Research on World Agricultural Economy
https://journals.nasspublishing.com/index.php/rwae

ARTICLE

Key Drivers of Eco-Friendly Agricultural Product Purchase Intentions: A Case Study in South Korea

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ABSTRACT

The increasing demand for environmentally friendly agricultural products reflects a global shift toward sustainable consumption. This study examines the key determinants influencing consumer behavioral intentions to purchase eco-friendly agricultural products, utilizing the Theory of Planned Behavior (TPB) as a conceptual framework. The study focuses on the effects of personal attitudes (ATT), subjective norms (SN), and perceived behavioral control (PBC) on behavioral intention (BI). Additionally, this research incorporates sustainability-related factors, including consumer knowledge, trust in eco-labels, and health consciousness, to enhance the understanding of sustainable purchasing behavior. A structured survey was conducted among 200 consumers in the Seoul metropolitan area, and the data were analyzed. The findings reveal that personal attitudes ($\beta = 0.504$, $p < 0.001$) and perceived behavioral control ($\beta = 0.670$, $p < 0.001$) were found to be a significant determinant behavioral intention, indicating that consumers with a positive attitude toward eco-friendly products and those who perceive greater ease in purchasing them are more likely to act on their intentions. Subjective Norms (SN) demonstrated a weaker influence on purchasing intention ($\beta = 0.413$, $p < 0.01$), suggesting that individual decision-making plays a more prominent role than social pressure. The study highlights the importance of making eco-friendly agricultural products more

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ARTICLE INFO
Received: 28 February 2025 | Revised: 14 March 2025 | Accepted: 26 May 2025 | Published Online: 1 July 2025
DOI: https://doi.org/10.36956/rwae.v6i3.1795

CITATION
Lee, S., Jeong, G., 2025. Key Drivers of Eco-Friendly Agricultural Product Purchase Intentions: A Case Study in South Korea. Research on World Agricultural Economy. 6(3): 97–111. DOI: https://doi.org/10.36956/rwae.v6i3.1795

accessible, affordable, and credible through policy interventions and marketing strategies. The findings might contribute to identify strategies that can encourage sustainable consumer choices and support policy development in the eco-friendly agricultural sector.

Keywords: Personal Attitude; Perceived Behavioral Control; Environmentally Friendly Agricultural Products

1. Introduction

"Would you pay more for food that protects your future?" "Can your grocery choices slow down climate change?" These questions are becoming increasingly relevant as the global community faces pressing environmental challenges. The accelerating depletion of natural resources and the mounting generation of waste due to economic growth have brought unprecedented attention to the need for sustainable consumption and production [1]. Recognizing this urgency, the United Nations (UN) launched the 2030 Agenda for Sustainable Development in 2015, introducing 17 Sustainable Development Goals (SDGs), among which SDG 12—"Responsible Consumption and Production"—stands out as a key directive to balance economic progress with environmental responsibility [2].

In this global transition, environmentally friendly agricultural products have emerged as a vital lever for promoting sustainable agriculture [3]. These products, produced using minimal chemical inputs and eco-conscious practices, address not only environmental sustainability but also public health, food safety, and ethical production values [4]. In South Korea, consumer awareness surrounding food safety and environmental issues has grown significantly in recent years [5]. Eco-friendly agricultural products are categorized based on sustainability standards, farming practices, and certification systems, reflecting their role in environmental conservation, food safety, and ethical sourcing [6]. Unlike certified organic products, which adhere to strict domestic and international regulations, eco-friendly agricultural products encompass a broader range of sustainable farming methods, including pesticide-free, carbon-neutral, and fair-trade agriculture [7]. While organic-certified products remain a premium segment, these alternative sustainable practices are gaining wider recognition among consumers [8]. Despite the increasing demand for sustainable food options, challenges such as price competitiveness, consumer trust, and accessibility persist [9]. Expanding sustainable food consumption in South Korea requires collaborative efforts from policymakers, businesses, and advocacy groups to improve affordability and transparency in eco-friendly labeling [10].

The market for environmentally friendly agricultural products in South Korea has experienced significant growth, reflecting a shift in consumer preferences. In 2018, the market was valued at approximately 1.4 trillion KRW, with projections estimating it will reach 2.14 trillion KRW by 2025, representing a compound annual growth rate (CAGR) of 6.2% [11]. Other estimates suggest that the market reached 2.22 trillion KRW in 2020 and is expected to grow to 2.63 trillion KRW by 2025, with a CAGR of 3.4% [12].

This growth aligns with global trends, as leading markets such as the United States and China collectively account for over 60% of global organic food sales [13]. These figures illustrate the transition of eco-friendly agricultural products from a niche segment to mainstream consumer preferences, driven by health consciousness, environmental awareness, and supportive government policies promoting sustainability [14]. However, the actual purchase rate remains limited when compared to consumer interest, suggesting a notable intention-behavior gap [15]. This gap highlights the need to better understand the psychological, social, and contextual factors that drive or hinder sustainable consumption behavior [16]. Although consumers may express positive attitudes toward eco-friendly products, a multitude of barriers—including perceived high prices, lack of trust in certification systems, limited availability, or social norms—can inhibit actual purchases [17]. Therefore, to bridge the gap between intention and behavior, a deeper exploration of these underlying mechanisms is essential [18].

The Theory of Planned Behavior (TPB), proposed

by Ajzen (1991), provides a well-established framework for examining consumer decision-making processes [19]. According to the TPB, behavioral intention—the most immediate predictor of actual behavior—is shaped by three key components: attitude (ATT) toward the behavior, subjective norm (SN), and perceived behavioral control (PBC) [20]. Numerous studies have applied TPB to explain sustainable or ethical consumer choices, including organic food purchases, low-carbon travel, and recycling behavior [21]. However, existing literature remains inconclusive on the relative influence of each TPB construct in different cultural or market contexts [22]. In collectivist societies such as South Korea, where social influence tends to play a more dominant role in shaping behavior, subjective norms may be particularly influential [23].

Furthermore, while TPB provides a solid theoretical foundation, extending the model to include mediating and moderating mechanisms can offer more nuanced insights [24]. Previous studies have highlighted the potential of subjective norms and perceived behavioral control to act as mediators in the attitude-intention link, and demographic factors such as age, income, and education have been examined as moderators, though with inconsistent results [25].

This study aims to identify the key determinants of consumers' purchase intentions toward environmentally friendly agricultural products in South Korea by applying and extending the Theory of Planned Behavior (TPB). Specifically, it investigates (1) the direct effects of attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC) on behavioral intention (BI); (2) the mediating roles of SN and PBC in the relationship between ATT and BI; and (3) the moderating effects of demographic variables—including gender, age, income, and education—on the relationship between ATT and BI.

2. Literature Review

To better understand the drivers of sustainable consumption, this study employs the Theory of Planned Behavior (TPB), developed by Ajzen (1991), as its primary theoretical framework [19]. TPB is widely utilized in environmental psychology and consumer behavior research, positing that behavioral intention is determined by three key constructs: attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC) [20]. Attitude refers to an individual's positive or negative evaluation of performing the behavior; subjective norm reflects perceived social pressure to perform or not perform the behavior; and perceived behavioral control indicates the individual's assessment of their ability to carry out the behavior. Together, these constructs predict behavioral intention, which subsequently influences actual behavior.

Extensive empirical studies have validated the TPB model in explaining pro-environmental behaviors, including organic food purchasing, energy conservation, and low-carbon transportation [21, 26]. For example, Yadav and Pathak (2016) demonstrated the model's explanatory power in predicting green purchase intentions among Indian consumers [21], while Hsu et al. (2017) emphasized the dominant role of subjective norms in East Asian cultural contexts such as Taiwan [22]. However, the relative influence of each TPB construct varies across cultural settings. In collectivist societies like South Korea, where community values and social expectations are emphasized, subjective norms often exert a stronger effect on intention formation than personal attitudes [23].

Scholars have proposed extensions to the core TPB model that incorporate mediating and moderating variables to improve its explanatory power. For instance, Carfora et al. (2019) highlighted the mediating role of perceived control in linking attitudes to behavioral intention [23], while Nguyen et al. (2019) identified the mediating role of subjective norms [24]. Demographic variables such as gender, age, education, and income have also been tested as potential moderators, with mixed results across studies. Some research, including work by Aertsens et al. (2009) and Scalco et al. (2017), found demographic differences to significantly shape green consumption behavior [25, 26], while other studies reported non-significant effects, suggesting cultural and contextual variability [27, 28].

Despite the growing body of literature, empirical research specifically focusing on eco-friendly agricultural products—distinct from certified organic food—remains limited [29, 30]. Most studies have examined or-

ganic food markets in general, often within Western contexts, and few have incorporated comprehensive structural models capturing both mediating and moderating effects [31]. Moreover, there is a lack of empirical research that integrates psychological factors with sociodemographic characteristics in the South Korean context, where environmental policies and consumer awareness are evolving [30, 32].

3. Method

An online survey was conducted in 2024, targeting residents of the Seoul Metropolitan Area in South Korea. A total of 200 valid responses were selected excepting no responses. The region was chosen due to its high level of consumer awareness regarding sustainability, strong purchasing power, and access to well-established distribution systems for eco-friendly agricultural products. Seoul, Incheon, and Gyeonggi Province together represent a highly urbanized population with active exposure to environmental policies and incentives, making it an appropriate setting for examining sustainable consumption behavior. Additionally, various government initiatives and policies promoting sustainable consumption, such as incentives for organic food purchases and expanded eco-friendly certification programs, have been actively implemented in this area. The presence of large-scale supermarkets, organic markets, and direct-to-consumer sales platforms further supports the growth of the eco-friendly food market.

To empirically test the proposed hypotheses, data were collected through a structured survey questionnaire. The survey targeted consumers who had prior experience purchasing agricultural products, including eco-friendly agricultural products. Participants were recruited through an online panel provided by a professional survey company to ensure a diverse and representative sample. Before answering the main survey items, participants were informed about the purpose of the study and provided consent to participate voluntarily.

This study employed a survey-based design to investigate the psychological and contextual factors influencing consumers' behavioral intentions toward environmentally friendly agricultural products. The research was grounded in the Theory of Planned Behavior (TPB), including its extended framework incorporating mediation and moderation effects. A structured questionnaire was developed based on established scales for TPB constructs—attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), and behavioral intention (BI). The Theory of Planned Behavior (TPB) is a widely recognized psychological model developed by Ajzen (1991) [19] to explain how individual intentions translate into actual behavior. This theory has been extensively applied in various domains, including consumer decision-making, health behavior, and environmental sustainability. In this study, the TPB framework is used to examine consumer purchasing intentions toward environmentally friendly agricultural products.

The questionnaire included demographic questions (e.g., gender, age, education level, income) and measured the four key TPB constructs using validated items adapted from previous studies. Each construct was assessed using a 5-point Likert scale (1 = Strongly Disagree/Very Bad/Never; 5 = Strongly Agree/Very Good/Always), depending on the item type. ATT was measured through two items assessing consumers' perceptions of the health benefits and environmental contributions of eco-friendly agricultural products. SN was evaluated using three items, capturing the degree to which consumers felt a sense of responsibility in consumption, consideration for future generations, and social support for eco-friendly farming practices. PBC was assessed through three items, examining consumers' financial capability, personal control over purchasing decisions, and access to relevant information about eco-friendly agricultural products. Lastly, BI was measured using three items that explored willingness to purchase, current behavior in checking certification systems, and future intent to verify eco-friendly product certifications before purchasing. The specific items used in the survey are presented in **Table 1**.

The ATT toward environmentally friendly agricultural products was assessed using two items measured on a 5-point semantic differential scale ranging from 1 ("very bad") to 5 ("very good"). Higher scores indicated more favorable evaluations of environmentally friendly agricultural products. The first item (ATT_1) evaluated

participants' perceptions of health benefits, asking respondents to indicate how beneficial they considered these products for health. The second item (ATT_2) measured perceived environmental contribution, with participants rating the extent to which they believed these products positively impacted environmental protection.

The Subjective Norms (SN) Subjective norms were measured using three items on a 5-point Likert scale ranging from 1 (”strongly disagree”) to 5 (”strongly agree”). Higher scores indicated stronger perceived social pressure to engage in environmentally friendly purchasing behaviors. The first item (SN_1) assessed participants' recognition of purchasing environmentally friendly agricultural products as responsible consumption behavior. The second item (SN_2) evaluated the belief that purchasing such products represents a choice made for future generations. The third item (SN_3) measured the perceived importance of support for eco-friendly farms by family members, friends, and other close acquaintances.

The PBC was evaluated through three items, each measured on a 5-point Likert scale ranging from 1 (”strongly disagree”) to 5 (”strongly agree”). Higher scores indicated greater perceived ease and control over purchasing environmentally friendly agricultural products. The first item (PBC_1) assessed participants' financial ability to purchase environmentally friendly agricultural products. The second item (PBC_2) captured the degree of autonomy participants felt regarding their purchasing decisions. The third item (PBC_3) measured whether participants believed they had sufficient information about environmentally friendly agricultural products.

The BI was measured with three items. The first item (BI_1) assessed willingness to purchase environmentally friendly agricultural products on a 5-point Likert scale ranging from 1 (”strongly disagree”) to 5 (”strongly agree”). The first item (BI_1) assessed willingness to purchase environmentally friendly agricultural products on a 5-point Likert scale ranging from 1 (”strongly disagree”) to 5 (”strongly agree”). The second item (BI_2) asked respondents how frequently they check the certification system for such products, using a scale from 1 (”never”) to 5 (”always”). The third item (BI_3) evaluated future intent to verify certification status before making a purchase, also measured on a 5-point scale ranging from 1 (”never”) to 5 (”always”).

Table 1. Survey Items for Key Constructs.

Survey Item	Statement	Scale (1–5)
ATT_1	I believe that environmentally friendly agricultural products are beneficial to health.	Very bad ∼ Very good
ATT_2	I believe that environmentally friendly agricultural products contribute to environmental protection.	Very bad ∼ Very good
SN_1	I recognize that purchasing environmentally friendly agricultural products is a responsible consumption behavior.	Strongly disagree ∼ Strongly agree
SN_2	I believe that purchasing environmentally friendly agricultural products is a choice made for future generations.	Strongly disagree ∼ Strongly agree
SN_3	I think it is important for my family, friends, and acquaintances to support eco-friendly farms.	Strongly disagree ∼ Strongly agree
PBC_1	I have the financial means to purchase environmentally friendly agricultural products.	Strongly disagree ∼ Strongly agree
PBC_2	I can decide entirely on my own whether or not to purchase environmentally friendly agricultural products.	Strongly disagree ∼ Strongly agree
PBC_3	I have sufficient information about environmentally friendly agricultural products.	Strongly disagree ∼ Strongly agree
BI_1	I am willing to purchase environmentally friendly agricultural products.	Strongly disagree ∼ Strongly agree
BI_2	I check the certification system for environmentally friendly agricultural products.	Never ∼ Always
BI_3	I intend to check the certification status of environmentally friendly agricultural products in the future.	Never ∼ Always

Notes: 1 = Very bad/Strongly disagree/Never, 5 = Very good/Strongly agree/Always.

The constructs in this study were measured using established scales adapted from prior research grounded in the Theory of Planned Behavior (TPB), with minor modifications to suit the context of environmentally friendly agricultural products. All variables were measured using a five-point Likert scale ranging from 1

to 5. Based on the Theory of Planned Behavior (TPB) and its extended framework, the following hypotheses were established to explain consumers' behavioral intention toward environmentally friendly agricultural products. The hypotheses developed in this study are grounded in the Theory of Planned Behavior (TPB) and the accumulated evidence from previous empirical research. Attitude, subjective norm, and perceived behavioral control have been consistently identified as direct determinants of behavioral intention across various consumption contexts. Attitude (ATT) was assessed by measuring the participants' overall evaluation of purchasing environmentally friendly agricultural products. Participants responded to statements evaluating whether purchasing eco-friendly agricultural products was beneficial to their health, contributed to environmental protection, and was considered a desirable action. Subjective norm (SN) was measured to capture the perceived social pressure from significant others regarding the purchase of eco-friendly agricultural products. Participants were asked to indicate the extent to which they believed their family and friends expected them to purchase eco-friendly agricultural products, the degree to which important people thought they should buy such products, and the influence of social pressure on their purchasing decisions. Perceived behavioral control (PBC) reflected the participants' perceived ease or difficulty associated with purchasing eco-friendly agricultural products. Measurement items evaluated whether participants felt they had sufficient information to purchase eco-friendly agricultural products, whether the purchase was easy for them, and whether they had the necessary financial resources to make such purchases. Behavioral intention (BI) was assessed by measuring participants' willingness and commitment to purchase environmentally friendly agricultural products. Participants indicated their level of agreement with statements expressing their intention to purchase eco-friendly agricultural products in the future, their effort to do so, and their tendency to choose eco-friendly options whenever possible.

Building upon this foundation, additional pathways among TPB components and the mediating roles of subjective norm and perceived behavioral control were hypothesized. Furthermore, the moderating effects of demographic factors such as gender, age, income, and education were also explored, based on prior suggestions that individual characteristics may influence the strength of attitude-behavior relationships. This study establishes twelve hypotheses(H1–H12) grounded in the extended Theory of Planned Behavior (TPB) framework to identify factors influencing consumers' intentions to purchase environmentally friendly agricultural products. The hypotheses are categorized into direct effects, structural relationships, mediation effects, and moderation effects.

Hypothesis 1 (H1). *Consumers' attitudes toward environmentally friendly agricultural products have a positive effect on their intention to purchase these products. H1 suggests that consumers who hold a positive attitude toward environmentally friendly agricultural products are more likely to intend to purchase them. A favorable attitude indicates that consumers recognize the benefits of such products, such as improved health, environmental sustainability, and ethical production. When consumers perceive these products positively, they develop a stronger motivation to buy them, aligning with the TPB framework, which posits that attitude directly influences behavioral intention.*

Hypothesis 2 (H2). *Subjective norms significantly influence consumers' intentions to purchase environmentally friendly agricultural products. H2 assumes that social expectations and peer influence significantly shape consumers' intentions to engage in sustainable behavior. If people believe that important others (e.g., family, friends, or society) approve of purchasing eco-friendly agricultural products, they are more likely to act accordingly. This aligns with TPB's notion that subjective norm is a social pressure that can directly influence one's behavioral intention.*

Hypothesis 3 (H3). *Perceived behavioral control has a significant effect on consumers' intentions to purchase environmentally friendly agricultural products. H3 is based on the idea that when consumers believe they have the ability, resources, and autonomy to purchase eco-friendly products—such as financial capability or product accessibility—they are more likely to form the intention*

to do so. According to TPB, higher perceived control increases the likelihood of enacting the behavior, especially when behavior is under volitional control.

Hypothesis 4 (H4). *Consumers' attitudes positively influence their subjective norms, such that a favorable attitude toward environmentally friendly agricultural products enhances the influence of subjective norms on purchasing decisions. H4 posits that consumers who hold positive attitudes toward eco-friendly products may also perceive stronger social support or pressure to act in a manner consistent with those attitudes. This reflects a potential interaction where individual evaluations influence their sensitivity to perceived social expectations, particularly in collectivist cultures where social consensus matters.*

Hypothesis 5 (H5). *Consumers' attitudes positively influence their perceived behavioral control, meaning that a positive attitude toward environmentally friendly agricultural products increases consumers' perceived ability to purchase these products. H5 assumes that positive evaluations of eco-friendly products not only foster intention but also enhance consumers' confidence in their capacity to engage in the behavior. For example, those with favorable attitudes may feel more knowledgeable or motivated, which can lead to a higher sense of control or efficacy in purchasing green products.*

Hypothesis 6 (H6). *Subjective norms positively influence consumers' perceived behavioral control, indicating that social expectations contribute to individuals' sense of control over purchasing eco-friendly agricultural products. H6 reflects the notion that when individuals experience strong social encouragement or norms, it may enhance their belief in their own ability to perform the behavior. For example, when peers or media strongly support eco-friendly consumption, individuals may feel more capable and empowered to follow through, even in the face of perceived barriers.*

Hypothesis 7 (H7). *Subjective norms mediate the relationship between consumers' attitudes and their intention to purchase environmentally friendly agricultural products. H7 suggests that a favorable attitude does not directly translate into behavioral intention unless supported by strong social norms. This mediation implies that subjective norms act as a channel through which personal beliefs influence actual intentions—attitudes shape how people perceive social approval, which in turn drives their behavior.*

Hypothesis 8 (H8). *Perceived behavioral control mediates the relationship between consumers' attitudes and their intention to purchase environmentally friendly agricultural products. H8 assumes that the influence of attitude on behavioral intention occurs through the consumer's perceived ability to act. In other words, consumers with a positive attitude may develop a stronger sense of control over purchasing decisions, which then leads to increased intention to buy eco-friendly products.*

Hypothesis 9 (H9). *Gender moderates the relationship between attitude and behavioral intention, such that the strength of this relationship differs between male and female consumers. H9 explores whether the effect of attitude on intention varies by gender. Prior research has suggested that women may be more sensitive to ethical or environmental concerns, potentially strengthening the attitude–intention link for female consumers. This hypothesis tests whether such differences exist in the context of eco-friendly agricultural consumption.*

Hypothesis 10 (H10). *Age moderates the relationship between attitude and behavioral intention, such that the effect varies across different age groups. H10 considers whether younger and older consumers respond differently to their attitudes when forming behavioral intentions. For instance, younger individuals may have stronger intentions when they hold favorable attitudes due to greater environmental engagement, while older consumers may be less influenced by attitude alone.*

Hypothesis 11 (H11). *Income level moderates the relationship between attitude and behavioral intention, such that the effect differs depending on consumers' income levels. H11 assumes that the strength of the attitude–intention relationship may be contingent on financial capability. Higher-income consumers may be better positioned to act on their positive attitudes toward eco-friendly products, while lower-income consumers may face budget constraints that weaken this relationship.*

Hypothesis 12 (H12). *Education level moderates the relationship between attitude and behavioral intention,*

such that the strength of this relationship varies across levels of educational attainment. H12 tests whether educational background influences how strongly attitudes affect intention. Individuals with higher education levels may better understand the benefits of sustainable choices and thus show a stronger alignment between favorable attitudes and actual behavioral intentions.

In this study, the hypotheses formulated based on the Theory of Planned Behavior (TPB) and its extended framework were empirically examined through a systematic and rigorous analytical approach. To investigate the direct effects of the core TPB constructs, multiple linear regression analyses were conducted. Specifically, attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC) were included as independent variables to assess their respective influences on behavioral intention (BI) (H1–H3). Additional regression models were used to examine the interrelationships among the TPB constructs, including the effects of ATT on SN and PBC, and the effect of SN on PBC (H4–H6).

The study's hypotheses, grounded in the TPB and its extensions, were tested through a structured analytical process. First, multiple linear regression analyses were conducted to examine the direct effects of attitude, subjective norm, and perceived behavioral control on behavioral intention (H1–H3). Additional regression models were used to investigate the interrelationships among the TPB constructs, specifically the effects of attitude on subjective norm and perceived behavioral control, as well as the effect of subjective norm on perceived behavioral control (H4–H6). To assess the mediating effects proposed in Hypotheses 7 and 8, the PROCESS macro for SPSS (Version 4.2) was utilized, applying Model 4 [33]. This approach enabled the evaluation of whether subjective norm and perceived behavioral control mediated the relationship between attitude and behavioral intention. The significance of indirect effects was determined using a bootstrapping procedure with 5,000 resamples, with mediation considered significant. Moderation analyses (H9–H12) were performed using PROCESS Model 1 to examine whether the relationship between attitude and behavioral intention varied according to demographic characteristics, including gender, age, income, and education level.

4. Results and Discussion

Table 2 provides an overview of the demographic characteristics of the survey respondents, including gender, age, education level, household size, and income distribution. The sample includes 102 male respondents (51.0%) and 98 female respondents (49.0%), indicating a nearly equal gender distribution. This balanced representation ensures that the findings reflect both male and female perspectives on the purchasing behavior of environmentally friendly agricultural products. Regarding age, the largest proportion of respondents falls within the 60s and older category (28.5%), followed by those in their 50s (19.5%), 40s (18.5%), 20s (17.0%), and 30s (16.5%). This variation allows for an examination of generational differences in attitudes toward sustainable consumption. With respect to educational background, a majority of respondents hold a university degree (64.5%), while 21.5% completed high school, 13.0% have education beyond university level, and 1.0% have only completed middle school. The high percentage of university-educated respondents may indicate a more informed consumer base regarding sustainability and environmental concerns. The income distribution reveals that the largest group of respondents falls within the 300–500 million KRW range (29.5%), followed by 500–700 million KRW (22.0%) and 100–300 million KRW (18.0%). Higher-income groups, including those earning over 900 million KRW, make up 13.5% of the sample, while lower-income earners (less than 100 million KRW) represent 1.5%.

Table 3 presents the results of the reliability and validity assessment of the key measurement constructs. These results are based on factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). The ATT construct was measured using two survey items to assess respondents' perceptions of environmentally friendly agricultural products. Item 1 evaluates whether these products are beneficial to health, with a mean score of 3.5 (SD = 0.8) and a factor loading of 0.847, indicating a strong relationship with the construct. Item 2 examines the perceived environmental benefits of eco-friendly agricultural products, showing a mean of 3.6 (SD = 0.8) and a factor loading of 0.839.

Table 2. Socio-Demographic Information of Respondents.

Category	Survey Items	Total	
		Number of People (Persons)	Ratio(%)
Gender	Male	102	51.0
	Female	98	49.0
Age	20's	34	17.0
	30's	33	16.5
	40's	37	18.5
	50's	39	19.5
	60's and older	57	28.5
Education	Middle	2	1.0
	High	43	21.5
	University	129	64.5
	Above university	26	13.0
Income (million KRW*)	< 100	3	1.5
	100∼300	36	18.0
	300∼500	59	29.5
	500∼700	44	22.0
	700∼900	31	15.5
	> 900	27	13.5

Note: As of November 2024, the average exchange rate was approximately 1 USD = 1,400 KRW.

Table 3. Inclusion and Exclusion Criteria.

Items	Mean (SD)	Factor Loadings	Cronbach's Alpha	CR	AVE
1	3.5 (0.8)	1.000	0.8403	0.913	0.794
2	3.6 (0.8)	0.767			
3	3.9 (0.8)	0.799	0.889	0.846	0.647
4	3.8 (0.8)	0.81			
5	3.7 (0.8)	0.805			
6	3.6 (0.9)	0.737	0.868	0.821	0.607
7	3.6 (0.9)	0.778			
8	3.7 (0.8)	0.873			
9	3.9 (0.8)	0.798	0.876	0.821	0.607
10	3.9 (0.8)	0.809			
11	3.7 (0.8)	0.776			

The subjective norms construct captures the extent to which social expectations and peer influence shape consumers' decisions regarding the purchase of environmentally friendly agricultural products. The results indicate that consumers recognize social responsibility and long-term environmental benefits as important factors in their purchasing decisions. The analysis reveals that respondents generally perceive purchasing eco-friendly agricultural products as a responsible consumption behavior (Mean = 3.9, SD = 0.8). Additionally, they consider their choices as contributing to future generations' well-being (Mean = 3.8, SD = 0.8) and believe that supporting eco-friendly farms is an important aspect of sustainable consumption (Mean = 3.7, SD = 0.8). These items exhibit strong factor loadings (ranging from 0.799 to 0.810), confirming that they reliably measure the social influence on consumer behavior.

The Cronbach's Alpha for SN is 0.895, indicating a

high degree of internal consistency, while the CR value of 0.846 exceeds the recommended threshold, confirming that the construct is statistically reliable. Additionally, the AVE value of 0.647 confirms that the construct explains a significant proportion of variance in the observed variables, supporting its validity in measuring social influence on eco-friendly consumption behavior.

Perceived behavioral control measures the extent to which individuals feel capable of purchasing environmentally friendly agricultural products, considering factors such as financial ability and access to information. The findings indicate that perceived control significantly impacts consumer decision-making, as it determines whether individuals can act on their sustainability intentions. Among the surveyed items, respondents reported moderate financial capacity to purchase environmentally friendly agricultural products. Similarly, they expressed a sense of autonomy over their purchasing decisions (Mean = 3.6, SD = 0.9), but responses varied slightly regarding access to sufficient information about eco-friendly agricultural products (Mean = 3.7, SD = 0.8).

Factor loadings for the PBC construct range from 0.737 to 0.873, indicating a strong relationship between the construct and the observed variables. The Cronbach's Alpha for PBC is 0.868, confirming its internal reliability, while the CR value of 0.821 ensures that the construct is statistically reliable. The AVE of 0.607 suggests that the construct captures a substantial portion of the variance in consumers' perceived ability to purchase eco-friendly products, reinforcing its validity as a predictive measure.

Table 4 presents the discriminant validity analysis the key constructs of the Theory of Planned Behavior (TPB): Attitude (ATT), Subjective Norms (SN), Perceived Behavioral Control (PBC), and Behavioral Intention (BI). Discriminant validity was assessed using the Fornell-Larcker criterion, which requires that the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlations with other constructs [34–36].

ATT demonstrated strong discriminant validity, with a square root of AVE (0.891) higher than its correlations with SN (0.700), PBC (0.650), and BI (0.710). Similarly, SN's square root of AVE (0.804) was greater than its correlations with PBC (0.680) and BI (0.720). PBC and BI also showed valid discriminant properties, with square roots of AVE (0.776 and 0.779, respectively) exceeding their inter-construct correlations. These findings are consistent with best practices in structural equation modeling and confirm that the constructs are conceptually distinct.

Table 4. Correlation Matrix of TPB Constructs.

	ATT	SN	PBC	BI
ATT	**0.89**			
SN	0.70	**0.80**		
PBC	0.65	0.68	**0.78**	
BI	0.71	0.72	0.69	**0.78**

Note: The bold diagonal values represent the square root of the Average Variance Extracted (AVE).

Table 5 presents the standardized regression weights for the hypothesized structural relationships among the TPB constructs. Results show that Attitude (ATT), Subjective Norms (SN), and Perceived Behavioral Control (PBC) each have significant positive effects on Behavioral Intention (BI) to purchase environmentally friendly agricultural products. Specifically, Attitude showed a strong positive influence on BI ($\beta = 0.504$, $p < 0.001$), confirming that favorable evaluations of eco-friendly agricultural products are a strong predictor of purchase intention. This supports earlier findings in sustainable consumer behavior research [36]. These results align with studies demonstrating that positive attitudes toward environmentally friendly products significantly increase purchase intention [37]. Furthermore, educational campaigns and sustainability messaging have been found to enhance consumer awareness and foster pro-environmental attitudes, thus strengthening the attitude-intention link [38, 39]. **Figure 1** illustrates the structural equation model developed to examine the factors influencing consumers' purchase intention toward eco-friendly agricultural products.

Table 5. Results of Structural Equation Modeling (SEM).

Hypothesis	Hypothesized Effects	Standardized Regression Weight
H1	BI ← ATT	0.504^{***}
H2	BI ← SN	0.670^{***}
H3	BI ← PBC	0.413^{*}

Note: $^{***}p < 0.001$; $^{*}p < 0.01$.

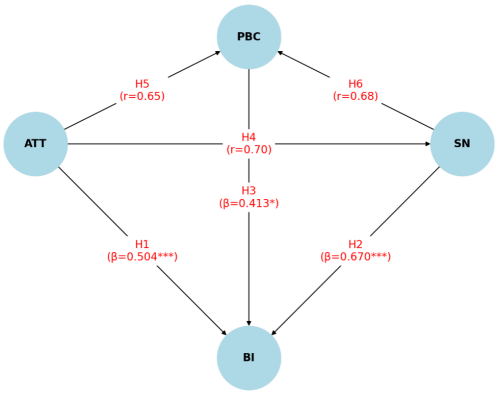

Figure 1. Structural Equation Model for Purchase Intention.

The strongest predictor of Behavioral Intention in our study was Subjective Norms ($\beta = 0.670$, $p < 0.001$). Our study reveals that subjective norms exert the strongest effect on behavioral intentions, suggesting that social influence is a key driver of sustainable consumption behavior. This finding highlights the potential effectiveness of public awareness campaigns, peer influence, and social marketing strategies in promoting environmentally friendly purchasing habits. The finding suggests that marketing strategies focusing on social proof and community engagement could be particularly effective in promoting environmentally friendly agricultural products. The result aligns with existing research emphasized the role of social norms in sustainable food consumption [31]. This result is consistent with the findings of Xu et al. [36] found that factors influencing consumers' green purchasing behaviors in China. Grounded in the Theory of Planned Behavior (TPB), the research introduces environmental indebtedness as a moral emotional variable to examine its impact on green purchase intentions and behaviors. The subjective norm had an influence on green product consumption and environmental mechanism. While our results emphasize the strong influence of subjective norms, it is important to note that their impact may vary across different cultural contexts. Previous study by Ho et al. [37] indicates that while subjective norms may not directly impact green-buying, the perception of others' actions (descriptive norms) significantly influences environmental civic engagement and the importance of communication channels and social influences in shaping pro-environmental behaviors [30]. This highlights the need for further research into the contextual and cultural factors that influence the effectiveness of social norms in shaping eco-friendly purchasing behavior, as suggested by Sun et al. [39] in their cross-cultural study on green product consumption. This discrepancy might be explained by cultural differences, as our study focused on a potentially more collectivist society where social influences play a more significant role in decision-making.

In addition, our results show that Perceived Behavioral Control has a significant but weaker effect on Behavioral Intention ($\beta = 0.413$, $p < 0.05$) compared to Attitude and Subjective Norms. Our findings indicate that perceived behavioral control (PBC) significantly influences consumers' intentions to purchase eco-friendly agricultural products. This suggests that when consumers perceive they have control over sustainable purchasing—whether due to financial affordability, product availability, or knowledge—they are significantly more likely to act on their intentions [40]. These results align with research indicating that reducing perceived barriers, such as high prices or lack of accessibility, can enhance sustainable consumption behaviors [41, 42]. Moreover, this finding is partially consistent with the meta-analysis conducted by Eberle et al. [43], which found PBC to be a significant predictor of organic food purchase intention.

Table 6 presents the standardized regression weights for the hypothesized relationships between Personal Attitude (ATT), Subjective Norms (SN), Perceived Behavioral Control (PBC), and Behavioral Intention (BI) to purchase environmentally friendly agricultural products. The results indicate that all three constructs significantly influence consumers' intentions to purchase eco-friendly agricultural products. Our study found that Attitude has a significant positive effect on Behavioral Intention ($\beta = 0.504$, $p < 0.001$). This finding aligns with numerous studies in the field of sustainable consumption. For instance, Hasan and Suciarto [44] reported a similar positive relationship between attitude and purchase intention for organic food products. Consumers with favorable attitudes toward eco-friendly agricultural products are more likely to exhibit strong purchasing intentions. This result aligns with previous studies emphasizing the role of consumer perceptions in shaping sustainable purchasing decisions [45, 46]. This finding is con-

sistent with prior research suggesting that awareness campaigns and sustainability education initiatives can enhance consumer attitudes and promote eco-conscious behavior [47].

Table 6. Inclusion and Exclusion Criteria.

Effect Type	Hypothesis	Path Relationship	Coefficient (β)	p-Value/BootCI	Result
Direct Effect	H1	ATT → BI	-0.086	0.156	Not Supported
	H2	SN → BI***	0.675	0.000	Supported
	H3	PBC → BI	-0.082	0.149	Not Supported
	H4	ATT → SN***	0.368	0.000	Supported
	H5	ATT → PBC***	0.239	0.001	Supported
	H6	SN → PBC**	0.174	0.014	Supported
Mediation Effect	H7	ATT → SN → BI**	0.2637	BootCI [0.1239, 0.4073]	Supported
	H8	ATT → PBC → BI	-0.0054	BootCI [-0.0574, 0.0570]	Not Supported
Moderation Effect	H9	ATT × Gender → BI	0.1378	0.3619	Not Supported
	H10	ATT × Age → BI	-0.0134	0.8045	Not Supported
	H11	ATT × Income → BI	0.0453	0.3923	Not Supported
	H12	ATT × Education → BI	-0.0811	0.5023	Not Supported

5. Summary and Conclusions

This study investigated the behavioral intentions of consumers toward environmentally friendly agricultural products by applying the Theory of Planned Behavior (TPB) and extending it to include mediation and moderation pathways. The findings revealed that among the three primary TPB constructs, subjective norms had the strongest and most significant impact on behavioral intention. This suggests that social expectations and perceived approval from others play a central role in motivating eco-friendly purchasing behaviors, particularly in the South Korean context, where collectivist cultural values may amplify the influence of social norms. In contrast, attitude and perceived behavioral control did not directly influence behavioral intention, but attitude had significant effects on both subjective norms and perceived behavioral control, underscoring its importance in shaping the underlying mechanisms that drive behavior.

Mediation analysis showed that subjective norms fully mediated the relationship between attitude and behavioral intention, whereas perceived behavioral control did not serve as a significant mediator. These results indicate that consumers' personal attitudes are most influential when they are aligned with perceived social expectations, reinforcing the importance of normative pressure in shaping sustainable consumption. Meanwhile, the lack of a significant indirect path through perceived behavioral control suggests that a sense of autonomy or ease in performing eco-friendly behavior may not be a decisive factor in this context.

In terms of moderation, none of the demographic variables—gender, age, income, or education—significantly moderated the relationship between attitude and behavioral intention. While this might imply that the effects of TPB variables are relatively stable across different demographic groups, it could also reflect limitations in the categorical measurement of these variables, a lack of variability within the sample, or contextual factors such as widespread environmental education and messaging in South Korea that reduce demographic differences in behavior.

By identifying subjective norms as the most influential factor and revealing the indirect role of attitude, this study provides important guidance for policymakers, marketers, and sustainability advocates. Social marketing strategies that emphasize collective responsibility and social approval may be especially effective in promoting eco-friendly agricultural products. At the same time, educational campaigns that target consumer attitudes while reinforcing social norms could help strengthen public engagement with sustainable food systems. Through a nuanced understanding of psychological and social drivers, more targeted and effective strategies can be developed to support sustainable consumption behaviors in agriculture. Marketing and public awareness efforts that emphasize the collective benefits of eco-friendly consumption and leverage peer behavior, influencer endorsements, or social identity appeals

are likely to be effective in shifting consumer intentions. For example, promoting stories of community leaders or social groups engaging in sustainable purchasing behaviors may reinforce eco-friendly consumption as a socially desirable norm. even though perceived behavioral control (PBC) was not a strong direct predictor of intention, it was significantly shaped by both attitude and subjective norms. This implies that increasing consumer self-efficacy and reducing perceived barriers—such as lack of information or price concerns—can still be valuable. Practical steps could include eco-label certification transparency, subsidies or incentives, or expanding distribution channels to improve product accessibility.

This study has several limitations. The sample was limited to residents of the Seoul Metropolitan Area, which may constrain generalizability to other regions or cultural contexts. In addition, the demographic variables were measured using relatively simple categories, potentially limiting the ability to capture nuanced moderating effects. Future research should therefore expand the geographic scope, adopt more refined measurement instruments, and explore additional moderating variables—such as environmental concern, trust in eco-labels, and actual purchasing constraints.

Future research should consider expanding the geographical scope and recruiting a larger, more diverse sample to test the robustness of these findings across different cultural and socioeconomic settings. Employing more nuanced, multidimensional measures of variables such as income or education may also provide a clearer picture of how demographic characteristics interact with behavioral determinants. Additionally, future studies may benefit from incorporating behavioral tracking or longitudinal approaches to observe whether stated intentions translate into actual purchasing behavior over time. Exploring other potential moderators such as trust in eco-certification, environmental concern, or perceived efficacy of sustainable behaviors could also offer deeper insight into the complexities of sustainable consumer decision-making.

Author Contributions

S.L. and G.J. conceptualized, S.L. collected the data, S.L. and G.J. wrote the paper. All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Data are available on reasonable request.

Acknowledgments

We would like to thank the anonymous reviewers for their valuable and constructive comments, which significantly contributed to improving the quality of this paper.

Conflicts of Interest

The authors declare no conflict of interest.

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