

Development of Green Housing Willingness to Pay Conceptual Model on Jabodetabek Community

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Abstract: The need for housing for Indonesian people is increasing yearly due to the high population growth rate. This fact can gradually trigger global warming. There is a need for intervention in the residential sector to minimize the resulting negative impacts by developing a green building concept. This study uses an extended Theory of Planned Behavior to identify the factors influencing purchase intention and willingness to pay for green housing (GH) in the Jabodetabek community. The study collected 347 valid responses through a survey with a purposive sampling method and used structural equation modeling to test the hypotheses. The factors raised in this study are attitudes, perceived behavioral control, subjective norms, environmental concern, subjective knowledge, policy, perceived risks, green communication, green purchase intentions (GPI), and willingness to pay (WTP). This research proves that attitude, policy, and subjective knowledge factors significantly directly affect GPI. Meanwhile, environmental concerns and subjective knowledge can also significantly and indirectly affect GPI. This study also proves a significant influence between GPI and WTP for GH in the Jabodetabek community. Perceived risk has a significant negative impact on the GPI. Additionally, developers can employ a strategy that combines attitude, subjective knowledge, and environmental concern to design programs that address consumers' cognitive and affective aspects. The government can also play a role in promoting the use of GH through incentives related to green construction.

Keywords: Willingness to pay, green purchase intention, extended theory of planned behavior, structural equation modeling, green housing.

Introduction

Indonesia experienced a population growth rate of 1,25% per year from 2000 to 2020. This population growth has implications for an increase in the need for housing. The addition of population will affect a region's development activities and increase the need for space or land. The activity of housing construction is increasingly becoming an obligation in order to fulfill the increasing number of human needs. The rapid growth of buildings worldwide has also become a long-term business opportunity for developers [1]. However, limited land motivates developers to build small houses with increasing demand [2]. Thus, building construction will continue to be carried out from time to time, one of which is the residential sector. The residential sector is able to represent as much as 27% of the world's total energy consumption and contributes as much as 17% of CO₂ emissions [3]. In addition, the building sector also accounts for around 40% of energy consumption and plays an important role in the energy market [3]. The construction industry has become one of the contributors to global warming, scarcity of natural resources, water and air pollution, and causes of various natural disasters [4]. This fact proves that, in reality, buildings can provide many benefits for human needs, but buildings have also been destroying the environment in recent years [5].

The role of building construction activities which is very large in supporting human activities, is directly proportional to the damage to nature it produces, making the Indonesian government not remain silent. The Government of Indonesia is participating in efforts to prevent natural damage due to construction activities, one of which is by setting a target for achieving Net Zero Emissions (NZE) in 2060 or earlier, as stated in the Long Term Strategies for Low Carbon and Climate Resilience 2050 (LTS-LCCR 2050) as one of the efforts to realize energy efficiency. Energy efficiency can be realized by creating behaviors to reduce carbon emissions, such as choosing energy-efficient products and facilities, utilizing green energy, and implementing energy-saving attitudes in daily activities [6]. DKI Jakarta, as the Capital of Indonesia, is the Center of Excellence for Green

Buildings with the mission of 100% of new buildings and 60% of existing buildings to meet green building requirements by 2030. Minister of PUPR Regulation No. 2 of 2015 notes that green buildings meet the requirements of green buildings and have significant measurable performance in saving energy, water, and other resources through applying green building principles following their functions and classifications in each implementation stage.

DKI Jakarta has a very high rate of population growth and economic development. This also has an impact on environmental degradation in DKI Jakarta due to CO₂ emissions which are increasing along with population growth and economic development in it. Considering that DKI Jakarta does not have many urban forests and open spaces, one method that can be used to deal with the problem of carbon emissions is to create interventions in buildings. The intervention is being developed with the concept of a green building. The government of DKI Jakarta also issued DKI Jakarta Provincial Governor Regulation Number 38 of 2012 concerning green buildings. Excellence in Design for Greater Efficiencies (EDGE) was also launched in 2015 as a green building certification system. This system was developed by the International Finance Corporation (IFC) as a member of the World Bank Group to develop buildings that pay attention to sustainable aspects while maintaining their economic value. IFC data shows that as of 2018, 339 green buildings were EDGE certified in DKI Jakarta and managed to contribute energy savings of USD 90 million. The benefits of green buildings can greatly impact improving natural resources and their sustainability. Therefore, the government is intensively encouraging people to switch to green buildings. Several public buildings in DKI Jakarta area have also begun to shift into green buildings, one of which is the most commonly found office building.

Society has become more aware of green building structures [7], especially since buildings are also a major component of efforts to reduce greenhouse gases [8]. The green building program that the DKI Jakarta Government wants to develop is the application of the green building concept, which targets the construction of buildings, houses, apartments, offices, and others. The green building concept tries to achieve efficiency in four factors: structural design efficiency, energy efficiency, water efficiency, and material efficiency. Green building implementation elaborates techniques and practitioners aimed at minimizing the impact of the construction industry on human health, resource consumption, and the environment [9]. Therefore, green buildings are considered a top sustainable development priority worldwide [10]. Unsustainable development resulting in environmental damage and economic losses has become a critical issue for the construction industry due to the high demand for construction and development activities [11].

The theory of adoption of new technology has been widely developed in the realm of green housing (GH) research in various countries. Zhang *et al.* surveyed people in China regarding their intention to buy GH using the extended Theory of Planned Behavior (TPB), identified seven constructs, and proposed nine hypotheses [12]. According to this study, the most significant factor is governmental incentives, followed by consumers' attitudes and subjective norms. Sang *et al.* conducted a survey of Chinese people regarding the desire to buy GH by collaborating on two theories of technology adoption, namely TPB and Norm Activation Theory (NAM) which are based on factors of awareness of responsibility, behavior control, personal norms, subjective norms, and awareness of consequences [13]. The results show how consumers' internal psychological factors, design, and implementation of related policies influence their willingness to purchase.

However, previous studies did not consider consumers' willingness to pay (WTP). Tan & Goh explored the impact of psychological factors on Malaysian consumers' purchase intention for green residential buildings and investigated the relationship between purchase intention and WTP for such buildings [14]. The findings suggest that attitude towards green residential buildings, perceived moral obligation, environmental concern, perceived value, perceived self-identity, and financial risk significantly influence purchase intention, while subjective norms, perceived behavioral control, performance risk, and psychological risk do not. Furthermore, purchase intention is a crucial predictor of consumers' WTP for GH.

However, no scientific research has been related to the purchase intention and WTP of GH in Jabodetabek community. Thus, what factors can influence green housing purchases in the Jabodetabek area is not yet known. Furthermore, we also extend the TPB model by adding subjective knowledge, environmental concerns, perceived risk, green communication, and policy constructs to improve the capacity of the model to predict customers' purchase intention and WTP. This research is expected to be a supporting document in providing the strength of the direct and indirect relationship between the factors that influence the purchase intention and willingness to pay for green housing in the Jabodetabek community.

Methods

Literature Review

The theory of Planned Behavior (TPB) is one of the theories of technology acceptance widely used by researchers. Ajzen developed the TPB by adding a factor that determines the behavioral intention based on a person's attitude toward that behavior [15]. The first two factors are the same as the Theory of Reasoned Action: attitude and subjective norms. Fishbein and Ajzen define attitude as an individual's evaluation of an object, define subjective norms as the link between an object and several attributes, and define behavior as the outcome or intention [16]. The second factor is subjective norms, which explain what individuals perceive from their immediate community's attitude toward a specific behavior. The third factor, perceived behavioral control, is the perceived control users have that can limit their behavior.

TPB has also been widely used to predict pro-environmental behavior at the individual level [17]. Some researchers have even developed TPB by adding additional variables to improve its accuracy. Zhang *et al.* added subjective knowledge, environmental concern, and governmental incentives as variables [11]. Sousa *et al.* added the variable of companies' green communication [18]. TPB and extended TPB have been widely applied to explain pro-environmental behavior in various aspects, such as organic food [19], the ecotourism industry [20], green purchasing behavior [21], sustainable housing [22], and the construction industry [23].

The TPB model has also been widely used to study consumers' adoption intentions toward green housing in various countries such as China [12], [13], Bangladesh [24], and Malaysia [14]. Zhang investigated Young Consumers' Purchasing Intention of Green Housing in China by considering six constructs: Attitude, Subjective norm, Perceived behavioral control, Subjective knowledge, Environmental concern, and Governmental incentives [12]. Sang examined the purchase willingness of green housing by integrating two technology acceptance theories, TPB and NAM [13]. Sang considered five constructs: Subjective norm, Perceived behavioral control, Personal norm, Awareness of consequences, and Ascription of responsibility [13]. Tan & Goh studied the role of psychological factors in influencing consumer purchase intentions toward green residential buildings, considering constructs such as attitude towards green residential buildings, perceived moral obligation, environmental concern, perceived value, perceived self-identity, financial risk, subjective norm, perceived behavioral control, performance risk, and psychological risk [14]. Based on previous research, it is known that human behavior is highly complex and cannot be identified by a single model. Therefore, in this study, we propose an extended TPB model by combining several models from previous research.

Research Hypotheses

The Theory of Planned Behavior (TPB) is a theory that predicts intentional behavior because it can be considered and planned. The development of the Structural Equation Model (SEM) model was carried out by adopting four reference research models from Ajzen [15], Zhang *et al.* [12], Tan and Goh *et al.* [14], Sousa *et al.* [18]. Through the results of the four research models, nine factors were found that influenced the intention to purchase green housing: attitudes, behavioral control, subjective norms, environmental awareness, subjective knowledge, policies, risks to be concerned about, and green communication. The variables selected in the development of the model are adjusted by looking at the field facts that occur in Indonesia and are supported by some literature in their adjustments. The variables were selected based on a review of several literatures in Indonesia and studies from several other countries. The selection of variables has also been adjusted to the facts in Indonesia so prospective respondents can understand and fill in objectively.

Ajzen defines attitude as a person's favorable or unfavorable behavior assessment [15]. According to the theory of planned behavior (TPB), attitudes are crucial in shaping behavioral intentions. Kang and Kim have found that attitude towards green products impacts purchase intentions [25]. In the context of green homes, the attitude has been found to significantly influence consumers' behavioral intentions and green purchase behavior [12], [26]. Additionally, individuals with knowledge of green products exhibit intentions and attitudes that lead to increased consumption of such products [12]. Therefore, the hypotheses that follow are proposed.

H₁: Attitude towards purchasing GH has a significant positive effect on green purchase intention.

Subjective norms, defined as an individual's sensitivity to social pressure to engage in a specific behavior, have been identified as a crucial factor in the social impact on behavioral intentions [15]. Various studies have emphasized the significance of subjective norms as a determining factor in the intention to purchase green

products [27], organic food [28], intention to stay at a green hotel [29], and purchasing intention toward GH [12]. Therefore, the subjective norm is an important factor affecting GH purchase intention, and we propose the following hypotheses.

H₂: Subjective norm has a significant positive effect on green purchase intention.

Ajzen defined perceived behavioral control as the difficulty or ease perceived by individuals in performing a specific behavior [30]. The TPB model highlights that ability and motivation play a role in influencing behavior, and the development of perceived behavioral control is crucial for forming intentions [31]. Assessing products before purchase relies on perceptual cues from perceived behaviors [32]. In the context of green residential buildings, several studies confirmed a significant positive relationship between perceived behavioral control and customer purchase intention [12], [33], [34]. Based on the discussion above, we propose the following hypothesis.

H₃: Perceived behavioral control has a significant positive effect on green purchase intention.

Companies increasingly emphasize their products' environmental friendliness, leading to a growing population of well-informed green consumers who scrutinize how companies communicate [35]. Green marketing communication seeks to draw consumers' attention to a company's environmental initiatives and responsibility, influencing consumer behavior and promoting the purchase of eco-friendly products [36]. Companies strive to communicate their green activities to all consumers, aiming to foster a greener mindset and appreciation for environmentally friendly companies, thus influencing purchase decisions. Thus, we suggest the following hypotheses.

H₄: Green communication has a significant positive effect on green purchase intention.

Perceived risk plays a significant role in consumer behavior [37], causing uncertainty and anticipated negative outcomes when consumers encounter products or services [38]. This study focuses on financial, performance, and psychological risks as critical factors influencing the purchasing intention of green residential. Financial risk concerns the price and potential financial loss of green residential buildings [38]. Kang and Kim demonstrated that financial risk negatively affects consumers' intentions to purchase ecologically sustainable apparel products [25]. Performance risk relates to the likelihood of a product not delivering the expected benefits [38]. Wu *et al.* showed that performance risk has a negative impact on the intention to purchase private-label brands [38]. Psychological risk refers to the fear of not achieving purchasing goals, potentially damaging self-esteem [39]. Crespo *et al.* discovered that psychological risk negatively influences purchase intentions [40].

H₅: Perceived risk has a significant negative effect on green purchase intention.

Knowledge plays a crucial role in behavioral studies, influencing decision-making and behavior regarding various subjects. Knowledge can be categorized into objective knowledge, representing actual understanding, and subjective knowledge, reflecting perceived or self-reported understanding [41]. Subjective knowledge is a better predictor of environmental behaviors than objective knowledge due to the complexity of measuring the latter. Studies have indicated that a lack of subjective knowledge is a psychological barrier to accepting environmentally friendly residential buildings [26]. Zhang *et al.* found that subjective knowledge indirectly affects attitude toward behavior [12]. Therefore, the following hypotheses are proposed.

H₆: Subjective knowledge has a significant positive effect on green purchase intention.

H₇: Subjective knowledge has a significant positive effect on attitude towards purchasing GH.

H₈: Subjective knowledge has a significant positive effect on green purchase intention through attitude towards purchasing GH.

Including environmental concern (EC) in the TPB has been shown to enhance its predictive power [42]. Researchers have demonstrated the positive relationship between environmental concern and various aspects of consumer behavior, such as the intention to purchase green-branded energy [43], green items [44], and electric vehicles [45], [46]. Hartmann and Apaolaza-Ibáñez highlight its direct and indirect effects on attitudes and purchase intentions towards green products [43]. Additionally, Fauzi found that environmental belief, environmental commitment, and environmental concern significantly impact attitudes toward visiting a green hotel [29]. Thus, we state four hypotheses as follows:

H₉: Environmental concern has a significant positive effect on attitude towards purchasing GH.

H₁₀: Environmental concern has a significant positive effect on subjective norms.

H₁₁: Environmental concern has a significant positive effect on green purchase intention through attitude towards purchasing GH.

H₁₂: Environmental concern has a significant positive effect on green purchase intention through subjective norms.

Table 1. Measurement items in the formal questionnaire

Constructs	Code	Indicator	Statement	Sources
<i>Attitude toward green housing</i>	ATT1	Purchase Decision	I think buying GH is a good decision	[24]
	ATT2	Long Term Advantages	In the long term, I think that purchasing GH will be profitable for me	[24]
	ATT3	Environmental Friendly Process	I think that GH is valuable because they are developed and built with eco-friendly processes.	[14]
	ATT4	Improved Quality of Life	I think that GH is beneficial because it can improve the quality of life without compromising the internal comfort of the occupants.	[14]
	ATT5	Sustainable Features	GH's availability of environmentally friendly facilities (such as artificial lighting, water meters, etc.) is very useful.	[14]
	ATT6	Standard Compliance	I feel the benefit if I have GH that is able to meet Greenship Home standards (GH Certification)	[14]
	ATT7	Effects on the Environment	Purchasing GH is a smart decision because it doesn't have a negative effect on the environment.	[14]
<i>Subjective Norm</i>	SN1	Influence of Closest Person	The people closest to me have a big influence on my decision to buy GH	[12]
	SN2	Family Influence	My family has a big influence on my decision to buy GH	[12]
	SN3	Influence of Public Opinion	Public opinion has a big influence on me to buy GH	[12]
	SN4	Media Influence	Information from the media has a major influence on my decision to buy GH	[14]
<i>Perceived Behavioral Control</i>	PBC1	Today's Purchasing Ability	I believe that I can buy GH right now if I want to	[24]
	PBC2	Future Purchasing Ability	I see that I can afford to buy GH in the future	[24]
	PBC3	Resources, Time, and Desire	I have the resources, time, and desire to buy GH	[24]
	PBC4	Purchasing Decision Control	I have complete control to make GH's buying decisions	[14]
<i>Subjective Knowledge</i>	SK1	Green Housing's Development	I understand why GH needs to be developed	[14]
	SK2	Green Housing's Advantages	I know what advantages I will get if I use GH	[14]
	SK3	Building Quality	I know how to judge the quality of green buildings	[59]
	SK4	Green Housing	I really understand GH	[59]
<i>Environmental Concern</i>	EC1	Purchasing Efforts	I will put in extra effort (cost/effort/time) to buy green products	[29]
	EC2	Decision on Selection of Use	If I have to choose between 2 similar products, I will buy a more environmentally friendly product that does not harm humans and the environment.	[29]
	EC3	Use of Environmentally Friendly Products	I have switched to using green products (e.g.: electric vehicles, organic vegetables, cloth shopping bags, etc.)	[29]
<i>Perceived Risk</i>	PR1	<i>Financial Risk</i>	I am worried that purchasing GH is not a profitable investment for me	[14]
	PR2	<i>Performance Risk</i>	I worry that buying GH cannot provide the comfort/quality I expect.	[14]
	PR3	<i>Psychological Risk</i>	GH doesn't suit my lifestyle	[14]
<i>Green Communication</i>	GC1	Attention to Advertisements	I tend to pay more attention to ads that carry messages related to environmental protection.	[18]
	GC2	Responses to Advertisements	I respond favorably to brands that carry environmental protection issues in their advertisements.	[18]
	GC3	Company Claims	I pay attention to the environmental impact of every purchase of a product.	[18]
	GC4	Environmental Characteristics Information	I think that it is important for a company to be able to provide information about the environmental characteristics of the products being marketed.	[18]
<i>Policy</i>	PO1	Tax Incentives	I am willing to buy GH if the government provides tax incentives for purchasing GH.	[60]
	PO2	Direct Subsidies	I am willing to buy GH if the government provides direct subsidies to consumers for every purchase of GH.	[60]
	PO3	Soft Loan Incentives	I am willing to buy GH if the government provides soft loan incentives to consumers to buy GH.	[60]
	PO4	Award from the Government	I am willing to buy GH if the government can give awards to people who buy GH to support government programs.	[60]
	PO5	Availability of Professionals	I am willing to buy GH if the government can provide professional staff to provide technical and non-technical support regarding the construction.	[60]
<i>Green Purchase Intention</i>	GPI1	The desire to buy GH	I am interested in buying GH	[12]
	GPI2	The desire to occupy GH	I am interested in occupying GH	[12]
	GPI3	Desire to recommend GH	I want to recommend GH to others	[12]
<i>Willingness to Pay</i>	WTP1	Eligibility to pay more	It's well worth paying more to get GH that engages in environmental practices.	[14]
	WTP2	Availability to pay more	I am willing to pay more to buy GH	[14]
	WTP3	Availability for purchase	I am willing to spend more money to buy GH	[14]

Policy interventions at the government level play a crucial role in shaping environmental behavior [47]. Eliminating tax incentives and subsidies can have an adverse impact on the sustainable development of existing buildings [48]. Zhang *et al.* found that government incentives positively influence purchase intention and the perception of buying green housing among young Chinese consumers [12]. Similarly, Zheng *et al.* observed a significant positive impact of policy incentives on the intention of Chinese youth to adopt rented housing [49].

The Indonesian government has actually issued incentives for green buildings, including tax reductions [50], but public awareness remains limited. Therefore, the following hypotheses are proposed:

H₁₃: Policy has a significant positive effect on perceived behavioral control.

H₁₄: Policy has a significant positive effect on green purchase intention.

H₁₅: Policy has a significant positive effect on green purchase intention through perceived behavioral control.

Various studies have examined purchase intentions towards green products such as organic food [51], eco-friendly products [52], green electric motorcycles [53], [54], and green housing [14]. As corporate social responsibility (CSR) gains prominence, homebuyers prefer socially responsible developers who cater to their housing needs [55]. WTP refers to the maximum price an individual is prepared to pay and becomes crucial for analyzing behavioral intentions [56]. Research suggests a positive correlation between purchase intention and willingness to pay [57]. Market demand and the willingness of purchasers to pay extra costs for green building (GB) are key factors influencing developers' decision-making [58]. Therefore, the following hypotheses are suggested:

H₁₆: Green purchase intention has a significant positive effect on willingness to pay.

To achieve the objective of the study, a questionnaire survey was conducted to collect data. The measurement items for each construct were carefully chosen or adapted from relevant studies. The ten constructs were measured using items that were rated on a five-point Likert scale, ranging from strongly disagree to strongly agree. The questionnaire included 39 measurement items that reflected the ten constructs and incorporated findings from multiple studies. Table 1 presents a comprehensive summary of the measurement items used in the survey questionnaire for data gathering.

Results and Discussions

Measurement Model

Table 2. Respondent characteristics

Variable-group	Frequency (%)
Gender	
- Male	121 (34.9)
- Female	226 (65.1)
Age	
- 15 – 27	78 (22.5)
- 28 – 41	206 (59.4)
- 42 – 57	49 (14.1)
- > 57	14 (4.0)
Marital Status	
- Single	71 (20.5)
- Marriage	270 (77.8)
- Divorce/widowed	6 (1.7)
Occupation	
- Student	7 (2.0)
- Public employee	18 (5.2)
- Private employee	162 (46.7)
- Business	89 (25.6)
- Other	71 (20.5)
Income	
- < 5,000,000	130 (37.5)
- 5,000,000 – 15.000.000	175 (50.4)
- 15,000,001 – 25.000.000	28 (8.1)
- 25,000,001 – 35.000.000	8 (2.3)
- > 35.000.000	6 (2.7)
Education	
- Elementary school	3 (0.9)
- High school	149 (42.9)
- Diploma	44 (12.7)
- Bachelor's degree	133 (38.3)
- Master's degree	16 (4.6)
- Doctoral degree	2 (0.6)

Table 3. Outer loading value

Indicator	Outer loading	Indicator	Outer Loading
ATT1	0.831	PO1	0.815
ATT2	0.820	PO2	0.836
ATT3	0.871	PO3	0.849
ATT4	0.875	PO4	0.840
ATT5	0.805	PO5	0.856
ATT6	0.859	PR1	0.928
ATT7	0.850	PR2	0.960
EC1	0.852	PR3	0.915
EC2	0.832	SK1	0.890
EC3	0.803	SK2	0.894
GC2	0.775	SK3	0.885
GC3	0.883	SK4	0.861
GC4	0.870	SN1	0.858
GPI1	0.935	SN2	0.843
GPI2	0.927	SN3	0.865
GPI3	0.878	SN4	0.849
PBC1	0.813	WTP1	0.894
PBC2	0.849	WTP2	0.939
PBC3	0.896	WTP3	0.920
PBC4	0.814		

Table 4. Average Variance Extracted and Composite Reliability Value

Variable	AVE	CR
ATT	0.714	0.934
EC	0.688	0.777
GC	0.713	0.843
GPI	0.834	0.901
PBC	0.712	0.874
PO	0.704	0.898
PR	0.874	1.002
SK	0.779	0.915
SN	0.729	0.899
WTP	0.824	0.906

The initial stage of PLS-SEM involves evaluating the outer model. This evaluation includes three criteria: convergent validity, discriminant validity, and composite reliability. Convergent validity is measured using the outer loading and AVE value, both presented in Table 3.

However, GC1 has an outer loading value that is less than 0.70 during the first iteration. As a result, the indicator is removed, and the second iteration is initiated. After the second iteration, all indicators have outer loading values above 0.70, and the variables have AVE values above 0.50, as shown in Table 4. Therefore, convergent validity can be confirmed. Discriminant validity is then tested using Fornell-Larcker's value, which shows that each variable is more significant on its construct than on others, indicating that all variables pass the discriminant validity test. Finally, the composite reliability (CR) value is used to test reliability, and all variables have CR values above 0.70, indicating that reliability can be confirmed. The loading factors of all measured items are above 0.50. Based on these results, it can be concluded that all research variables are valid, and the research instruments are reliable.

Hypothesis Testing

Hypothesis testing can be conducted by looking at the p-value. Table 5 presents the results of the hypothesis testing. Figure 1 presents the suggested research model and its corresponding path coefficients and p values. We employed N=5000 bootstrapping to compute the path coefficients (i.e. original sample, T value, and p values) for every path.

H₁. The significance value for the direct effect of attitude (ATT) on purchase intention (GPI) is 0.000, supporting hypothesis 1. This statement is in accordance with the opinion [14], which is in line with the initial TPB model, which shows that attitude is an important factor influencing purchase intention. This research illustrates that an attitude influences purchase intention.

H₂. The significance value for the direct influence of subjective norm (SN) on purchase intention (GPI) is 0.503, so it cannot support hypothesis 2. The results of the relationship between subjective norm variables and purchase intentions are not in line with research [12], which found that subjective norms affect purchase intentions. However, research [13] supports it, stating that subjective norms have no significant effect on purchase intentions. This research shows that in the Jabodetabek community, social pressure given to an individual is not able to support an intention to buy GH.

H₃. The significance value for the direct effect of perceived behavioral control (PBC) on purchase intention (GPI) is 0.093 so it cannot support hypothesis 3. The results of the relationship between perceived behavioral control variables and purchase intentions are supported by research [12] which states that there is no significant effect of perceived behavioral control on purchase intentions. This study shows that in the Jabodetabek community, perceived behavioral control is not able to support the intention to purchase GH.

Table 5. Hypothesis testing

	Original sample	p-values	Result
ATT → GPI	0.411	***0.000	Supported
SN → GPI	-0.023	0.503	Not Supported
PBC → GPI	0.098	0.093	Not Supported
GC → GPI	0.063	0.179	Not Supported
PR → GPI	-0.118	***0.000	Supported
SK → GPI	0.159	*0.023	Supported
SK → ATT	0.572	***0.000	Supported
SK → ATT → GPI	0.235	***0.000	Supported
EC → ATT	0.279	***0.000	Supported
EC → SN	0.480	***0.000	Supported
EC → ATT → GPI	0.114	**0.004	Supported
EC → SN → GPI	-0.011	0.514	Not Supported
PO → PBC	0.571	***0.000	Supported
PO → GPI	0.242	***0.000	Supported
PO → PBC → GPI	0.056	0.102	Not Supported
GPI → WTP	0.623	***0.000	Supported

* p < 0.05, ** p < 0.01, *** p < 0.001

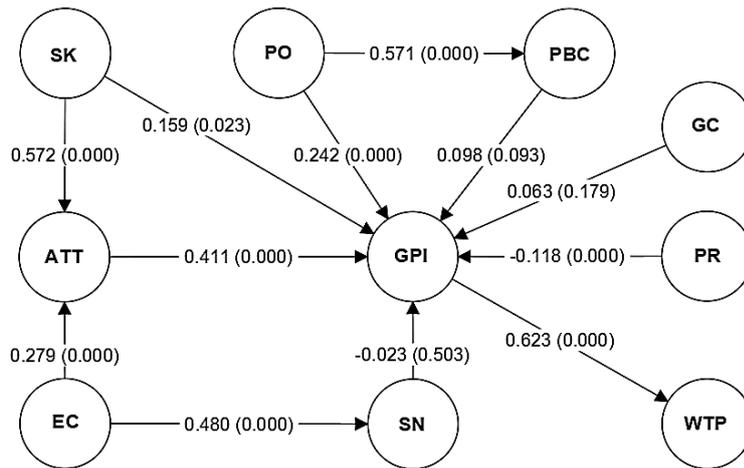


Figure 1. Results of the research model

H₄. The significance value for the direct effect of green communication (GC) on purchase intention (GPI) is 0.179, so it cannot support hypothesis 4. The results of the relationship between the green communication variable and purchase intention are not in line with the research [18]. Suppose Sousa *et al.* stated that green communication supports green purchase intentions [17], in this study, even though a person receives a lot of information about GH through green communication. In that case, it will not increase interest in buying GH.

H₅. The significance value for the direct effect of perceived risk (PR) on purchase intention (GPI) is 0.000. However, the original sample is -0.118, indicating that perceived risk (PR) significantly negatively affects purchase intention, supporting hypothesis 5. The results of this study support the study [14], which states that perceived risk has a significant negative effect on purchase intentions. This shows that if a person's perceived risk factors increase, then a person's intention to buy GH will decrease.

H₆. The significance value for the direct effect of subjective knowledge (SK) on purchase intention (GPI) is 0.023, so that it can support hypothesis 6. This statement is consistent with the opinion [62] that subjective knowledge significantly positively affects green purchasing intentions.

H₇. The significance value for the direct effect of subjective knowledge (SK) on attitude (ATT) is 0.000, so that it can support hypothesis 7. This statement is consistent with the opinion [12] which suggests that subjective knowledge (SK) has a significant positive effect on attitude (ATT).

H₈. The significance value for the indirect effect of subjective knowledge (SK) on purchase intention (GPI) through the attitude factor (ATT) is 0.000, so that it can support hypothesis 8. This can also be seen through the direct relationship between subjective knowledge (SK) and attitude (ATT), which has a significant influence, then attitude (ATT) also has a significant influence on purchase intention (GPI). This research shows that a

good understanding and knowledge of GH will lead to a positive attitude toward the environment, which can trigger an intention to purchase GH.

H₉. The significance value for the direct effect of environmental concern (EC) on attitude (ATT) is 0.000 to support hypothesis 9. This statement is supported by opinion [12], which states that there is a significant positive influence between environmental concern (EC) with attitude (ATT).

H₁₀. The significance value for the direct effect of environmental concern (EC) on the subjective norm (SN) is 0.000 to support hypothesis 10. This statement is supported by the opinion [12], which states that there is a significant positive influence between environmental concerns (EC) with subjective norms (SN).

H₁₁. The significance value for the indirect effect of environmental concern (EC) on purchase intention (GPI) through the attitude factor (ATT) is 0.004, so that it can support hypothesis 11. This can also be seen through the direct relationship between environmental concern (EC) and attitude (ATT), which has a significant influence, then attitude (ATT) also has a significant influence on purchase intention (GPI). Through this research, it is known that individual concern for the environment is able to provide a pro attitude towards the intention to purchase GH.

H₁₂. The significance value for the indirect effect of environmental concern (EC) on purchase intention (GPI) through the subjective norm (SN) factor is 0.514 so it cannot support hypothesis 12. This can also be seen through the direct relationship between environmental concern (EC) and subjective norm (SN), which has a significant effect, but there is no significant direct effect of the subjective norm (SN) on purchase intention (GPI). This research shows that the environmental concern factor cannot support a person's intention to buy GH through one's perception of the social pressure he receives.

H₁₃. The significance value for the direct effect of policy (PO) on perceived behavioral control (PBC) is 0.000 to support hypothesis 13. This statement is consistent with the opinion [12], which suggests that policy (PO) has a positive influence and significant effect on perceived behavioral control (PBC).

H₁₄. The significance value for the direct effect of policy (PO) on purchase intentions for environmentally friendly housing (GPI) is 0.000 to support hypothesis 14. This statement is consistent with the opinion [12], which suggests that policy (PO) has a significant positive effect on green purchase intention (GPI).

H₁₅. The significance value for the indirect effect of policy (PO) on purchase intentions for environmentally friendly housing (GPI) through perceived behavioral control (PBC) is 0.102, so it cannot support hypothesis 15. In hypothesis 3, it is known that the perceived behavioral control (PBC) factor is not able to have a significant positive effect on the intention to buy environmentally friendly houses (GPI), so the results of hypothesis 15 show that there is no indirect effect between policy (PO) on the intention to buy a house environmentally friendly (GPI) through perceived behavioral control (PBC).

H₁₆. The significance value for the direct effect of green purchase intention (GPI) on willingness to pay (WTP) is 0.000, so it can support hypothesis 16. These results are in line with research [14], which suggests that the green purchase intention (GPI) factor has a significant positive influence on willingness to pay (WTP). Research on the Jabodetabek community shows that the intention to purchase GH is important in increasing people's willingness to pay for GH.

Table 6 is referenced to test the relationship between certain demographic factors and WTP or GPI. The table presents the results of chi-square tests for the following crosstabs: Marital Status * WTP, Occupation * GPI, and Income * GPI, where the p-value is less than 0.05. These results show differences in GPI and WTP between groups in this demographic variable. In contrast, the results of the crosstab analysis for other demographic variables found no differences in GPI and WTP between groups in each demographic variable.

Table 6. Chi-square test for the demographic variables

Variables	Dep.Var.	Value	df	Asy. Sig.
Gender	GPI	14.320	8	0.074
	WTP	13.200	12	0.355
Age	GPI	21.907	24	0.585
	WTP	42.922	36	0.199
Marital status	GPI	12.628	16	0.700
	WTP	37.661	24	0.038*
Occupation	GPI	46.532	32	0.047*
	WTP	47.959	48	0.475
Income	GPI	72.181	32	<.001*
	WTP	59.537	48	0.123
Education	GPI	42.015	40	0.384
	WTP	36.638	60	0.993
Domicile	GPI	70.485	64	0.270
	WTP	91.464	96	0.612

* p < 0.05

The study found that ATT, SK, and EC have significant direct and indirect effects on GPI where these results are consistent with previous studies [12]–[14], [24], [26], [59], [63], while for PO it is consistent with He [60]. Meanwhile, GPI directly affects GH's WTP, which is consistent with previous research [14]. On the other hand, PR has a significant negative impact on GPI, which is consistent with previous studies [14]. Otherwise, subjective norm, and perceived behavioral control do not significantly affect purchasing intention, which is consistent with Tan and Goh [14], but is inconsistent with Maichum *et al.* [63] and Sang [13]. GC factor was found not to affect GPI, which is inconsistent with Sousa [18]. Therefore, developers of GH can employ a strategy that combines attitude, subjective knowledge, and environmental concern by designing programs that address consumers' cognitive, affective, and conative aspects. These programs should aim to change consumers' attitudes to be more positive towards green housing and identify environmental attitudes that strengthen program development strategies. Companies also need to extensively expose product information and provide detailed explanations to enhance knowledge among potential consumers.

Strategies involving PO involve the government as a regulator. The government's role can influence the purchasing behavior of GH. The Indonesian government has shown support for green buildings through incentives related to green construction, such as reductions in the Land and Building Tax for Rural and Urban Areas [50]. However, tax incentives for green buildings have not been fully implemented to promote environmentally friendly buildings because property tax incentives in Indonesia are primarily aimed at improving payment compliance [50]. The government can involve the private sector to increase public purchasing of GH. The government could contribute to GB projects by providing low-interest rates for contractors, promoting the benefits of GB, and indirectly providing incentives to support private sectors. This collaboration between the government and the private sector will indirectly impact the public by increasing the number of green buildings.

The significant differences in GPI and WTP among different demographic groups suggest the need for targeted strategies and interventions (see Table 6). The government should consider designing policies that specifically cater to the demographic groups identified in the study. This policy may involve creating incentives or regulations for green purchasing behavior and WTP within these groups. Resource allocation should be prioritized to target the demographic groups with higher GPI and WTP. This policy can include funding initiatives, awareness campaigns, and infrastructure development that align with the preferences and values of these groups. Developers should consider segmenting their target market based on the demographic variables that demonstrated significant differences in GPI and WTP. This segmentation allows tailored marketing strategies and product offerings to effectively appeal to these specific groups. Developers can focus on creating sustainable and environmentally friendly products that align with the preferences of the demographic groups displaying higher GPI and WTP. This strategy may incorporate eco-friendly features or certifications that resonate with these consumers. Overall, the findings emphasize the importance of understanding the varying attitudes and behaviors toward green purchases across different demographic groups.

Conclusion

The study aimed to investigate the factors influencing the purchase intention of GH in the Jabodetabek community. The results showed that attitude, perceived behavioral control, subjective knowledge, and environmental concern significantly positively affect purchase intention. However, subjective norms and green communication did not significantly affect purchase intention. The study highlights the importance of creating awareness and knowledge about GH to increase purchase intention among consumers. The study also highlights the negative impact of perceived risk on purchase intention. The results suggest that developers and policymakers should focus on addressing consumers' cognitive, affective, and conative aspects to promote the adoption of GH. Developers and policymakers can use the findings to design effective strategies to promote the adoption of green buildings and sustainable development.

The study has some limitations that need to be considered. Firstly, the study was conducted in the Jabodetabek community only, limiting the findings' generalizability to other regions. Secondly, the study used a survey method to collect data, which may have resulted in response bias. Finally, the study only focused on the factors influencing purchase intention and did not investigate the actual purchase behavior of consumers. Future research can address the limitations of this study by conducting a similar study in other regions to increase the generalizability of the findings. Additionally, future research can use different data collection methods, such as interviews or focus groups, to reduce response bias. Finally, future research can investigate consumers' actual purchase behavior to understand better the factors that influence the purchase of GH.

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