

Determinants of Green Purchase Intention toward Eco-Innovation and Green Products in Sibul, Sarawak

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Abstract

Purpose: The purpose of this study is to investigate how different factors in Sibul, Sarawak, affect consumers' intentions to purchase green products. The study's model and hypotheses were adopted from previous studies. **Design/methodology/approach:** Out of 200 participants in Sibul contacted via Google Forms, 189 agreed to participate in this online survey. A non-probability convenience sampling method was used to select the sample. The hypothesis was investigated using Jeffrey's Amazing Statistics Programme (JASP) version 0.18.3. **Findings:** The study found a positive correlation between green purchase intention and environmental concern, environmental knowledge, green products, and eco-innovation factors. Furthermore, the study demonstrates that, while gender, age, education, income, and occupation were not statistically significant, there are statistically significant differences regarding green buying intentions between demographic characteristics like marital status. **Research limitations/implications:** A few restrictions have been noted. First, one of the usual limits of scientific research, and this study is not an exception, is the findings' generalizability. The current investigation was conducted in Sibul, Sarawak. Therefore, more research needs to be done in different parts of Sarawak to increase the validity of the findings. Second, as a measure of green purchase intention, green products were the main focus of the current research. Other categories of green products, such as green energy, may be the subject of future research. Third, even though the study's sample size was enough and suitable, bigger samples could be used in later research to strengthen the findings' validity. **Practical**

implications: The article offers recommendations for practitioners to develop green policies that enhance purchase intentions. It provides guidelines for the government, regulators, educators, businesses, and consumers on establishing green purchase intentions. Policies supporting eco-innovation and green production, such as subsidies, assistance, awareness programs, and specific regulations, are crucial. **Originality/value:** This study is one of the few in Sibul dedicated to developing and evaluating a model of determinants predicting the propensity to purchase green products. It uniquely examines the influence of demographic characteristics on the intention to purchase eco-innovation and green products, using demographic data as control variables.

Keywords Environmental Concern, Environmental Knowledge, Green Product, Eco-Innovation, Green Purchase Intention.

Introduction

The global environment is changing at an accelerated rate due to global warming (Intergovernmental Panel on Climate Change [IPCC], 2021). Conventional goods contribute significantly to environmental degradation and pose risks to human health (Smith & Johnson, 2022). In response to these challenges, there has been a notable global shift towards environmentally friendly products and technologies (Jones et al., 2020). Green products are considered beneficial for both the environment and human health (Green & Lee, 2023). A key strategy in this transition is to encourage consumers to choose green products over conventional ones (Williams & Brown, 2021). The term "green purchase intention" describes a customer's desire to buy more ecologically friendly products and stay away from those that are bad for the environment. In addition to making life even more convenient, rapid advancements in technology and the economy have also resulted in several environmental issues, including air pollution, climate change, and global warming. Green products are mostly recycled materials, non-toxic, organic, and beneficial to the environment. Numerous human endeavors have a detrimental impact on the environment. Among these are the quick depletion of natural resources, carbon emissions, and ozone layer degradation.

Recent market share data on green products indicate that consumers are increasingly considering environmental impacts when making purchasing decisions. However, there remains a significant gap between consumers' stated attitudes and their actual buying behavior. For instance, while a substantial 67% express positive attitudes toward purchasing organic food, the actual purchase rate is much lower, at only 4% (Birch et al., 2019; Costa et al., 2021; Zhao et al., 2021). This disparity underscores the challenge of translating environmental awareness into consistent consumer choices in favor of sustainable products. Moreover, the environment relies on green purchasing to mitigate the negative effects of impulsive consumerism on our surroundings. Approximately 40% of environmental damage in Malaysia stems from household consumer purchases. Embracing green products empowers consumers with choices that lessen their environmental footprint. Recent trends indicate a growing consumer preference for environmentally friendly items, reflecting a shift towards more sustainable consumption practices and increased demand for such products.

Another significant barrier to purchasing green products is the widespread perception that they are more expensive. Research indicates that four out of five consumers believe environmentally friendly products carry a higher price tag compared to conventional alternatives. This preconceived notion about pricing often influences consumer decisions

even before they view actual product costs. Addressing this misconception is crucial for promoting greater adoption of green products, as affordability remains a key factor in consumer purchasing behavior. Moreover, research suggests that even if the price of a green product matches that of its non-green counterpart in the market, only 3 out of 5 consumers would choose to purchase it (Ali et al., 2020; Tan et al., 2021). These findings highlight significant challenges in understanding green products and influencing consumer intentions toward sustainable choices at more advanced levels. Addressing these barriers effectively is essential for promoting wider adoption of environmentally friendly products in the marketplace. Growing consumer awareness about environmental degradation and sustainability concerns significantly drives the demand for environmentally friendly products and practices in any civilization. As consumers become more aware of the impacts of their consumption habits, they increasingly seek out sustainable alternatives, influencing markets and prompting businesses to adopt greener practices, Nascimento, L. F., & Loureiro, S. M. C. (2022).

Consuming green products can indeed help mitigate the effects of global warming to some extent. Suki (2019) emphasized the role of green consumption in addressing environmental issues. Zheng et al (2020), highlighted that purchasing environmentally friendly products involves choosing non-toxic options, ensuring safer consumption for both individuals and the environment. Zheng et al (2020), noted that eco-friendly products and services have become central to green consumerism, emphasizing the importance of not only buying but also using and discarding green items responsibly. Furthermore, green products are designed to minimize their environmental impact. They are often made from recyclable and renewable resources, which helps reduce waste and pollution. Beatson et al (2020), pointed out that the design of green products focuses on minimizing environmental harm, thereby promoting sustainability and conservation of resources. The Malaysian government recognizes the need to enhance its current environmental rating and make substantial improvements to become a greener country. Furthermore, the government has shown a strong commitment to environmental protection, conservation, and preservation, as highlighted by Rahman (2018). This commitment is reflected in policies and programs aimed at fostering sustainable development and reducing environmental impact.

Furthermore, using environmentally friendly products is seen by many as an effective means of protecting the environment. Purchasing eco-friendly products helps support businesses that integrate sustainable and eco-friendly practices into their supply chains and manufacturing processes. As a result, we can mitigate the increasing carbon footprint and work towards a more sustainable future (Kamalanon et al., 2022). In this context, this study aims to answer the following main research question:

- RQ1:* What is the influence of various factors on green purchase intention to buy green products in Sibul, Sarawak? This study attempts to address the following sub-research issue in light of this question:
- RQ2:* What is the influence of environmental concerns, environmental knowledge, eco-innovation, and green products on green purchase intention?
- RQ3:* What is the role of demographic variables (i.e. gender, age, income, education, occupation, and marital status) on customers' purchase intention of green products in Sibul, Sarawak?

As a result, the primary goals of the current study are as follows:

- To examine the influence of various factors on green purchase intention of green products; and
- To investigate the role of Sibu customers' demographic characteristics in their behaviour toward the green purchase intention

Literature Review

Environmental challenges and concerns have gained relevance in the last few decades. This significance is emphasized in organizations as well as in international forums for environmental conservation. Because of their wide-ranging application and serious environmental concerns, buying intentions for eco-friendly products have garnered international attention lately. In this regard, Islam et al (2021), and Kamarudin et al (2021), looked at the trends and obstacles related to environmental concerns, which have a big influence on consumers' intentions to buy. Environmental issues typically relate to the conservation of land, sea, air, and wildlife. Concerns regarding the natural environment and consumer-used and consumed products are also addressed by this safeguard. Many businesses are trying to create specialized measures targeted at accomplishing long-term goals as a result of consumers' growing awareness of environmental issues (Lukin et al., 2022; Hossain et al., 2023a). Customers' top worries have revealed that the environment is one of them, which has led to the development of many green products. According to Siraj et al (2022), consumer concern for the environment has increased demand for a variety of environmentally friendly products. Customers buy green products regularly (Felix et al 2021, Wang et al 2023).

For millennia, people have been concerned about green consumerism and the psychological forces behind it. It has been influenced by several historical occurrences, shifts in culture, and developments in science. Green consumerism has its roots in prehistoric communities when religious and cultural activities included environmental conservation. A sense of connectedness to and responsibility for the environment resulted from these communities' appreciation of nature and practice of sustainable resource management (Masud et al 2023a). Empirically, a great deal of research has been done to comprehend consumers' intentions to buy green products globally. Nazir and Tian (2022), for instance, looked at Malaysian customers' propensity to use eco-friendly products. Their research verified that the primary elements influencing consumers' intentions to purchase environmentally friendly items were cost, simplicity of use, social media, relative benefits, and awareness.

However, Krawczyk et al (2021), discovered that in Sibu, Sarawak, individuals were positively persuaded to buy green items by functional value, environmental value, quality, and savings. According to Atulkar's (2022), research, several factors, including government activities, social influence, advertising, and awareness, drive Malaysians' intention to purchase environmentally friendly goods. In contrast to Krawczyk et al (2021); Atulkar (2022), claimed that cost and environmental value had little influence on consumers' intentions to make green purchases. Moreover, positive consumer attitudes boost expenditure, which enhances an organization's performance. The favorable inclusion of green items and plans to make green purchases are also supported by consumer intention. Furthermore, Trivedi et al (2018), examined how media and information sources affect the intentions, actions, and environmental attitudes that encourage green buying. The purchase of green and

environmentally friendly items is greatly influenced by consumers' sensitivity to the environment.

The body of research emphasizes how crucial demographic characteristics are in determining an individual's inclination to make green purchases. Avicenna and Febriani (2021) carried out a quantitative study in this regard to comprehend Malaysian green purchasing intentions toward environmentally friendly products in Sibul, Sarawak. They found that one of the most significant factors influencing consumers' intentions to make green purchases was marital status. Ali et al (2021), conducted a second survey to determine consumers' intentions to purchase environmentally friendly goods. Wall et al (2021), reported that in Sibul, Sarawak, consumers were driven to buy environmentally friendly products due to their awareness; additionally, the decision to buy environmentally friendly products was found to be influenced primarily by marital status and the type of product, with cost having no bearing on the intention to buy. Additional research revealed that perceived benefits had an impact on customers' inclinations to purchase environmentally friendly goods (Akroush et al., 2019). However, other research (Rai and Robinson, 2013) claimed that purchasing such conventional products is contingent upon the availability of green products. In a similar vein, Korcaj et al (2015), also supported the significance of the availability factor in influencing consumers' decisions to purchase eco-friendly goods. Furthermore, according to Ali et al (2021), the availability of eco-friendly appliances and products encourages and draws consumers to adopt eco-friendly items and facilitates the decision to buy. That knowledge increases people's willingness to adopt green products in Sibul, Sarawak; they also showed that the more knowledgeable customers are, the more likely it is that they will be to make green purchase intentions. Other studies have argued that customers' knowledge plays a vital role in enhancing the purchase intention towards green products (Cheam et al., 2021).

The literature on demographic variables shows that customers' purchasing intentions and product decisions are highly influenced by their demographic profile (Basha and Lal, 2019). Prior research in the area of green purchase intention revealed that certain factors, like marital status, had an impact on consumers' willingness to pay for environmentally friendly items in Sibul, Sarawak (Mercado and Rajagopal, 2014). Furthermore, Masrahi et al.'s findings from 2021 demonstrated that in Sibul, Sarawak, shoppers' inclinations to make green purchases are significantly influenced by their marital status.

Conceptual Framework and Hypotheses Development

The following factors encouraged the green purchase intention: environmental concern, environmental knowledge, eco-innovation, and green products. Separate exploration is given to the connections with the green purchase intention. Thus, the first hypothesis was postulated as follows:

H1: Environmental Concerns Significantly and Positively Influence the Green Purchase Intention.

Islam et al (2021), and Kamarudin et al (2021), explored trends and obstacles related to environmental concerns and their significant influence on consumers' green purchase intentions. Environmental issues often pertain to the conservation of land, sea, air, and wildlife, and address concerns related to the natural environment as well as the products consumers use and consume. In this context, Choi and Johnson (2019), investigated how

consumer intentions to purchase green items were influenced by both hedonic and environmental motives. Their research delves into the dual role of personal enjoyment and environmental concern in shaping consumers' green purchasing behaviors. Chawla and Joshi (2019), evaluated the significance of customer attitudes in influencing consumers' inclinations to switch to environmentally friendly products. In this context, customer attitudes play a crucial role in shaping consumers' willingness to adopt green products. To measure this construct, the current study utilized a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." This scale helps quantify respondents' attitudes and their impact on their green purchase intentions. Based on this, the second hypothesis for the study could be postulated as follows:

H2: Environmental Knowledge Influences Green Purchase Intention Positively.

Han (2021), examined consumer behavior and environmental sustainability from the perspectives of concepts and knowledge. The study highlighted that consumers' green purchase intentions are significantly influenced by their level of environmental understanding. This aligns with findings from Heo and Muralidharan (2019), and Huang et al (2022), who discovered that eco-friendly items associated with environmental concerns, consumer efficacy, and environmental knowledge are key drivers prompting consumers to make environmentally conscious purchases. Additionally, perceived green intentions are linked to consumer effectiveness, quality, values, trust, and collectivism. In this context, consumer mentality and attitude significantly impact sales marketing strategies, as discussed by (Ainou et al 2022; and Fam et al 2019). Furthermore, Wang et al (2020), explored how demographics and consumers' goals for green product selection influence purchase behavior. To measure these constructs, H2 is assessed using a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." Based on this, the third hypothesis could be postulated as follows:

H3: Eco-Innovation Influences Green Purchase Intention Positively.

Sharma et al (2022b), examined the relationship between eco-innovation and green purchase intention in light of the effects of loyalty and emotional generation. Reducing ecological footprints can help minimize environmental effects through eco-innovation, but it also depends on the products, processes, and business strategies employed. Innovation is environmentally friendly when it incorporates sustainable development to make major adjustments to business operations, offerings, and services. Additionally, eco-innovation is a powerful indicator of consumer behavior that is appropriate and motivated by environmental concerns. With this regard, as a result, product innovation has a significant influence on consumers' inclinations to make green purchases. In this regard, Amin et al (2017), evaluated how consumer preferences and attitudes positively highlight different productive sectors. Hence, in response to environmental rules and customer expectations, Liao and Tsai (2019), proposed the roles of eco-innovation, creativity enhancement, and innovation intensity strategy. Green purchase intentions are necessary for effective sustainable development, and eco-innovation helps to promote these intentions. Furthermore, the needs and concerns of customers have led to a significant increase in the opportunities for innovation. Hence, this construct was included in the current study by using a five-point Likert scale, labeled from "strongly disagree" to "strongly agree". Accordingly, the fourth hypotheses were postulated as follows:

H4: Green Products Influence Green Purchase Intention Positively

There are two types of products: environmentally friendly and those that harm the environment. According to Tan et al (2019), green purchasing intentions significantly influence consumer propensity to purchase both types of products. Products that cause environmental devastation have inflicted substantial damage on the world's ecosystem. In this context, Ali et al (2020), explored how purchasing intentions for electronic devices are influenced by altruism and green thinking. Similarly, Cai et al (2017), investigated the relationship between merchants and the credibility of eco-labels, examining how this relationship affects consumers' willingness to buy green items. Thus, green products have significantly facilitated the implementation of beneficial environmental protection strategies, supporting efforts to mitigate ecological damage. Green products and green purchasing intentions are significantly influenced by consumer sentiments. Gupta and Singh (2021), explored customer perceptions regarding sustainable living and how these perceptions drive green purchase intentions. Products that benefit the environment are increasingly becoming the primary and most popular choice among consumers. Therefore, consumers' attitudes towards green products and their intentions to make green purchases can be shaped by various factors. In a similar vein, Liobikienė and Bernatoniene (2017), assessed the factors that positively influence customer intentions toward green products, thereby determining green purchasing intentions. Based on these insights, the fifth hypothesis for the current study could be suggested as follows:

H5: The Different Demographic Variables Produce Significant Differences In Green Purchase Intention.

Six demographic factors were employed in the surveys for this study. As a result, the following six sub-hypotheses are proposed in light of the main hypothesis mentioned above:

H5a: There are significant differences in green purchase intentions for consumers of different genders.

H5b: There are significant differences in green purchase intentions for consumers of different age groups.

H5c: There are significant differences in green purchase intentions for consumers of different income levels.

H5d: There are significant differences in green purchase intentions for consumers of different education levels.

H5e: There are significant differences in green purchase intentions for consumers of different occupation levels.

H5f: There are significant differences in green purchase intentions for consumers of different marital statuses.

Based on the above discussion of the constructs and hypotheses of the current study, Figure 1 below shows the conceptual framework developed for this study.

Methodology*Study design*

The purpose of this study is to be quantitative. Thus, Google Forms was utilized to create an online survey, or questionnaire, that was employed to gather the main data. Out of 200 respondents, 189 respondents in total were the focus. The authors utilized JASP software

version 0.18.3 for data analysis. To illustrate the respondents' demographic information, frequency, and descriptive analysis were conducted; skewness and kurtosis were also employed to guarantee the data's normalcy. Additionally, Cronbach's alpha and average variance extraction (AVE) were used to guarantee the data's convergent validity and reliability (Hair et al., 2022). The proposed hypotheses were tested using linear multiple regression (Mardani et al., 2017). Additionally, Cronbach's alpha and average variance extraction (AVE) were used to guarantee the data's convergent validity and reliability (Hair et al., 2022). The proposed hypotheses were tested using linear multiple regression (Mardani et al., 2017).

Additionally, the association between the purchase intention and the demographic factors (control variables) was examined using the T-test and one-way analysis of variance (ANOVA). As may be seen in the Appendix, measures used in this study were taken from previous research. A five-item scale was used to gauge environmental concerns (Chan, 2001). A six-item scale was also used to gauge respondents' environmental knowledge (Mohr et al., 1998). A six-item scale was used to measure eco-innovation control (Yurdakul & Kazan, 2020). A six-item scale was used to measure green products (Armitage et al., 1999). A nine-item scale was used to gauge purchase intention (Armitage et al., 1999 & Chang et al., 2019). Five-point Likert scales, with 5 representing "strongly agree" and 1 representing "strongly disagree," were used to measure each study construct (Witek and Kuzniar, 2020). In addition, a brief section on the respondents' demographic information such as gender, age, income, education, occupation, and marital status was added to the questionnaire.

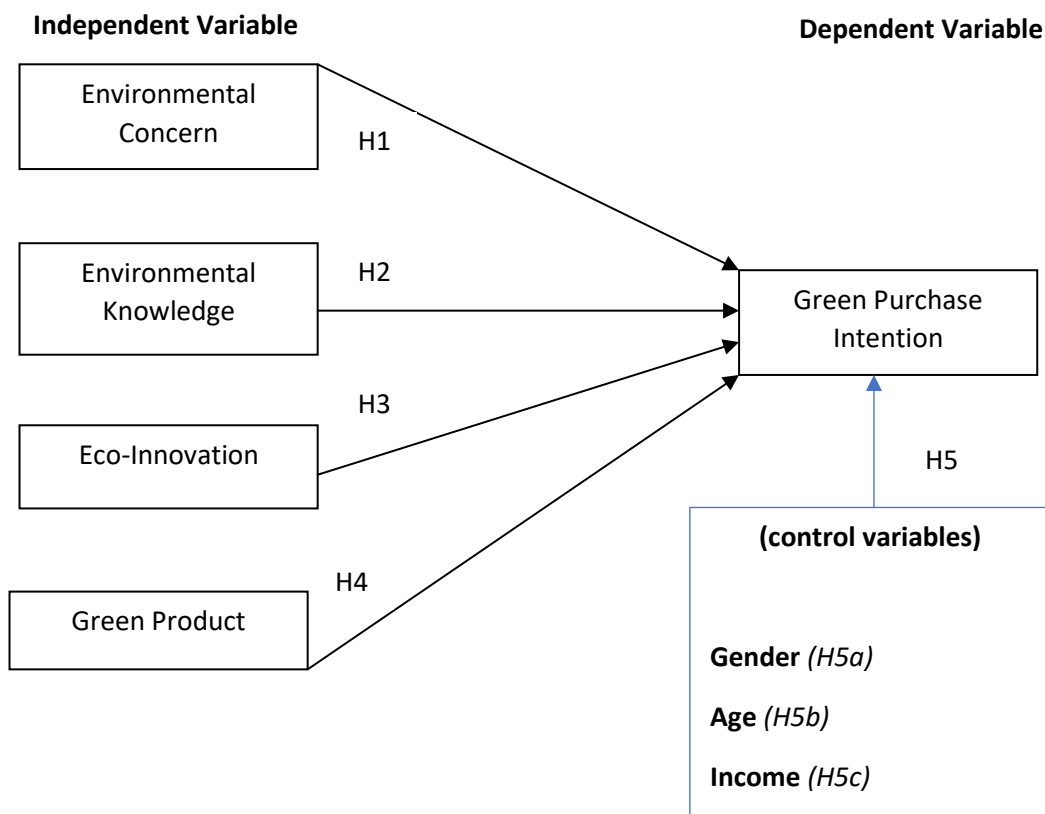


Figure 1: The conceptual framework

Source: Previous studies and Adapted from M. Moslehpour et al., 2022

The study focused on Malaysian consumers who are nongreen adopters (users), specifically those residing in Sibu, Sarawak. The unit of analysis was the person. This setup indicates a comprehensive approach to understanding environmental behaviors and intentions among a specific segment of Malaysian consumers. The use of established scales from previous research ensures the study's constructs are grounded in existing literature, enhancing the validity and comparability of the findings. Data collection took place between March 18, 2024, and March 30, 2024.

Population and sample

The demographic of the current study consisted of individuals based in Sibu, Sarawak, who are at least 18 years old and utilize green products in their homes. To gather the core data, the study employed a non-probability with convenience sampling method to ensure the appropriate respondents were reached. As previously mentioned, the survey was distributed via Google Forms. The authors disseminated the surveys through email and social media platforms like WhatsApp and Messenger to collect responses efficiently.

Indeed, the study encountered time constraints leading to some respondents declining to participate, while others agreed. The data collection took place between March 18 and March 30, 2024. Some academics have asserted that the number of variables included in the study's model can be utilized to predict the sample size (Kline, 2015). This justification suggests that the researchers might employ 20 respondents for each variable in the conceptual framework. Conversely, Hair et al (2022), proposes that employing five to ten respondents per individual item on the measurement scale would be adequate. These differing recommendations offer flexibility in determining an appropriate sample size for the study.

Some academics suggest that the number of variables in a study's model can help determine the required sample size (Hox, & McNeish, (2020). Specifically, using 20 respondents per variable in the conceptual framework is often recommended. Alternatively, other guidelines propose using five to ten respondents per item on the assessment scale (Hair et al., 2022). Additionally, previous studies argue that a sample size of 189 respondents might be sufficient for quantitative research.

On the other hand, 200 respondents can be sufficient for quantitative research, according to Papastathopoulos, (Ahmad, Sabri, and Kaminakis 2019). In this study, 39 out of the distributed questionnaires were completed and deemed eligible for entry and analysis, resulting in a 95% response rate. Consequently, the study's sample size is considered adequate for data analysis (Hair et al., 2022), aligning with the previously mentioned debate regarding sample size estimation.

Findings

Table 1 shows the demographic profiles of respondents. 56.6 of responses were female, making up 107 people, while 43.4% were male, comprising 82 people.

Table 1
 Respondents' demographic characteristics

Characteristics	Frequency	%
<i>Gender</i>		
Male	82	43.4
Female	107	56.6
<i>Age</i>		
18-29	36	19.0
30-39	67	35.0
40-49	47	25.0
50-60	24	13.0
61 and above	15	8.0
<i>Marital status</i>		
Single	73	38.6
Married	107	56.6
Divorced	9	4.8
<i>Education</i>		
SPM	24	12.7
STPM/Foundation	10	5.3
Diploma	48	25.4
Bachelor	53	28.0
Master	43	22.8
PhD	11	5.8
<i>Occupation</i>		
Private sector	120	63.5
Public sector	69	36.5
<i>Income</i>		
Below 2,500	57	30.1
2,501-4,000	49	25.9
4,001-6,000	33	17.5
6,001-8,000	20	10.6
More than 8,000	30	15.9

Source: Author's creation

Approximately 36 respondents (19%) were young adults in the 18–29 age range, 67 respondents (35%) were in the 30-39 age range, 47 respondents (25%) were middle-aged in the 40–49 age range, 24 respondents (13%) are in the 50–60 age range, and 15 respondents (8%) are in the 61 and over age range. Approximately 107 (56.6%) respondents are married, 9 (4.8%) are divorced, and 73 (38.6%) are single. Nevertheless, for the respondents' educational background there is approximately twenty-four respondents (12.7%) hold an SPM, ten respondents (5.3%) hold an STPM/Foundation, forty-eight respondents (25.4%) hold

a diploma, 53 respondents (28%) hold a bachelor's degree, forty-three respondents (22.8%) possess a master's degree, and eleven respondents (5.8%) hold a PhD. Furthermore, the respondents' occupations were displayed with the remaining 69 respondents (36.5%) from the public sector, while 120 respondents (63.5%) are from the private sector. Approximately the respondents' monthly income level was recorded with 57 (30.1%) earning less than RM2,500 per month, 49 (25.9%) earning between RM2,501 and RM4,000, 33 (17.5%) earning between RM4,001 and RM6,000, 20 (10.6%) earn between RM6,001 and RM8,000, and 30 (15.9%) earn RM8,000 or more.

Normality of the data

The authors used skewness and kurtosis to assess data normality (Kline, 2005). According to Kline (2005), the skewness and kurtosis values should fall within the range of -3 to +3 and -10 to +10. Table 2 presents the skewness and kurtosis values for the variables, demonstrating that all values fall within the acceptable range, indicating a normal distribution of the data.

Table 2

Normality of the data

Variable	Item	Mean	Std. Deviation	Skewness	Kurtosis
Environmental concern	EC1	4.434	0.800	-1.638	3.166
	EC2	4.608	0.740	-2.487	7.318
	EC3	3.413	1.403	-0.392	-1.120
	EC4	3.963	1.222	-1.131	0.394
	EC5	3.640	1.206	-0.637	-0.436
Environmental knowledge	EK1	3.968	0.945	-0.778	0.146
	EK2	3.810	0.866	-0.265	-0.626
	EK3	3.804	0.831	-0.350	-0.079
	EK4	3.862	0.883	-0.572	0.184
	EK5	3.831	0.953	-0.513	-0.282
	EK6	3.762	0.946	-0.421	-0.348
Eco-innovation	EI1	3.656	1.012	-0.778	0.146
	EI2	3.804	0.945	-0.265	-0.626
	EI3	3.767	0.961	-0.350	-0.079
	EI4	3.804	0.956	-0.572	0.184
	EI5	3.751	0.971	-0.513	-0.282
	EI6	3.746	0.933	-0.421	-0.348
Green products	GP1	4.466	0.733	-1.313	1.304
	GP2	4.243	0.919	-1.168	0.931
	GP3	4.333	0.786	-1.131	1.298
	GP4	4.222	0.821	-0.899	0.584
	GP5	4.392	0.726	-0.839	-0.319
	GP6	4.175	0.823	-0.798	0.396
Green purchase intention	GPI1	4.222	0.781	-0.615	-0.480
	GPI2	4.217	0.832	-0.706	-0.440
	GPI3	3.651	1.132	-0.502	-0.469
	GPI4	3.439	1.122	-0.292	-0.527

GPI5	4.000	0.881	-0.660	0.248
GPI6	3.995	0.828	-0.274	-0.851
GPI7	4.169	0.746	-0.597	-0.013
GPI8	3.788	0.904	-0.355	-0.421
GPI9	3.931	0.832	-0.262	-0.714

Source: Authors' creation

Construct reliability and convergent validity of the data

To ensure the validity of the measurement scale, the authors of this study employed Cronbach's alpha. According to Hair et al. (2022), determining the coefficient of reliability is a crucial step in ensuring the accuracy of quantitative data. For this purpose, the authors used JASP version 0.18.3 to calculate Cronbach's alpha for each variable in the study, aiming for a minimum value of 0.6 (Hair et al., 2022). Additionally, the Average Variance Extracted (AVE) was used to verify convergent validity, with a threshold value of 0.50 or higher (Hair et al., 2022). The values of the AVE and coefficient of reliability for each variable utilized in the study are shown in Table 3 below. Table 3 demonstrates that the reliability and convergent validity of the measurement scales used in the study are well within acceptable limits, supporting the robustness of the research findings. All of the variables can be considered statistically reliable because, as the table shows, their Cronbach's alpha (α) values varied from 0.621 to 0.953. Additionally, the AVE values for each model construct are acceptable, confirming convergent validity. This indicates that the measurement scales used in the study are reliable and valid, supporting the robustness of the research findings.

Table 3
Reliability coefficients of the variables

No.	Variable	Cronbach's alpha	Convergent Validity (AVE)
1	Environmental concern	0.621	0.83
2	Environmental knowledge	0.884	0.92
3	Eco-innovation	0.953	0.92
4	Green products	0.922	0.94
5	Green purchase intention	0.909	0.94

Source: Authors' creation

Hypotheses testing relating to independent and dependent variables

The authors employed JASP software to conduct multiple regression analysis to investigate the hypotheses put forth. This method allowed them to ascertain the causal relationship between the study's variables as well as the impact of independent variables on dependent ones (Peng et al., 2019). Multiple regression is therefore the appropriate statistical method to be used in this context. According to statisticians, P values indicate statistical significance at levels of 0.001, 0.01, and 0.05 (Hair et al., 2022). Additionally, T-tests and one-way ANOVA were used to evaluate the hypotheses regarding the control variables. Table 4 presents the findings of the multiple regression analysis for all hypotheses, while Table 5 displays the T-test results, and Tables 6–15 present the one-way ANOVA results. These tables demonstrate the statistical significance and relationships between the study's variables, providing robust support for the research hypotheses and the control variables.

The **first hypothesis (H1)** investigates the effect of environmental concern on customers' green purchase intention toward eco-innovation and green products in Malaysia, as illustrated in the conceptual model. The findings show that consumers' green purchase intention was significantly influenced by the environmental concern construct, as shown in Table 4 (the p-value was significant at <0.001 level ***). Furthermore, the crucial ratio (t-value) was 3.359 and the path coefficient (β) was 0.145. Therefore, a one-unit rise in the environmental concern construct would result in a 0.145 increase in the purchasing intention. This meant that the hypothesis was validated.

The purpose of the **second hypothesis (H2)** was to look into how customers' green purchase intention is affected by their environmental knowledge. Customers' green purchase intention was significantly influenced by the environmental knowledge construct, according to the regression analysis (the p-value was significant at the 0.001 level ***). Furthermore, the crucial ratio (t-value) was 3.320 and the path coefficient (β) was 0.142. Therefore, a 0.142 rise in the green purchase intention would result from a one-unit increase in the environmental knowledge construct. Thus, this theory was validated, as shown in Table 4.

Regarding the **third hypothesis (H3)**, the results of the multiple regression analysis showed that customers' green purchase intentions are significantly and favorably influenced by eco-innovation. Table 4 indicates that the p-value was less than 0.01, specifically <0.001 ***. Furthermore, the crucial ratio (t-value) was 9.216 and the path coefficient (β) was 0.321. Therefore, there would be a 0.321 increase in the desire to make green purchases for every unit increase in the eco-innovation build. This meant that the hypothesis was validated. H3 was therefore approved.

Examining how green products affect consumers' green purchase intention is the goal of the **fourth hypothesis (H4)**. The results demonstrate that customers' green purchase intention is significantly influenced by the green products concept. The p-value was significant at the <0.001 level which is less than the threshold of less than 0.01, as Table 4 demonstrates ***. The last hypothesis looks at how green products affect consumers' green purchase intention. Furthermore, the crucial ratio (t-value) was 8.764 and the path coefficient (β) was 0.398. Therefore, there would be a 0.398 increase in the desire to make green purchases for every unit increase in the green products built. H4 was therefore approved.

Table 4

Multiple regression analysis

Multiple regression analysis						
Model		Unstandardized (β)	Coefficient Standard Error	Standardized coefficients (β)	(t) value	(p) value
H ₀	(Intercept)	3.935	0.050		78.572	< .001
H ₁	(Intercept)	-0.107	0.174		-0.617	0.538
	EC-Mean	0.145	0.043	0.146	3.359	< .001
	EK-Mean	0.142	0.043	0.149	3.320	0.001
	EI-Mean	0.321	0.035	0.404	9.216	< .001
	GP-Mean	0.398	0.045	0.394	8.764	< .001

a. Dependent variable: green purchase intention

Source: Authors' creation

Results of hypothesis examination related to control variables

One-way ANOVA and T-test methods were utilized to examine demographics as control variables and determine whether there was a significant difference between the control variables and the dependent variable (green purchase intention). Additionally, this method is helpful and frequently applied in business research to simultaneously analyze the significant difference between more than two sample means (groups) (Hair et al., 2022). Furthermore, one-way ANOVA is employed in investigations with a single dependent variable, and this particular study has been the subject of numerous studies. Therefore, one-way ANOVA is a useful method to investigate how demographic traits (control variables) affect consumers' intentions to make green purchases. It was decided to use JASP software version 0.18.3 for one-way ANOVA and T-tests.

The T-test findings are included in Table 5 to help determine if the mean scores for green purchase intentions between the male and female groups differed significantly. The findings of Levene's test between gender and the dependent variable (intention to make green purchases) are shown in Table 5. The statistical value of sig (0.802) was greater than 0.05, as shown in Table 5 below, suggesting that there were no significant differences between the mean scores for green purchasing intentions between the male and female groups. *H6a* was so disregarded. One-way ANOVA was used to see whether the intentions of occupation groups, age, income, education, and marital status to buy green items differed significantly from one another. In the current study, the homogeneity of variance was evaluated using Levene's test before one-way ANOVA was carried out.

Table 5

T-test results of gender group's green purchase intention

T-test for equality of means					Levene's test for equality of variance	
Gender	T	Df	Sig. (2-tailed)	Mean different	F	Sig.
Equal variances assumed	1.230	187	0.220	0.124	0.063	0.802

Source: Authors' creation

The findings of Levene's test between age and the dependent variable (intention to make green purchases) are shown in Table 6. The findings of Levene's test were not significant at the 0.05 level of significance, as the table below shows because the supplied P-value (0.669) is greater than 0.05. This implies that the one-way ANOVA test can be used with validity and that age groups show homogeneity of variance. Levene's test was performed initially, and subsequently, *H6b* was investigated using a one-way ANOVA. Table 6 below displays the *H6b* test results.

Table 6

Homogeneity of variance analysis (Levene's test)

Dependent variable	Levene's statistic	Sig.
Green purchase intention	0.592	0.669

Source: Authors' creation

The value of sig (0.917) in statistics is displayed in Table 7 below. This implies that the mean scores for intentions to make green purchases were no significant differences in the age groups. *H6b* was rejected.

Table 7*One-way ANOVA results of age group green purchase intention*

Age	Sum square	of Df	Mean square	F	Sig.
Age	0.457	4	0.114	0.237	0.917
Residuals	88.652	184	0.482		

Source: Authors' creation

Levene's test was also performed to confirm the homogeneity of variance across income groups and the dependent variable. The outcomes of Levene's test are shown in Table 8. Given that the provided P-value (0.135) is bigger than 0.05, Levene's test result was not significant at the 0.05 significance level, as the table illustrates. This suggests that variance is homogeneous across income categories and that the one-way ANOVA test may be applied with validity. Levene's test was run first, and then a one-way ANOVA was run to examine *H6c*. The test results for *H6c* are shown in Table 8 below.

Table 8

Homogeneity of variance analysis (Levene's test)

Dependent variable	Levene's statistic	Sig.
Green purchase intention	1.781	0.135

Source: Authors' creation

The one-way ANOVA results, which were used to determine if monthly income groups differed significantly in their intentions to make green purchases, are listed in Table 9 below. The result of a one-way ANOVA revealed that the sig value was 0.765, signifying that there were no significant variations in the average score for intentions to purchase environmentally across the various income brackets. *H6c* was so rejected.

Table 9

One-way ANOVA results of income group's green purchase intention

Income	Sum of square	Df	Mean square	F	Sig.
Income	0.882	4	0.220	0.460	0.765
Residuals	88.227	184	0.479		

Source: Authors' creation

Levene's test was employed in this study to evaluate the homogeneity of variance between the education group and the dependent variable. Levene's test findings are displayed in Table 10. Given that the provided P-value (0.701) is more than 0.05, Levene's test result was not significant at the 0.05 level of significance, as seen in the table illustrates. This suggests that variance is homogeneous across educational categories and that the one-way ANOVA test can be used with validity. Levene's test was run first, and then a one-way ANOVA was run to examine *H6d*. The test results for *H6d* are shown in Table 10 below.

Table 10

Homogeneity of variance analysis (Levene's test)

Dependent variable	Levene's statistic	Sig.
Green purchase intention	0.599	0.701

Source: Authors' creation

Greater than 0.05 indicates that the sig value is insignificant, according to the one-way ANOVA result, shown in Table 11. As a result, the means core for green purchase intents varied not significantly between the education groups. *H6d* was therefore rejected.

Table 11

One-way ANOVA results of education groups' green purchase intention

Education	Sum of square	Df	Mean square	F	Sig.
Education	0.563	5	0.113	0.233	0.948
Residuals	88.546	183	0.484		

Source: Authors' creation

To confirm the homogeneity of variance across occupation groups and the dependent variable, Levene's test was also performed. The outcomes of Levene's test are shown in Table 12. Given that the provided P-value (0.140) is more than 0.05, Levene's test result was not significant at the 0.05 significance level, as seen in the table illustrates, shown in Table 12 below.

Table 12

Homogeneity of variance analysis (Levene's test)

Dependent variable	Levene's statistic	Sig.
Green purchase intention	2.192	0.140

Source: Authors' creation

The statistical value of sig (0.219) was bigger than 0.05, as shown in Table 13 below, suggesting that there were no significant variations in the mean scores for green purchasing intentions between the occupation groups. *H6e* was therefore rejected. This suggests that variance is homogeneous across occupation categories and that the one-way ANOVA test may be applied with validity.

Table 13

One-way ANOVA results of Occupation groups' green purchase intention

Occupation	Sum square	Df	Mean square	F	Sig.
Occupation	0.719	1	0.719	1.522	0.219
Residuals	88.389	187	0.473		

Source: Authors' creation

To confirm the homogeneity of variance across marital status groups and the dependent variable, Levene's test was also performed. The outcomes of Levene's test are shown in Table 14. Given that the provided P-value (0.055) is at 0.05, Levene's test result was that were indicating significant differences in the mean score for green purchase intention among marital status groups at the 0.05 level of significance, as seen in Table 14 below.

Table 14

Homogeneity of variance analysis (Levene's test)

Dependent variable	Levene's statistic	Sig.
Green purchase intention	2.944	0.055

Source: Authors' creation

The statistical value of sig (0.663) as shown in Table 15 below, suggests that there were significant variations in the mean scores for green purchasing intentions between the marital status groups. Thus, *H6f* was accepted.

Table 15

One-way ANOVA results of marital status groups' green purchase intention

Marital Status	Sum of square	Df	Mean square	F	Sig.
Marital Status	0.393	2	0.197	0.412	0.663
Residuals	88.716	186	0.477		

Source: Authors' creation**Discussion**

Previous studies have revealed a positive connection between eco-innovation and green purchase intention. This indicates that in Malaysia, firms that incorporate eco-friendly innovations into their production processes and include environmentally friendly features in their products and services are more successful in satisfying customers with green buying intentions and enhancing their market appeal. These results are supported by Sharma et al. (2022a), who found that customers with a high level of environmental awareness prefer to purchase products and services made from green materials and designed with sustainability in mind. Thus, in the context of Malaysia, this study attempts to comprehend the possible influence of many elements (environmental concern, environmental knowledge, eco-innovation, and green products) on buyers' intention to make green purchases.

The study's findings demonstrated that customers' intentions to make green purchases were significantly positively impacted by environmental concerns ($\beta = 0.145$, $p < 0.001$). This result supported the findings of Ali et al (2021), which stressed the significance of environmental concern for green purchase intention. In line with this, Akroush et al (2019), verified this discovery. They claimed that one of the main factors influencing individuals to buy green items was environmental concern.

Green purchase intention is known to be positively and significantly influenced by environmental knowledge ($\beta = 0.142$, $p = 0.001$). This conclusion was consistent with the research conducted by Irfan et al. (2020), which found a strong and positive relationship between people's intentions to buy green items in Sibul, Sarawak, and their environmental knowledge construct. Similarly, Liobikiene and Dagiliute (2021), verified this result, stating that customers' intentions to make green purchases in Sibul, Sarawak, were significantly influenced by their awareness of the environment. Furthermore, Ali et al (2021), confirmed that consumers benefit from having sufficient information and understanding when deciding whether to make a green purchase. Therefore, one strategy to change behavior is to increase consumer environmental awareness of the green product options that are available and, consequently, their propensity to buy such equipment through advertising efforts.

Consistent with earlier research findings, eco-innovation was found to positively influence Malaysians' propensity to accept and pay for green products ($\beta = 0.321$, $p < 0.001$) in this study (Ali et al., 2021). In a similar vein, numerous earlier research investigations have indicated that eco-innovation architecture is a crucial consideration when making green product purchases. As a result, this element is valued to the intention to make green purchases. Additionally, this study discovered that Malaysian green buying intentions were significantly positively influenced by green products ($\beta = 0.398$, $p < 0.001$). Atulkar (2022), who observed the substantial correlation between eco-innovation and green purchase

intention when buying green items in Sibu, Sarawak, corroborated this conclusion in this regard. Similarly, Avicenna and Febriani (2021), claimed that one of the things that influence people's decisions to choose and, consequently, buy a product is its eco-friendliness. Therefore, it is believed that eco-innovation and green products play a significant role in consumers' intentions to make green purchases.

In **H5**, which was developed to ascertain whether there are any statistically significant differences between customers' demographic traits and their intentions to make green purchases, demographic factors are finally shown as control variables. Gender *H5a*, age *H5b*, income *H5c*, education *H5d*, occupation *H5e*, and marital status *H5f* are the six sub-hypotheses that makeup H5. The results of the T-test and one-way ANOVA showed that the remaining demographic traits (control factors), except for gender, have an impact on consumers' intentions to purchase environmentally friendly goods.

Conclusion, Limitations, and Future Recommendations

In summary, the present study aims to contribute to the existing literature by investigating the green product purchasing intentions of consumers in Sibu, Sarawak. In this study, the authors also employed demographic factors as control variables. JASP software was used to create and examine five hypotheses. The study discovered that green purchase intention is positively and significantly impacted by elements including environmental concern, environmental knowledge, eco-innovation, and green products. These results show the inclusion of the larger model's applicability for researching purchase intentions in the context of green purchase intention. Furthermore, the study looked at the impact of demographic characteristics and found that, while gender, age, income, education, and occupation were not significant, there is a significant difference between the dependent variables and the control variables, namely marital status.

In addition, this study has made several contributions to both practice and the corpus of knowledge. First, this study was conducted to look into the impact of several factors on customers' purchase intentions in this context, as there isn't much information available about Malaysians' intentions to buy green products. Second, a conceptual framework that could be helpful for further research has been proposed by the current study. Additionally, by highlighting the primary drivers of green product usage and purchase among Malaysian consumers, the study's findings may be useful to industry practitioners in the green products sector. They may use the study's findings to encourage more people to buy and utilize green appliances and products to build marketing strategies and policies. Furthermore, a few restrictions have been noted. First, one of the usual limits of scientific research, and this study is not an exception is the generalisability of the findings. The current investigation was conducted in Sibu, Sarawak, in this regard. Therefore, more research must be done in different parts of Sarawak to increase the validity of the findings. Second, as a measure of green purchase intention, green products were the main focus of the current research. Other categories of green products, such as green energy, might be the subject of future research. Third, even though the study's sample size was enough and suitable, bigger samples might be used in further research to strengthen the validity of the findings.

Motivation and Contribution

This study is driven by the critical need to explore the determinants of green purchase intention in a time when environmental sustainability is not just a growing concern but an urgent global priority. With increasing awareness of environmental degradation, climate change, and the depletion of natural resources, consumers are becoming more conscious of their purchasing decisions. This shift in consumer behavior has profound implications for businesses, which are now required to innovate and align their practices with eco-friendly standards to stay competitive and socially responsible.

The primary motivation behind this research is to bridge the gap in understanding how various psychological, social, and economic factors influence consumers' intentions to purchase eco-friendly products. Previous studies have often focused on isolated determinants, but a lack of comprehensive analysis integrates these factors within a unified framework. By addressing this gap, the study aims to provide a holistic understanding that can better inform both academic inquiry and practical applications.

The contribution of this research is multifaceted. First, it offers an in-depth analysis of the key determinants of green purchase intention, including environmental concern, perceived consumer effectiveness, social influence, and personal norms. This analysis expands the theoretical foundation of green consumer behavior and introduces a nuanced perspective that considers the interplay between these factors. Second, the study contributes to the practical field by providing businesses with actionable insights on how to effectively market eco-friendly products. By understanding what drives consumers towards green purchases, companies can tailor their marketing strategies to resonate with environmentally conscious customers, ultimately leading to increased sales and a positive brand image.

Furthermore, this research holds significant implications for policymakers and environmental advocates. The findings can guide the development of policies and campaigns aimed at promoting sustainable consumption. By highlighting the importance of social influence and personal norms, the study suggests that public policies and community initiatives that foster a culture of sustainability can play a crucial role in enhancing green purchase intentions among consumers.

In summary, this study not only fills a critical gap in the literature but also provides a comprehensive framework that can be utilized by academics, businesses, and policymakers alike. By elucidating the determinants of green purchase intention, the research underscores the importance of understanding consumer motivations in the pursuit of a more sustainable future.

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Appendix: Measurement of the Variables

Variable	Items
Environmental concern Source: Chan, 2001	<ol style="list-style-type: none"> 1. Human beings need to understand the ways of nature and act accordingly. 2. We should maintain harmony with nature. 3. Being the master of the world, human beings are entitled to deploy any of the natural resources as they like. 4. Human beings are only part of nature. 5. We should master instead of adapting to the environment.
Environmental knowledge Source: Mohr et al., 1998	<ol style="list-style-type: none"> 1. I know that I buy products and packages that are environmentally safe. 2. I know more about recycling than the average person. 3. I know how to select products and packages that reduce the amount of waste ending up in landfills. 4. I understand the environmental phrases and symbols on product packages. 5. I am confident that I know how to sort my recyclables properly. 6. I am very knowledgeable about environmental issues.
Eco-innovation Source: Yurdakul & Kazan, 2020	<ol style="list-style-type: none"> 1. Our business develops products using less material. 2. Our company develops products that can be recycled easily. 3. Our business develops products that cause the least amount of waste. 4. Our business develops products that minimize the damage caused by waste. 5. Our business develops products to minimize energy use. 6. Our business develops easily separable products.
Green products Source: Armitage et al., 1999	<ol style="list-style-type: none"> 1. Purchasing green products is good. 2. Purchasing green products is wise. 3. Purchasing green products is beneficial. 4. Purchasing green products is favorable. 5. Purchasing green products is positive. 6. Purchasing green products is satisfactory.
Green purchase intention Source: Chang et al., 2019 & Armitage et al., 1999	<ol style="list-style-type: none"> 1. I want to purchase green products. 2. I plan to purchase green products. 3. The price of green products would have to go up quite a bit before I would switch to other conventional products. 4. I am willing to pay a higher price for green products than for conventional products. 5. The green product contributes significant benefits to the consumer. 6. The outstanding green product enhances consumer satisfaction and gains intentions. 7. The green product continues to improve its development over time. 8. The green product is more attractive than its competitors.

9. The green product can achieve its aims to attract consumers.

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