

THE PSYCHOLOGY OF SUSTAINABLE HOUSING PURCHASE INTENTION IN THAILAND: A PSYCHOMETRIC AND STRUCTURAL EQUATION MODELING APPROACH

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Abstract

This research investigates psychological factors underlying the intention to purchase sustainable housing in Thailand. Structural Equation Modeling (SEM) was employed to investigate the impact of marketing communication and service quality on purchase intention, utilizing data from 260 potential homebuyers. The model exhibited excellent fit. Both marketing communication ($\beta = 0.57$, $p < .01$) and service quality ($\beta = 0.44$, $p < .01$) emerged as significant direct determinants of intention. Moreover, service quality was found to mediate the effects of marketing communication on purchase intention (indirect $\beta = 0.28$, $p < .01$), revealing a path from external persuasion to internal trust. Together, these factors accounted for 74% of the variance in intention. The findings illustrate how perceived reliability and message credibility together shape sustainable consumer behaviour in a high-involvement setting, extending the psychology of green decision-making.

Keywords: environmental psychology; marketing communication; purchase intention; Thailand

INTRODUCTION

Global environmental issues, such as climate change and resource depletion, have intensified the relevance of sustainable consumer decision-making. The psychological underpinnings of these decisions—how individuals perceive, evaluate, and act upon sustainability-related information—have become a significant concern in environmental and applied psychology (IPCC, 2018; Yahia & Shahjalal, 2024).

In this context, the construction and housing sectors are a key focus of environmental sustainability; however, they also face specific behavioral barriers. This is because buying a green home is a high-involvement, high-risk decision; it must engage the cognitive, affective, and evaluative processes of consumers. These include perceived reliability, trust in developers, and the persuasiveness of sustainability-related communications as part of the marketing mix (Durdyev & Ihtiyar, 2019; Tan & Goh, 2018).

In the context of Thailand, the adoption of the sustainable housing paradigm has been uneven, driven by prevailing economic, institutional, and technological conditions, while constrained by institutional regulations (Krungsri Research, 2021). Therefore, it is essential to identify the psychological mechanisms underlying sustainable housing purchase intentions among prospective homebuyers in order to inform policymakers and practitioners.

Building on theories of information processing and trust-based decision-making, this study investigates two main antecedents of purchase intention (PI): marketing communication (MC) and service quality (SQ). Marketing communication is the external persuasion mechanism—how information about sustainability is framed, communicated, and cognitively processed in consumers' minds (Kotler, 2017; Mocanu & Szakal, 2023). Contrarily, service quality is the internal evaluative mechanism that reflects consumers' trust, reliability perception, and confidence in the developer (Parasuraman et al., 1988; Zeithaml et al., 2017).

While prior research has examined these constructs separately, few studies have integrated them within a psychological model of sustainable housing purchase intention using structural equation modeling. Furthermore, most existing studies emphasize marketing or environmental aspects rather than psychometric validation of constructs. This study thus aims to:

1. Develop and validate a psychometrically strong model linking marketing communication (MC), service quality (SQ), and purchase intention (PI) for sustainable housing in Thailand.
2. Examine the direct, indirect, and total effects among these constructs to identify the underlying cognitive pathways that shape consumer decisions.

By addressing these aims, the research contributes to applied psychology by offering a theoretically grounded and methodologically rigorous model of sustainable decision-making behavior. The findings have practical

implications for aligning marketing strategies with the psychological processes that underlie trust, persuasion, and intention formation in the eco-housing market.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Marketing Communication (MC) and Purchase Intention (PI)

Marketing Communication (MC) represents a powerful instrument, a means by which an organization informs, persuades, and reminds consumers, directly or indirectly, about the products and brands it sells (Armstrong et al., 2010). In the sustainable housing market, where features and benefits can be abstract or future-oriented in nature (e.g., energy savings, lower environmental impact, and healthier living environments), effective communication plays a vital role by educating potential buyers on these distinct value propositions while helping reduce their perceived risk and uncertainty (Mocanu & Szakal, 2023).

A Hierarchy of Effects Model posits that communication helps propel consumers through a set of phased stages (awareness, knowledge, liking, preference, conviction, and purchase intention) (Chakravarty & Sarma, 2022). In the case of a high-involvement decision, such as buying a house, a multi-channel MC is required. The target audience must be aware of the existence and features of the product (advertising), be motivated to buy within a specific period of time (sales promotions), believe in the credibility and positivity of the company and the product's image in the marketplace (public relations), understand in detail how the product works (personal selling) and given individualised follow-up (direct marketing) in order to be sure about their purchase decision (Armstrong et al., 2010). When consumers are continuously exposed to cohesive MC messages that show clear, compelling reasons for the benefits of buying eco-friendly homes, their intention to purchase is likely to be strengthened. Therefore, we propose the following hypothesis:

H1: Marketing communication has a positive direct effect on the purchase intention of sustainable eco-friendly housing in Thailand.

The Interrelationship: Marketing Communication, Service Quality, and Purchase Intention

Marketing communication does not exist in isolation; marketing shapes customer expectations and affects customer perceptions of the service they will receive before it. Through professional marketing collateral, the quick response of sales agents, and a clear message communicated to the target audience, a potential property developer can have a direct effect on customers' perceptions of service quality (Zeithaml et al., 2017). When a customer's experience aligns with the promises made in marketing, it enhances the perception that they are a good fit and that they made the right decision.

In other words, the effective MC contributes to generating expectation based on which SQ is perceived. Suppose the experienced service quality aligns with the expectations communicated, either by being equal to or better than what is expected. In that case, this makes the message credible and enhances its effect on PI. This depicts service quality as a mediator variable between MC and PI. The communication catches and informs the customer; however, the quality of the service interaction provides the final assurance for turning the intention into a decision, which is why we hypothesize.

H2: Service quality mediates the relationship between marketing communication and purchase intention of sustainable eco-friendly housing in Thailand.

Service Quality (SQ) and Purchase Intention (PI)

Service Quality (SQ) is one of the primary factors that determine customer satisfaction and loyalty, especially in service-dominant industries such as real estate development companies (Liu et al., 2025; Sao et al., 2022). It represents the difference between customers' expectations and their views of actual service delivery (Fazal-Hasan et al., 2018). Moreover, purchasing a house is an excellent event in customers' lives; thus, the definition of service SQ in property development companies transcends the point of sale and affects the whole customer journey.

The SERVQUAL model offers a pertinent framework, as its dimensions of tangibles (the quality of show units and materials), reliability (the developer's ability to keep promises), responsiveness (the speed at which inquiries are addressed), assurance (the knowledge and trustworthiness of employees), and empathy (personalized attention) (Parasuraman et al., 1988). Good service quality helps lower the perceived risk and establish trust in the developer, which is an important antecedent of forming a purchase intention for an expensive asset, such as a home (Liu et al., 2025). We therefore formulate:

H3: Service quality has a positive direct effect on purchase intention towards sustainable, eco-friendly housing in Thailand.

RESEARCH METHODOLOGY

Research Design And Data Collection

This study employed a quantitative, cross-sectional design to investigate the psychological links between marketing communication (as an external persuasion cue), service quality (as a perceptual construct of trust and reliability), and purchase intention (as a behavioral intention outcome) in the context of sustainable housing in Thailand.

A structured questionnaire was used to collect primary data from housing consumers who registered their interest in purchasing sustainable, eco-friendly housing units. Since the sampling frame ensured that respondents were genuine consumers involved in decision-making, the data collection team administered the questionnaire on-site across selected districts of Bangkok. The trained team of research assistants eliminated ineligible respondents by asking a screening question.

Population and Sampling

The study population consists of consumers who have registered with sustainable housing developers in Thailand. According to the recommended sample size for Structural Equation Modeling (SEM) of 1020 cases per observed variable (Hair et al., 2010), where there are thirteen observed indicators in this study, a sample of 260 respondents was deemed sufficient to ensure robust statistical power and stable parameter estimates. A multi-stage sampling method was employed to ensure diversity among urban areas. Simple Random Sampling: Ten districts were randomly selected out of 50 districts in Bangkok, with each district having an equal chance of being selected.

Proportionate Allocation: The number of respondents from each district was proportionally distributed based on its population size.

Purposive sampling: Within each district, respondents were screened to identify those who had previously expressed interest in sustainable housing projects. The final sample distribution is presented in Table 1.

TABLE 1 Sample distribution across selected Bangkok districts ($n=260$)

District	Population	Sample Size	%
1. Phra Nakhon	43,062	11	4.24%
2. Dusit	81,494	22	8.47%
3. Nong Chok	178,856	47	18.07%
4. Bang Rak	45,015	12	4.60%
5. Bang Khen	186,200	50	19.24%
6. Lat Krabang	178,424	47	18.07%
7. Yan Nawa	75,076	20	7.70%
8. Samphanthawong	20,777	6	2.30%
9. Phaya Thai	66,212	18	6.92%

Research Instrument and Measurement

The survey instrument comprised four sections and was developed based on psychometrically validated constructs:

- Section 1: Demographic information (9 items).

Section 2: *Purchase Intention (PI)* — 15 items assessing cognitive readiness to purchase, affective satisfaction, trust in the developer, and recommendation behavior. The Cronbach's Alpha (α) value received from the pilot test was 0.86.

Section 3: *Marketing Communication (MC)* — 25 items representing informational and persuasive stimuli across advertising, sales promotion, public relations, personal selling, and direct marketing. The Cronbach's Alpha (α) value received from the pilot test was 0.87.

Section 4: *Service Quality (SQ)* — 25 items adapted from the SERVQUAL model (Parasuraman et al., 1988), covering tangibles, reliability, responsiveness, assurance, and empathy, conceptualized here as psychological perceptions of reliability and trust. The Cronbach's Alpha (α) value received from the pilot test was 0.88.

Items in Sections 2–4 were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). To establish content validity, five subject-matter experts in applied psychology and marketing evaluated the items, yielding Item-Objective Congruence (IOC) values ranging from 0.80 to 1.00. A pilot test involving 30 respondents (excluded from the main sample) confirmed instrument clarity and preliminary reliability. The internal consistency of the final scales all exceeded the recommended threshold ($\alpha > .70$).

Data Analysis

Data were analyzed using LISREL 9.10, following a two-stage psychometric and structural validation process:

1. Preliminary Analysis: Descriptive statistics (frequency, mean, SD) were computed. Normality was confirmed via skewness (± 3) and kurtosis (± 7) thresholds.
2. Measurement Model Validation (CFA): A CFA assessed construct validity, composite reliability (CR), and average variance extracted (AVE). All constructs demonstrated acceptable psychometric properties (CR > 0.70, AVE > 0.50), supporting both convergent validity and discriminant validity.
3. Structural Model Testing (SEM): The hypothesized paths among MC, SQ, and PI were examined to test direct and indirect relationships.

Model adequacy was evaluated using multiple fit indices, with thresholds indicating excellent fit (Schumacker & Lomax, 2016):

- $\chi^2/df \leq 2.00$ (Byrne, 2013).
- RMSEA ≤ 0.05 (Doğan, 2022).

- CFI ≥ 0.95 (Byrne, 2013).
- GFI ≥ 0.90 (Schumacker & Lomax, 2016)
- AGFI ≥ 0.90 (Schumacker & Lomax, 2016)
- RMR ≤ 0.05 (Doğan, 2022).

The combination of CFA and SEM allowed for both psychometric verification of latent constructs and testing of the proposed psychological mechanisms linking external persuasion (MC), perceived reliability (SQ), and behavioral intention (PI).

RESULTS

Descriptive Statistics of the Sample

Data were collected from 260 respondents who had expressed interest in sustainable housing in Thailand. The demographic profile of the sample is summarized in Table 2. The sample was relatively evenly distributed between genders, though a majority were female (52.69%). Most respondents were aged between 21 and 40 years old (37.69%), held a bachelor's degree (48.07%), and were married (35.38%). Furthermore, nearly half had an average monthly income of 40,001–60,000 Baht (47.69%) and worked as employees of private companies (36.92%). Most respondents currently live in a single-detached house (46.15%) that is used by them and/or their family (81.53%), and they also live with their family (82.30%).

TABLE 2 Demographic characteristics of the sample ($n = 260$)

Characteristic	Category	n	%
Gender	Male	123	47.30%
	Female	137	52.69%
Age	21-40 years	98	37.69%
	Other (18-20, 41-75+)	162	62.31%
Marital Status	Married	92	35.38%
	Single/Other	168	64.62%
Education	Bachelor's Degree	125	48.07%
	Other (Below/Above Bachelor's)	135	51.93%
Monthly Income (THB)	40,001 ₮–60,000 ₮ \approx \$1100–\$1667	124	47.69%
	Other (<40,001 (≈\$1100) >60,000 ₮ (≈\$1667)	136	52.31%
Occupation	Private Company Employee	96	36.92%
	Other (Gov't, Business Owner, etc.)	164	63.08%

Descriptive Statistics and Normality of Variables

The means (M) and standard deviations (SD) for all observed variables were calculated (Table 3), with all latent constructs receiving high mean scores, ranging from 4.04 to 4.21 on the 5-point scale used. This indicates that respondents generally held positive perceptions of MC and SQ, and had strong PI. The data were tested for normality, with skewness values ranging from -0.442 to -0.127 and kurtosis values from -2.564 to -1.118. These values fall within the acceptable ranges for SEM (skewness ± 3 ; kurtosis ± 7), confirming that the data followed a normal distribution (Binheem et al., 2021).

TABLE 3 Descriptive statistics of the observed variables

Latent & Observed Variables	Mean	SD
Purchase Intention (PI)		
PI1: Purchase Satisfaction	4.19	0.80
PI2: Trust	4.21	0.86
PI3: Word-of-Mouth	4.20	0.82
Marketing Communication (MC)		
MC1: Advertising	4.11	0.70
MC2: Sales Promotion	4.04	0.75
MC3: Public Relations	4.07	0.71
MC4: Personal Selling	4.07	0.73
MC5: Direct Marketing	4.11	0.71
Service Quality (SQ)		
SQ1: Tangibles	4.13	0.73
SQ2: Reliability	4.19	0.75
SQ3: Responsiveness	4.09	0.72
SQ4: Assurance	4.04	0.76
SQ5: Empathy	4.14	0.74

Notes. SD = standard deviation

Measurement Model Assessment (CFA)

A CFA was conducted to validate the measurement model. The results demonstrated a good fit for all constructs individually and for the overall measurement model. The factor loadings of all observed variables were statistically significant ($p < 0.01$) and exceeded the recommended value of 0.5, indicating convergent validity. The fit indices for the overall measurement model were excellent: $\chi^2/df = 1.15$, RMSEA = 0.00, RMR = 0.00, CFI = 0.99, GFI = 0.99, AGFI = 0.99, all meeting the thresholds for good model fit.

Structural Model and Hypothesis Testing

The structural model was tested to assess the hypothesized causal relationships among the latent constructs. The model demonstrated an excellent fit to the data ($\chi^2/df = 1.15$, RMSEA = 0.00, CFI = 0.99, GFI = 0.99), indicating that the proposed structural relationships adequately represent the observed data.

The results of the hypothesized causal relationships among MC, SQ, and PI were as follows:

- The direct path from MC to PI (H1) is significant ($\beta = 0.57$, $p < 0.01$), indicating that effective MC positively influences consumers' PI of Thai sustainable housing projects.
- The direct relationship between SQ and PI (H2) is also significant ($\beta = 0.44$, $p < 0.01$), suggesting that higher perceived SQ directly enhances PI.
- The indirect effect of MC on PI through SQ (H3) is significant ($\beta = 0.28$, $p < 0.01$), confirming that SQ mediates this relationship.

These results collectively demonstrate that both MC and SQ are crucial determinants of consumers' PI, with SQ serving as a partial mediator that strengthens the influence of MC on behavioral intention.

Table 4 illustrates the structural relationships and the explanatory power (R^2) of the model. The R^2 values reveal that the exogenous variables collectively explain 60% of the variance in service quality and 74% of the variance in purchase intention, indicating a high level of predictive accuracy for the model.

MC \rightarrow SQ ($\beta = 0.65$, $p < 0.01$): Marketing communication exerts a strong and positive direct influence on perceived service quality. This suggests that transparent, credible, and sustainability-oriented communication strategies significantly enhance consumers' evaluation of service quality in the housing sector.

SQ \rightarrow PI ($\beta = 0.44$, $p < 0.01$): Service quality directly and positively influences purchase intention, underscoring that consumers' satisfaction with quality aspects—such as trust, responsiveness, and eco-friendly features—encourages their intention to purchase.

MC \rightarrow PI (Direct $\beta = 0.57$, Indirect $\beta = 0.28$, Total $\beta = 0.85$, $p < 0.01$):

Marketing communication not only has a strong direct effect on PI but also has an additional indirect effect through SQ. This combined influence (TE = 0.85) highlights the pivotal role of MC as a key driver of consumers' behavioral intentions toward Thai sustainable housing projects.

In summary, the results confirm that MC and SQ both exert significant positive influences on consumers' PI, with SQ acting as a mediating variable. The model demonstrates robust explanatory power, affirming its suitability for understanding consumer behavior in the context of sustainable housing in Thailand.

TABLE 4 Direct, Indirect, and Total Effects in the SEM

Endogenous Variable	R^2	Effect Type	SQ (Predictor)	MC (Predictor)
SQ	0.60	DE	-	0.65**
		IE	-	-
		TE	-	0.65*
PI	0.74	DE	0.44**	0.57**
		IE	-	0.28**
		TE	0.44**	0.85**
SQ	0.60	DE	-	0.65**

Notes. ** $p < .01$, DE = Direct Effect, IE = Indirect Effect, TE = Total Effect. A dash (–) indicates that no path was hypothesized.

The results show that:

- **H1** is supported: MC has a significant positive DE on PI ($\beta = 0.57$, $p < 0.01$).
- **H2** is supported: SQ has a significant positive DE on PI ($\beta = 0.44$, $p < 0.01$).
- **H3** is supported: SQ partially mediates the relationship between MC and PI, as evidenced by the significant indirect effect ($\beta = 0.28$, $p < 0.01$).

The model explains a substantial portion of the variance in both SQ ($R^2 = 0.60$) and PI ($R^2 = 0.74$).

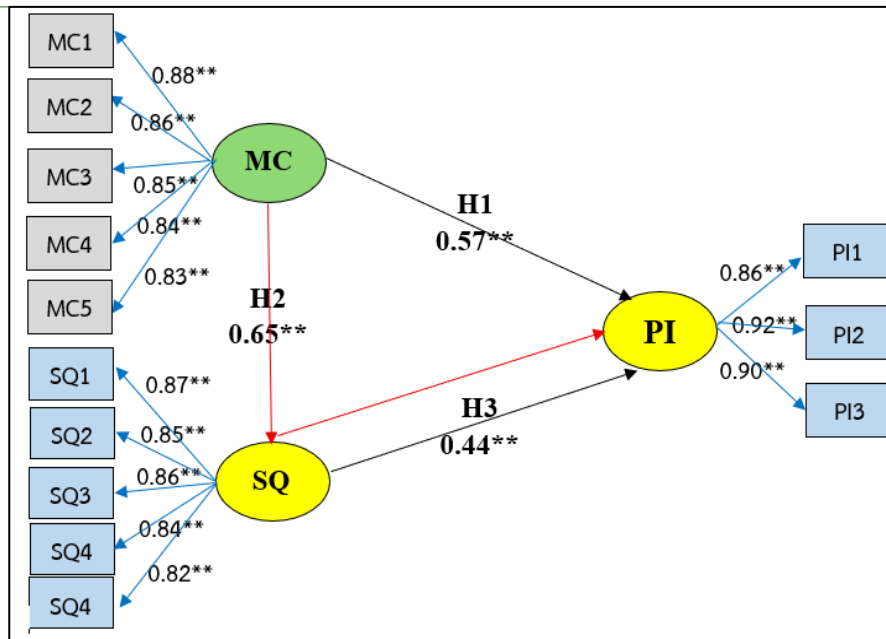


FIGURE 1 The final SEM with standardized path coefficients. $**p < 0.01$

5. DISCUSSION

This study constructed and validated an SEM for examining the impact of marketing communication and service quality on the purchase intention of sustainable eco-friendly housing in Thailand. The results provide strong evidence in support of the hypothesized model, with significant direct and indirect effects offering valuable implications for both theory and practice.

Interpretation of Key Findings

The findings indicate that marketing communication (MC) and service quality (SQ) are crucial antecedents of purchase intention (PI) in Thailand's sustainable housing market. The significant direct effect of MC ($\beta = 0.57$) highlights its importance as a primary driver of consumer intention. In a market where the benefits of sustainable features are often intangible or long-term, effective communication is crucial for educating consumers, raising awareness, and crafting a message that resonates with their needs (Kotler, 2017; Mocanu & Szakal, 2023). This also aligns with the Hierarchy of Effects Model, which suggests that sequential communication stages, from awareness to conviction, result in PI (Chakravarty & Sarma, 2022).

Additionally, the strong direct effect of SQ ($\beta = 0.44$) indicates that even for environmentally conscious consumers, having pragmatic trust in the developer is imperative. Housing purchase is a high-involvement purchase that is associated with significant financial risk. High service quality – in the form of reliability in delivering the project, assurance from knowledgeable staff, and responsiveness to client needs – is a strong signal of the developer's competence and trustworthiness, which lowers the perceived risk in a high-involvement purchase such as housing (Parasuraman et al., 1988; Zeithaml et al., 2017). This lowers the perceived risk and provides the confidence necessary for consumers to commit, effectively acting as a facilitator in the decision-making process.

The Mediating Role of Service Quality

A key finding from this study is the important mediating role of service quality in the relationship between marketing communication and purchase intention. The results indicate that MC has a substantial indirect impact on PI ($\beta = 0.28$) through SQ. This demonstrates a sequential relationship, whereby consumer expectations are set, and initial perceptions are shaped by marketing communication; however, it is the experience of service quality that validates and reinforces these messages.

This mediation effect can be interpreted in terms of the trust-building mechanism: marketing communication builds the promised trust, and service quality builds the experienced trust. However, in the experience of direct encounter with the sale staff, information transparency, as well as professional service encounter characteristic of good SQ, "experience-based trust" (Fazal-e-Hasan et al., 2018) is reinforced by the confidence in professional, ethical, and beneficial agent, i.e., when the experience of SQ is consistent with or better than the promise of MC, the developer's credibility is powerfully boosted, and thus solidly strengthened the intention to purchase. We have shown that MC and SQ are not independent parallel drivers; they are intrinsically related in the supply chain of trust-building that leads to purchase intention.

Theoretical and Practical Implications

Theoretical Implications: The present research contributes to the knowledge by empirically confirming an integrated research model in a new setting: Thailand's emerging eco-housing market. We have shown that simple additive forces do not drive purchase intention, but by the powerful cross-action between communication that builds desire and service quality that injects assuredness and boosts the confidence to act. Our verification of the mediation of service quality thus provides a richer insight into the mechanism of the decision process for sustainable housing than past models of simple direct effect.

Practical Implications: For developers and marketers in Thailand, the findings offer a clear strategic roadmap:

1. Prioritize integrated marketing communication that conveys both environmental and financial value, emphasizing credibility through transparent green certifications. Transparency about green features and certifications is key to building credibility. Prioritize integrated marketing communication that conveys both environmental and financial value, emphasizing credibility through transparent green certifications. Transparency about green features and certifications is key to building credibility.

2. Operationalize Service Excellence: Superior SQ is not a support function, but a core competitive advantage. Invest in training salespeople and customer-facing representatives to be knowledgeable, responsive, and empathetic. Ensuring that project delivery aligns with marketing promises is crucial for establishing long-term trust and credibility.

3. Mediation pathway: Realize that marketing is most powerful when it is integrated with the service experience, ensuring the quality of interaction at all touchpoints from the first advertisement to the final sales meeting is consistent and strengthens the message.

4. Conclusion: The study identified and tested the primary factors that influence sustainable housing purchase intention in Thailand. The outcome showed that both MC and SQ are essential, while SQ is also an important factor as a mediating variable. Developers need to employ a two-pronged strategy, comprising both compelling and educational marketing, alongside unwavering service quality, to foster trust and, in turn, a willingness to make a purchase.

This finding confirms the evidence from previous research that a marketing communication mix leads consumers towards green consumption via credibility signalling (Perumandla & Bhattacharyya, 2024; Mocanu & Szakal, 2023). Besides, the mediating effect of service quality lends support to the results of Fazal-e-Hasan et al. (2018) and Van Nguyen and Le (2026), who found service encounters to be the mediator that converts marketing communication into behavioral trust.

CONCLUSION

Summary of the Study

This research aspired to achieve two main objectives: 1) to develop and verify a structural equation model of marketing communication, service quality, and purchase intention of sustainable housing in Thailand; and 2) to study the direct, indirect, and total effects between marketing communication, service quality, and purchase intention of sustainable housing in Thailand. In achieving these two objectives, the study found that the model was stable and displayed an excellent fit with the empirical data. Additionally, the analysis confirmed that both marketing communication and service quality had significant direct effects on purchase intention. In contrast, marketing communication also had a significant indirect effect on purchase intention through service quality. Overall, the model explained 74% of the variance in purchase intention.

Limitations and Future Research

The limitations of this study indicate areas for future research. Firstly, the contribution of marketing communication, service quality, and purchase intention in explaining the variance was high, suggesting that some additional influencing factors were not included in this study. Further study could address additional variables to build a more comprehensive model. Such additional factors include environmental awareness, business innovation, marketing mix strategies, and customer expectations.

Secondly, the data were collected from potential buyers only in the Bangkok area. To enhance the generalizability of the study results, future studies could broaden the geographical scope to other major provinces or regional areas in Thailand, as differences in market dynamics and consumer preferences are expected.

Third, this research employed a cross-sectional design, examining a specific moment in time. Longitudinal research that tracks changes in perception and intention from when the customer begins to consider options to the time they make a purchase decision will generate additional insights regarding the causal relationships and the development process of decision-making.

Finally, future studies could consider a multi-level analysis, whereby factors could be explored from both the corporate management level (e.g., business strategy, sustainability policies) and the employee level (e.g., service mindset, training). This will help provide more comprehensive insights into the organisational factors that enhance effective marketing communication and service quality delivery in the sustainable housing industry.

In conclusion, this study presents a validated framework for understanding the antecedents of intention to purchase, given the increasing trend in the sustainable housing market. The results highlight the importance of an integrated approach that combines marketing communication and service quality in developing consumer trust and encouraging intention to purchase in Thailand's sustainable housing market.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

DATA SHARING AGREEMENT

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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ETHICS APPROVAL

An ethics exemption was granted by the Kasetsart University Research Ethics Committee (KUREC) (Exemption Certificate No. KUREC-KPS68/109, dated August 18, 2025), which was issued to ensure compliance with international publication standards. All participants provided informed consent before data collection, either by signing a written ICF for interviews or by confirming consent via a "Yes/No" choice in the Google Forms survey. No personally identifying data was collected, and participants could withdraw without penalty. The study's ICF is available for review upon reasonable request.

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