	0.003
N of Valid Cases	232		
a. 26 cells (76.5%) have an expected count of less than 5. The minimum expected count is .46.			
Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	0.376	0.008
	Cramer's V	0.376	0.008
N of Valid Cases		232	

Source: By the Author

Hypothesis 7 (Ha): There is an inviolable interconnectedness between challenges of usage and Green Packaging of a sustainable environment.

The chi-square value of 32.733, Phi 0.376, and Cramer's V 0.376. indicates the P value of <05, which is 0.008. Hence, the selected hypothesis (H7a) will be accepted for there is an inviolable interconnectedness between usage challenges and green packaging to maintain a sustainable environment (Table 4). A strong correlation has been seen between the obstacles faced using sustainable packaging in Saudi Arabia. Therefore, it is essential to admit the factors of sustainable packaging challenges before promoting selling the product among consumers.

5. Conclusion

As a result, the study has found that the respondents have contributed positively and are aware of the environmental situation in Saudi Arabia. Moustafa et al. [3] suggested that green packaging (GP) has become a better option for sustainable development in the environment of several different countries. The analysis unequivocally demonstrates that respondents are environmentally conscious and have a positive impact. The study examined vital factors such as age group, education, and other relevant variables to determine buying patterns and frequency of green/eco-friendly package purchasing. Statistical examinations were performed to specify the impact of each segment. While green packaging has become a popular option for sustainable growth, it is crucial to consider its advantages and disadvantages.

The study also evaluated consumer education on green packaging to promote its use. The statistical tests validated the propositions in the study and measured the relatedness of variables. It was found that male members do not prefer green packaging products in regards to women, and most respondents aged '26-35' like to buy such products. The study also found that respondents with sound schooling stages will likely purchase eco-friendly packaging products (GPP). Those with lower salaries have less preference for purchasing green packaging products as it may seem costly to them and might be more price sensitive. These values are all greater than < 0.05, indicating no difference in consumers' opinions towards green packaging products based on gender. Age does not influence consumers' attitudes towards green packaging products. The current premise will be acknowledged, and it can be concluded that education level does not affect consumers' attitudes toward GPP.

Furthermore, age does not influence consumers' attitudes towards GPP. This result is consistent with the study's findings by Shamsi and Siddiqui [55]. It aimed to determine the customers' preferences for green packaging (GP) and explore potential links between packaging selection and a commitment to green packaging for a sustainable environment (SE). The chi-square test results also confirm the previous study and are consistent with it that there is a positive correlation between preferred packaging for a sustainable environment (SE) [56]. Thus, green packaging of products can be made sustainable by considering the consumers' preferences in their packaging.

Eco-friendly packaging or products packaged in environmentally-conscious materials often come at a higher price. More significant recycling efforts and the need for more storage space are substantial barriers to consumers when purchasing green products [55]. Consumers must become more aware of the long-term advantages of using eco-friendly packaging (EFP). Companies should take the initiative to educate users about the benefits of using EFP through communication and campaign drives. Thereupon a greener and healthier planet for future generations is promoted. It is suggested that all the stakeholders of sustainable development should motivate the user through awareness and informing the benefit of the environment, especially the government should take specific steps on it. The pricing of environmentally-friendly packaging products should be carefully managed to align with consumers' buying behavior, especially since lower-income individuals tend to avoid purchasing such items.

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References:

[1]. Ansar, N. (2013). Impact of green marketing on consumer purchase intention. *Mediterranean Journal of Social Sciences*, *4*(11), 650.

[2]. Alam, M. Z. (2020). Children's preferences concerning fast- foods/junk- foods in Saudi Arabia. *International Journal on Emerging Technologies*, *11*(1), 108-113.

[3]. Moustafa, H., Youssef, A. M., Darwish, N. A., & Abou-Kandil, A. I. (2019). Eco-friendly polymer composites for green packaging: Future vision and challenges. *Composites Part B: Engineering*, *172*, 16-25.

[4]. Guillard, V., Gaucel, S., Fornaciari, C., Angellier-Coussy, H., Buche, P., & Gontard, N. (2018). The next generation of sustainable food packaging to preserve our environment in a circular economy context. *Frontiers in nutrition*, *5*, 121.

[5]. Ketelsen, M., Janssen, M., & Hamm, U. (2020). Consumers' response to environmentally-friendly food packaging systematic review. *Journal of Cleaner Production*, *254*, 120123.

[6]. Li, C., Zhou, J., Song, J., Xu, J., Zhang, H., Zhang, X., ... & Sun, Y. (2021). Non-fullerene acceptors with branched side chains and improved molecular packing to exceed 18% efficiency in organic solar cells. *Nature Energy*, *6*(6), 605-613.

[7]. *Bech-Larsen T. (1996). Danish consumers' attitudes to the functional and environmental characteristics of food packaging. J. Consum. Policy, 19, 339–36.*

[8]. Orzan, G., Cruceru, A. F., Bălăceanu, C. T., & Chivu, R. G. (2018). Consumers' behavior concerning sustainable packaging: An exploratory study on Romanian consumers. *Sustainability*, *10*(6), 1787.

[9]. Boz, Z., Korhonen, V., & Koelsch Sand, C. (2020). Consumer considerations for the implementation of sustainable packaging: A review. *Sustainability*, *12*(6), 2192.

[10]. Dilkes-Hoffman, L. S., Lane, J. L., Grant, T., Pratt, S., Lant, P. A., & Laycock, B. (2018). Environmental impact of biodegradable food packaging when considering food waste. *Journal of Cleaner Production*, *180*, 325-334.

[11]. Zadek, S. (2007). The path to corporate responsibility. *Corporate ethics and corporate governance*, 159-172.

[12]. Biswas, A., & Roy, M. (2015). Green products: an exploratory study on the consumer behavior in emerging economies of the East. *Journal of cleaner production*, *87*, 463-468.

[13]. Hellström, D., & Saghir, M. (2007). Packaging and logistics interactions in retail supply chains. *Packaging Technology and Science: An International Journal*, *20*(3), 197-216.

[14]. Vidales, G., & Dolores, M. (1995). *El mundo del envase : manual para el diseño y producción de envases y embalajes.* AZCAPOTZALCO.

[15]. Madushanka, G., & Ragel, V. R. (2016). Consumer's attitude towards green packaging: a study on Trincomalee district. *Journal of Marketing*, *1*(2); 18-27.

[16]. Alam M Z, & Abunar S. (2023). Appraising the Buyers Approach Towards Sustainable Development with Special Reference to Buying Habits and Knowledge Source of Green Packaging: A Cross-Sectional Study,". *WSEAS Transactions on Environment and Development*, *19*, 400-411

[17]. Rokka, J., & Uusitalo, L. (2008). Preference for green packaging in consumer product choices–Do consumers care? *International Journal of Consumer Studies*, *32*(5), 516-525.

[18]. Seo, S., Ahn, H. K., Jeong, J., & Moon, J. (2016). Consumers' attitude toward sustainable food products: Ingredients vs. Packaging. *Sustainability*, *8*(10), 1073.

[19]. Sandu, R. M. (2014). Green: Marketing, products, and consumers. *SEA–practical Application of Science*, *2*(5), 555-561.

[20]. Ottman, J. A. (1993). *Green Marketing: Challenges & Opportunities for the New Marketing Age*. NTC: Lincolnwood, IL.

[21]. Yaacob, M. R., & Zakaria, A. (2011). Customers' awareness, perception and future prospects of green products in Pahang, Malaysia. *The Journal of Commerce*, *3*(2), 1.

[22]. Rettie, R., Burchell, K., & Riley, D. (2012). Normalising green behaviours: A new approach to sustainability marketing. *Journal of Marketing Management*, *28*, 420-444.

[23]. Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & health*, *26*(9), 1113-1127.

[24]. Orzan, G., Cruceru, A. F., Bălăceanu, C. T., & Chivu, R. G. (2018). Consumers' behavior concerning sustainable packaging: An exploratory study on Romanian consumers. *Sustainability*, *10*(6), 1787.

[25]. Boesen, S., Bey, N., & Niero, M. (2019). Environmental sustainability of liquid food packaging: is there a gap between Danish consumers' perception and learnings from life cycle assessment? *Journal of cleaner production*, *210*, 1193-1206.

[26]. Wu, X., Yue, H., Zhang, Y., Gao, X., Li, X., Wang, L., ... & Ge, J. (2019). Packaging and delivering enzymes by amorphous metal-organic frameworks. *Nature communications*, *10*(1), 5165.

[27]. Li, C., Zhou, J., Song, J., Xu, J., Zhang, H., Zhang, X., ... & Sun, Y. (2021). Non-fullerene acceptors with branched side chains and improved molecular packing to exceed 18% efficiency in organic solar cells. *Nature Energy*, *6*(6), 605-613.

[28]. Pauer, E., Wohner, B., Heinrich, V., & Tacker, M. (2019). Assessing the environmental sustainability of food packaging: An extended life cycle assessment including packaging-related food losses and waste and circularity assessment. *Sustainability*, *11*(3), 925.

[29]. Fernqvist, F., Olsson, A., & Spendrup, S. (2015). What's in it for me? Food packaging and consumer responses, a focus group study. *British Food Journal*, *117*(3), 1122-1135.

[30]. Steenis, N. D., Van Herpen, E., Van Der Lans, I. A., Ligthart, T. N., & Van Trijp, H. C. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, *162*, 286-298.

[31]. Eldesouky, A., & Mesías Díaz, F. J. (2014). An insight into the influence of packaging and presentation format on consumer purchasing attitudes towards cheese: a qualitative study. *Spanish Journal of Agricultural Research*, *12*(2), 305-312.

[32]. Nakatani, J., Maruyama, T., & Moriguchi, Y. (2020). Revealing the intersectoral material flow of plastic containers and packaging in Japan. *Proceedings of the National Academy of Sciences*, *117*(33), 19844-19853.

[33]. Sumrin, S., Gupta, S., Asaad, Y., Wang, Y., Bhattacharya, S., & Foroudi, P. (2021). Eco-innovation for environment and waste prevention. *Journal of business research*, *122*, 627-639.

[34]. Wandosell, G., Parra-Meroño, M. C., Alcayde, A., & Baños, R. (2021). Green packaging from consumer and business perspectives. *Sustainability*, *13*(3), 1356.

[35]. Niranjana Prabhu, T., & Prashantha, K. (2018). A review on present status and future challenges of starch-based polymer films and their composites in food packaging applications. *Polymer Composites*, *39*(7), 2499-2522.

[36]. Brown, G., & Harris, C. C. (1992). The US forest service: Toward the new resource management paradigm?. *Society & Natural Resources*, *5*(3), 231-245.

[37]. Alam M Z, & Abunar S.(2020). Sustainable/ Green Product Packaging From the Shoppers Perspective: A Case of Saudi Arabia. *Research in World Economy 11*(5), 164-176.

[38]. Tikka, P. M., Kuitunen, M. T., & Tynys, S. M. (2000). Effects of educational background on students' attitudes, activity levels, and knowledge concerning the environment. *The journal of environmental education*, *31*(3), 12-19.

[39]. Alam, M. Z. (2022). Influence of Covid-19 Pandemic on Grocery Shopper Behavior in Relation to 4Ps of Marketing: An Empirical Study. In *Explore Business, Technology Opportunities and Challenges After the Covid-19 Pandemic*, 1228-1240. Cham: Springer International Publishing.

[40]. Horowitz, R., & Mohun, A. (Eds.). (1998). *His and hers: Gender, consumption, and technology*. University of Virginia Press.

[41]. Grunert-Beckmann, S. C. (1997). Values and Attitude Formation Towards Emerging Attitude Objects: From Recycling to General, Waste Minimizing Behavior. *ACR North American Advances*.

[42]. Lindh, H., Williams, H., Olsson, A., & Wikström, F. (2016). Elucidating the indirect contributions of packaging to sustainable development: A terminology of packaging functions and features. *Packaging Technology and Science*, *29*, 225-246.

[43]. Thφgersen, J. (1999). The ethical consumer. Moral norms and packaging choice. *Journal of consumer policy*, *22*, 439-460.

[44]. Ceptureanu, E. G., Ceptureanu, S. I., Orzan, M. C., Bordean, O. N., & Radulescu, V. (2017). Empirical study on sustainable opportunities recognition. a polyvinyl chloride (PVC) joinery industry analysis using augmented sustainable development process model. *Sustainability*, *9*(10), *22*, 439-460.

[45]. Durrani, K., & Saqib, N. U. (2019). Green Marketing: A Strategic Balancing Act For Creating Value; A Qualitative Inquiry. *Journal of Marketing and Logistics (JML)*, *2*, 1-15.

[46]. Saunders, M. N., & Bezzina, F. (2015). Reflections on conceptions of research methodology among management academics. *European management journal*, *33*(5), 297-304.

[47]. Chaudhary, T., & Chanda, A. (2015). Evaluation and measurement of performance, practice and pressure of green supply chain in Indian manufacturing industries. *Uncertain Supply Chain Management*, *3*(4), 363-374.

[48]. Tao, S., & Zhong, Y. (2012). Research and development of green packaging structure design. *Advanced Science Letters*, *10*(1), 225-228.

[49]. Xiong, X., Ma, Q., Wu, Z., & Zhang, M. (2020). Current situation and key manufacturing considerations of green furniture in China: A review. *Journal of Cleaner Production*, *267*, 121957.

[50]. Sheikh, K., Ranson, M. K., & Gilson, L. (2014). Explorations on people centredness in health systems. *Health policy and planning*, *29*.

[51]. Chen, T. B., & Chai, L. T. (2010). Attitude towards the environment and green products: Consumers' perspective. *Management science and engineering*, *4*(2), 27-39.

[52]. Sheikh, F. Z., Mirza, A. A., Aftab, A., & Asghar, B. (2014). Consumer green behaviour toward green products and green purchase decision. *International Journal of Multidisciplinary Science and Engineering*, *5*(9), 1-9.

[53]. Mainieri, T., Barnett, E. G., Valdero, T. R., Unipan, J. B., & Oskamp, S. (1997). Green buying: The influence of environmental concern on consumer behavior. *The Journal of social psychology*, *137*(2), 189-204.

[54]. Shamsi, M. S., & Siddiqui, Z. S. (2017). Green product and consumer behavior: An analytical study. *Pertanika Journal of Social Sciences and Humanities*, *25*(4), 1545-1554.

[55]. Yang, Q., Williamson, A. M., Hasted, A., & Hort, J. (2020). Exploring the relationships between taste phenotypes, genotypes, ethnicity, gender and taste perception using Chi-square and regression tree analysis. *Food Quality and Preference*, *83*, 103928.

[56]. Salawu, M. D., Arowolo, M. O., Abdulsalam, S. O., Isiaka, R. M., Jimada-Ojuolape, B., Olumide, M. L., & Gbolagade, K. A. (2020). A chi-square-SVM based pedagogical rule extraction method for microarray data analysis. *International Journal of Advances in Applied Sciences*, *9*(2), 93-100.