

Article

Beyond Linear Models: A Hybrid SEM-fsQCA Approach to Understanding Consumer Intentions for Organic Rice

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Abstract

Interest in organic food has grown steadily, driven by its health and environmental benefits and concerns about conventional production. Yet organic rice remains largely overlooked, while imported, low-cost inorganic rice dominates the market. This study addresses that gap by extending the Theory of Planned Behavior (TPB) to include environmental concern and knowledge, alongside health consciousness and status, as predictors of purchase intention, and the TPB constructs as mediators. Using survey data from 401 Haitian consumers, we applied structural equation modeling and fuzzy-set qualitative comparative analysis. Results show health consciousness as the strongest and most consistent driver, shaping attitudes, norms, and perceived control, while environmental concern also plays a significant role. Environmental knowledge proved context-dependent, and health status and perceived control were not significant. The mediation analysis revealed several significant indirect effects. Environmental concern influenced behavioral intention through both attitudes and subjective norms, while environmental knowledge showed a significant indirect effect via subjective norms. Health concern demonstrated the strongest mediation effects, with significant pathways through attitudes and subjective norms. In contrast, mediations through perceived behavioral control were consistently non-significant across all tested relationships. The fsQCA analysis identified environmental concern, environmental knowledge, health consciousness, attitudes, and subjective norms as necessary conditions for consumers' intention to purchase organic rice to occur. This analysis also revealed 22 pathways to high purchase intention, with most pathways including two or three of the identified necessary conditions. These findings advance TPB and offer practical insights for promoting sustainable consumption.

Keywords: environmental knowledge; environmental concern; health status; health consciousness; theory of planned behavior; organic food consumption; SEM-fsQCA



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1. Instruction

In recent years, we have witnessed growing attention from different stakeholder groups (e., academics, policymakers, and advocacy institutions) regarding the consumption of organic food products. This ongoing attention offers a powerful incentive to advance several sustainable development objectives (Squalli, 2025). One can cite protecting public health, incentivizing responsible consumption, and promoting sustainable agricultural systems as among the sustainable development objectives. Scholars across management

and marketing, and other related fields, have used Ajzen's Theory of Planned Behavior (TPB) (Ajzen, 1991) in order to explain the drivers of pro-environmental behaviors (e.g., purchase organic food). This explains why the TPB has been predominantly used to define the psychological mechanisms that motivate environmentally responsible purchasing choices across cultures (e.g., Arvola et al., 2008; Bhutto & Rütelionè, 2026; Nouredine et al., 2026; Nguyen et al., 2026; Qi & Ploeger, 2019; Y.-F. Wang & Wang, 2016). While the Theory of Planned Behavior (TPB) remains a foundational framework, many scholars have integrated additional variables to address its limitations and bolster its ability to predict green consumerism. In this regard, studies have combined the TPB constructs with environmental knowledge and concern to predict green purchase behaviors either directly (Ahmed et al., 2021; Alam et al., 2020; Maichum et al., 2016; Ukenna & Ayodele, 2019) or indirectly through the TPB constructs (e.g., Dlamini & Mahowa, 2024; Paul et al., 2016; Zheng et al., 2021).

Past studies have demonstrated that the integration of health-related factors with the TPB has improved the explanatory power of the underlying research framework (see, Hong et al., 2023; Qi et al., 2020). Also, prior studies have shown that sustainable consumption behaviors are not linear but configurational and consequently shaped by the interplay of multiple factors (Bhattacharyya et al., 2023; Gonçalves et al., 2016). Until recently, the literature has predominantly used linear models (e.g., regressions and correlations) to predict green purchase intentions and other consumers' green behaviors. Unfortunately, these linear models cannot, by any means, help to understand the complex combinatory pathways and necessary conditions that truly represent consumer behavior; therefore, many academics have called for the joint use of the linear models and fuzzy set qualitative analysis (fsQCA) in explaining consumer behaviors (Fiss, 2011; Pappas & Woodside, 2021; Ragin, 2009). As a result, we have witnessed a growing interest in a hybrid approach that combines the linear models, such as the structural equation model, and the fsQCA to analyze both overall effects and complex combination patterns across various green product categories (e.g., Chanda et al., 2024; Synodinos et al., 2023; Wu et al., 2025).

To date, however, no study has jointly applied SEM and fsQCA to examine how environmental factors (e.g., knowledge, concern), health-related dimensions (e.g., status, consciousness), and the TPB variables interact to predict purchase intentions for organic rice, resulting in an important gap in the literature. More importantly, empirical findings regarding the net effects of environmental concerns and environmental knowledge on green consumption behaviors remained mixed and inconclusive (e.g., Dlamini & Mahowa, 2024; Konuk, 2019; Maduku, 2024), which ultimately represents another important gap in the literature. Furthermore, studies on green consumption or ethical consumerism have been largely developed-country-centric (Kutaula et al., 2024), leaving a substantial gap regarding green consumption in developing economies.

Through this current scholarly investigation, we seek to address the gaps mentioned above by integrating environmental factors (knowledge and concern), health-related factors (status and consciousness), and the traditional components of the Theory of Planned Behavior (attitudes, perceived behavioral control, and subjective norms) into a single, extended research framework aimed at predicting consumers' intentions to purchase organic rice regularly. By doing so, this study moves beyond isolated examinations of these variables and instead evaluates their combined and comparative explanatory relevance within a unified model.

More specifically, the study pursues four interrelated objectives. First, it aims to assess whether environmental concerns and health consciousness contribute meaningful incremental explanatory power beyond the traditional TPB constructs. Second, it seeks to clarify whether these environmental and health-related factors exert direct motivational

effects on intention or operate indirectly by shaping attitudes, subjective norms, and perceived behavioral control. Third, it investigates whether environmental and health concerns function as antecedent belief structures that reshape the cognitive foundations of the TPB components, thereby theoretically extending the model. Fourth, it explores how these variables may combine in different configurations to produce either a high or low intention to regularly purchase organic rice.

These objectives translate into the following research questions:

- (1) To what extent do environmental concerns and health consciousness provide incremental explanatory power in predicting consumers' intention to purchase organic rice beyond the traditional components of the Theory of Planned Behavior (attitude, subjective norms, and perceived behavioral control)?
- (2) Do environmental and health-related factors influence purchase intention primarily through direct motivational effects, or do they operate indirectly by shaping attitudes, subjective norms, and perceived behavioral control?
- (3) Do environmental and health concerns function as antecedent belief structures that reshape the cognitive foundations of the TPB components, thereby expanding the explanatory scope of the model in emerging market settings?
- (4) How are these environmental, health-related, and TPB variables configured to predict a high or low level of intention to regularly purchase organic rice?

Instead of assuming that behavior results from one linear route, we complement regression-based analysis with fuzzy-set Qualitative Comparative Analysis (fsQCA) to examine whether different combinations of conditions may lead consumers toward the intention to choose organic rice. This methodological choice aligns directly with our fourth objective, as real-life decisions rarely emerge from a single dominant predictor. Haitian consumers may follow multiple causal pathways that do not fit neatly into symmetric or net-effect assumptions. By identifying alternative configurations of environmental, health, and cognitive drivers, we provide a more nuanced understanding of intention formation.

We apply this extended model (Figure 1) to the Haitian context, where imported conventional rice has, over time, pushed local organic options into the background. This shift is not merely economic; it also reflects evolving consumption habits, limited consumer awareness, and the fragile position of domestic agricultural production. Examining the extended TPB framework within this setting, therefore, allows us not only to test its explanatory robustness but also to explore how contextual pressures in emerging markets may alter the relative influence and configuration of motivational factors.

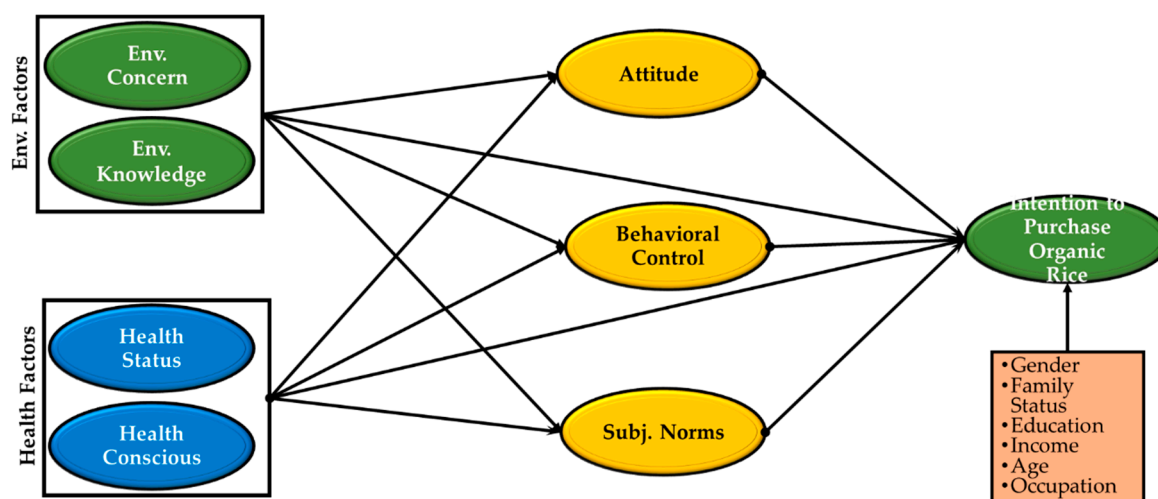


Figure 1. Theoretical Framework.

By conducting this study, we make three primary contributions to the literature. First, and most importantly, we offer a theoretical contribution by extending the TPB with health and environment-related factors. Testing this extended framework in a developing country context provides a more nuanced understanding of organic food purchase intentions and advances the theoretical application of TPB beyond its traditional boundaries. Second, we contribute to methodological advancement through the joint application of SEM and fsQCA. This dual-method approach allows us to uncover both net effects and complex causal configurations, offering deeper insights than a single analytical technique could provide. Third, we provide a contextual contribution by focusing on organic rice as a specific product category within the underexplored context of Haiti, thereby enriching the literature with empirical evidence from a developing country setting.

In the next section, we walk through the theoretical foundations and key empirical findings that shaped our hypotheses. The methodology section follows, where we explain the survey design, sampling strategy, and data collection process. We also outline how we assessed the quality and reliability of the measures before presenting the results of the hypothesis testing. After reviewing the findings, we offer some reflections on what they might mean in practice and in theory. The paper closes with a discussion of the study's limitations and a set of possible directions for researchers who want to explore this topic further.

2. Scholarly Review

2.1. Theoretical Foundations

The theory of planned behavior (TPB) is a foundational framework for understanding consumer behavior. It posits that intention, the immediate antecedent of behavior, is shaped by three core constructs: attitude toward the behavior, subjective norm (perceived social pressure), and perceived behavioral control (PBC), which reflects the ease or difficulty of performing the behavior (Ajzen, 1991; Fishbein & Ajzen, 1977). A substantial body of research demonstrates that purchase intention is a significant predictor of actual purchasing behavior (X. Hu et al., 2016; Prentice et al., 2019). Given its robust explanatory power, scholars frequently extend the TPB by integrating additional variables to better predict specific outcomes in various contexts (e.g., Aldaihani et al., 2024; Berberyan et al., 2025; Nayak et al., 2024; Nimri et al., 2020; Y. Wang et al., 2024).

This study applies and extends the TPB to the context of organic food consumption, a domain of growing global importance (Eyinade et al., 2021; Huo et al., 2023). While the TPB provides a robust framework for predicting intentions, green consumption is a complex and multidimensional phenomenon (Nair & Little, 2016). Therefore, to enhance the model's predictive power in this specific context, we incorporate environmental and health-related antecedents. Despite the TPB's prominence, our understanding of how these factors interact with its core variables to shape purchase intentions for specific organic products, such as rice, remains limited. This study addresses this gap.

2.2. Environmental Concern

Consumers' awareness, understanding, and willingness to act on environmental issues are collectively termed Environmental Concerns (Hong et al., 2023; H.-H. Hu et al., 2010) and it is also seen as a noteworthy predictor of consumers' pro-environmental behaviors (Felix et al., 2018; McDonald et al., 2015; White & Simpson, 2013), encompassing instances of purchase or intention to purchase organic food. Despite the increase in environmental concern, however, research has yielded mixed evidence concerning its effect on green consumption behaviors. For instance, some studies report that environmental concern strongly predicts consumers' intentions and actual responsible purchasing practices (e.g.,

Hong et al., 2023; Hosta & Zabkar, 2021), green consumption intentions (see, for example, Bulut et al., 2021; Maduku, 2024; Y. Zhang et al., 2023), and willingness to buy green products (e.g., Konuk, 2019; Tong et al., 2020). Several other studies, however, contrastingly report that environmental concern fails to predict sustainable consumption behaviors across various categories of green products (e.g., Alberto de Morais Watanabe et al., 2023; Chi et al., 2021; Dlamini & Mahowa, 2024).

Researchers have long tried to understand how the key predictors in similar conceptual frameworks relate both to the main outcome variable and to the components of the TPB. The evidence, however, does not always point in a single direction. T. Hu et al. (2024), for instance, reported that environmental concern tends to strengthen consumers' attitudes toward organic food. A comparable pattern appears in Pandey and Yadav (2023), who observed that environmental concern predicted attitudes toward green products, which in turn predicted shoppers' intentions to buy eco-friendly garments. Other studies show a slightly more complex picture. Hong et al. (2023) noted that environmental concern significantly influenced perceived behavioral control and attitudes toward green products, two of the three TPB variables, suggesting that its influence may not be uniformly distributed across the model. Earlier work by Jaiswal and Singh (2018) also linked environmental concern to more favorable attitudes toward eco-friendly goods, a result echoed by Saut and Saing (2021), who found that environmental concern was associated with stronger intentions to purchase green products.

One of the more comprehensive examinations, by Paul et al. (2016), indicated that environmental concern influenced all three TPB constructs. Yet, not all findings from other studies are so consistent in this regard. Maichum et al. (2016) reported positive effects of environmental concern on attitude and perceived behavioral control, as well as on green purchase intention, but its effect on subjective norms was insignificant. This mix of results indicates that, although environmental concern frequently plays an important role, its effects may vary depending on the context, the product category, or even the way each study operationalizes the TPB variables. Consequently, we propose to examine whether environmental concern will predict TPB constructs and also intention to purchase organic rice by formulating the following hypotheses:

Hypothesis 1a. *Consumers' environmental concern predicts their intention to purchase organic rice regularly.*

Hypothesis 1b. *Consumers' environmental concern positively predicts their attitude toward purchasing organic rice.*

Hypothesis 1c. *Consumers' environmental concern positively predicts their perceived behavioral control over purchasing organic rice.*

Hypothesis 1d. *Consumers' environmental concern predicts subjective norms regarding the purchase of organic rice.*

2.3. Environmental Knowledge

Environmental knowledge extends beyond awareness to include understanding issues, causes, effects, and solutions to environmental problems, as well as the interactions between humans and the environment (Boerschig & De Young, 1993; Jensen, 2002). Studies confirm that broader knowledge not only predicts pro-environmental actions but also increases consumers' willingness to invest in green products (Levine & Strube, 2012; Ogbeide et al., 2015). Remarkably, studies have shown that environmental knowledge meaningfully predicts green consumption or green consumption intent (e.g., Kaur et al., 2024; Kusuma &

Handayani, 2018; Lee, 2010; Sivarajah, 2024; Tong et al., 2020) and many other categories of pro-environmental behaviors. Furthermore, research has established positive connections between environmental knowledge and the TPB variables or other extended models across different pro-environmental behaviors, including green consumption intentions. L. Wang et al. (2020), for instance, demonstrated that both objective and subjective knowledge positively influence visitors' attitudes toward eco-friendly accommodations and their intentions to choose these accommodations. Similarly, a study by Lin and Niu (2018) confirmed that social norms, environmental knowledge, and environmental consciousness meaningfully predicted environmental attitudes and also indicated that social norms and environmental knowledge were linked to an enhanced sense of well-being.

Also, Hong et al. (2023) identified that environmental knowledge significantly predicts subjective norms, attitudes, and PBC. Similar results were echoed by X. Xu et al. (2020b), who confirmed that environmental awareness positively influenced the TPB constructs and willingness to pay a premium for green furniture. Similarities and inconsistencies are also reported. For example, Maichum et al. (2016) found that environmental knowledge predicted all TPB variables, but did not predict green purchase intent. Jaiswal and Singh (2018) found that environmental knowledge did not predict attitudes toward eco-friendly products. However, they reported several interesting results, as discussed in the earlier section on environmental concern. Thus, we propose to examine whether Environmental Knowledge will yield significant results with organic rice by formulating the following hypotheses:

Hypothesis 2a. *Consumers' environmental knowledge predicts their intention to purchase organic rice regularly.*

Hypothesis 2b. *Consumers' environmental knowledge positively predicts their attitude toward purchasing organic rice.*

Hypothesis 2c. *Consumers' environmental knowledge positively predicts their perceived behavioral control over purchasing organic rice.*

Hypothesis 2d. *Consumers' environmental knowledge predicts subjective norms regarding the purchase of organic rice.*

2.4. Health Status

In recent years, we have witnessed a general concern about the consumption of traditionally grown food or non-organic food products. This is because of the health risks, ethical issues, and environmental impact associated with traditionally grown food. Consequently, the literature shows that a growing number of consumers worldwide have opted to purchase organic food. In this study at hand, health status denotes an individual's perceived overall well-being, a factor that can substantially influence how they assess risks in purchasing decisions (Deng et al., 2015). Research showed that an increase in health concerns significantly influences organic food consumption (Bansal & Gefen, 2010; Valero-Gil et al., 2023). Additionally, studies suggest that poor health may trigger emotions such as uncertainty and anxiety, which subsequently shape the likelihood that consumers will opt for organic rather than conventionally produced food products (Esmaeilzadeh, 2018). We consequently assume that these emotions may drive consumers with a negative perception of their health to seek out solutions, potentially leading them to consume organic foods. Empirical findings by Hong et al. (2023) demonstrated that health status predicts subjective norms, PBC, and attitudes. We assume, therefore, that perceived health status

positively influences consumers' intention to purchase organic rice and the TPB constructs and propose to test the following hypotheses:

Hypothesis 3a. *Perceived health status positively predicts intention to purchase organic rice regularly.*

Hypothesis 3b. *Perceived health status positively predicts attitude toward purchasing organic rice.*

Hypothesis 3c. *Perceived health status positively predicts perceived behavioral control over purchasing organic rice.*

Hypothesis 3d. *Perceived health status positively predicts subjective norms regarding the purchase of organic rice.*

2.5. Health Consciousness

Health consciousness refers to the extent to which consumers incorporate health-related concerns into their daily food choices (Chiang et al., 2018). It encompasses both their willingness to adopt behaviors that enhance well-being (Hong et al., 2023) and their attentiveness to health considerations in everyday activities (Akhondan et al., 2015). This further confirms why consumers who display higher health consciousness tend to prefer organic foods over conventional alternatives (Hong et al., 2023). Scholarly research further confirms this affirmation. For instance, studies showed that health consciousness predicts numerous health-related attitudes and behaviors, including organic food consumption (Diagourtas et al., 2023; T. Hu et al., 2024; Kumar et al., 2023; Parashar et al., 2023; J. Wang et al., 2023), and also confirmed that consumers with heightened health awareness are more inclined to adopt environmentally friendly behaviors compared to those less focused on their health (Rana & Paul, 2020).

Supporting the results outlined above, X. Xu et al. (2020b) identified a positive relationship between health consciousness and attitudes toward green furniture. Similarly, Prakash et al. (2019) reported comparable results. They found positive and significant associations between health consciousness and attitudes toward green products. Consistent with the aforementioned findings, Hoang et al. (2026) showed that health consciousness predicts both attitudes and PBC. In the same vein, Hong et al. (2023) further demonstrated that health consciousness significantly predicted all TPB constructs. In addition, Qi et al. (2020) showed that health consciousness influenced both intentions and behaviors related to purchasing green food. Kumar et al. (2023) found that although health consciousness positively influences attitudes toward organic foods, but paradoxically has a negative effect on actual purchasing behavior for organic food. Our framework clearly shows that health consciousness serves as a predictor of TPB constructs. Accordingly, we propose that higher levels of health consciousness positively affect TPB constructs in relation to the purchase of organic rice. Thus, the following specific hypotheses are advanced:

Hypothesis 4a. *Consumers' health consciousness positively predicts intention to purchase organic rice regularly.*

Hypothesis 4b. *Consumers' health consciousness positively predicts attitude toward purchasing organic rice.*

Hypothesis 4c. *Consumers' health consciousness positively predicts perceived behavioral control over purchasing organic rice.*

Hypothesis 4d. *Consumers' health consciousness positively predicts subjective norms regarding the purchase of organic rice.*

2.6. Main Effects of the TPB Model Variables

A large corpus of the literature has scrutinized the main effects of the TPB variables on different pro-environmental behaviors, including organic food consumption, but reports mixed findings regarding the influence of these variables on pro-environmental behaviors. X. Xu et al. (2020a), for instance, found that among the three TPB variables, only PBC predicted consumers' intentions to purchase green products, whereas Roh et al. (2022) observed that both attitudes and subjective norms predicted purchase intentions for organic food. More contrastingly, Dalila et al. (2020) reported that all three TPB variables significantly shaped intentions toward green food packaging and its actual adoption among food vendors, whereas X. Xu et al. (2020b) found that attitudes toward green furniture and subjective norms were not linked to consumers' purchase intentions, with PBC emerging as the variable meaningfully associated with these intentions. Furthermore, X. Xu et al. (2020b) showed that attitudes exerted a positive influence on both pro-environmental behaviors and environmental behavioral intentions (X. Xu et al., 2020b).

Ruslim et al. (2022) reported that environmental awareness, attitudes, and perceived behavioral control in relation to eco-friendly skincare products significantly shaped purchasing intentions. Nonetheless, they found that personal standards and product availability failed to exert such influence. That result may suggest that, for some consumers, internal values are not as decisive as moment-to-moment attitudes or perceptions of control. Other scholars have come to similar conclusions. For instance, Al-Swidi et al. (2014) and Salimi (2019) observed that social influences (subjective norms), PBC, and pro-environmental attitudes were all predictors of stronger green consumption intentions. Research findings by Gupta (2021) also showed that attitudes and PBC positively predicted green consumption. De Canio and Martinelli (2021) added another layer by showing that attitudes and subjective norms shaped intentions to buy EU quality-label and organic foods. Interestingly, Hoang et al. (2026) have made a similar observation by showing that attitude and PBC directly predict green purchase intention. Even in more niche cases, such as seaweed consumption, Govaerts and Ottar Olsen (2023) found that attitudes had a noticeable impact.

Rahman and Luomala (2021) further reinforced the idea that attitudes consistently help predict interest in green products, although not every study lines up perfectly. Conversely, Paul and colleagues (2016) concluded that only attitudes and PBC predicted green purchasing behavior, with social norms showing no effect in their sample. Taken together, these studies point to the usefulness of the Theory of Planned Behavior, though its components do not always weigh the same across contexts. Depending on the product category, cultural background, or even local economic realities, the balance among attitudes, social pressure, and perceived control seems to shift in ways that deserve closer attention. Consequently, we propose to examine the following hypotheses:

Hypothesis 5. *Attitude toward purchasing organic rice positively predicts intention to purchase organic rice regularly.*

Hypothesis 6. *Perceived behavioral control over purchasing organic rice positively predicts intention to purchase organic rice regularly.*

Hypothesis 7. *Subjective norms regarding organic rice consumption positively predict intention to purchase organic rice regularly.*

2.7. The Mediation of the TPB Variables

Our research framework, presented in Figure 1, shows that both environmental and health factors also shape intentions to purchase organic rice through the constructs of the TPB. Empirical studies support this observation. Dlamini and Mahowa (2024), for example, found that environmental concern indirectly predicted consumers' intentions to purchase green cosmetic products via their attitudes toward those products. A similar result was echoed by Zheng et al. (2021) who demonstrated that perceived environmental responsibility indirectly influenced green purchasing behavior through attitude. The mediating effects presented in our research framework are further supported by the findings of Salimi (2019). This author reported that green knowledge and environmental concern indirectly affected green consumption behavior through attitudes toward green purchases, subjective norms, and PBC. Paul et al. (2016) also identified an indirect effect of environmental concern on green purchase intentions mediated by PBC. Health-related factors show a comparable dynamic. Kumar et al. (2023), for example, found that health consciousness indirectly predicted actual organic food consumption through attitudes and willingness to purchase. Notably, Duong et al. (2026) demonstrate that green purchase intentions are driven by two key pathways: (1) green attitudes, which mediate the effects of environmental responsibility and concern, and (2) perceived behavioral control, which mediates the impact of subjective norms and concern. Building on these insights and our research framework, we formulate the following hypotheses:

Hypotheses 8a–8c. *Attitude toward organic rice (H8a), perceived behavioral control (H8b), and subjective norms (H8c) mediate the effect of environmental concern on intention to regularly purchase organic rice.*

Hypotheses 9a–9c. *Attitude toward organic rice (H9a), perceived behavioral control (H9b), and subjective norms (H9c) mediate the impact of environmental knowledge on intention regularly to purchase organic rice.*

Hypotheses 10a–10c. *The relationship between perceived health status and intention to purchase organic rice is indirectly mediated through attitude toward organic rice (H10a), perceived behavioral control (H10b), and subjective norms regarding organic rice consumption (H10c).*

Hypotheses 11a–11c. *The relationship between health consciousness and intention to purchase organic rice is mediated by attitude toward organic rice (H11a), perceived behavioral control over purchasing organic rice (H11b), and subjective norms regarding organic rice consumption (H11c).*

3. Method

3.1. Study Context

Haiti's ongoing difficulty in meeting the United Nations Sustainable Development Goals is closely connected to deep structural problems in its food system. One major issue is the country's long-running dependence on foreign aid and imported staples, especially rice, an arrangement that leaves the domestic supply fragile and easily disrupted. Much of this dependence traces back to earlier policy choices. The trade liberalization of the mid-1990s, along with steep tariff cuts on imported rice, opened the floodgates to cheap U.S. rice, heavily subsidized and far more competitive than what Haitian farmers could produce. As reported by sources such as Democracy Now (2016) and (Joseph et al., 2023), this shift appears to have accelerated the decline of Haiti's rice sector, leaving many producers unable to survive.

Not surprisingly, domestic rice cultivation shrank dramatically, bringing widespread livelihood losses and chronic food insecurity. Haiti is now the second-largest destination for U.S. long-grain rice exports, after Mexico, and more than four-fifths of the rice consumed in the country originates in the United States (Richardson et al., 2022). Efforts to rebuild have been hampered by long-term underinvestment in irrigation, production inputs, and post-harvest infrastructure. These gaps have kept paddy yields low and reduced grain quality, making local rice both less competitive and more vulnerable to shocks (Richardson et al., 2022). Internal challenges compound the problem. Government initiatives to promote environmental practices are often weak or inconsistent, and entrepreneurial responses tend to lag as well. This may reflect a generally low level of public awareness and concern about sustainability. At the same time, the shrinking availability of locally grown organic rice and the dominance of cheaper, less sustainable alternatives have weakened the social expectations or “subjective norms” that might otherwise encourage consumers to choose organic options. Higher prices only deepen this shift, eroding earlier habits of consuming locally produced organic rice. All of this unfolds within a broader landscape marked by fragile institutions and irresponsible business practices, which together hinder efforts to rebuild a resilient rice sector. Taken as a whole, Haiti represents a particularly telling case: decades of policy decisions have created market conditions that undercut domestic organic rice production and consumption. This makes the country a distinctive setting for examining how well the Theory of Planned Behavior holds up in an environment shaped by structural disadvantage.

3.2. Instrument Development

To measure the key constructs in our study, we relied on scales that have already been vetted in earlier research (see Appendix A). For environmental concern, we used four items that have appeared repeatedly in the literature and have held up well across different samples (e.g., Maduku, 2024; Wu et al., 2024; Yadav & Pathak, 2016). Environmental knowledge was captured with four items adapted from prior work, each of them drawn from studies that report solid reliability and validity (e.g., Isac et al., 2024; Wu et al., 2024; Yadav & Pathak, 2016). Health status and health consciousness were measured with three and four items, respectively, following Prakash et al. (2019). The TPB variables followed the classic approach: three items for attitude, three for subjective norms, and another three for perceived behavioral control. These items come from earlier studies that have used and refined them over time (e.g., S. Wang et al., 2016; S. Wang & Sun, 2020; Y. Wang et al., 2024; Y. Xu et al., 2022). Purchase intention, the dependent variable, was assessed using three items adapted from previous research (e.g., Wu et al., 2024; Yadav & Pathak, 2017). All items were rated on a five-point scale, which seemed appropriate for capturing subtle differences in responses without overwhelming participants. We also included demographic variables (Figure 1) as controls. While these additions may seem routine, they help reduce the risk of omitted variable bias and give us more confidence in the relationships we ultimately report (Carlson & Wu, 2012).

3.3. Data Collection and Sample Characteristics

We recruited Haitian consumers aged 18 and above using a random sampling approach across three rural areas in the Centre Department—Hinche, Mirebalais, and Lascahobas. Before launching the full survey, we ran a small pilot with 30 participants to check whether the questions were clear and whether the instrument actually worked the way we intended. That quick test helped us adjust a few wording issues before moving on to the main data collection. From 1 June to 31 July 2023, we distributed 600 questionnaires and received 486 back, which, by typical fieldwork standards, was a surprisingly strong response rate

of 81%. After cleaning the data, we removed 85 surveys due to missing answers or the absence of signed consent forms. This left us with a final sample of 401 respondents. The demographic breakdown reflects the region's population in some ways but also shows a few interesting patterns. Men made up 56.4% of the sample, while women represented 43.6%. The group was fairly young overall: those aged 18–28 and 29–39 together accounted for more than four-fifths of the sample (81.6%). In terms of marital status, 40.4% were single, 31.2% married, and 12.2% living in common-law unions. Education levels were relatively high for a rural context, 42.2% were enrolled in or had completed a graduate program, and another 37.2% had a high school diploma. Employment was split mainly between public/private sector workers (44.4%) and independent professionals (39.9%). Income data showed that nearly half of participants (49.1%) earned under 20,000 Haitian Gourdes per month, which needs to be read in light of the exchange rate at the time (1 USD $\approx$ 131.5 HTG). This financial profile helps situate the socioeconomic constraints under which purchasing decisions, especially for organic foods, are made.

An independent *t*-test revealed no substantial differences between males ($n = 226$; $M = 2.1947$; $SD = 0.91487$) and females ($n = 175$, $M = 2.3295$, $SD = 1.08$) for independent variables namely, Environmental Concern [$t(399) = 1.352$, $p = 1.77$], environmental knowledge [$t(399) = 0.546$, $p = 0.585$], health status [$t(399) = 0.807$, $p = 0.420$], health consciousness [$t(399) = 1.401$, $p = 0.162$]. Also, significant differences in gender were found for attitudes [$t(399) = 2.312$, $p = 0.021$] and subjective norms [$t(399) = 3.344$, $p = 0.021$]. Additionally, we found significant gender differences in consumers' intentions to purchase organic rice [$t(399) = 2.234$, $p = 0.026$].

4. Results

4.1. Measurement Assessment

Our preliminary checks suggested that the data behaved much like a normal distribution. Skewness and kurtosis values stayed within the commonly accepted ± 1 threshold, which several methodological sources treat as reasonable for structural modeling (see, Byrne, 2013; George, 2011; Johnson & Wichern, 2007). When assessing the measurement model, we looked at the usual indicators: item reliability, internal consistency, and both convergent and discriminant validity (see Tables 1 and 2). Most factor loadings were comfortably above 0.70, with only three items slipping slightly below that mark—still considered acceptable in many applied studies (Fornell & Larcker, 1981). Internal consistency also held up well. Composite reliability and McDonald's Omega both cleared the 0.70 threshold, giving us reasonable confidence that the constructs were measured consistently (Hair et al., 2021; Hayes & Coutts, 2020). Convergent validity was supported as all constructs achieved AVE values greater than 0.50 (Hair et al., 2019; Leguina, 2015). Discriminant validity was established by the square root of each construct's AVE surpassing its inter-construct correlations (Fornell & Larcker, 1981), complemented by HTMT ratios below 0.85 (Henseler et al., 2015), as shown in Table 2. Finally, checks for multicollinearity and common method bias using variance inflation factors (VIFs) revealed values well under the threshold of 5, with the highest VIF recorded at 2.820 for Health Consciousness (Kock, 2015; Neter et al., 1996).

Table 1. Psychometric Properties of the Items.

Items	Skew	Kurtosis	Loadings	Omega	CR	AVE
EnvC3	0.791	−0.438	0.828	0.836	0.826	0.616
EnvC2	0.764	−0.375	0.861			
EnvC1	1.011	0.839	0.649			

Table 1. Cont.

Items	Skew	Kurtosis	Loadings	Omega	CR	AVE
EnvK4	0.554	−0.542	0.861	0.857	0.853	0.594
EnvK3	0.614	−0.139	0.765			
EnvK2	0.522	−0.024	0.775			
EnvK1	0.546	−0.249	0.670			
HS3	0.691	−0.166	0.783	0.831	0.832	0.623
HS2	1.018	0.428	0.796			
HS1	0.837	−0.110	0.788			
HC4	1.022	−0.205	0.878			
HC3	1.117	0.155	0.874	0.910	0.907	0.709
HC2	1.055	0.191	0.858			
HC1	1.159	0.614	0.753			
ATT3	0.592	−0.433	0.755			
ATT2	0.909	−0.220	0.909	0.884	0.881	0.712
ATT1	0.876	−0.178	0.860			
PBC3	0.325	−0.352	0.686			
PBC2	0.659	−0.414	0.788			
PBC1	0.342	−0.331	0.744	0.785	0.784	0.549
SN3	0.673	−0.137	0.815			
SN2	0.594	−0.486	0.883			
SN1	0.566	0.052	0.731			
GPI3	0.944	−0.189	0.891	0.914	0.913	0.778
GPI2	0.894	−0.135	0.890			
GPI1	1.070	0.228	0.866			

Table 2. Mean, Standard Deviation, Discriminant Validity, and Correlations.

Variables	Mean	Std. Dev	1	2	3	4	5	6	7	8
1. Environmental Concerns	2.2535	0.99177	[0.785]	0.641	0.351	0.756	0.647	0.531	0.697	0.727
2. Environmental Knowledge	2.3672	0.87302	0.640 ***	[0.771]	0.390	0.687	0.556	0.596	0.617	0.632
3. Health Status	2.2835	0.94854	0.360 ***	0.373 ***	[0.789]	0.410	0.256	0.362	0.304	0.267
4. Health Consciousness	2.2835	0.94854	0.768 ***	0.697 ***	0.389 ***	[0.842]	0.732	0.568	0.741	0.767
5. Attitudes toward Organic Food	2.1197	1.06478	0.637 ***	0.559 ***	0.254 ***	0.725 ***	[0.844]	0.497	0.634	0.759
6. Perceived Behavioral Control	2.2510	1.03931	0.542 ***	0.586 ***	0.361 ***	0.582 ***	0.491 ***	[0.741]	0.636	0.500
7. Subj. Norms	2.4589	0.88571	0.692 ***	0.614 ***	0.304 ***	0.747 ***	0.618 ***	0.623 ***	[0.812]	0.737
8. Intention to Regularly Purchase Organic Rice	2.4946	0.95890	0.726 ***	0.643 ***	0.268 ***	0.775 ***	0.758 ***	0.521 ***	0.737 ***	[0.882]

*** $p < 0.001$; HTMT matrix is in grey.

4.2. Comparison of the CFA Models

To assess the model's fit, we carried out three separate CFA analyses. In the first analysis (Model 1), we included the TPB constructs together with consumers' intention to regularly purchase organic rice. The second analysis incorporated the environmental and health factors along with consumers' intention. In the third and most comprehensive analysis (Model 3), we included every variable in the framework. All three models showed acceptable fit based on the standard goodness-of-fit indicators, χ^2/df , CFI, GFI, AGFI, and RMSEA, which are summarized in Table 3. That said, Model 3 stood out. With $\chi^2/\text{df} = 2.995$, CFI = 0.952, IFI = 0.952, and RMSEA = 0.071, it appeared to offer the strongest overall fit. Model 3 also performed better in terms of predictive accuracy. Its adjusted R^2 reached 0.633, suggesting that the full specification captured more of the variation in the outcome than the more restricted models.

Table 3. Fit Indices of Models and Explanatory Power.

Measure	Model 1	Model 2	Model 3
χ^2	108.663	326.413	587.427
DF	48.000	109.000	271.000
χ^2/df	2.264	2.995	2.168
CFI	0.980	0.952	0.954
IFI	0.980	0.952	0.955
SRMR	0.043	0.069	0.060
RMSEA	0.056	0.071	0.054
Adjusted R^2	0.572	0.555	0.633

4.3. Results of the SEM Analysis

To address potential confounding effects (Dierdorff & Morgeson, 2007; Tiwana & Keil, 2007), we performed two separate SEM analyses in AMOS 26. The first analysis excluded the demographic variables, and the second one excluded them. To enhance the robustness of the results, bootstrapping with 5000 resamples was applied. The results that included the demographic variables and the results that excluded these variables are described in Tables 4 and 5, respectively. With the exclusion of the CVs, the model revealed high predicted power with 61.2% variance in subjective norms, 43.6% variance in PBC (PBC), 55.3% variance in attitudes, and 73.8% of the variance in consumers' intent to regularly purchase organic rice. When the control or demographic variables were added to the model, we found no substantial changes in the variance of subjective norms (61.6%), PBC (43.8%), attitudes toward organic food (55.5%), and intent to purchase organic food (74.5%). We report the results of direct effects graphically, as shown from the Amos output in Figure 2.

Effects of environmental concern & Knowledge. When the demographic variables are omitted in the CB-SEM analysis, the results revealed that Environmental Concern predicted consumers' intention to regularly purchase organic rice (Hypothesis 1a: $\beta = 0.170$, CR = 2.535, $p = 0.011$), their Attitudes Toward Organic Rice (Hypothesis 1b: $\beta = 0.187$, CR = 2.387, $p = 0.017$), their PBC (Hypothesis 1c: $\beta = 0.258$, $p < 0.001$), but not Subjective Norms (Hypothesis 1d: $\beta = 0.148$, CR = 1.585, $p = 0.113$). As shown in Table 4, these effects remain unchanged when the control variables are added, except for some minor changes in the estimated values. Our results revealed that Environmental Knowledge partially predicts Consumers' Intention to Regularly Purchase Organic Rice (Hypothesis 2a: $\beta = 0.108$, CR = 1.910, $p = 0.056$), fully predicts PBC (Hypothesis 2c: $\beta = 0.137$, CR = 2.124, $p = 0.034$), Subjective Norms (Hypothesis 2d: $\beta = 0.292$, CR = 3.610, $p < 0.001$) but does not predict Attitudes (Hypothesis 2b: $\beta = 0.078$, CR = 1.192, $p = 0.233$). When the control variables were included in the analysis, the effect of Environmental Knowledge on Consumers' Intention shifted from partially significant to fully significant (Hypothesis 2a: $\beta = 0.117$,

CR = 2.094, $p = 0.036$). Its effect on Attitudes also changed, moving from non-significant to significant (Hypothesis 2b: $\beta = 0.079$, CR = 2.084, $p = 0.037$). Moreover, its effect on PBC showed a notable increase in significance (Hypothesis 2c: $\beta = 0.134$, CR = 3.634, $p < 0.001$). Nevertheless, the effect of Environmental Knowledge on Subjective Norms has changed from being significant to being insignificant when the CVs are included in the analysis (Hypothesis 2d: $\beta = 0.294$, CR = 1.210, $p = 0.226$).

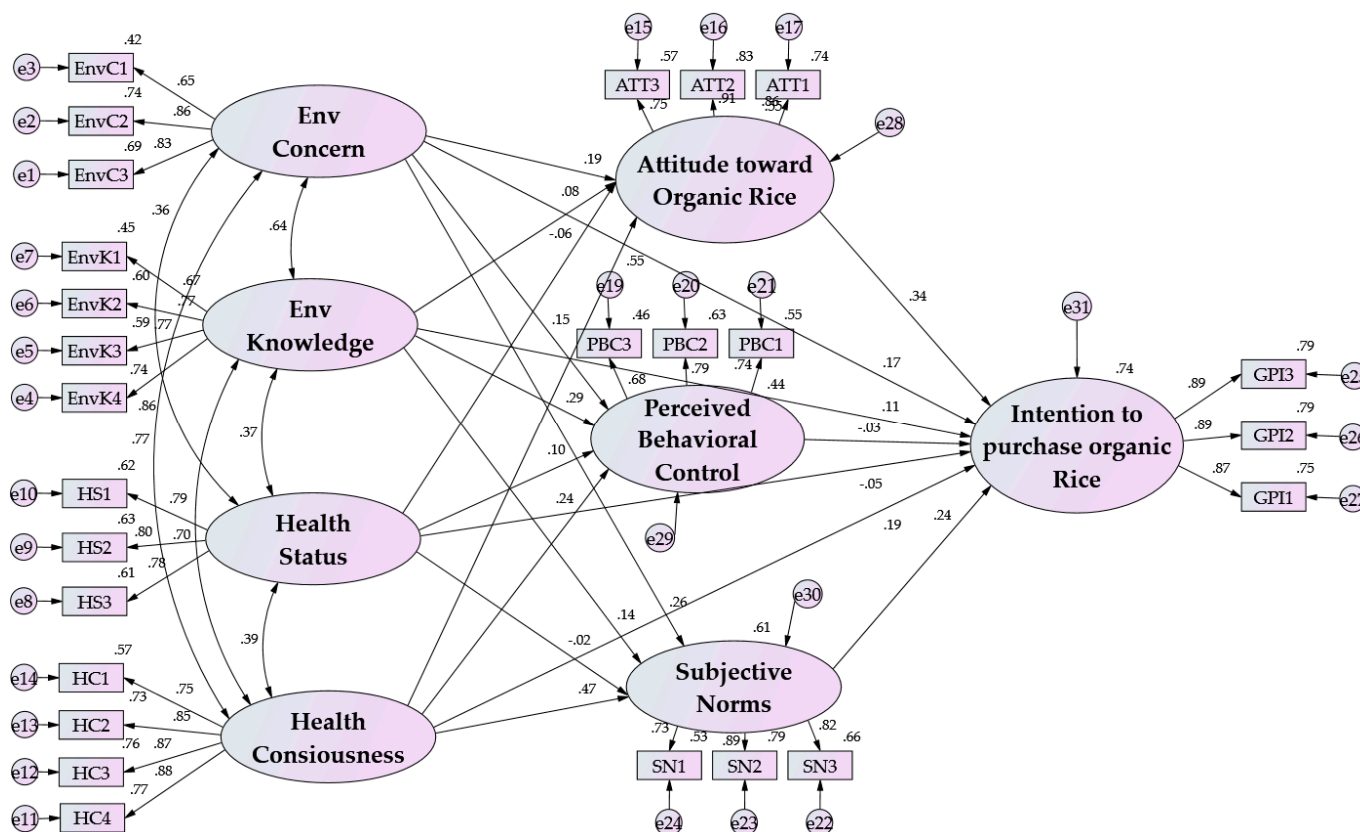


Figure 2. Results of the CV-SEM Analysis in the Absence of the CVs.

Health status & Health Consciousness. Our results also showed that “Health Status” had an insignificant negative effect on Consumers’ Intention to Regularly Purchase Organic Rice (Hypothesis 3a: $\beta = -0.053$, CR = -1.345 , $p = 0.179$), their Attitudes toward purchasing organic rice (Hypothesis 3b: $\beta = -0.057$, CR = -1.188 , $p = 0.235$), PBC (Hypothesis 3c: $\beta = -0.020$, CR = -0.431 , $p = 0.666$) but had an insignificant positive impact on Subjective Norms (Hypothesis 3d: $\beta = 0.103$, CR = 1.792, $p = 0.073$) when the CVs are excluded in the analysis. As indicated in Table 4, no substantial changes were observed regarding the effects of Health Status when the CVs were included in the analysis. In the absence of the CVs, our findings showed that Health Consciousness positively predicted consumers’ intention to purchase organic rice (Hypothesis 4a: $\beta = 0.185$, CR = 2.267, $p = 0.023$), their Attitudes Toward Organic rice (Hypothesis 4b: $\beta = 0.553$, CR = 6.404, $p < 0.001$), PBC (Hypothesis 4c: $\beta = 0.468$, CR = 5.687, $p < 0.001$), Subjective Norms (Hypothesis 4d: $\beta = 0.240$, CR = 2.438, $p = 0.015$). When the CVs were added to the analysis, no substantial changes were observed in the effects of Health Consciousness.

TPB and the control variables. Additionally, we found that Attitudes (Hypothesis 5: $\beta = 0.336$, CR = 5.974, $p < 0.001$) and Subjective Norms (Hypothesis 7: $\beta = 0.241$, CR = 3.911, $p < 0.001$) significantly predict Consumers’ Intention to purchase organic rice regularly. However, our findings displayed an insignificantly negative relationship between PBC and Consumers’ Intention to purchase organic rice regularly (Hypothesis 6: $\beta = -0.031$, CR = -0.613 ,

$p = 0.540$). Including the control variables did not produce notable changes in the effects of the TPB constructs on consumers' purchase intentions. However, the analysis revealed that age exerted a significant negative influence on the intention to buy organic rice ($\beta = -0.103$, $CR = -2.498$, $p = 0.012$), whereas income showed a significant positive effect on consumers' intention to regularly purchase organic rice ($\beta = 0.098$, $CR = 2.484$, $p = 0.013$).

Table 4. Results of the CV-SEM (CVs excluded).

Proposed Direct Effects	Estimate	S.E.	C.R. (t-Values)	<i>p</i> Values
H1a: EnvC → Intention	0.170	0.074	2.535	0.011
H1b: EnvC → Attitudes	0.187	0.064	2.387	0.017
H1c: EnvC → Behavioral Control	0.258	0.067	3.332	***
H1d: EnvC → Subj Norms	0.148	0.063	1.585	0.113
H2a: EnvK → Intention	0.108	0.064	1.910	0.056
H2b: EnvK → Attitudes	0.078	0.055	1.192	0.233
H2c: EnvK → Behavioral Control	0.137	0.057	2.124	0.034
H2d: EnvK → Subj. Norms	0.292	0.056	3.610	***
H3a: HealthS → Intention	−0.053	0.053	−1.345	0.179
H3b: HealthS → Attitudes	−0.057	0.048	−1.188	0.235
H3c: HealthS → Behavioral Control	−0.020	0.050	−0.431	0.666
H3d: HealthS → Subj. Norms	0.103	0.048	1.792	0.073
H4a: HealthC → Intention	0.185	0.080	2.267	0.023
H4b: HealthC → Attitudes	0.553	0.062	6.404	***
H4c: HealthC → Behavioral Control	0.468	0.063	5.687	***
H4d: HealthC → Subj. Norms	0.240	0.059	2.438	0.015
H5: Attitudes → Intention	0.336	0.076	5.974	***
H6: Behavioral Control → Intention	−0.031	0.083	−0.613	0.540
H7: Subj. Norms → Intention	0.241	0.079	3.911	***

Intention = consumers' intention to regularly purchase organic rice; Attitudes = attitudes toward organic rice.

*** p is the significance level of the correlation at the 0.001 confidence level.

Table 5. Results of the CV-SEM (CVs included).

Proposed Direct Effects	Standardized Estimate	S.E.	C.R.	<i>p</i>
H1a: EnvC → Intention	0.159	0.074	2.389	0.017
H1b: EnvC → Attitudes	0.187	0.064	2.385	0.017
H1c: EnvC → Behavioral Control	0.263	0.067	3.400	***
H1d: EnvC → Subj Norms	0.156	0.063	1.665	0.096
H2a: EnvK → Intention	0.117	0.063	2.094	0.036
H2b: EnvK → Attitudes	0.079	0.057	2.084	0.037
H2c: EnvK → Behavioral Control	0.134	0.056	3.634	***
H2d: EnvK → Subj. Norms	0.294	0.055	1.210	0.226
H3a: HealthS → Intention	−0.046	0.053	−1.180	0.238
H3b: HealthS → Attitudes	−0.060	0.048	−1.263	0.207
H3c: HealthS → Behavioral Control	−0.022	0.050	−0.478	0.632
H3d: HealthS → Subj. Norms	0.102	0.048	1.778	0.075
H4a: HealthC → Intention	0.176	0.079	2.153	0.031
H4b: HealthC → Attitudes	0.555	0.062	6.432	***
H4c: HealthC → Behavioral Control	0.469	0.063	5.710	***
H4d: HealthC → Subj. Norms	0.235	0.059	2.386	0.017
H5: Attitudes → Intention	0.338	0.075	6.069	***
H6: Behavioral Control → Intention	−0.029	0.082	−0.568	0.570
H7: Subj. Norms → Intention	0.232	0.078	3.808	***
Gender → Intention	0.012	0.071	0.380	0.704
Family Status → Intention	0.001	0.026	0.046	0.964
Education → Intention	0.049	0.042	1.471	0.141
Occupation → Intention	0.042	0.030	1.337	0.181
Age → Intention	−0.103	0.055	−2.498	0.012
Income → Intention	0.098	0.053	2.484	0.013

Note: Intention = consumers' intention to regularly purchase organic rice; Attitudes = attitudes toward organic rice. *** p is the significance level of the correlation at the 0.001 confidence level.

4.4. Findings on the Mediation Effects of the TPB Variables

Table 5 reveals two significant indirect effects from environmental concern: (1) Environmental concern → Attitudes → Intention (H8a: $\beta = 0.070$, $p = 0.049$) and (2) Environmental Concern → Subjective Norms → Intention (H8c: $\beta = 0.069$, $p = 0.004$). We found one significant indirect effect from environmental knowledge: Environmental Knowledge → Subjective Norms → Intention (H9c: $\beta = 0.037$, $p = 0.029$). Furthermore, two indirect effects from Health Consciousness displayed significant results: (1) Health Consciousness → Attitudes → Intention (H10a: $\beta = 0.182$, $p < 0.001$); (2) Health Consciousness → Subjective Norms → Intention (H10c: $\beta = 0.110$, $p = 0.002$). However, all the indirect effects from health status were negative and insignificant, as shown in Table 6.

Table 6. Mediating effects of the TPB variables.

Indirect Relationships	Estimate	95% Confidence Interval		<i>p</i>
		Lower	Upper	
H8a: EnvC → Attitudes → Intention	0.070	0.000	0.170	0.049
H8b: EnvC → PBC → Intention	−0.005	−0.063	0.014	0.427
H8c: EnvC → SubjN → Intention	0.069	0.019	0.164	0.004
H9a: EnvK → Attitudes → Intention	0.030	−0.019	0.111	0.217
H9b: EnvK → PBC → Intention	−0.010	−0.072	0.035	0.571
H9c: EnvK → SubjN → Intention	0.037	0.004	0.101	0.029
H10a: HealthC → Attitudes → Intention	0.182	0.096	0.314	0.000
H10b: HealthC → PBC → Intention	−0.007	−0.070	0.022	0.474
H10c: HealthC → SubjN → Intention	0.110	0.043	0.221	0.002
H11a: HealthS → Attitudes → Intention	−0.026	−0.087	0.018	0.206
H11b: HealthS → PBC → Intention	−0.004	−0.041	0.014	0.433
H11c: HealthS → SubjN → Intention	−0.007	−0.045	0.030	0.593

Note: EnvC = environmental concerns; EnvK = environmental knowledge; HealthS = health status; HealthC = health consciousness; PBC = perceived behavioral control; SubjN = subjective norms; Intention = Intention to regularly purchase organic rice.

5. Overview of the fsQCA Methodology

The main difference between fsQCA and more traditional statistical tools—say, linear regression—is really about where each method places its attention. Variable-oriented approaches try to estimate the net effect of individual predictors across a sizeable sample (Gefen et al., 2000; Woodside, 2017). FsQCA, however, takes a different route. It treats each case as a combination of attributes and looks at how these combinations relate to an outcome, rather than separating everything into independent and dependent variables (Fiss, 2011; Furnari et al., 2021; Ragin, 2009; Woodside, 2017). This angle can be especially helpful when studying human behavior, an area where context, variation, and messy realities tend to matter quite a bit (Gerrits & Pagliarin, 2021). FsQCA builds on fuzzy set theory, which allows cases to have partial membership in a condition instead of being forced into a simple yes-or-no category. Under crisp set logic, a case is either fully in (1) or fully out (0). Fuzzy sets, by contrast, let membership fall anywhere on a continuum between 0 and 1 (Fiss, 2007). This makes particular sense for social and psychological variables. Concepts like health consciousness, perceived health status, environmental knowledge, or environmental concern are almost always measured in degrees, often via Likert scales, rather than as binary states. Calibrating fuzzy sets gives us a way to reflect that gradation more faithfully, capturing the nuance and ambiguity that naturally show up in this type of data (Pappas & Bley, 2023; Pappas & Woodside, 2021).

The shift to set-theoretic thinking also opens the door to handling two ideas that conventional linear models often gloss over: equifinality and conjunctural causation (Woodside,

2017; X. Xu et al., 2024). Equifinality means that there is not necessarily a single road to an outcome—several different pathways may lead to the same outcome (Fiss, 2007; Woodside, 2014; Woodside, 2017). Conjunctural causation reminds us that outcomes typically arise from a combination of factors acting together rather than one dominant variable operating in isolation (Pappas & Bley, 2023; Pappas & Woodside, 2021; Ragin, 2009; Woodside, 2014). FsQCA also allows researchers to identify necessary and sufficient conditions. A necessary condition must be present for the outcome to happen at all, whereas a sufficient condition, if present, guarantees the outcome (Fiss, 2007; Fiss, 2011; Furnari et al., 2021; Ragin, 2009). In practice, though, social science rarely deals in single-variable sufficiency; it is usually the particular configuration of conditions that matters most (Gerrits & Pagliarin, 2021). With this in mind, our study uses fsQCA to uncover which combinations of conditions are sufficient to shape consumers' intentions to purchase organic rice rather than imported alternatives that suppress local organic demand. This analysis complements the SEM results discussed earlier. Figure 3 outlines the conceptual model and the pathways we expect to lead to the outcome, which can be summarized as: $C_INT = f(C_EK, C_EC, C_HS, C_HC, C_ATT, C_PBC, C_SN)$.

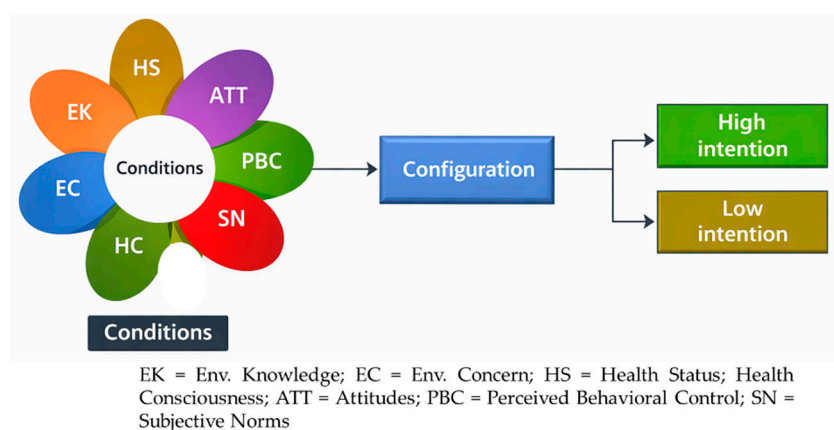


Figure 3. Configuration of causal conditions for consumer intention to purchase organic rice.

5.1. Analysis of the Contrarian Cases

As an initial analytical step, we used contrarian case analysis to spot observations that run against the dominant trend in the dataset. The goal was to pick up outliers—or at least atypical cases—that might still carry theoretical value rather than simply treating them as noise (Woodside, 2014). In this approach, a “contrarian case” refers to a situation where a low score on variable X pairs with a high score on variable Y (or the reverse), even though the overall pattern between X and Y is positive and fairly strong. These cases often slip under the radar in standard linear analyses (Pappas & Woodside, 2021; Woodside, 2014). To locate such cases, we began by calculating the mean for each variable, ranking all observations, and placing them into quintiles. We then used a simple cross-tabulation to scan for combinations that matched the contrarian profile and to determine how common they were in percentage terms. This exercise revealed that the relationships in our data are not entirely captured by the main effects alone. Several observations behaved in ways that contradicted the general pattern, suggesting that meaningful contrarian cases do exist within our sample. For instance, although higher levels of environmental knowledge typically enhance consumers' intention to regularly purchase organic rice, we also observed paradoxical patterns: in certain cases, low environmental knowledge coincided with strong purchase intention, while in others, high knowledge was linked to weaker intention to purchase. Below, we present the main effects of environmental concern on the intention to purchase organic rice, as reflected in the percentile group cross-tabulation, where the

values in italics represent the main effects, while values in bold indicate contrarian cases. The result is shown in Table 7. Detailed results for the remaining cases are provided in Appendix B.

Table 7. Percentile Group of Environmental concern* Percentile Group of Intention to purchase organic rice cross-tabulation.

Note: IPOSGR-Intention to Purchase Organic Staple Grain Regularly EnvC-Environmental Concern			Percentile Group of IPOSGR					Total
			1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	
Percentile Group of EnvC	1	count	25	34	15	8	3	85
		% total	6.23	8.48	3.74	2	0.7	21.15
	2	count	38	38	14	14	5	109
		% total	9.47	9.47	3.49	3.5	1.2	27.13
	3	count	17	24	10	10	2	63
		% total	4.24	5.99	2.49	2.49	0.5	15.71
	4	count	9	15	10	8	17	59
		total	2.24	3.74	2.49	2	4.24	14.71
	5	% count	2	11	5	11	56	85
		% total	0.5	2.74	1.25	2.74	13.97	21.2
Total			91	122	54	51	83	401

Phi = 0.604

5.2. Analysis of fsQCA and Results

We employed fsQCA 4.1 to identify the configurations of consumers' intention to regularly purchase organic rice, as illustrated in Figure 2. We followed scholarly established best practices to calibrate the variables, and the results are presented in Table 8 (e.g., Li et al., 2025; Pappas & Woodside, 2021). Following calibration, we constructed a truth table (Appendix C) and conducted a necessity analysis to evaluate individual conditions.

Table 8. Fuzzy-Set Calibration Thresholds.

Calibration Method	EK	EC	HS	HC	ATT	PBC	SN	IN
Full non-membership (5%)	1.33	1.25	1.33	1.25	1.00	1.33	1.33	1.00
Cross (50%)	2.00	2.25	2.00	1.75	2.00	2.33	2.33	1.67
Full membership (95%)	4.33	4.00	4.33	4.50	4.33	4.33	4.33	4.67

5.3. Results of the Necessary Conditions

In fsQCA, necessity denotes conditions that must be present for an outcome, while sufficiency indicates conditions that can produce or prevent it, with validity typically assessed through consistency and coverage (Cooper & Glaesser, 2015; Rihoux & Ragin, 2009). Consistency measures how closely a causal configuration aligns with the outcome across cases, while coverage assesses the empirical relevance of a sufficient condition within the dataset (Ragin, 2009; Rihoux & Ragin, 2009). A consistency threshold of 0.8 is commonly recommended for robustness, with scores above 0.9 denoting near-perfect necessity, and those above 0.8 are generally regarded as very strong necessary conditions in social science research (Ragin, 2009; Woodside, 2017). Accordingly, Table 9 reveals that C_EK, C_EC, C_HC, C_ATT, and C_SN each function as strong necessary conditions for high purchase intention of organic rice, within the model: $C_INT = f(C_EK, C_EC, C_HS, C_HC, C_ATT, C_PBC, C_SN)$.

Table 9. Results of the Necessary Conditions.

Antecedents Conditions	High Intention to Purchase		Low Intention to Purchase	
	Consistency	Coverage	Consistency	Coverage
C_EK	0.859649	0.68807	0.609894	0.584638
C_EC	0.806982	0.68171	0.588341	0.595232
C_HS	0.754809	0.63089	0.654235	0.654895
C_HC	0.879323	0.6964	0.626825	0.594532
C_ATT	0.83718	0.71051	0.609619	0.619628
C_PBC	0.791966	0.67762	0.618405	0.633687
C_SN	0.840686	0.71392	0.595891	0.606041

5.4. Results of the Configural Solutions (fsQCA Findings)

In fsQCA, three solution types are produced: complex, parsimonious, and intermediate, with core conditions identified when present in both parsimonious and intermediate solutions, and peripheral conditions when appearing only in the intermediate solution (Pappas & Woodside, 2021; Ragin, 2009; Rihoux & Ragin, 2009). Tables 10 and 11 present the parsimonious and intermediate solutions, respectively, with 22 distinct configurations leading to consumers' intention to regularly purchase organic rice (Table 11); core conditions are shown in bold, and all values are rounded. Raw coverage indicates the empirical bearing of a causal recipe by showing the part of the outcome—here, consumers' intention to purchase organic rice—that is explained by a specific combination of conditions. Configurations with higher raw coverage represent more frequently observed pathways to the outcome. The most prevalent pathway (raw coverage = 0.638) consists of the combination C_EK • C_HC • C_ATT • C_SN, that is, the presence of environmental knowledge, health consciousness, attitudes, and subjective norms. Two other notable configurations also show substantial coverage: C_EC • C_HS • C_HC • C_ATT • C_PBC (0.527) and C_EK • C_EC • C_HS • C_ATT • C_PBC (0.512). Across these recipes, core conditions such as health consciousness and attitudes consistently appear. Thereby, this suggests that their role is central in driving purchase intention. Also, other factors like environmental concern and health status serve as peripheral elements. Consistency reflects the degree to which a configuration reliably leads to the outcome.

The rule of thumb suggests that values close to 1 signal highly sufficient recipes. The most consistent combination (0.956) is C_EK • C_EC • ~C_HS • C_HC • ~C_PBC, which comprises environmental knowledge, environmental concern, and health consciousness, in the absence of health status and PBC. Other highly consistent configurations (e.g., C_EK • ~C_HS • C_HC • C_ATT • ~C_PBC at 0.951 and C_EK • ~C_HS • C_ATT • ~C_PBC • C_SN at 0.954) share two key features: the presence of environmental knowledge and the absence of PBC. This pattern appears to show that environmental awareness can be a powerful motivator even when consumers feel they lack direct control, highlighting its role as a persistent factor across different pathways. It is not the only trigger, but it is one that seems to hold weight even in the absence of other drivers. Taken together, these results paint a picture of organic purchase intention as genuinely complex and equifinal. In simpler terms, there is not one single route to a buying decision. Instead, several distinct combinations of attitudes and circumstances, each with its own empirical strength and reliability, can all lead to the same consumer choice.

Table 10. Results of the parsimonious solutions.

frequency cutoff: 1			
consistency cutoff: 0.801846			
Configurations	Raw coverage	Unique coverage	Consistency
C_EK	0.859649	0.0102482	0.688072
C_HC	0.879323	0.00548029	0.696396
C_ATT	0.83718	0.00843972	0.71051
C_PBC	0.791966	0.00208247	0.677623
C_SN	0.840686	0.00526118	0.713919
Solution coverage: 0.845947			
Solution consistency: 0.756369			

Table 11. Results of the Intermediate solution.

Configurations	Raw Coverage	Unique Coverage	Consistency
1. C_EK•C_HC•C_ATT•C_SN	0.637694	0.0369924	0.870174
2. ~C_EK•~C_EC•~C_HS•C_ATT•~C_PBC	0.236313	0.00646681	0.891093
3. C_EC•C_HC•~C_ATT•~C_PBC•~C_SN	0.258618	0.000602841	0.922761
4. C_EK•C_EC•~C_HS•C_HC•~C_PBC	0.314627	0.00191814	0.955559
5. C_EK•~C_HS•C_HC•C_ATT•~C_PBC	0.324492	0.00427479	0.951317
6. C_EK•~C_HS•C_ATT•~C_PBC•C_SN	0.306078	0.0013153	0.954048
7. ~C_EC•~C_HS•C_HC•C_ATT•C_SN	0.303064	0.00202781	0.942239
8. C_EK•C_HS•~C_ATT•C_PBC•C_SN	0.374034	0.0124953	0.916107
9. C_EK•C_EC•C_HS•C_ATT•C_PBC	0.512358	0.00624764	0.881897
10. C_EC•C_HS•C_HC•C_ATT•C_PBC	0.527319	0.0116183	0.879121
11. ~C_EK•~C_EC•~C_HS•~C_HC•~C_PBC•C_SN	0.187538	0.00389099	0.837084
12. C_EK•C_HS•~C_HC•~C_ATT•~C_PBC•~C_SN	0.195155	0.00208247	0.881217
13. ~C_EK•~C_EC•C_HC•C_ATT•~C_PBC•~C_SN	0.222612	0.00197291	0.938974
14. ~C_EC•C_HS•~C_HC•~C_ATT•C_PBC•~C_SN	0.200143	0.00219196	0.807786
15. C_EC•C_HS•~C_HC•~C_ATT•C_PBC•C_SN	0.24837	0.000602841	0.924898
16. C_EC•~C_HS•C_HC•~C_ATT•C_PBC•C_SN	0.295501	0.00942624	0.954336
17. C_EK•~C_EC•~C_HS•~C_HC•C_ATT•C_PBC•~C_SN	0.191155	0.0013153	0.946797
18. ~C_EK•C_EC•~C_HS•~C_HC•C_ATT•C_PBC•~C_SN	0.172796	0.000657618	0.925177
19. C_EK•C_EC•C_HC•~C_PBC•~C_SN	0.305639	0.0013153	0.936996
20. C_EK•C_EC•C_HC•C_ATT•~C_PBC	0.406807	0	0.936655
21. ~C_EK•~C_HS•C_HC•~C_ATT•~C_PBC•~C_SN	0.190278	0	0.879655
22. ~C_EK•~C_EC•~C_HS•C_HC•~C_PBC•~C_SN	0.203979	0	0.885347
Solution coverage: 0.845947			
Solution consistency: 0.756369			

Note: In the configurations above, the dot symbol (•) represents the logical “AND,” meaning the listed conditions are combined. The tilde (~) indicates that a particular condition is notably absent from the recipe.

6. Discussion and Theoretical Implications

Through this study, we set out to understand how environmental concern, knowledge, health consciousness, and health status might, directly or indirectly (through the lens of the Theory of Planned Behavior (TPB) constructs), influence a consumer’s decision to purchase organic rice regularly. Beyond these basic relationships, we also analyzed the specific configurations, the unique combinations of these independent variables that best predicted a regular intention to purchase organic rice. Interestingly, our data clearly showed that consumers’ environmental concerns were a positive predictor of their intention to buy organic rice, and this held even when we factored in our control variables. While this outcome lines up nicely with several previous studies (e.g., Bulut et al., 2021; Maduku, 2024; Tong et al., 2020; Y. Zhang et al., 2023), it is worth noting that other researchers have reported the opposite, finding no significant effect of environmental concern on purchasing organic food (Chen & Zhang, 2021; Chi et al., 2021; Dlamini & Mahowa, 2024). This

divergence really underscores the context-specific nature of the relationship; what drives consumption in one setting may not apply in another.

Moving to the TPB variables, we also found that environmental concern positively predicted both attitudes and perceived behavioral control, regardless of whether controls were included in the model. However, it did not predict subjective norms. These results are consistent with prior work suggesting that environmental concern shapes consumers' attitudes toward green products (Pandey & Yadav, 2023) and also influences their PBC (Hong et al., 2023). More critically, our findings suggest that only attitudes and PBC, out of the three TPB constructs, actually functioned as mediators connecting environmental concern to the intention to purchase organic rice.

A substantial body of previous scholarly work has repeatedly shown that environmental knowledge predicts various types of pro-environmental behaviors (e.g., Kusuma & Handayani, 2018; Tong et al., 2020; L. Wang et al., 2020). When we looked at our own data, the results were a bit nuanced: consumers' environmental knowledge partially predicted their intentions to buy organic rice when control variables (CVs) were excluded, but fully predicted these intentions once the controls were added to the analysis. Previous research generally found that environmental knowledge positively predicted all the TPB variables (e.g., Hong et al., 2023; Liu et al., 2020; L. Wang et al., 2020). Our results were more selective: knowledge predicted attitudes toward purchasing organic rice only in the presence of CVs, predicted PBC regardless of the presence of CVs, and predicted subjective norms only when CVs were included. Ultimately, our analysis showed that consumers' environmental knowledge indirectly predicted their intention to purchase organic rice only through subjective norms.

Hong et al. (2023) offered findings supporting the idea that health consciousness, along with a person's health status, can have a notable impact on the TPB variables. Other research has also confirmed that being health-conscious predicts various pro-green behaviors (e.g., Amin & Tarun, 2022; H. Zhang & Qi, 2021; Huang et al., 2022; Rana & Paul, 2020). In contrast to some of this prior work, our results displayed some curious effects: health status had an insignificantly negative impact on purchase intention, attitudes, and PBC, and an insignificant positive influence on subjective norms. This was true both with and without the CVs. Moreover, we found that none of the TPB variables acted as mediators in the relationship between health status and the intention to purchase organic rice. These particular findings carry important theoretical implications; they may suggest that health status is not a consistent predictor of attitudes, intentions, or subjective norms across every product and socioeconomic context.

Health consciousness, by contrast, was a significant predictor of consumers' intention to purchase organic rice, both with and without control variables. Similarly to the findings of Hong et al. (2023), our results indicated that health consciousness influenced all three TPB constructs regardless of the presence of controls. Additionally, only subjective norms and attitudes worked as mediators in the link between health consciousness and purchase intention. Looking at all four primary independent variables, health consciousness emerged as the strongest driver of consumers' regular intention to purchase organic rice. This consistency appears to be a key finding, holding up even across diverse economic settings.

The research focusing on how TPB variables shape pro-environmental behaviors has produced what some might call a mixed set of results. X. Xu et al. (2020a) reported that only attitudes and subjective norms significantly predicted consumers' intention to regularly purchase organic food, while Roh et al. (2022) found both variables to be influential. Consistent with these studies, our own findings showed that both attitudes toward purchasing organic rice and subjective norms reliably predicted consumers' intention to purchase it, even after controlling for demographic factors. This definitely reinforces the view that a

person's individual attitudes and the social pressures they feel are central drivers of environmentally responsible actions. However, PBC exhibited an unexpectedly insignificant negative effect on purchase intention, with or without controls. This counterintuitive result is likely to suggest that consumers, even if they have positive attitudes and feel social pressure, may perceive themselves as lacking the necessary resources or ability, perhaps easy access, extra money, or time, to act on their green consumption preferences. Taken together, the findings align with prior scholarship emphasizing the need to account for demographic factors, which often confound or moderate these relationships (e.g., Becker, 2005; Bernerth & Aguinis, 2016).

Finally, the fsQCA results were particularly insightful, as they revealed both necessary conditions and specific configurational pathways leading to the intention to purchase organic rice regularly. The analysis identified environmental concern, environmental knowledge, health consciousness, attitudes, and subjective norms as necessary conditions for such intention to occur. This configurational evidence suggests that intention emerges from the combined presence of several reinforcing factors rather than from isolated predictors. When integrating these findings with the SEM results, important complementarities and distinctions become evident. The SEM analysis identified environmental concern, health consciousness, attitudes, and subjective norms as direct predictors of purchase intention. Environmental knowledge also emerged as significant when control variables were included, whereas health status showed no significant effect. Thus, SEM clarifies the net effects of individual predictors, while fsQCA highlights how these conditions operate jointly in different causal configurations.

Importantly, most fsQCA solutions included two of the three TPB constructs as core conditions, typically alongside environmental knowledge and health consciousness. This complements the SEM findings by demonstrating that even when certain variables may show weaker or conditional net effects, they remain structurally central within broader causal recipes. In other words, SEM identifies which variables independently predict intention, whereas fsQCA shows how combinations of motivational, normative, and knowledge-related factors collectively produce high intention.

The recurring presence of environmental knowledge across the strongest fsQCA pathways is particularly noteworthy. While SEM suggests that knowledge contributes directly (especially when controls are included), fsQCA indicates that knowledge functions as a foundational enabling condition within multiple configurations. This implies that knowledge does not merely strengthen attitudes but may also compensate for potential barriers, such as lower perceived behavioral control. In contexts like organic food consumption, where structural constraints often intervene, this highlights the strategic importance of educational and awareness initiatives. Overall, the two analytical approaches converge in underscoring the central role of attitudes and normative influences, while diverging in how they conceptualize causality: SEM emphasizes linear net effects, whereas fsQCA captures causal complexity and equifinality. Together, they provide a more comprehensive understanding of how environmental and health-related motivations translate into pro-environmental purchase intentions.

6.1. Practical and Policy Implications

The long-term success of Haiti's local organic food sector seems, at least for now, likely to rest on whether producers can form an agricultural cooperative. Most farms in the country operate on a very small scale, and that reality makes it hard for individual growers to gather the resources or information they need to compete. A cooperative, even a modest one, could help farmers pool tools, share risks, and gain some of the basic market knowledge that usually only larger producers have access to. More concretely, such a cooperative

could establish a small centralized marketing unit responsible for packaging, labeling, and coordinating weekly sales in local markets. It could also negotiate collective purchasing of organic inputs and organize shared transportation to urban centers, thereby reducing transaction costs that currently limit competitiveness. When it comes to marketing, health consciousness probably has to stand at the center of the strategy, not because other motives do not matter, but because health tends to be the clearest and most immediate driver of purchase decisions, as our findings indicate. Campaigns run through the cooperative might therefore systematically emphasize clearly identifiable claims such as “grown without synthetic pesticides” or “produced using natural soil management techniques.” Simple, standardized labels in both Creole and French could make these claims visible at the point of sale. In addition, short radio segments, market-day demonstrations, and printed leaflets explaining the health-related differences between conventional and organic rice could translate abstract benefits into practical household considerations. These are the kinds of details that people can picture in their everyday lives and that align directly with the motivational patterns observed in this study.

Social influence also plays a huge role in consumer decisions in Haiti, perhaps more than we usually admit. Encouraging respected elders, local pastors, radio hosts, or even a few well-known cooks to speak publicly about their experience with organic rice could gradually reshape what feels “normal” to buy. To make this operational rather than symbolic, cooperatives or local authorities could formally partner with community leaders to organize quarterly public tasting events, cooking demonstrations, or short testimonial recordings broadcast through local radio stations. Community events, simple things like neighborhood cooking afternoons or short testimonies recorded at local markets, might help this shift feel more organic rather than imposed, while reinforcing the social norms that our results show to be influential in shaping intention.

Although health messaging carries the most weight, environmental arguments should not be ignored entirely. They may not convince everyone on their own, but they can reinforce the idea that buying organic is not only good for one’s household but also for local soil, rivers, and long-term food security. In practical terms, environmental communication could focus on visible and locally relevant issues, such as soil degradation or water contamination, linking organic farming practices to tangible community outcomes. Municipal authorities could integrate these messages into local environmental awareness days or agricultural fairs, ensuring that environmental concerns complement, rather than replace, health-based appeals.

On the policy side, the situation gets more complicated. Haiti’s domestic market is constantly under pressure from cheaper, heavily subsidized rice imports. Without strong political will, and here “strong” may simply mean consistent, local producers will always be at a disadvantage. One possible measure is a small environmental or social surcharge on imported conventional rice. The point is not to punish consumers but to create a dedicated support fund earmarked specifically for strengthening domestic organic production. For such a measure to be credible, the revenue would need to be transparently ring-fenced and publicly reported, possibly through the Ministry of Agriculture, to finance training programs, post-harvest infrastructure, and marketing support for certified organic producers. Another missing piece is certification. If consumers are being asked to trust that the rice is truly organic, a credible and affordable certification body is essential. Ideally, the government would make certification either very inexpensive or free for smallholders, who already operate on razor-thin margins. One operational approach could involve establishing a national participatory guarantee system (PGS), supervised by a public agency but implemented locally to reduce administrative costs. A publicly accessible registry of certified producers, whether online or displayed at municipal offices, could further strengthen transparency and consumer confidence.

Strengthening regulatory agencies also matters: if imported rice keeps arriving with inconsistent quality, public trust, already fragile, will erode even further. Regular inspection protocols and clearer quality standards for both imported and domestic rice would help level the playing field. Transitioning to organic farming is not cheap, especially in the early years. Some farmers may need low-interest microcredit simply to survive the switching period. Without that support, many will understandably stick to conventional methods, even if they know the long-term benefits of going organic. In practical terms, targeted credit lines with grace periods of one to two years, possibly administered through rural development banks or microfinance institutions, could reduce the immediate financial burden of conversion. Lastly, Haiti's younger population often receives little exposure to environmental or agricultural concepts in school. Updating primary and secondary curricula to include topics such as sustainable farming, food heritage, and basic ecological principles could, over time, create a generation more aware of where their food comes from and why it matters. Concretely, this could involve integrating short modules on local agriculture into civic education courses, organizing school visits to organic farms, or developing partnerships between schools and producer cooperatives. Over the longer term, such educational interventions may help normalize organic consumption and strengthen the social and health-related motivations identified in this study.

6.2. Theoretical Contributions

This study offers several contributions that matter for the broader conversation in this field. To begin with, bringing both environmental and health-related elements into the TPB framework appears to strengthen its ability to predict consumers' intentions to buy organic rice. Although earlier work has hinted at these connections, they have not really been examined in a setting like Haiti, where the market conditions and social norms differ sharply from those in wealthier countries. By drawing on data from a developing context, the study helps fill a gap that many researchers acknowledge but seldom address. The findings suggest that environmental concern plays a central role in shaping attitudes, perceived behavioral control (PBC), and even subjective norms surrounding organic rice. Health consciousness also has a notable influence on intentions, attitudes, and subjective norms, though interestingly, it does not seem to alter PBC. This may imply that people's awareness of health issues, not necessarily their actual health status, carries more psychological weight in their decision-making. Of course, more work would be needed to confirm that interpretation, but the pattern is hard to ignore.

A second contribution lies in the attempt to stretch the TPB by bringing complexity theory into the picture. Instead of treating behavior as the product of clean, linear relationships, the analysis points toward a more tangled, real-world scenario where several different configurations of conditions can lead to the same outcome. This idea of equifinality, multiple pathways reaching the same endpoint, pushes back against the typical assumption that one dominant factor or sequence explains everything. In practice, it means that two consumers may arrive at the intention to buy organic rice through quite different combinations of attitudes, norms, and concerns. The results also point to asymmetric causality. In plain terms, having strong attitudes or high health consciousness can contribute to purchase intentions, but lacking those traits does not automatically shut the door. Other configurations seem capable of compensating. This asymmetry is something linear models tend to gloss over, and acknowledging it provides a more realistic picture of how people weigh their options. Taken together, the study's evidence suggests that environmental and health considerations are not just peripheral add-ons but core elements within these complex behavioral pathways. While the findings do not claim to settle all debates about sustainable consumption, they do offer a stronger empirical basis for broadening the TPB so it can better reflect how consumers actually make decisions in emerging food systems.

6.3. Limitations and Suggestions

Although this study makes several useful contributions, there are a few limitations worth noting, some of which suggest interesting avenues for future work. Initially, the data were collected from only three rural regions in Haiti. That narrow focus may not fully reflect the views of urban consumers or groups with different socioeconomic backgrounds. It seems likely that a broader sample, perhaps even one that includes comparisons across countries, would help determine whether the patterns observed here hold in very different cultural or economic environments. Another issue has to do with timing. Because the study relies on a cross-sectional design, it captures behavior at just one moment. Consumer motivations change—sometimes slowly, sometimes very abruptly, and a single snapshot cannot fully reveal how or why these shifts occur. A longitudinal approach, although more demanding, would be better suited for studying how attitudes, norms, and intentions evolve, and might provide a clearer sense of causal direction. The study also concentrates solely on organic rice. While this choice helped keep the analysis manageable, it may not reflect how consumers behave when considering other organic foods, fresh vegetables, fruits, poultry, or dairy products, for instance. People may judge these categories differently because of price, perishability, cultural preferences, or simple familiarity. Examining these other product groups could provide a much fuller picture of how organic food decisions are made in developing economies.

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Informed Consent Statement: Informed consent for participation was obtained from all subjects involved in this study.

Data Availability Statement: The dataset supporting the findings of this study is available in Harvard Dataverse and can be accessed at: <https://doi.org/10.7910/DVN/O3MULI>.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Truth Table Generated from the Data Set

C_EK	C_EC	C_HS	C_HC	C_ATT	C_PBC	C_SN	Number	C_INT	Cases	Raw Consistency	PRI Consistency	SYM Consist
1	0	1	1	1	0	1	1	1		0.976378	0.821101	0.826154
1	1	0	1	1	0	1	3	1		0.97634	0.847102	0.85875
1	1	0	0	1	0	1	1	1		0.974761	0.707691	0.737179
1	1	1	1	1	0	0	1	1		0.971848	0.774876	0.805084
1	0	0	1	1	0	1	2	1		0.970989	0.789138	0.792938
1	1	0	1	0	0	1	1	1		0.970699	0.782536	0.782536
1	0	0	1	1	0	0	1	1		0.967611	0.740953	0.740953
1	1	0	1	0	0	0	1	1		0.966762	0.714285	0.714284
1	1	0	1	1	0	0	2	1		0.966129	0.739966	0.739966
0	0	0	1	1	0	1	1	1		0.965765	0.681484	0.681483
1	1	0	1	1	1	1	6	1		0.965662	0.845165	0.86625

C_EK	C_EC	C_HS	C_HC	C_ATT	C_PBC	C_SN	Number	C_INT	Cases	Raw Consistency	PRI Consistency	SYM Consist
1	1	1	0	1	1	0	1	1		0.965551	0.718252	0.718253
1	1	0	1	0	1	1	2	1		0.965537	0.804463	0.813978
1	1	1	1	1	0	1	5	1		0.96146	0.788062	0.811942
1	0	1	1	1	1	1	2	1		0.961313	0.767136	0.775738
1	1	1	1	0	0	0	1	1		0.959644	0.686169	0.68984
1	0	0	0	1	0	1	1	1		0.957154	0.579365	0.583999
0	0	0	1	1	1	1	1	1		0.956096	0.640563	0.655032
0	0	0	1	1	0	0	1	1		0.955228	0.596621	0.596619
0	1	0	1	0	1	1	1	1		0.954858	0.606836	0.606836
1	0	0	1	1	1	1	1	1		0.954724	0.720873	0.720874
0	1	1	1	1	1	1	1	1		0.95318	0.670807	0.684411
1	1	1	0	1	1	1	1	1		0.953045	0.713004	0.713004
1	1	1	0	0	1	1	1	1		0.949729	0.657816	0.657815
1	0	1	1	0	1	1	2	1		0.946839	0.682446	0.700235
1	0	0	0	1	1	0	1	1		0.946797	0.536642	0.545672
1	1	1	1	0	1	1	1	1		0.946564	0.73217	0.732169
0	1	1	1	1	1	0	2	1		0.945117	0.507043	0.536171
0	0	1	1	1	0	0	2	1		0.944819	0.451033	0.464192
1	1	1	1	1	1	0	6	1		0.944086	0.67248	0.698891
0	1	1	1	0	0	0	1	1		0.935908	0.323698	0.334327
0	0	0	0	1	0	1	2	1		0.933372	0.329444	0.348762
1	0	1	0	0	1	1	1	1		0.929963	0.514529	0.525304
1	1	1	0	0	0	0	1	1		0.928314	0.434495	0.445188
0	1	0	1	0	0	0	1	1		0.928189	0.280598	0.280597
0	1	0	0	1	1	0	1	1		0.925177	0.238806	0.238806
0	1	1	0	0	1	1	1	1		0.923156	0.296909	0.304876
1	1	1	1	1	1	1	19	1		0.920928	0.696147	0.780889
1	0	1	0	0	1	0	1	1		0.896469	0.329896	0.329896
0	0	0	0	1	0	0	2	1		0.891479	0.307689	0.314133
1	0	1	0	0	0	0	1	1		0.883827	0.288776	0.292151
0	0	0	1	0	0	0	1	1		0.879784	0.197839	0.197839
0	0	0	0	0	0	1	2	1		0.835426	0.0807919	0.0807919
0	0	1	0	0	1	0	1	1		0.801846	0.10739	0.10739
0	0	1	0	0	0	0	6	0		0.626161	0.0428936	0.0428936
0	0	0	0	0	0	0	46	0		0.445655	0.020711	0.020711

Appendix B. Results of the Scattergrams



Appendix C. Contrarian Cases for Percentile Group of EnvK x Percentile Group of IPOSGR

Note: IPOSGR-Intention to Purchase Organic Staple Grain Regularly EnvK-Environmental Knowledge			Percentile Group of GreenPurchase					Total
			1 Strongly Disagree	2	3	4	5 Strongly Agree	
Percentile Group of EnvK	1	count	21	40	17	11	1	90
		% total	5.24	9.98	4.24	2.74	0.25	22.45
	2	count	23	30	13	4	3	73
		% total	5.74	7.48	3.24	1	0.75	18.21
	3	count	28	18	10	9	5	70
		% total	6.98	4.49	2.49	2.24	1.25	17.45
	4	count	17	22	5	11	25	80
		% total	4.24	5.49	1.25	2.74	6.24	19.96
	5	count	2	12	9	16	49	88
		% total	0.5	3	2.24	4	12.22	21.96
Total			91	122	54	51	83	401

Appendix D. Contrarian Cases for Percentile Group of HealthS x Percentile Group of IPOSGR

Note: IPOSGR-Intention to Purchase Organic Staple Grain Regularly HealthS-Health Status			Percentile Group of IPOSGR					Total
			1 Strongly Disagree	2	3	4	5 Strongly Agree	
Percentile Group of HealthS	1	count	18	21	9	15	9	72
		% total	4.49	5.24	2.24	3.73	2.24	17.94
	2	count	22	40	22	12	3	99
		% total	5.49	9.98	5.47	3	0.75	24.69
	3	count	11	26	7	4	20	68
		% total	2.74	6.48	1.75	1	4.99	16.96
	4	count	24	24	7	11	20	86
		% total	5.99	5.99	1.75	2.74	4.99	21.46
	5	count	16	11	9	9	31	76
		% total	3.99	2.74	2.24	2.24	7.73	18.94
Total			91	122	54	51	83	401

Appendix E. Contrarian Cases for Percentile Group of HealthC x Percentile Group of IPOSGR Crosstabulation

Note: IPOSGR-Intention to Purchase Organic Staple Grain Regularly HealthC-Health Concern			Percentile Group of IPOSGR					Total
			1 Strongly Disagree	2	3	4	5 Strongly Agree	
Percentile Group of HealthC	1	count	26	32	18	8	1	85
		% total	6.48	7.98	4.49	2	0.25	21.2
	2	count	32	37	15	17	3	104
		% total	7.98	9.23	3.74	4.24	0.75	25.94
	3	count	20	37	10	6	3	76
		% total	4.99	9.23	2.49	1.50	0.75	18.96
	4	count	12	10	9	10	17	58
		% total	3	2.49	2.24	2.49	4.24	14.46
	5	count	1	6	2	10	59	78
		% total	0.25	1.50	0.50	2.49	14.71	19.45
Total			91	122	54	51	83	401

Appendix F. Percentile Group of Attitudes x Percentile Group of IPOSGR Crosstabulation

Percentile Group of Attitudes x Percentile Group of IPOSGR Crosstabulation								
IPOSGR-Intention to Purchase Organic Staple Grain Regularly Attitudes-Attitudes Toward Organic Food			Percentile Group of IPOSGR					Total
			1 Strongly Disagreed	2	3	4	5 Strongly Agree	
Percentile Group of Attitudes	1	count	27	41	20	6	3	97
		% total	6.73	10.22	4.99	1.50	0.75	24.19
	2	count	27	40	16	11	1	95
		% total	6.73	9.98	3.99	2.74	0.25	23.69
	3	count	16	22	12	12	3	65
		% total	3.99	5.49	2.99	2.99	0.75	16.21
	4	count	15	9	4	13	20	61
		% total	3.74	2.24	1	3.24	4.99	15.21
	5	count	6	10	2	9	56	83
		% total	1.50	2.50	0.50	2.24	13.97	20.71
Total			91	122	54	51	83	401

Appendix G. Item Measurements

All the items were measured on 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree)

1. Environmental Concern (EnvC)

1. I make additional efforts to purchase local organic rice.
2. I have shifted part of my food choices toward local organic rice because of environmental concerns.
3. When choosing between two similar rice products, I prefer the one that is certified organic and less harmful to the community and the environment.
4. I support the consumption of local organic rice as a way to reduce dependence on imports and strengthen Haiti's agricultural economy.

2. Environmental Knowledge (EnvK)

1. I know that purchasing local organic rice is an environmentally safe choice.
2. I am aware of the environmental benefits of consuming local organic rice instead of imported rice.
3. I am very knowledgeable about how local organic rice production contributes to food security and sustainability in Haiti.
4. I know more than the average person about the importance of supporting local farmers who grow organic rice.

3. Perceived Health Status (HealthS)

1. I consider my current health condition to be excellent.
2. In general, I consider myself a person in very good physical health.
3. I believe my health is better than that of most people my age.

4. Health Consciousness (HealthC)

1. I choose rice carefully to ensure it contributes positively to my health.
2. I always consider the health benefits of organic rice when making a purchase.
3. I consider myself a health-conscious consumer who values eating organic rice.
4. I often think about how consuming organic rice relates to my overall health.

5. Attitude Toward Locally Produced Organic Rice

1. For me, buying local organic rice is favorable.
2. For me, buying local organic rice is pleasurable.
3. Overall, I have a positive attitude toward buying local organic rice.

6. Perceived Behavioral Control

1. I have the resources, time, and opportunities to buy local organic rice.
2. I am confident that if I want to, I can buy local organic rice instead of imported rice.
3. Local organic rice is available in my daily life.

7. Subjective Norms

1. People whose opinions I value would prefer that I purchase local organic rice.
2. Most people who are important to me would want me to buy local organic rice instead of imported rice.
3. Most people who are important to me would think I should choose local organic rice.

8. Intention to Purchase Local Organic Rice Regularly

1. I strongly intend to purchase local organic rice regularly despite its higher price.
2. I plan to make local organic rice a part of my regular purchases despite its higher price.
3. I intend to regularly purchase local organic rice to support the local economy despite its higher price.

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