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Trust-Based Marketing Model in Promoting the Adoption of Sustainable Agricultural Products in Indonesia

Sukanta¹, Ade Suhara², Andriasan Sudarso³, Nunung Ayu Sofiati⁴, Maretta Ginting⁵

¹Universitas Singaperbangsa Karawang, sukanta@staff.unsika.ac.id

²Universitas Buana Perjuangan Karawang, ade.suhara@ubpkarawang.ac.id

³Universitas IBBI Medan, andriasans@gmail.com

⁴Universitas Indonesia Membangun, nunungayu.sofiati@inaba.ac.id

⁵Universitas Sari Mutiara Indonesia, gintingmaretta11@gmail.com

Corresponding Author: sukanta@staff.unsika.ac.id

Abstract: This study develops and tests a trust-based marketing model to promote the adoption of sustainable agricultural products, specifically hydroponic vegetables, in modern markets in Karawang, West Java, Indonesia. The increasing demand for healthy and environmentally friendly food has not necessarily translated into widespread consumer adoption. Previous research suggests that consumer trust may play an important role in purchasing decisions involving sustainable products. This study employed a quantitative approach using structural equation modeling (SEM). Primary data were collected from 250 consumers who purchased hydroponic vegetables in modern markets in Karawang during January to February 2026 using systematic random sampling based on purchasing time intervals. The respondents consisted of 50 male and 200 female consumers, reflecting the dominant role of women in household food purchasing decisions. The proposed model examines the influence of perceived product quality, perceived environmental value, and marketing communication on consumer trust, and subsequently on purchase intention and adoption behavior. The results indicate that perceived quality and environmental value significantly influence trust, while marketing communication plays a crucial role in strengthening trust formation. Consumer trust showed positive and statistically significant relationships with purchase intention and the measured adoption construct. However, further statistical comparisons are required to establish whether trust has a significantly greater influence than other predictors. These findings are consistent with recent empirical studies emphasizing trust as a central determinant in sustainable product adoption. This study contributes to the literature by proposing an integrated trust-based marketing model in the context of sustainable agriculture in emerging markets. Practically, the findings suggest that marketers and producers should focus on building consumer trust through transparency, quality assurance, and credible communication strategies to accelerate the adoption of hydroponic products in Indonesia.

Keywords: Trust-Based Marketing, Sustainable Agriculture, Hydroponic Vegetables, Consumer Trust, Purchase Intention, SEM

INTRODUCTION

The transition toward sustainable agriculture has become a global priority, driven by environmental concerns, food safety issues, and increasing consumer awareness of health and sustainability. In Indonesia, the demand for environmentally friendly agricultural products has grown significantly, particularly in urban and peri-urban areas. Hydroponic vegetables, which are cultivated without soil and with controlled nutrient systems, are increasingly recognized as a sustainable alternative due to their efficiency in water use, reduced pesticide dependency, and consistent quality. Recent studies by Yadav et al. (2023), Nguyen et al. (2021), and Lim et al. (2022) emphasize that sustainable food consumption is no longer a niche behavior but is becoming part of mainstream consumer trends, especially among middle-class urban populations.

Despite this growing awareness, the adoption rate of sustainable agricultural products, including hydroponic vegetables, remains relatively limited. This paradox between awareness and actual purchasing behavior has been widely discussed in recent literature as the “attitude–behavior gap” (Joshi and Rahman, 2021; Prakash et al., 2023). One of the most critical factors underlying this gap is consumer trust. Trust plays a central role in reducing perceived risk and uncertainty, particularly for products that involve credence attributes such as sustainability, organic quality, and environmental benefits, which cannot be directly verified by consumers at the point of purchase (Chen and Chang, 2022; Wang et al., 2021).

In the context of Karawang, West Java, the presence of modern markets has facilitated access to hydroponic vegetables for consumers. However, purchasing decisions in this category are still strongly influenced by trust-related factors, including perceptions of product quality, environmental value, and the credibility of marketing communication. Consumers often question whether hydroponic products truly deliver the promised benefits, whether they are safer and healthier than conventional vegetables, and whether the price premium is justified. These concerns highlight the importance of developing a trust-based marketing approach that can effectively bridge the gap between consumer awareness and actual adoption behavior.

Recent studies indicate that perceived product quality is one of the most important determinants of trust in food products. High-quality attributes such as freshness, cleanliness, and consistency can enhance consumer confidence and reduce perceived risk (Suki et al., 2022; Rahman et al., 2024). Similarly, perceived environmental value, which reflects the extent to which consumers believe that a product contributes to environmental sustainability, has been shown to positively influence trust and purchase decisions (Nguyen et al., 2021; Prakash et al., 2023). In addition, marketing communication plays a crucial role in shaping consumer perceptions and trust. Transparent, informative, and credible communication strategies can strengthen consumer confidence and increase the likelihood of adoption (Lim et al., 2022; Chen and Chang, 2022).

Furthermore, trust has been consistently identified as a key mediator in consumer behavior models, particularly in the context of sustainable products. Trust not only influences purchase intention but also determines actual adoption behavior, as consumers are more likely to purchase and repeatedly buy products they trust (Wang et al., 2021; Yadav et al., 2023). This indicates that trust serves as a critical mechanism through which marketing and product-related factors translate into behavioral outcomes.

Previous studies have examined consumer trust, perceived quality, environmental value, and purchase intention in sustainable consumption. However, further empirical investigation is needed to understand how these factors operate together in the context of hydroponic vegetable purchasing in Indonesia. This study examines their relationships within an integrated structural model involving consumer trust, purchase intention, and self-reported adoption behavior. This study addresses this gap by proposing a comprehensive trust-based marketing model that links these variables within a single framework.

Based on the theoretical and empirical background discussed above, the following hypotheses are proposed:

- H1 Perceived product quality has a positive and significant effect on consumer trust
- H2 Perceived environmental value has a positive and significant effect on consumer trust
- H3 Marketing communication has a positive and significant effect on consumer trust
- H4 Consumer trust has a positive and significant effect on purchase intention
- H5 Purchase intention has a positive and significant effect on adoption behavior
- H6 Consumer trust has a positive and significant effect on adoption behavior

This study aims to develop and empirically test a trust-based marketing model to explain the adoption of hydroponic vegetables in modern markets in Karawang. The findings are expected to contribute to both theoretical development in sustainable marketing and practical strategies for increasing the adoption of environmentally friendly agricultural products in Indonesia.

METHOD

Research Design

This study employed a quantitative, cross-sectional explanatory design to examine the hypothesized relationships among perceived product quality, perceived environmental value, marketing communication, consumer trust, purchase intention, and self-reported adoption behavior. Structural equation modeling (SEM) was used to estimate the relationships among the latent constructs and assess the proposed structural model. Recent methodological guidelines indicate that SEM is appropriate for consumer behavior research involving complex models and latent variables (Hair et al., 2021; Kline, 2021; Sarstedt et al., 2022).

Research Setting

The research was conducted in modern markets located in Karawang, West Java, Indonesia. These retail environments were selected because they are key distribution channels for hydroponic vegetables and attract consumers with higher awareness of health and environmental issues. Modern markets in urbanizing regions such as Karawang have been identified as strategic points for the diffusion of sustainable agricultural products (Rahman et al., 2024; Suki et al., 2022).

Population and Sample

The target population comprised consumers purchasing hydroponic vegetables in modern markets in Karawang. The study included 250 respondents. The adequacy of this sample size should be evaluated according to the estimation method, model complexity, number of estimated parameters, and statistical power requirements rather than a universal minimum sample size estimation (Hair et al., 2021; Kline, 2021).

Respondents were recruited at modern markets in Karawang during January and February 2026 using a time-based sampling procedure. To establish whether this procedure qualifies as systematic random sampling, the study must specify the sampling interval, random starting point, selection of survey locations and periods, and procedures for handling refusals. Without these details, sample representativeness cannot be established (Malhotra et al., 2022). The demographic composition of the sample includes 50 male respondents and 200 female respondents. This distribution reflects the dominant role of women in household food purchasing decisions, consistent with recent findings in consumer behavior research (Suki et al., 2022; Rahman et al., 2024).

Data Collection Procedure

Primary data were collected through structured questionnaires administered directly to consumers after purchasing hydroponic vegetables. The instrument uses a five-point Likert scale ranging from strongly disagree to strongly agree. Survey-based data collection is widely recognized as effective for capturing perceptions, attitudes, and behavioral intentions in marketing research (Malhotra et al., 2022; Sekaran and Bougie, 2021).

Measurement of Variables

All constructs in this study are measured using reflective indicators adapted from recent literature on sustainable consumption and trust-based marketing. The measurement items are designed to capture consumer perceptions and behavioral tendencies in the context of hydroponic vegetable consumption.

Table 1. Measurement of Variables and Indicators

Variable	Indicators
Perceived Product Quality	Freshness of vegetables
	Cleanliness and hygiene
	Nutritional value
	Consistency of quality
Perceived Environmental Value	Environmentally friendly production
	Reduced pesticide usage
	Water efficiency
	Contribution to sustainability
Marketing Communication	Clarity of product information
	Credibility of information
	Transparency of production process
	Promotional effectiveness
Consumer Trust	Confidence in product safety
	Trust in product claims
	Reliability of product quality
	Trust in seller or brand
Purchase Intention	Willingness to buy
	Likelihood of repeat purchase
	Preference over conventional vegetables
Adoption Behavior	Actual purchase frequency
	Routine consumption behavior
	Long term usage commitment

The indicators are adapted from recent studies on sustainable marketing and consumer trust, ensuring content validity and contextual relevance (Chen and Chang, 2022; Nguyen et al., 2021; Lim et al., 2022; Prakash et al., 2023).

Data Analysis Technique

Data analysis is conducted using Structural Equation Modeling with LISREL. The analysis is performed in several stages.

The first stage involves evaluation of the measurement model. Convergent validity is assessed through factor loadings greater than 0.50, while reliability is evaluated using composite reliability values above 0.70 and average variance extracted values above 0.50. These thresholds are widely accepted in SEM studies (Hair et al., 2021; Sarstedt et al., 2022).

The second stage involves evaluation of the structural model to test the hypothesized relationships among variables. The significance of relationships is determined using t values, where values greater than 1.96 indicate statistical significance at the 5 percent level (Kline, 2021).

The third stage involves assessment of model fit using several goodness of fit indices. The model is considered acceptable if the Root Mean Square Error of Approximation is below 0.08 and Comparative Fit Index and Goodness of Fit Index values exceed 0.90 (Hair et al., 2021; Sarstedt et al., 2022).

Research Model

The proposed model positions consumer trust as a central mediating variable linking marketing-related factors to behavioral outcomes. Perceived product quality, perceived environmental value, and marketing communication are hypothesized to influence consumer trust. Consumer trust subsequently affects purchase intention, which leads to adoption behavior. In addition, trust is hypothesized to have a direct effect on adoption behavior.

This model reflects a trust-based marketing perspective, where trust serves as the key mechanism that transforms consumer perceptions into actual purchasing and adoption behavior in the context of sustainable agricultural products.

RESULTS AND DISCUSSION

Descriptive Statistics

The study involved 250 respondents who purchased hydroponic vegetables in modern markets in Karawang during January to February 2026. The gender distribution shows that 50 respondents are male and 200 are female, indicating that purchasing decisions for fresh vegetables are predominantly made by women. This pattern aligns with recent findings that women play a dominant role in household food purchasing behavior (Rahman et al., 2024; Suki et al., 2022).

Table 2. Respondent Profile

Category	Frequency	Percentage
Male	50	20%
Female	200	80%
Total	250	100%

Descriptive Analysis of Variables

Table 3. Descriptive Statistics of Variables

Variable	Mean	Standard Deviation	Category
Perceived Product Quality	4.32	0.52	Very High
Perceived Environmental Value	4.25	0.55	Very High
Marketing Communication	3.85	0.63	High
Consumer Trust	4.20	0.50	Very High
Purchase Intention	4.18	0.54	Very High
Adoption Behavior	4.05	0.58	High

The descriptive results indicate that perceived product quality has the highest mean score, suggesting that consumers strongly recognize the superior quality of hydroponic vegetables. Marketing communication has the lowest mean, indicating that promotional strategies and information delivery still need improvement.

Measurement Model Evaluation

The measurement model was assessed using standardized factor loadings, composite reliability, and average variance extracted (AVE). The reported results suggest that the constructs met the selected reliability and convergent validity criteria. However, the complete measurement results, including construct-specific values and evidence of discriminant validity, should be presented to enable independent evaluation (Hair et al., 2021; Sarstedt et al., 2022).

Structural Model Results

Table 4. Hypothesis Testing Results

Hypothesis	Relationship	Coefficient	t-value	Result
H1	Product Quality → Trust	0.52	6.85	Supported
H2	Environmental Value → Trust	0.48	6.12	Supported
H3	Marketing Communication → Trust	0.36	4.95	Supported
H4	Trust → Purchase Intention	0.71	9.10	Supported
H5	Purchase Intention → Adoption Behavior	0.65	8.45	Supported
H6	Trust → Adoption Behavior	0.58	7.30	Supported

Model Fit Evaluation

Table 5. Goodness of Fit

Fit Index	Cut-off Value	Result	Interpretation
RMSEA	≤ 0.08	0.062	Good Fit
CFI	≥ 0.90	0.95	Good Fit
GFI	≥ 0.90	0.92	Good Fit

The reported fit indices met the selected thresholds (RMSEA = 0.062, CFI = 0.95, and GFI = 0.92), indicating an acceptable level of model fit according to these criteria. Nevertheless, satisfactory model fit alone does not establish the theoretical validity of the proposed relationships or confirm the model's explanatory superiority over alternative specifications.

Discussion

The results confirm that perceived product quality has a positive and significant effect on consumer trust. This finding indicates that consumers tend to trust hydroponic vegetables when they perceive them as fresh, clean, and consistent in quality. High product quality reduces uncertainty and perceived risk, which are critical factors in food purchasing decisions. This result is consistent with recent studies showing that perceived quality plays a central role in building consumer trust in sustainable food products (Nguyen et al., 2021; Chen and Chang, 2022; Lim et al., 2022; Prakash et al., 2023; Rahman et al., 2024). Consumers are more likely to trust products that demonstrate tangible quality attributes, particularly in categories such as fresh vegetables where safety and hygiene are major concerns.

Perceived environmental value is also found to have a significant effect on trust. This suggests that consumers who recognize the environmental benefits of hydroponic farming, such as reduced pesticide use and efficient water consumption, are more likely to trust these products. Environmental value enhances the perceived credibility of the product and aligns with consumers' pro-environmental attitudes. This finding is supported by recent literature indicating that environmental awareness strengthens trust and influences sustainable consumption behavior (Yadav et al., 2023; Nguyen et al., 2021; Wang et al., 2021; Prakash et al., 2023; Suki et al., 2022). Consumers increasingly evaluate products not only based on functional benefits but also on their contribution to sustainability.

Marketing communication is found to have a positive and significant effect on trust, although its influence is weaker compared to other variables. This indicates that communication strategies play an important role in shaping consumer perceptions, but their effectiveness depends on clarity, credibility, and transparency. Consumers need reliable information about production processes, product benefits, and safety to develop trust. This finding aligns with recent studies highlighting the importance of transparent communication in building trust for sustainable products (Chen and Chang, 2022; Lim et al., 2022; Wang et al., 2021; Rahman et al., 2024; Prakash et al., 2023). Ineffective communication may limit consumer understanding and reduce trust formation.

The results also show that consumer trust has a strong and significant effect on purchase intention. This indicates that trust acts as a key driver in converting positive perceptions into behavioral intentions. When consumers trust hydroponic products, they are more willing to purchase them and consider them as a preferred option. This finding is consistent with recent research emphasizing the mediating role of trust in consumer decision-making (Wang et al., 2021; Yadav et al., 2023; Lim et al., 2022; Nguyen et al., 2021; Prakash et al., 2023). Trust reduces uncertainty and increases confidence in the product, thereby enhancing purchase intention.

Purchase intention showed a positive and statistically significant relationship with the self-reported adoption construct. This finding suggests that respondents with stronger purchase intentions also reported higher levels of adoption-related behavior. However, the cross-sectional survey does not independently verify actual purchasing frequency or establish whether purchase intention precedes subsequent adoption. This finding supports the theory of planned behavior, which suggests that intention is the most immediate determinant of behavior. Recent studies also confirm that purchase intention plays a crucial role in the adoption of sustainable products (Yadav et al., 2023; Prakash et al., 2023; Nguyen et al., 2021; Lim et al., 2022; Rahman et al., 2024).

Finally, trust is found to have a direct and significant effect on adoption behavior. This indicates that trust not only influences intention but also directly drives actual behavior. Consumers who strongly trust hydroponic products are more likely to repeatedly purchase and integrate them into their consumption habits. This finding reinforces the central role of trust in sustainable marketing, as highlighted in recent studies (Chen and Chang, 2022; Wang et al., 2021; Suki et al., 2022; Prakash et al., 2023; Lim et al., 2022).

Overall, the results highlight that trust is the most critical variable in promoting the adoption of hydroponic vegetables. While product quality and environmental value are essential in building trust, and marketing communication supports this process, it is trust that ultimately drives both intention and behavior. This confirms that a trust-based marketing approach is essential for increasing the adoption of sustainable agricultural products in Indonesia.

CONCLUSION

This study develops and empirically tests a trust-based marketing model to explain the adoption of hydroponic vegetables as sustainable agricultural products in modern markets in Karawang, West Java. The results provide several important conclusions.

First, perceived product quality, perceived environmental value, and marketing communication are proven to have positive and significant effects on consumer trust. Among these variables, perceived product quality is the strongest determinant, indicating that tangible attributes such as freshness, cleanliness, and consistency are the primary drivers of trust formation. Perceived environmental value also plays an important role, showing that consumers increasingly consider sustainability aspects in evaluating products. Marketing communication contributes to trust building, although its effect is relatively weaker, suggesting

that current communication strategies are not yet fully effective in conveying product value and credibility.

Second, consumer trust has a strong and significant influence on purchase intention. This finding confirms that trust is a key mechanism in transforming consumer perceptions into behavioral intentions. Consumers who trust hydroponic vegetables are more likely to express willingness to purchase and prefer them over conventional alternative.

Third, purchase intention significantly affects adoption behavior, indicating that intention is a reliable predictor of actual consumption. Consumers with high purchase intention tend to repeatedly buy and integrate hydroponic vegetables into their daily consumption patterns.

Fourth, consumer trust also has a direct and significant effect on adoption behavior. This highlights the dual role of trust, not only as a mediator but also as a direct driver of behavior. Trust reduces uncertainty and strengthens commitment, leading to consistent purchasing behavior.

Overall, the findings identify consumer trust as an important construct associated with purchase intention and self-reported adoption behavior among the surveyed consumers. Perceived product quality, perceived environmental value, and marketing communication were positively associated with trust. These findings suggest that product information, quality assurance, and credible communication deserve consideration in marketing hydroponic vegetables, although the effectiveness of specific interventions requires further evaluation.

From a practical perspective, producers and marketers of hydroponic vegetables in Karawang should focus on maintaining consistent product quality, clearly communicating environmental benefits, and providing transparent information about production processes. In addition, efforts to educate consumers and build long-term relationships are necessary to strengthen trust and accelerate adoption.

This study contributes to the development of sustainable marketing literature by proposing an integrated trust-based model that links perception, trust, intention, and behavior. The model provides a comprehensive understanding of how trust functions as the central mechanism in encouraging the adoption of sustainable products in emerging markets such as Indonesia.

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