# AN EMPIRICAL ANALYSIS OF FACTORS AFFECTING GREEN CONSUMPTION BEHAVIORS OF CUSTOMERS IN HANOI, VIETNAM

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**Abstract.** Consumption of green products has tended to increase in Vietnam in recent years along with economic development and people's awareness of environmental protection. This study analyzes factors affecting customers' intention to consume green products in Hanoi based on the theory of planned behavior. We conducted a survey of 580 customers using the convenient sampling method, then used Cronbach's alpha analysis, exploring factor analysis, ANOVA and multivariate regression to identify influencing factors. The results show that there are 6 factors that influence green product consumption behavior including environmental attitude, social influence, trust, environmental concern, green promotion and eco label, in which environmental attitude is the factor that has the strongest impact on behavior. Based on the results, the study provides some implications for promoting green consumption in Vietnam.

Keywords: green growth, net zero, social inclusion, sustainable development, theory of planned behaviors

#### Introduction

Environmental issues have garnered widespread attention over recent decades, driven by the recognition of their significant impact (Alibeli, 2009; Luchs et al., 2015; World Bank, 2020; Dat and Truong, 2023). Recently, an increase in natural disasters, partly attributed to environmental pollution, has heightened these concerns. The severe consequences of environmental damage include global warming, air pollution, and the greenhouse effect (Intergovernmental Panel on Climate Change, 2023; World Meteorological Organization, 2023). Consequently, public awareness regarding environmental issues like water pollution, ozone depletion, and the greenhouse effect has grown. This heightened concern stems from the realization that environmental pollution is leading to more severe consequences than ever before (Konuk and Rahman, 2015; Liobikiene et al., 2016; Han et al., 2020). This has prompted the development of the concept of sustainable development, aimed at minimizing negative environmental impacts (World Commission on Environment and Development, 1987; Han et al., 2020). Sustainable development encourages people to purchase and use environmentally friendly products and services (Chen and Chang, 2012; Yadav and Pathak, 2017). Consequently, environmentally conscious consumers have increasingly chosen to express their concerns through the purchase of eco-friendly products and services, giving rise to concepts like "green consumption" and "green purchase." In this context, "green" denotes

environmentally friendly practices (Baker and Ozaki, 2008). Green consumers actively select eco-friendly products and are willing to reject those harmful to the environment (Wang et al., 2014; Yadav and Pathak, 2017). Moreover, this trend extends to Asian countries, particularly developing nations like Malaysia and Vietnam, where environmental issues have gained prominence over the past few decades. In the last decade, environmental protection has become a top priority for Asian governments due to the increasing occurrence of natural disasters (Wang and Liu, 2014; Dagher et al., 2015).

Vietnam is among the top 10 countries most affected by natural disasters in the last two decades, and within the last four years, it ranks among the six most impacted nations (Dat and Truong, 2020; World Bank, 2020). This underscores the urgent need for Vietnam to address environmental issues and mitigate their adverse effects (Thuy and Sihem, 2019; Le and Truong, 2019). Interestingly, Vietnamese citizens have become increasingly environmentally conscious following recent natural disasters. A study by Dat and Truong (2023) found that around 47% of surveyed individuals aimed to minimize their environmental footprint through their consumption choices, indicating a rising awareness of environmental concerns among Vietnamese consumers. Furthermore, initiatives like the "Green Products Consumption Campaign" in 2018 garnered over four million participants in Vietnam. This campaign encouraged people to opt for environmentally friendly or less harmful products, leading to a substantial increase in the sales of green products, as reported by the country's top five largest supermarkets in 2019 (Switch Asia, 2019; Nielsen, 2023). Given the rapid growth of green consumption and purchasing, numerous studies have explored customer behavior regarding eco-friendly products since the 1970s (Dagher et al., 2015). These research efforts have consistently shown that green purchase intention significantly influences consumers' decisions. Intention, in turn, plays a pivotal role in shaping actual purchasing behavior, making it a reliable predictor of consumer actions (Maichum et al., 2016; United Nations University, 2021). Green purchase intention serves as a potent motivator for customers to opt for environmentally friendly products. Consequently, green purchase intention has emerged as a crucial research area within the realm of green consumption behavior, particularly in developed countries (Fisher et al., 2012; Paco et al., 2019).

It is worth noting that while Western countries have developed substantial knowledge and environmental awareness over several decades, Asian countries, particularly developing nations like Vietnam, have only recently begun to grasp environmental issues (Dat and Truong, 2023). This has resulted in a dearth of research on customer behavior regarding green products in Asian countries, with Vietnam being no exception. Most studies on green purchase intention, aimed at investigating customer green consumption behavior, have predominantly been conducted in Western and developed markets (Massimo and Suchita, 2022). Consequently, it becomes imperative for businesses and marketers to disseminate more information about environmental protection and encourage Vietnamese consumers to embrace green products over conventional ones. Moreover, disparities in cultural and geographical factors have led to gaps in the application of green purchase intention across different markets, resulting in contradictions between previous research findings and actual customer behavior in Asian markets, including Vietnam (Dat and Truong, 2020; Han et al., 2020). To address these issues and explore strategies for motivating Vietnamese consumers to purchase and use green products, this thesis endeavors to examine the factors influencing green purchase intention among customers in Vietnam.

This study aims to explore the factors influencing green purchase intention among Vietnamese customers to promote environmentally conscious consumption in Vietnam. To fulfill the research aim, this research sets the following objectives: Identify the factors that impact green purchase intention among consumers in Vietnam, refine the proposed factors related to green purchase intention in the impact of demographic factors context of Vietnamese customers, and also identify the on green purchase's intention of Vietnamese customers.

# Conceptual framework and hypothesis development

# Green consumption and intention

Green consumption is synonymous with being environmentally friendly, responsible, and eco-conscious (Khare, 2015). Green products are those that do not have adverse effects on the environment or human health (Paval and Payal, 2017). It is suggested that green products are predominantly non-toxic items made and packaged with recyclable materials (Modi and Patel, 2016). In essence, eco-friendly products, which cause minimal harm to the environment, are categorized as green products. Moreover, "green products" and "environmental products" are commonly used business terms denoting products designed to protect the environment by reducing energy consumption and minimizing waste (Yadav and Pathak, 2016; Mostafa, 2017).

Green consumption signifies a shift in consumption patterns aimed at minimizing adverse environmental impacts. It was described as the purchase and use of goods meeting customer requirements while being environmentally friendly (Rashid et al., 2009). Green purchasing involves incorporating environmental factors into purchasing decisions, beyond just considering quality and price. Green consumption is a global priority for sustainable development. Consumers are increasingly aware of the environmental consequences of their consumption, including water pollution and resource depletion. Consequently, consumers are inclined to prioritize sustainable products. Encouraging green consumption is a goal for changing consumption habits towards sustainability in many countries (Yadav and Pathak, 2017). However, the consumption patterns of most nations are not yet sustainable, posing a significant challenge for businesses and governments to promote greener habits. Understanding the motivations driving customers' purchase intentions is essential to encourage the adoption of green products (Rashid et al., 2019).

Behavioral intention is a fundamental concept in understanding human behavior. It reflects an individual's desire and resolve to perform a specific action (Dima, 2013). Intention involves conscious planning, motivation, and serves as a predictor of actual behavior. Purchase intention, a subset of behavioral intention, is the precursor to purchasing products or services in the future (Hale et al., 2003; Nath, 2013; Khare, 2015; Dagher et al., 2015).

The concept of "Green Purchase Intention (GPI)" encompasses various definitions. It was defined as a consumer behavior where individuals are willing to pay for and prefer green products over regular ones (Ramayah and Lee, 2010). It also involved consumers' purchasing decisions based on their demands and environmental concerns (Luchs et al., 2015). Some scholars described it as an orientation towards environmentally friendly purchasing, often referred to as "going green" (Konuk and Rahman, 2015). A typical example was provided where individuals use services from green hotels, engage in positive word-of-mouth communication, and are willing to pay more for green services,

exemplifying GPI. GPI was also identified as consumers' environmentally responsible purchase plans within a specific timeframe (Khare, 2015).

Research on green purchase intention, especially for eco-friendly products, has been ongoing since the 1970s, emphasizing the role of variables like knowledge, awareness, beliefs, and social demographics in shaping consumer behavior (Baker and Ozaki, 2008). Five key variables consistently found to influence green purchase intention include.

- Environmental attitude (Pavan and Payal, 2010; Han et al., 2020)
- Environmental knowledge (Baker and Ozaki, 2008; Wang et al., 2014)
- Environmental concern (Dagher et al., 2015; Yadaw and Pathak, 2016)
- Social influence (Khare, 2015; Dagher et al., 2015)
- Eco-label (Paco and Raposo, 2019; Dima, 2013)

Despite extensive research, there is a dearth of studies on green purchasing behavior, especially in Asian markets compared to Western markets (Rashid et al., 2019; Massimo and Suchita, 2022). Green purchase intention has gained prominence in developing countries like China, Indonesia, and Malaysia (Pavan and Payal, 2010; Han et al., 2020). Therefore, it is crucial to investigate green purchase behavior, particularly green purchase intention, in Asian developing countries like Vietnam. In this context, five common variables from prior research serve as hypotheses to explore the factors influencing green purchase intention in Vietnam.

# Theory of planned behavior (TPB)

The Theory of Planned Behavior (TPB) is a widely employed conceptual model in studies focusing on behavior intentions. This model builds upon the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen in 1975. Both TRA and TPB have proven to be reliable frameworks for understanding and predicting human behavior, making them valuable choices for research in the realm of green purchasing (Hale et al., 2003; Dima, 2013).

TPB incorporates attitudes, subjective norms, perceived behavioral control, and knowledge, is often used to understand intention and behavior (Modi and Patel, 2016; Mostafa, 2017). TPB posits that intention plays a pivotal role in encouraging individuals to execute behavior, and a stronger intention is associated with a higher likelihood of taking action. Similarly, Yadav and Pathak (2016) demonstrate that consumer attitude and perceived behavioral control significantly influences actual purchase behavior based on a model that combines TPB and the Theory of Reasoned Action (TRA) by Fishbein (Han et al., 2020). TRA, the precursor to TPB, revolves around the concept of intention, which encompasses an individual's motivation, awareness, and decisions related to a specific behavior (Mostafa, 2017). TRA posits that a significant portion of human behaviors can be predicted based on intention because behavior is believed to depend on intention. It suggests that attitudes toward behaviors and the subjective norms associated with those behaviors are instrumental in determining behavioral intentions (Ramayah and Lee, 2010). TRA has been successfully applied and refined in various previous studies to explore and explain human decision-making processes (Yadav and Pathak, 2016) (Fig. 1). Numerous studies have demonstrated its effectiveness in predicting human decisions and behaviors across various situations. Consequently, TRA has been widely utilized in diverse research to gain insights into the psychological mechanisms guiding individual behavioral decisions. It has also played a pivotal role in investigations related to green purchase behavior, particularly in studies examining customer purchase intentions (Azian and Suki, 2013; Dima, 2013).



Figure 1. The TPB model components. Source: Han et al. (2020)

# Hypothesis development

In the next section, the study proposes a model and hypotheses based on literature review of studies on green consumer behavior in the world.

# Environmental attitude

General attitudes encompass individuals' beliefs that translate into actions related to their concerns (Yadav and Pathak, 2016). Specifically, when it comes to environmental attitudes, these beliefs often manifest as a willingness to pay more for environmentally friendly products (Dima, 2013; Paco and Raposo, 2019). Environmental attitude was defied as how people perceive their role in environmental protection, reflecting their awareness of environmental concerns (Ramayah and Lee, 2010). A slightly different perspective was offered in viewing environmental attitudes as individuals' conjectures about what has positive or negative impacts on the environment (Han et al., 2020). It was well-documented that attitudes are a significant factor influencing behavior and behavioral intentions (Azian and Suki, 2013). Numerous studies explored the relationship between environmental behavior and environmental attitudes (Meing et al., 2012; Mostafa, 2017). In essence, attitudes encompass beliefs and actions that can translate into behavioral intentions. Thus, intentions are influenced by attitudes, suggesting that more positive attitudes lead to greater intentions to engage in a particular behavior (Conraud and Rivas, 2009). Additionally, it was highlighted that attitudes serve as predictors of purchase intention. However, it is worth noting that environmental behavior is often considered independent of environmental attitudes (Gan et al., 2018).

*H1: Environmental attitude has a positive impact on green purchase intention. Environmental knowledge* 

Consumer knowledge about the environment can be acquired through education or information about green products (D'Souza et al., 2016). Environmental knowledge encompasses all information related to the environment, including ecology and

environmental themes (Ling, 2013). Furthermore, it was elaborated that environmental knowledge includes an understanding of environmental phenomena, the causes of environmental problems, and the role of humans in environmental protection (Conraud and Rivas, 2009).

Numerous studies have explored the relationship between green purchase intention and environmental knowledge (Nath and Rivas, 2013). Existing literature consistently suggested that environmental knowledge is a crucial factor with a positive influence on consumers' green purchase intention (Dima, 2013; Paco and Raposo, 2019). When consumers possess environmental knowledge, the likelihood of their green purchase intention increases, as knowledge enhances their awareness of environmental issues. Similarly, environmental knowledge heightens consumers' awareness of environmental concerns, leading to an increase in green purchase intention. It was also reported that environmental knowledge directly impacts the consumer purchase decision-making process, including their green purchase intention (Han et al., 2011). However, some studies have pointed out that environmental knowledge does not necessarily influence green purchase intention (Kumar et al., 2017). Based on these findings, the following hypothesis is proposed:

H2: Environmental knowledge has a positive impact on green purchase intention.

# Environmental concern

Environmental concern has been reported to play a significant role in consumers' purchase decisions (Alibeli, 2009; Konik and Ralman, 2015; Dagher, 2015). It was claimed that most environmentally concerned customers tend to have a green purchase intention; that the higher the level of environmental concern among customers, the more likely they are to intend to purchase green products (Wang et al., 2014). Moreover, environmentally concerned customers were more likely to assess the environmental impact of their purchases (Chen and Chang, 2012). This suggests that individuals with significant environmental concerns may be inclined to buy green products, demonstrating green purchase intention.

H3: Environmental concern has a positive influence on green purchase intention.

# Social influence

Social influence, refers to how individuals' awareness, emotions, and beliefs can be influenced by other people (Fisher et al., 2012; Khare, 2015). It can also be defined as the changes in individuals' opinions, emotions, and awareness resulting from the influence of other individuals or group (Paco and Raposo, 2019). Essentially, social influence means that individuals are susceptible to the standards and expectations of others and groups (Conraund, 2009; Han et al., 2011; Gan et al., 2018). Social influence is the primary factor affecting the purchase intentions of young people in Asia (Lee, 2009; Ling, 2013). Furthermore, social influence was found to be the most potent factor influencing consumers' purchase intentions for green products in the UK and Europe (Moisander, 2017; Jobber, 2020). In the context of this study, social influence, such as online communication, may indeed have effects on green purchase intention. Based on these observations and literature, the following hypothesis is proposed:

H4: Social influence has a positive impact on green purchase intention.

# Trust

Belief was viewed as a state of vulnerability or perceived risk that results from personal uncertainty regarding the motives, intentions, and potential actions of those who influence the consumer (Baker and Ozaki, 2008; Ramayah and Lee, 2010). In many cases, trust served as a general mechanism to reduce the perceived risk of taking actions by increasing the expectation of a positive outcome and certainty in the perception of behavioral intentions (Mei et al., 2012; Nath, 2013). Trust is one of the most effective ways to reduce consumer uncertainty. Therefore, the importance of trust in green product quality as well as suppliers and their certifications has a great influence on consumer attitudes and behavioral intentions (D'Souza et al., 2016).

H5: Trust has a positive relationship with intention to buy green products.

# Eco-label

Eco-label referred to the provision of product information related to environmental issues to customers (Wang et al., 2014; Moisander, 2017; Han et al., 2020). It served as a way for brands to communicate whether their products meet certain environmentally friendly criteria (Luchs, 2015; Maichum et al., 2016). A substantial body of literature highlighted the crucial role of eco-labeling in promoting green purchase intention (Konuk and Rahman, 2015; Yadav and Pathak, 2016). Eco-labels have been shown to positively impact consumers' awareness of green products and their intention to make environmentally conscious purchases. This is particularly important because consumers often find it challenging to discern the environmental characteristics of green products without the guidance of eco-labels (Chen and Chang, 2012). Eco-labels are essentially statements from brands about the environmentally friendly attributes of their products, aiming to reduce the negative impacts of production and consumption on the Massachusetts environment. Department of Environmental Protection even recommended the use of eco-labels to help customers avoid confusion when purchasing green products, as customers may struggle to identify such products without clear labeling. Moreover, customers were generally more willing to purchase and pay a premium for products that bear eco-labels (Paco and Raposo, 2019; Han et al., 2020).

H6: Eco-label has a positive impact on green purchase intention.

# Green promotion

Green promotions are activities that promote products and services to target markets including paid advertising, public relations, promotional sales, direct marketing and website promotions (Dagher et al., 2015; Yadaw and Pathak, 2017). Advertising is a very important part of the green marketing strategy, because advertising helps consumers recognize the contributions of businesses to environmental protection. Promotional strategies that businesses can use include advertisements about enjoying a daily lifestyle using green products, thereby demonstrating that the business is environmentally responsible (Nath, 2013; Khare, 2015; Dagher et al., 2015).

*H7: Green promotion has a positive impact on green purchase intention. Figure 2* shows proposed analysis model.



Figure 2. Proposed analytical model and hypotheses. Source: Research design (2023)

# **Data collection**

This study was reviewed and approved by the Scientific and Training Committee of the National Economics University, Vietnam which has the responsibility of academic ethics approval (Ref number: CBQT.05.2023). The data collection process for the study is divided into two phases. In phase 1, we conducted a focus group discussion (FGD) to assess the green consumption landscape, identify key factors that can influence green product consumption intentions, and compare these factors with the theoretical framework. Also in phase 1, a pilot study was conducted with 20 customers to test and validate questions, learn approach strategies and collect information, and other input information to complete the questionnaire. 15 customers participating in the test interview were selected at AONE shopping mall (the leading large multi-industry supermarket in Hanoi and attracting customers of all ages). Customers were randomly selected at food, clothing, household goods, and children's stores. In addition, 5 other customers were selected for interview and questionnaire testing from showrooms selling motorbikes and cars in Hanoi.

Phase 2 includes formal data collection, data entry and cleaning. The main investigation was conducted from July to August 2023 in Hanoi.

The study used the following formula to estimate the sample size (Hair et al., 2019):

$$n = Z^2 \times \frac{p \times (1-p)}{e^2}$$
(Eq.1)

where: *n*: sample size, z = z-score, e = margin of error, p = standard of deviation.

Supposed with a 90% confidence level, 50% standard of deviation and a 3.5% margin of error (for 90% confidence, we use the z-score as 1.65). From there, the sample to ensure reliability is 550. In fact, the study collected 580 questionnaires, including two forms including face-to-face interviews and online forms. With a group of direct interviews, survey locations included shops, supermarkets, traditional markets, shopping malls and sales showrooms (cars, motorbikes). These locations were located in 8 metropolitan

districts (Hoan Kiem, Ba Dinh, Hai Ba Trung, Dong Da, Hoang Mai, Tay Ho, Long Bien and Nam Tu Liem.) In each research district, at least 40 ballots were collected using the convenience sampling method. We approached customers at interview points after the purchasing process, and avoided disturbing them while shopping. Before answering the questions, the interviewee was specifically introduced to the objectives of the interview and the purpose of the research. At the same time, they were asked if they agreed and were willing to participate in the interview. All responded and were willing to participate and ticked into the options of willing to participate in the questionnaires. There were 368 votes collected in the form of face to face for 8 metropolitan districts of Hanoi.

For the online survey, the interview invitation and Google Forms questionnaire link were uploaded to the Facebook pages of the Times City, Hapulico and Ocean Park resident groups (03 large residential communities with diverse social groups in Hanoi). The questionnaire included questions about people's living locations to exclude residents outside Hanoi. We collected 212 votes from Hanoi people online.

The questionnaire includes 3 main parts: (i) socio-economic information of customers; (ii) customer awareness, attitudes and concerns about green products; (iii) impact factors such as trust, social influence, eco-labels, green marketing. In each quantitative question, respondents will score on a Likert scale from 1 to 5 corresponding to the choices from strongly disagree (1), neutral (3) and strongly agree (5). After review, there were 15 questionnaires lacking information and incomplete, so they were excluded from final analysis.

Table 1 presents the questions in the survey to measure the factors in analytical model.

SPSS 23.0 software was used for quantitative analysis in this research. SPSS showed the statistical description of variables, synthesize data on the frequency, and their effect on the Green consumer behavior of respondents. Besides, the Cronbach Alpha technique was employed to test the reliability of the factors. Moreover, exploratory factor analysis (EFA) technique was also implemented to eliminated unsuitable constructs/variables. Multiple regression then was carried out to examine the linear model between dependent and independent variables Aiming to test the difference in mean values between the demographic variables, the study additionally used One-way ANOVA test.

# Results

# Description of social demographic factors

With 565 participants, the number of women participating in the survey was 305 and 260 men. The number of survey participants is mainly between 18-35 years old with 52.92% of surveyors in the age group from 18 to 25 and 20.88% of surveyors in the age group of 26-35 years old. The remaining 18.94% of people are under the age of 18 and 7.26% are in the age group of over 35. The majority of people surveyed had university/college education with 38.94% (220 people). In addition, 26.02% of people have just reached the high school level of education and 24.07% of those surveyed have higher level of education. The remaining 10.97% of people have other level of education. Income groups are relatively equal in the survey sample. Of which the lowest income group (under 10 million VND/month) accounts for 24.96%, the middle-income group (20-30 million VND/month) accounts for 32.92%. The high-income group (over 30 million VND/month) accounts for 22.12% (*Table 2*).

Constructs/questionnaire itemsSourcesEnvironmental attitude (EA)EA1It is important to promote green living in VietnamEA2It is essential to increase environmental awareness among VietnameseEA3It is wise for Vietnamese to spend the amount of money on environmental protectionEA4Environmental protection is the responsibility of individualsEnvironmental knowledge (EK)Environmental knowledge (EK)	ıak al. al.
EA1It is important to promote green living in VietnamYadav and PathEA2It is essential to increase environmental awareness among Vietnamese(2016), Gan etEA3It is wise for Vietnamese to spend the amount of money on environmental protection(2018), Han etEA4Environmental protection is the responsibility of individuals(2020)	ıak al. al.
EA1It is important to pronote green fiving in VietnamYadav and PathEA2It is essential to increase environmental awareness among Vietnamese(2016), Gan etEA3It is wise for Vietnamese to spend the amount of money on environmental protection(2018), Han etEA4Environmental protection is the responsibility of individuals(2020)Environmental knowledge (EK)Environmental knowledge (EK)(2018)	iak al. al.
EA2       It is essential to increase environmental awareness among vietnamese       (2016), Gan et         EA3       It is wise for Vietnamese to spend the amount of money on environmental protection       (2018), Han et         EA4       Environmental protection is the responsibility of individuals       (2020)         Environmental knowledge (EK)       Environmental knowledge (EK)       (2018), Han et	al. al.
EA3     It is wise for Vietnamese to spend the amount of money on environmental protection     (2010), Hall et (2020)       EA4     Environmental protection is the responsibility of individuals     (2020)	ui.
EA4       Environmental protection is the responsibility of individuals         Environmental knowledge (EK)	
Environmental knowledge (EK)	
EK1I understand about the greenhouse effectLing (2013),	
EK2I understand about the pollution from pesticidesD'Souza et al (2016) Paco au	nd
EK3     I understand about the destruction of the forest     (2010), 1 aco all       Raposo (2019)     Raposo (2019)	)
EK4 I understand about the water pollution	/
Environmental Concern (EC)	
EC1 I am very concerned about environmental issues of Vietnam Alibeli (2009)	),
EC2 I am willing to reduce my consumption to contribute to protecting the environment (2015), Daghe	nan er
EC3 I am willing to switch to eco-friendly brands to help protect the environment	
Social Influence (SI)	
SI1 I learn so much about green products from my friends	
SI2 I learn so much about environmental issues from my friends	12),
SI3 I often buy green products with my friends I obber (2015)	, )
SI4 Most people who are important to me think I should purchase green products rather than normal products	)
Trust (BL)	
TR1     I think companies in the green product sector are aware of their responsibility     Baker and Oza	ki
TR2 I trust green product sellers with quality certification (2008), Ramay	ah
TR3 I trust the quality of green products with packaging or logos	))
TR4 I trust organizations that certify green products	
Eco-label (EC)	
EC1 I want to check the eco-label and certifications on green products before purchasing Wang et al. (20)	14),
EC2 I want to understand more about the inputs, processes, and impacts of the product before buying Moisander (201 Han et al. (202	7), 0)
EC3 I want to know the key ingredients of green products before purchasing	
Green Promotion (GP)	
GP1 Green marketing programs should take place regularly and on many media Dagher et al. (20	15)
GP2Green marketing programs are important to provide information to customers about green productsDagnet et al. (20 Yadaw and Path (2017)	nak
GP3 Green marketing programs should target urban customers	
Green purchase intention (GI) Ling (2013).	
GI1 I want to buy/use green products D'Souza et al	•
GI2 I am considering purchasing green products before making a decision (2016), Paco and (2	nd
GI3 I will introduce and encourage others to buy green products Han et al. (202	(), 0)

#### Table 1. Variables in analytical model

Source: Research design (2023)

Characteristics (sample n = 565)		Number (people)	Percentage
Candan	Male	260	53.98%
Gender	Female	305	46.02%
	<18	107	18.94%
A ===	18-25	299	52.92%
Age	26-35	118	20.88%
	>35	41	7.26%
	High school	147	26.02%
Education level	College/university	220	38.94%
	Post college/university	136	24.07%
	Other	62	10.97%
	Students	170	30.09%
Drafasian	Office staff	260	46.02%
Profession	Freelancer	62	10.97%
	Others	73	12.92%
	<10 million VND	141	24.96%
Tu a sur s	From 10 to 20 million VND	113	20.00%
Income	Over 20 to 30 million VND	186	32.92%
	>30 million VND		22.12%

 Table 2. Characteristics of the survey sample

VND: Vietnamese dong. Source: Research results (2023)

# Variables reliability analysis

To evaluate the reliability of the scale, Cronbach's Alpha test was used in the study. This is a test reflecting the level of close correlation between variables of the same factor. It indicates which observed variables of a factor contribute to the measurement of the factor concept. A good Cronbach's Alpha results show that the observed variables measuring this factor are appropriate and demonstrate properties of original factor.

The analysis results showed that all measurement scales had reliable values for their respective factor groups (Cronbach's Alpha coefficients > 0.6). This demonstrates that the research concepts built from the observed variables achieved internal consistency and ensured good measurement properties (*Table 3*). Thus, all measurement scales were used EFA.

# Exploratory factor analysis

EFA was conducted on 25 observed variables belonging to 7 independent factors. We conducted separate EFA analyses for independent and dependent variables. The Kaiser-Meyer-Olkin (KMO) was 0.779 (>0.5), and the Bartlett's had a significant value of Sig = 0.00, indicating the appropriate of EFA model. The analysis revealed that at Eigenvalues > = 1 and 7 factors were extracted from the 23 observed variables (after taking out 2 bad variables), accounting for an extracted variance of 70.65% (*Table 4*).

NEXT, EFA analysis of the dependent variable (GI) showed that the coefficient KMO = 0.711 > 0.5, Bartlett's test with Sig. = 0.000 < 0.05 (5% significance level), so the observed variables are correlated with each other in the whole. The Eigenvalue of the

first factor is 3.235 > 1, showing the convergence of the analysis stopping at the first factor, the total variance extracted (cumulative %) is 69.15 > 50% of the loading factor. All factors are greater than 0.5. Thus, the results of the EFA analysis of the dependent variable Showed that there was one factor extracted from the 3 observed variables of the scale for the intention of green purchasing, and this factor explains up to 69.15% of the variation in the data set (*Table 5*).

# **Regression analysis**

To test the hypotheses and identify factors affecting the green product purchasing intention in Hanoi, we applied a multiple regression analysis model. *Table 6* showed results of correlation variables analysis.

	Min	Max	Average	Cronbach's alpha
EA1	2	5	4.06	
EA2	2	5	3.83	0.992
EA3	1	5	4.20	0.885
EA4	2	5	3.99	
EK1	2	5	4.11	
EK2	1	5	4.04	0.001
EK3	2	5	4.13	0.901
EK4	2	5	3.98	
EC1	2	5	4.02	
EC2	2	5	3.87	0.877
EC3	1	5	3.92	
SI1	2	5	4.07	
SI2	2	5	4.19	0.010
SI3	2	5	4.02	0.910
SI4	1	5	3.99	
TR1	2	5	4.11	
TR2	2	5	3.82	0.972
TR3	2	5	3.67	0.875
TR4	2	5	3.95	
EL1	1	5	4.23	
EL2	1	5	4.11	0.896
EL3	2	5	4.03	
GP1	2	5	4.13	
GP2	1	5	3.99	0.882
GP3	2	5	4.02	
GI1	2	5	4.03	
GI2	2	5	4.11	0.891
GI3	2	5	3.96	

Table 3. Constructs' scores from survey

EA (Environmental attitude), EK (Environmental knowledge), EC (Environmental concern), SI (Social influence), Trust (TR). Eco label (EL), Green promotion. Source: Research results (2023)

	1	2	3	4	5	6	
EA2	0.873						
EA1	0.856						
EA3	0.843						
EA4	0.801						
EK2		0.833					
EK3		0.799					
EK1		0.786					
EC3			0.902				
EC1			0.891				
EC2			0.866				
SI3				0.892			
SI2				0.876			
SI1				0.834			
SI4				0.812			
TR2					0.871		
TR3					0.797		
TR4					0.772		
EL2						0.912	
EL1						0.898	
EL3						0.882	
GP1							0.889
GP2							0.882
GP3							0.853
КМО	0.779						
Eigenvalue	1.124						
Sig Bartlett	0.000						
Total variance extracted	70.65						

Table 4. Results of EFA for independent variables

EA (Environmental attitude), EK (Environmental knowledge), EC (Environmental concern), SI (Social influence), Trust (TR). Eco label (EL), Green promotion. Source: Research results (2023)

Kaiser-Meyer-Olkin measu	0.711	
Bartlett's test of sphericity	Approx. chi-square	321.642
	df	3
	Sig.	0.000
Eigenvalue	3.125	
Total variance extracted	69.15	

Table 5. KMO and Bartlett's test

Source: Research results (2023)

		EA	EK	EC	SI	EL	GI
EA	Pearson correlation	1	.351**	.325**	.294**	.3504**	.522**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	Ν	565	565	565	565	565	565
	Pearson correlation	.351**	1	.237**	.250**	.364**	.549**
EK	Sig. (2-tailed)	.000	0.00	.000	.000	.000	.000
	Ν	565	565	565	565	565	565
EC	Pearson correlation	.325**	.237**	1	.140**	.184**	.520**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	Ν	565	565	565	565	565	565
SI	Pearson correlation	.294**	.250**	.140**	1	.211**	.352**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	Ν	565	565	565	565	565	565
EL	Pearson correlation	.350**	.364**	.184**	.211**	1	.383**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	Ν	565	565	565	565	565	565

Table 6. Correlation matrix of variables

EA (Environmental attitude), EK (Environmental knowledge), EC (Environmental concern), SI (Social influence), Belief (BL). Eco label (EL), Green promotion. Source: Research results (2023) \*\*Correlation is significant at the 1% level (2-tailed)

The results showed that all the independent variables have a linear relationship with the dependent variable. In which, the variable EA (Environmental attitude) has the highest correlation coefficient with the dependent variable (r = 0.549) and the variable SI (Social influence) has the lowest correlation coefficient with the dependent variable (r = 0.352). These pairs of variables have a linear correlation at the 99% confidence level (corresponding to a significance level of 1% = 0.01). With the above results, all the independent variables are eligible to be included in the regression analysis.

Estimation results showed that adjusted  $R^2$  is equal to 0.712, which means 71.2% of the variation of the dependent variable is explained by the variation of the 7 independent variables included in the model. The F test has sig = 0.000 < 0.05, which means the linear regression model is suitable for the data set.

*Table 7* indicated that independent variables have a significant relationship with the intention to buy green products in Hanoi namely environmental attitude, trust, social influence, environmental concern, ecolabel and green promotion. The environmental knowledge factor does not have a meaningful impact on green product purchasing behavior.

Specifically, the order of factors affecting the intention to buy green products is arranged from high to low as follows: Environmental attitude ( $\beta = -0.197$ ) has the strongest effect and has a positive relationship (sign +). Social influence ( $\beta = 0.184$ ) has the second strongest impact and has a positive relationship (sign +). Trust ( $\beta = 0.175$ ) has the third strongest impact and has a positive relationship (sign +). Environmental concern ( $\beta = 0.169$ ) has the fourth strongest impact and has a positive relationship (sign +). Environmental concern ( $\beta = 0.163$ ) has the fifth strongest impact and has a positive relationship (sign +). Green promotion ( $\beta = 0.163$ ) has the fifth strongest impact and has a positive relationship (sign +). The last factor, Eco label ( $\beta = 0.151$ ), has the lowest impact and has a positive relationship (sign +).

The standardized regression equation is:

$$GI = 1.134 + 0.197 \times EA + 0.184 \times SI + 0.175 \times TR + 0.169 \times EC + 0.163 \times GP + 0.151 \times EL$$

In estimated model, the Dubin–Watson value was 1.933, in the range of 1.5-2.5, so autocorrelation did not occur. With VIF coefficient < 2, therefore, there was no multicollinearity. Normalized residual frequency graph showed a normal distribution curve of residual distribution. The Normal P–P Plot residual plot also showed the points of the scattered residuals centered quite closely the diagonal. Therefore, the assumption of the normal distribution of the residuals was not violated (*Figs. 3* and 4).

Fostors	Unstandardized coefficients		Standardized coefficients	Sia	Multicollinearity	
ractors	В	Standard error	В	51g.	Tolerances	VIF
Constant	1.134	.213	-	.004**		
EA – Environmental attitude	.203	.028	.197	.011**	.813	1.136
EK- Environmental knowledge	213	.425	202	.312	.473	1.505
EC - Environmental concern	.174	.046	.169	.018**	.894	1.752
SI – Social influence	.196	.023	.184	.00***	.845	1.321
TR- Trust	.178	.041	.175	.008***	.680	1.324
EL- Eco label	.162	.031	.151	.036**	.946	1.547
GP – Green promotion	.171	.035	.163	.025**	.768	1.411
Durbin-Watson coefficient: 1.933						
		Test value l	F: 48.453			

Table 7. Regression model analysis results

\*\*\*, \*\* correspond for the significant level of 1% and 5%. Source: Research results (2023)



Figure 3. Normalized residual frequency graph. Source: Research results (2023)



Figure 4. Normal P-P plot of regression standardized residual graph. Source: Research results (2023)

The normalized residuals were distributed centered around the zero-coordinate line and not scattered too far, so the assumption of linear relationship was not violated (*Fig. 5*).



*Figure 5.* Normal P-P plot of regression standardized residual graph. Source: Research results (2023)

#### Impact of demographic factors to green consumption intention

The study used Anova test to analyze the difference between the average values of GI scores according to demographic factors of respondents (*Table 8*).

Regarding gender, the results showed that men's GI score was 3.121 while women's was 3.708 with sig. is 0.032 (<0.05), thus there was a significant difference between men and women in their intention to consume green products. With age variable, Sig. equal to 0.021 showing the significant difference between age groups in the intention to consume green products. Using Tamhane's test T2 pairwise variance indicated that there was a significant difference between the age group 18–25 compared to the two older age groups, the 26–35-year-old group (Sig. = 0.00 < 0.05) and the over 35-year-old group. For educational level variable, Sig. = 0.008 < 0.05 implied that there were significant differences in green intention between the "Education level - High school" group compared to the other groups (Sig. = 0.00 < 0.05). For the income variable, ANOVA analysis showed that Sig. = 0.065 > 0.05 which means there was no difference in green consumption between income levels.

Factors	Groups	Mean of GI scores	Std. deviation	Sig.	
Gender	Male	3.121	.523	0.022	
	Female	3.708	.461	0.032	
	<18	3.203	.306		
4	18-25	3.451	.324	0.021	
Age	26-35	3.813	.463	0.021	
	>35	3.802	.401		
	High school	3.008	.324	0.008	
Education laval	College/university	3.615	.470		
Education level	Post college/university	3.743	.397		
	Other	3.338	.426		
Income	<10 million VND	3.457	.371		
	From 10 to 20 million VND	3.573	.331	0.065	
	From 20 to 30 million VND	3.584	.392	0.065	
	>30 million VND	3.602	.354		

Table 8. Anova results of mean difference by gender

Source: Research results (2023)

#### Discussion

This study evaluated the factors influencing green product consumption behavior of people in Hanoi, Vietnam. We identified 6 factors having significant relationship with the intention to buy green products including Environmental attitude, Social influence Trust, Environmental concern, Green promotion and Eco- label.

The factor that has the strongest influence on green consumption behavior is consumer attitude. Vietnamese consumers' environmental attitudes, including attitudes toward a green lifestyle, environmental awareness, and environmental protection, can influence Vietnamese consumers' green purchasing intentions. When Vietnamese consumers value promoting an environmentally friendly lifestyle, raising environmental awareness, and investing in environmental protection, they will be more willing to buy environmentally friendly products. The above results are consistent with the TRA theory and TPB theory that have been researched and proven (Hale et al., 2003; Han et al., 2020). The finding that environmental attitude is a good predictor of green purchase intention is consistent with the results of some studies (Pavan and Payal, 2010; Khare, 2015; Massimo and Suchita; 2022). However, this finding is not consistent with the results of Chen and Chang (2012) on green purchase intentions of Chinese or with the results of Rashid et al. (2019) on green purchase intentions of Malaysians.

The second strong factor affecting the intention to consume green products is social influence. According to TRA theory and TPB theory, social influence is an individual's perception of social pressure to perform or not perform a behavior. In this case, the encouragement, urging, and wishes of relatives and other important people have a positive impact on each individual's green consumption behavior in Hanoi. The results are consistent with TRA and TPB (Dima, 2013) as well as few other experimental studies (Conraund, 2009; Han et al., 2011; Azian and Suki, 2013; Gan et al., 2018).

Trust is the third important factor in the impact model. Research also shows that if a product is safe, good for health and the community, consumers trust the quality of the product, manufacturers, consumer protection organizations and government agencies that control production will consume more. In other words, green consumer behavior will increase if they trust the product. The above results are consistent with previous studies (Baker and Ozaki, 2008; Ramayah and Lee, 2010 Mei et al., 2012; Nath, 2013).

Environmental concern was found to have a positive and statistically significant relationship with green purchase intention of Vietnamese consumers. The more Vietnamese people care about environmental issues in Vietnam, the more they are willing to limit consumption to protect the environment and the more willing they are to switch brands to protect the environment, the more Vietnamese customers intend to buy environmentally friendly products. The positive and statistically significant influence of environmental awareness on green purchase intention is consistent with findings in some studies (Alibeli, 2009; Konik and Ralman, 2015; Dagher, 2015).

Environmentally friendly advertising is also one of the important factors affecting consumers' environmentally friendly consumption behavior. This result is consistent with some findings (Dagher et al., 2015; Yadaw and Pathak, 2017). It shows that customers care about environmental issues through the company's communication and marketing activities. Marketing programs must choose appropriate communication channels at convenient locations such as supermarkets, trade fairs so that customers can more easily be informed about environmentally friendly products. The more attractive and practical advertising measures are, the more they stimulate purchasing behavior towards environmentally friendly products (Khare, 2015; Dagher et al., 2015).

The eco-label factor is the least important factor determining Vietnamese consumers' intention to buy environmentally friendly products. This is consistent with the results in previous studies, which argued that eco label can definitely influence consumers' purchasing decisions (Wang et al., 2014; Moisander, 2017; Han et al., 2020). However, this result contradicts the observation that consumers are also willing to pay and buy more for environmentally friendly products with eco-labels (Paco and Raposo, 2019).

This study also analyzed the influence of demographic variables on the expected green shopping intention of customers in Hanoi. The results showed that gender has an influence on green shopping intentions. This is consistent with previous research results (Lee, 2009; Ling, 2013). Research showed gender differences in this behavior. Specifically, women are more likely to shop "green". Women and men have different

gender characteristics and often have different shopping behaviors. This finding was confirmed in this experimental study with a sample of customers in Hanoi. Similarly, age and education level had an impact on the difference in green consumption intention. When buyers have more years of education, their general and social awareness of the environment often improves, and can lead to a change in their green behavioral intentions (Dima, 2013; Paco and Raposo, 2019). Age is also a factor that affects consumers' green purchasing intentions. Different ages have different psychological characteristics, and different experiences and knowledge about the environment. And these factors can create differences in consumer behavior. This result is similar to some previous studies (Alibeli, 2009; Konik and Ralman, 2015). One difference of the study is that it did not find a relationship between income and green purchasing behavior. Previous studies often demonstrated and found that relationship (Khare, 2015; Fisher et al., 2012). It can be explained that in Vietnam in general and Hanoi in particular, rapid economic development in recent years has improved people's income significantly; however green goods are a new and growing trend. Consumption has not penetrated into the behavior of different income groups. Over time, as income continues to improve, this difference will likely be demonstrated as leading to differences in individual and societal green consumption behavior, as is the case in Malaysia and China (Ramayah and Lee, 2010; Wang et al., 2014).

# **Conclusions and recommendations**

In conclusion, this research has provided valuable insights into the factors influencing consumers' intent to purchase green products in Vietnam. The study successfully identified and analyzed key variables which play a crucial role in shaping consumers' green purchase intentions. The theoretical framework, based on the TPB, was validated through regression analysis, confirming the positive impact of these variables on green purchase intention. Environmental concern emerged as the most influential factor, indicating that consumers who are more environmentally conscious are more likely to express an intent to purchase green products. This finding underscores the importance of raising awareness and education on environmental issues to promote sustainable consumption patterns.

From the results, we proposed some implications for green consumption enhancement in Vietnam:

First, environmental education and green promotion: government should implement educational programs and campaigns that raise environmental awareness among the public. These initiatives can inform consumers about the importance of sustainable consumption and its positive impact on the environment. Educational campaigns should be tailored to different age groups and demographics to maximize their effectiveness. Businesses should develop marketing strategies tailored to different consumer segments, considering their specific attitudes, knowledge, and concerns related to green products. Personalized and targeted approaches can be more effective in encouraging green purchases.

Second, promotion of eco-friendly products: management agencies should encourage businesses to prioritize the development and marketing of eco-friendly products. This can be achieved through incentives, subsidies, or regulatory measures that make it financially beneficial for businesses to produce and market green products. Promoting eco-friendly products will increase consumer choices and make it easier for them to make environmentally conscious purchasing decisions. More overs, policymakers and businesses should work together to establish clear standards for eco-labeling practices, ensuring that consumers can easily identify and trust products that are environmentally friendly. This can play a vital role in guiding consumers toward green purchase decisions.

Third, support for sustainable practices: government bodies and non-governmental organizations should provide support to businesses and individuals adopting sustainable practices. This support may include funding for green initiatives, access to resources for eco-friendly production, and training programs to enhance environmental responsibility.

Fourth, collaboration and partnerships: we should foster collaborations between different stakeholders, including businesses, government agencies, environmental organizations, and academia. Such partnerships can lead to the development of comprehensive strategies for promoting green consumption and addressing environmental concerns.

In addition, continuous research and monitoring: continue to conduct research on green consumption behavior and its influencing factors in Vietnam. Regular monitoring and analysis of consumer trends will enable policymakers and businesses to adapt their strategies and initiatives to changing market dynamics and consumer preferences. Government and business should consider conducting longitudinal studies to gain a more in-depth understanding of how consumer behavior evolves over time. Long-term research can help identify changing patterns and trends in green consumption and provide valuable insights for sustained environmental advocacy.

Last but not least, transparency and accountability: Encourage businesses to maintain transparency and accountability in their green product claims. Implement mechanisms for consumers to report cases of misleading eco-labeling or false environmental claims, ensuring that companies adhere to sustainable practices. Companies also should introduce incentive programs and rewards for consumers who consistently make green purchases. These initiatives can include discounts, loyalty programs, or other benefits for choosing eco-friendly products, thereby encouraging sustained green consumption.

Besides the above findings, the study also has some limitations:

First, sample size and selection: The research was conducted with a specific sample size and selection method, which may not represent the entire population of Vietnam. A larger and more diverse sample could provide a more comprehensive understanding of consumer behavior in the country.

Second, cross-sectional nature: This research followed a cross-sectional design, capturing data at a single point in time. A longitudinal approach, tracking participants over time, would offer a more dynamic view of how these variables influence green purchase intentions.

Generalization: while the findings provide valuable insights for the Hanoi market, caution should be exercised when generalizing the results to other regions or countries, as consumer behaviors and preferences can vary significantly.

Despite these limitations, this research contributes to the understanding of green consumption behavior in Vietnam and provides a foundation for future studies in the field. The findings underscore the need for businesses, policymakers, and environmental advocates to focus on enhancing environmental concern, providing clear eco-labeling, and promoting eco-conscious attitudes to drive sustainable consumption and address environmental challenges.

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