

Article

Green State Regulation and Sustainable Consumption: Evidence from Eco-Conscious Prosumers

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Abstract

Climate change and the transition toward sustainable development have increased interest in the institutional and psychological factors shaping sustainable consumption behavior. This study investigates how perceived government regulation, perceived corporate environmental responsibility, sustainable production practices, perceived digital environmental transparency, and eco-anxiety jointly influence sustainable consumption behavior among eco-conscious producer-consumers in Azerbaijan. Data were obtained from 425 eco-conscious producer-consumers through a structured questionnaire, and the proposed research model was empirically examined using Structural Equation Modeling. The findings indicate that perceived government regulation positively influences perceived corporate environmental responsibility, which subsequently enhances sustainable production practices. However, sustainable production practices do not exert a significant direct effect on sustainable consumption behavior. The results further demonstrate that perceived digital environmental transparency partially mediates the relationship between corporate environmental responsibility and sustainable consumption behavior, while eco-anxiety positively moderates the relationship between perceived government regulation and sustainable consumption behavior. These findings suggest that self-reported sustainable consumption behavior is shaped by individuals' perceptions of institutional and organizational sustainability signals, perceived transparency of sustainability communication, and psychological responses to environmental challenges. The study contributes to the sustainability literature by providing evidence from eco-conscious producer-consumers in an emerging sustainability-transition context and highlights the importance of integrating governance, corporate responsibility, digital transparency, and environmental concern within a unified analytical framework.

Keywords: government regulation; corporate environmental responsibility; sustainable production practices; digital environmental transparency; eco-anxiety



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1. Introduction

The growing challenges associated with climate change, environmental degradation, and unsustainable production and consumption patterns have intensified global attention toward sustainability as a central pillar of green transition and sustainable development strategies. Governments, corporations, and international organizations increasingly promote environmentally responsible production and consumption practices as key components of environmental governance and long-term development agendas [1–3]. Consequently, sustainability outcomes are increasingly viewed as the result of interconnected institutional, organizational, informational, and psychological processes rather than solely individual ethical choices [4–8].

Within this context, understanding the factors that encourage environmentally responsible production and consumption has become increasingly important. Among these factors, perceived government regulation represents an important institutional signal through which stakeholders evaluate sustainability expectations and organizational legitimacy. Contemporary environmental policies extend beyond traditional pollution-control approaches and increasingly promote green innovation, sustainability reporting, environmental transparency, and responsible production systems [9–12]. Previous studies show that regulatory pressure can stimulate green technological innovation, strengthen environmental disclosure practices, and encourage firms to adopt sustainability-oriented strategies [13–15].

As firms respond to regulatory and societal expectations, corporate environmental responsibility becomes an important organizational mechanism through which sustainability objectives are translated into practice. Consumers increasingly evaluate firms according to their environmental accountability, sustainability communication, and ecological responsiveness [16–18]. When stakeholders perceive firms as environmentally responsible, they are more likely to evaluate sustainability practices positively, develop trust, and demonstrate stronger intentions toward environmentally responsible consumption behavior [19,20].

The effectiveness of these efforts, however, depends not only on sustainability performance itself but also on how environmental information is communicated and interpreted. In digitally connected environments, stakeholders are continuously exposed to sustainability claims, environmental disclosures, and green marketing messages. As a result, digital environmental transparency has become increasingly important for communicating environmental performance and sustainability commitments. While transparency can enhance environmental awareness and stakeholder trust, it may also generate skepticism when sustainability claims are perceived as symbolic rather than genuine [21–23]. Therefore, the credibility and accessibility of environmental information have become important determinants of sustainability-related behavior.

At the same time, environmental anxiety and climate-related psychological concerns have emerged as influential drivers of pro-environmental behavior. Growing exposure to climate risks, environmental crises, and ecological uncertainty has increased eco-anxiety among both consumers and producers [24–26]. Previous studies suggest that eco-anxiety can strengthen environmentally responsible decisions by increasing environmental awareness, perceived urgency, and moral responsibility toward sustainability challenges [27–29]. Nevertheless, the conditions under which eco-anxiety shapes sustainability-related behavior remain insufficiently understood.

In this study, eco-conscious producer-consumers are defined as individuals who simultaneously participate in environmentally oriented production activities and engage in sustainable consumption practices. Unlike conventional green consumers, whose role is primarily limited to purchasing environmentally friendly products, eco-conscious producer-

consumers represent dual-role actors who both contribute to the creation of sustainable products or services and make environmentally responsible consumption decisions in their personal lives. Therefore, they differ from traditional producers, entrepreneurs, and consumers by combining production-related sustainability experience with consumption-based environmental responsibility. It should be noted that this study adopts a perception-based approach. The proposed framework does not directly measure the objective strength of environmental regulations, verified corporate environmental performance, or externally assessed sustainability practices. Instead, it examines how eco-conscious producer-consumers perceive institutional pressures, organizational sustainability actions, and environmental information signals, and how these perceptions are associated with self-reported sustainable consumption behavior.

Building on these arguments, the present study develops a moderated mediation framework integrating institutional, organizational, informational, and psychological dimensions of sustainability. Government regulation is expected to encourage corporate environmental responsibility and sustainable production practices. Digital environmental transparency is proposed as a mediating mechanism that translates environmental responsibility into credible sustainability information, while eco-anxiety serves as a moderating factor influencing how individuals respond to sustainability-related information and practices.

Beyond addressing this empirical gap, this study advances sustainability and consumer behavior literature by integrating Institutional Theory and Signaling Theory into a framework linking institutional pressures, organizational sustainability responses, information-based signals, and psychological factors.

This study makes three specific contributions to sustainability and consumer behavior literature. First, it introduces eco-conscious producer-consumers as a distinct stakeholder group by examining individuals who simultaneously participate in sustainability-oriented production and consumption activities. While previous studies have mainly focused on conventional consumers or firms separately, this study highlights the importance of dual-role actors whose sustainability decisions are shaped by both production experience and environmental consumption values.

Second, this study extends Signaling Theory by demonstrating the role of perceived digital environmental transparency as a mechanism through which corporate environmental responsibility becomes more meaningful for sustainable consumption behavior. The findings suggest that sustainability actions influence behavioral responses not only through their implementation but also through transparent and credible communication.

Third, this study contributes to Institutional Theory by showing that eco-anxiety strengthens the behavioral effect of perceived governmental regulation. This demonstrates that institutional sustainability signals may generate stronger consumption responses when individuals have higher psychological sensitivity toward environmental risks.

Azerbaijan provides a theoretically relevant context for examining sustainable consumption behavior because it represents an emerging sustainability-transition economy where environmental governance structures, corporate sustainability practices, and consumer environmental awareness are developing simultaneously. Unlike advanced economies with mature environmental institutions and established green consumer markets, Azerbaijan is undergoing a transition in which environmental regulations, sustainability communication mechanisms, and corporate responsibility practices are still evolving.

Furthermore, as a resource-dependent economy seeking diversification toward greener development pathways, Azerbaijan provides an important setting for examining how sustainability-related institutional and informational mechanisms operate in emerging economies. Recent sustainability initiatives, including increased attention to climate gover-

nance and the hosting of COP29, have accelerated discussions on environmental regulation, transparency, and responsible production. However, empirical evidence remains limited regarding how these emerging institutional pressures influence sustainability-oriented behavior in transitional contexts.

Therefore, examining eco-conscious producer-consumers in Azerbaijan extends sustainability and consumer behavior research beyond contexts characterized by mature environmental institutions and provides insights into how regulation, corporate responsibility, transparency, and environmental concerns jointly shape sustainability transitions.

Accordingly, this study aims to investigate how government regulation, corporate environmental responsibility, sustainable production practices, digital environmental transparency, and eco-anxiety jointly influence sustainability outcomes among eco-conscious producer-consumers. The study addresses the following research questions:

RQ1: How do perceived government regulation and corporate environmental responsibility influence sustainable production and sustainable consumption behavior?

RQ2: How does perceived digital environmental transparency mediate the relationship between corporate environmental responsibility and sustainable consumption behavior?

RQ3: How does eco-anxiety moderate the relationship between perceived government regulation and sustainable consumption behavior?

2. Literature Review and Hypotheses

2.1. Governmental Regulation as a Driver of Corporate Environmental Responsibility

Institutional Theory suggests that organizations operate within regulatory and social environments that influence their behavior and strategic decisions. To maintain legitimacy and meet stakeholder expectations, firms are often required to adapt to environmental regulations and sustainability standards [30,31]. In recent years, growing concerns about climate change, environmental degradation, and unsustainable economic activities have increased the importance of governmental regulation as a key driver of corporate sustainability.

Modern environmental regulations extend beyond traditional pollution-control measures. Governments and international institutions increasingly promote green innovation, sustainability reporting, environmental transparency, and responsible production practices through various regulatory frameworks and policy initiatives [3,12]. As a result, governmental regulation is no longer perceived solely as a mechanism for ensuring compliance; rather, it functions as a strategic instrument that motivates firms to embed sustainability principles into their operational and managerial practices.

Empirical evidence generally supports the positive role of environmental regulations in promoting corporate sustainability. Cui et al. [9] found that environmental regulations stimulate technological progress while contributing to pollution reduction, indicating that regulatory pressure can encourage firms to adopt environmentally responsible operational practices. Similarly, Wang et al. [10] reported that environmental regulations significantly promote green technological innovation and support the transition toward a green economy. These results indicate that environmental regulations can encourage organizations to incorporate ecological priorities into their decision-making processes and overall business strategies. Furthermore, firms that actively engage in environmental initiatives tend to demonstrate stronger corporate environmental responsibility, which can positively influence stakeholder evaluations and sustainable consumer responses [16].

On the other hand, corporate environmental responsibility refers to a firm's efforts to reduce environmental harm, support sustainable development, and incorporate environmental considerations into decision-making processes [17]. Firms operating under stronger environmental regulations are more likely to demonstrate responsible environmental behavior through sustainability initiatives, environmental reporting, and ecological

accountability practices. These actions can improve stakeholder trust and strengthen perceptions of corporate environmental commitment [32,33].

While prior research has extensively examined how environmental regulations influence organizational sustainability outcomes, considerably less attention has been devoted to how these regulatory efforts shape stakeholder perceptions of corporate environmental responsibility. This limitation is particularly evident among eco-conscious producer-consumers, whose dual involvement in production and consumption activities may lead them to evaluate corporate environmental responsibility differently from conventional consumers. Examining this relationship therefore extends the literature from an organizational-outcome perspective to a stakeholder-perception perspective.

Drawing upon the theoretical perspectives and empirical evidence discussed above, perceived governmental regulation is expected to strengthen stakeholders' evaluations of corporate environmental responsibility practices. Based on this reasoning, the study proposes the following research assumption:

H1. *Perceived environmental government regulation has a significant positive effect on perceived corporate environmental responsibility.*

2.2. Environmental Responsibility as a Foundation for Sustainable Production

Institutional Theory suggests that organizations responding to environmental pressures are more likely to translate environmental responsibility into operational sustainability practices. As environmental challenges and stakeholder expectations continue to increase, firms are increasingly expected to integrate sustainability principles into their business activities. Within this context, corporate environmental responsibility reflects a firm's commitment to reducing environmental harm, supporting ecological protection, and incorporating sustainability considerations into organizational decision-making processes [16,34].

One of the most important outcomes of corporate environmental responsibility is the adoption of sustainable production practices. Sustainable production refers to environmentally responsible production systems that reduce pollution, improve energy efficiency, optimize resource use, and support long-term environmental sustainability [1,2]. Implementing such practices often requires firms to redesign production processes, adopt green technologies, and integrate environmental considerations into operational and supply chain management activities.

From an institutional perspective, firms face increasing pressure from regulators, consumers, and other stakeholders to demonstrate responsible environmental behavior [31]. To maintain legitimacy and remain competitive, organizations are encouraged to adopt sustainability-oriented strategies and operational practices. As a result, corporate environmental responsibility serves not only as an ethical commitment but also as a strategic mechanism that facilitates sustainable production transformation.

Additional support for this relationship can be found in the strategic sustainability literature. According to the Porter Hypothesis, environmentally responsible firms are more likely to invest in innovation, cleaner technologies, and sustainable capabilities that improve long-term environmental performance and competitiveness [35]. Rather than viewing sustainability as a regulatory burden, these firms often perceive it as a source of innovation and strategic advantage.

Empirical studies provide substantial evidence for this relationship. Zhuo [14] finds that environmentally responsible firms are more likely to engage in green innovation and sustainability transformation. Similarly, Chen et al. [33] report that corporate environmental responsibility contributes positively to industrial green transformation and environmental

performance. Serrano-García et al. [19] further demonstrate that environmental responsibility supports sustainable product innovation through investments in green research and development.

In addition, environmental responsibility can strengthen sustainable production through internal organizational mechanisms such as environmental leadership, sustainability governance, green human resource management, and ecological organizational culture. Research suggests that environmentally oriented organizational systems enhance firms' innovation capabilities and support sustainable operational performance [18,36,37].

The relationship between environmental responsibility and sustainable production is particularly relevant for eco-conscious producer-consumers. Because these individuals participate in sustainability both as producers and consumers, they are more likely to recognize whether firms genuinely implement environmentally responsible production practices or merely communicate symbolic sustainability commitments. Their perceptions therefore provide valuable insight into how environmental responsibility is interpreted and associated with perceived sustainability-oriented production activities.

Drawing on these theoretical and empirical insights, perceived corporate environmental responsibility is expected to positively influence sustainable production practices among eco-conscious producer-consumers. Therefore, the following hypothesis is proposed:

H2. *Perceived corporate environmental responsibility positively influences sustainable production practices.*

2.3. Linking Sustainable Production Practices to Sustainable Consumption Behavior

Institutional Theory argues that sustainability-oriented organizational practices gradually influence stakeholder perceptions and behavioral outcomes, thereby encouraging environmentally responsible consumption behavior. As environmental challenges associated with resource depletion, pollution, and unsustainable production systems continue to intensify, sustainable consumption has become an increasingly important component of sustainability transitions. Sustainable consumption behavior refers to consumers' preference for products, services, and lifestyles that minimize environmental harm and contribute to long-term ecological sustainability [4,7].

Within this context, sustainable production practices play a critical role in shaping consumer behavior. Sustainable production involves environmentally responsible operational systems that reduce pollution, improve energy efficiency, minimize waste, and promote responsible resource use [1,6,38]. Such practices include green manufacturing technologies, sustainable supply chain management, renewable energy utilization, and environmentally friendly innovation processes.

From the perspective of sustainable consumption theory, consumers increasingly consider not only product quality and price but also the environmental characteristics of production processes when making purchasing decisions [39]. Sustainable production practices provide visible signals of environmental commitment and corporate responsibility, influencing how consumers evaluate firms and their products. When production systems are perceived as environmentally responsible, consumers are more likely to develop positive sustainability attitudes and stronger intentions to engage in sustainable consumption [17,32].

This relationship is supported by behavioral decision-making perspectives, which suggest that environmental information and sustainability signals influence consumer judgments and choices. As environmental awareness continues to grow, consumers increasingly incorporate sustainability-related considerations into their purchasing decisions [38,40,41].

Consequently, firms that adopt sustainable production practices are more likely to encourage environmentally responsible consumption behavior.

Empirical evidence supports this argument. Previous studies demonstrate that sustainability-oriented production practices significantly influence environmentally responsible consumption patterns, particularly among Generation Z consumers [39]. Furthermore, sustainable production practices and environmental responsibility have been identified as important drivers of sustainable consumption behavior across different consumer groups [6]. Recent findings also indicate that sustainability-oriented production processes positively influence environmentally conscious apparel consumption by strengthening consumer awareness and preference for sustainable products [42].

The relationship is particularly relevant for eco-conscious producer-consumers. Because these individuals participate in sustainability processes both as producers and consumers, they are generally more attentive to environmental practices, production standards, and sustainability commitments. Therefore, they are more likely to incorporate evaluations of production-related sustainability practices into their consumption decisions.

Considering the theoretical and empirical evidence presented above, sustainable production practices are expected to positively influence sustainable consumption behavior among eco-conscious producer-consumers. Accordingly, the following hypothesis is proposed:

H3. *Sustainable production practices positively influence sustainable consumption behavior.*

2.4. The Mediating Role of Perceived Digital Environmental Transparency

Signaling Theory provides the theoretical foundation for understanding how firms communicate their environmental commitment through transparent sustainability disclosures. In increasingly digitalized market environments, consumers rely on online environmental information, sustainability reports, and corporate disclosures when evaluating firms' environmental responsibility and sustainability performance [32,43]. Thus, perceived digital environmental transparency has emerged as an important mechanism influencing sustainability-related perceptions and behavior.

Perceived digital environmental transparency refers to consumers' belief that firms openly, clearly, and credibly communicate environmental information through digital channels. Such information may include sustainability initiatives, environmental practices, carbon emissions, green innovation activities, and ecological performance indicators. By reducing information asymmetry and uncertainty, transparent communication can strengthen trust and improve stakeholders' ability to evaluate firms' environmental commitments.

According to Signaling Theory, transparency serves as a signal that helps consumers assess organizational quality and authenticity when direct observation of environmental performance is difficult [31]. Firms that demonstrate stronger environmental responsibility are generally more willing to disclose sustainability-related information, invest in environmental reporting systems, and maintain transparent communication practices [44,45]. Through these activities, firms seek to strengthen stakeholder trust and reinforce perceptions of environmental accountability.

Existing empirical findings are consistent with this relationship. Previous studies indicate that green information disclosure positively influences green consumption intentions by enhancing consumer trust and confidence in sustainability-related claims [46]. Similarly, digital sustainability initiatives have been shown to strengthen green brand advocacy through sustainability-oriented innovation mechanisms [47]. Furthermore, digital sustainability reporting increasingly shapes stakeholder evaluations of environmental re-

sponsibility and transparency by improving the accessibility and credibility of sustainability information [32].

Beyond its informational function, digital environmental transparency also influences consumer behavior. Transparent environmental communication reduces uncertainty, strengthens confidence in sustainability claims, and increases the likelihood of sustainability-oriented decisions [48]. Therefore, transparency can serve as an important mechanism through which perceptions of corporate environmental responsibility are translated into sustainable consumption behavior.

This mediating role is expected to be particularly relevant for eco-conscious producer-consumers. Because these individuals are involved in sustainability both as producers and consumers, they are generally more attentive to environmental information and sustainability disclosures when evaluating firms' environmental commitments. Given these circumstances, transparent environmental communication is likely to play a stronger role in shaping their sustainability-related behavioral responses.

Supported by the foregoing theoretical and empirical evidence, the present study conceptualizes perceived digital environmental transparency as a mediating mechanism linking perceived corporate environmental responsibility with sustainable consumption behavior. Collectively, the existing evidence indicates that:

H4. *Perceived digital environmental transparency mediates the relationship between perceived corporate environmental responsibility and sustainable consumption behavior.*

2.5. The Moderating Role of Eco-Anxiety

Although governmental regulations can encourage sustainable consumption behavior, Institutional Theory suggests that the effectiveness of institutional pressures may vary across individuals depending on their psychological characteristics. Eco-anxiety therefore serves as a boundary condition that influences how individuals interpret and respond to sustainability-oriented regulatory signals.

Eco-anxiety refers to feelings of worry, fear, and psychological distress associated with climate change, environmental degradation, and ecological uncertainty [24,25]. Unlike general environmental concern, eco-anxiety reflects a stronger emotional response to perceived environmental threats and future ecological risks. Recent studies identify eco-anxiety as an important factor influencing pro-environmental attitudes and sustainability-related behavior, particularly among environmentally conscious individuals [26,27,49].

From a psychological perspective, individuals are more likely to adopt adaptive and protective behaviors when environmental risks are perceived as personally relevant. In this context, governmental regulations, green transition policies, and environmental standards can be viewed as institutional signals that communicate the importance and urgency of addressing environmental challenges [3,12,50–54]. However, individuals may differ in how strongly they respond to these signals.

Individuals experiencing higher levels of eco-anxiety are more likely to perceive environmental problems as immediate and personally significant. As a consequence, they may be more receptive to sustainability-oriented regulations and more willing to translate regulatory signals into environmentally responsible consumption behavior. In contrast, individuals with lower levels of eco-anxiety may perceive environmental risks as less urgent and therefore respond less strongly to regulatory initiatives [28,55–59].

Previous studies further suggest that eco-anxiety is positively associated with green purchasing behavior, environmentally responsible consumption, and sustainability-oriented decision-making [38,60–63]. This moderating role may be particularly relevant among eco-conscious producer-consumers because their involvement in both production

and consumption activities increases their exposure to sustainability-related information and environmental challenges. Accordingly, eco-anxiety may strengthen the extent to which governmental regulation influences their sustainable consumption behavior.

Accordingly, the positive relationship between perceived government regulation and sustainable consumption behavior is expected to be stronger among individuals with higher levels of eco-anxiety.

H5. *Eco-anxiety positively moderates the relationship between perceived government regulation and sustainable consumption behavior.*

3. Materials and Methods

This study adopts a quantitative perception-based research design to examine relationships among perceived government regulation, perceived corporate environmental responsibility, perceived sustainable production practices, perceived digital environmental transparency, eco-anxiety, and self-reported sustainable consumption behavior. The research integrates perspectives from institutional theory and sustainability-oriented consumer behavior literature to empirically test the proposed conceptual framework.

Data collection was conducted using a structured questionnaire developed based on previously validated measurement instruments. The collected data were subsequently analyzed using IBM SPSS Statistics (Version 26) and IBM AMOS (Version 24). The statistical procedures used to evaluate the measurement model, test the proposed hypotheses, and assess common method bias and non-response bias are presented in the following sections.

3.1. Measurement Instruments

Five principal latent constructs were incorporated into the research model: Perceived Government Regulation (PGR), Perceived Corporate Environmental Responsibility (PCER), Sustainable Production Practices (SPP), Perceived Digital Environmental Transparency (PDET), and Sustainable Consumption Behavior (SCB). In addition, Eco-Anxiety (EA) was incorporated into the model as a moderating construct. All constructs were measured using items assessed on a five-point Likert scale, with responses ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

PGR captures respondents’ perceptions of environmental regulations, sustainability policies, and governance mechanisms that encourage environmentally responsible corporate behavior. PCER reflects respondents’ evaluations of firms’ environmental accountability, sustainability commitment, and responsible business practices. SPP measures perceptions regarding the implementation of sustainable production systems, green technologies, resource-efficient processes, and ecological operational practices.

PDET represents respondents’ perceptions of the extent to which firms provide transparent, credible, and accessible environmental information through digital communication channels. SCB measures individuals’ self-reported environmentally responsible purchasing and consumption behavior. Finally, EA captures individuals’ emotional concern, anxiety, and psychological sensitivity regarding climate change and environmental challenges.

The measurement items used in this study were adapted from previously validated scales in the fields of green supply chain management, corporate environmental responsibility, sustainable consumption behavior, and environmental psychology. Specifically, the measurement development was based on established instruments from previous studies [64–68]. No completely new items were developed; however, selected items were adapted and minor wording modifications were made to ensure consistency with the context of eco-conscious producer-consumers.

This adaptation process ensured that the measurement items appropriately captured respondents' perceptions of government regulation, corporate environmental responsibility, sustainable production practices, digital environmental transparency, eco-anxiety, and sustainable consumption behavior. The final measurement items used to operationalize each construct are presented in Appendix A.

Since the survey was conducted in Azerbaijan, the questionnaire was translated into Azerbaijani using a translation and back-translation procedure. First, the original English version was translated into Azerbaijani. Subsequently, an independent back-translation into English was conducted. The original and back-translated versions were compared to confirm semantic equivalence, conceptual consistency, and clarity before conducting the pilot study.

3.2. Research Framework

Aligned with the objectives of this study, the conceptual framework was designed to examine the direct, mediating, and moderating relationships among the proposed constructs. The proposed model integrates institutional, organizational, informational, and psychological dimensions within a unified sustainability framework for understanding the behavior of eco-conscious producer-consumers.

The proposed conceptual model is presented in Figure 1.

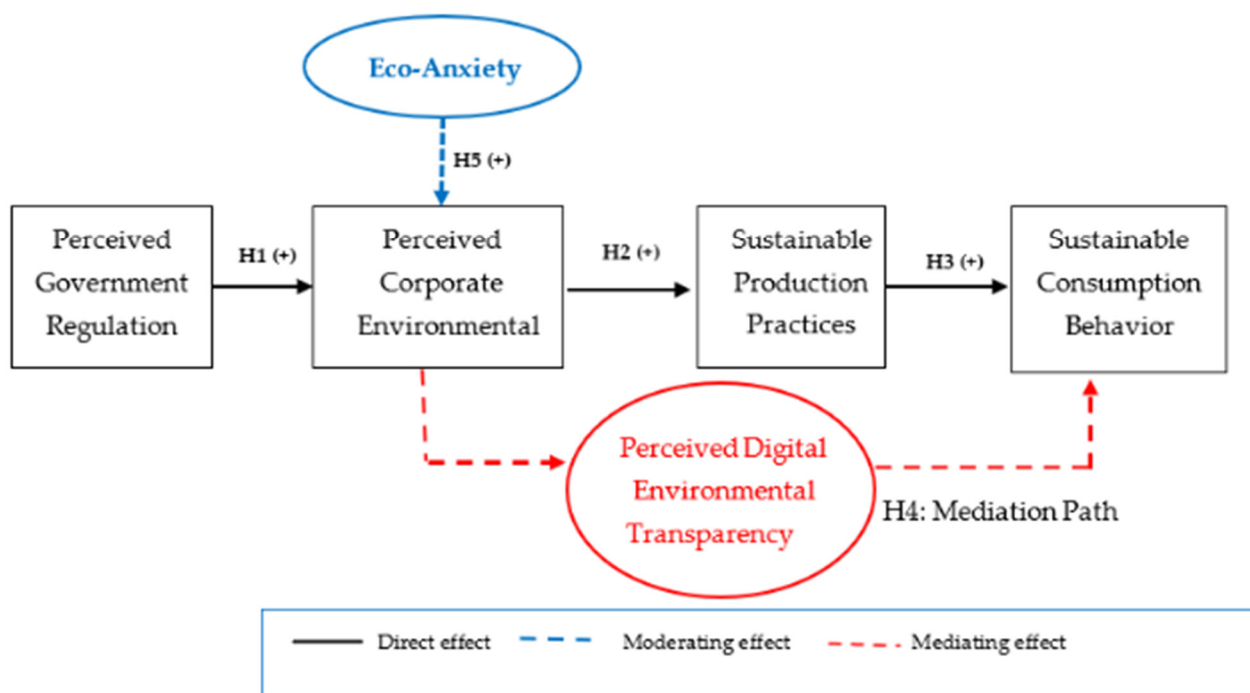


Figure 1. Conceptual framework of the study.

3.3. Sampling and Data Collection

To operationalize the concept of eco-conscious producer-consumers, the study included only respondents who met two criteria simultaneously: (1) involvement in the production of environmentally sustainable products or services and (2) engagement in environmentally responsible consumption practices. Therefore, respondents were selected not merely because they operated sustainable businesses, but because they also reported purchasing and using environmentally friendly products in their personal consumption behavior. This dual-role characteristic distinguishes the sample from studies focusing exclusively on producers, entrepreneurs, or consumers.

Respondents were identified using a non-probability purposive sampling strategy targeting individuals actively involved in environmentally oriented production activities. Potential participants were recruited through sustainability-related social media groups, online communities of eco-product producers, small green business networks, and digital platforms where environmentally friendly products and services were promoted. This approach was considered appropriate because the target population could not be easily identified through probability-based sampling methods.

To ensure that participants met the definition of eco-conscious producer-consumers, an eligibility screening procedure was applied before respondents accessed the main questionnaire. Participants were asked screening questions regarding: (1) whether they were directly involved in producing, selling, or managing environmentally sustainable products or services and (2) whether they personally purchased or used environmentally friendly products in their daily consumption. Only respondents who answered positively to both screening questions were included in the final sample.

Additional verification was conducted through questions about the type of eco-oriented activity, product category, and frequency of eco-friendly product consumption. Responses that did not demonstrate simultaneous producer and consumer characteristics or contained inconsistent information were excluded during the data-cleaning process. This approach increased the validity of the sampling procedure and ensured alignment between the target population and the theoretical focus of the study.

Empirical data were gathered between June and October 2025 via an online questionnaire administered through the selected recruitment channels in Azerbaijan.

To enhance the quality and validity of the survey instrument, a preliminary pilot study was conducted with 35 respondents before the main data collection phase, focusing on item clarity, comprehension, reliability, and content validity. Based on participant feedback, minor wording revisions were implemented to improve conceptual consistency and item clarity. The results of the reliability assessment showed that all constructs achieved acceptable levels of internal consistency (Cronbach's $\alpha > 0.70$). In addition, exploratory factor analysis supported the adequacy of factor loadings and confirmed the dimensional structure of the measurement items. Pilot study responses were not included in the final data analysis.

After applying data-screening procedures to identify missing values, incomplete submissions, and inconsistent response patterns, the final dataset consisted of 425 valid respondents. The sample reflected sufficient demographic and behavioral diversity, providing an appropriate empirical basis for investigating sustainability-oriented consumer behavior (see Table 1).

The demographic profile indicates that the sample represents a diverse group of eco-conscious producer-consumers. In terms of gender, 58.6% of the respondents were male and 41.4% were female. The analysis of age characteristics indicates that respondents were predominantly concentrated within the 26–45 age range (65.4%), with the 26–35 age group accounting for the highest share (35.3%), followed by participants aged 36–45 years (30.1%). This age profile suggests that most participants were economically active individuals likely to be directly involved in environmentally sustainable production and consumption activities.

The occupational distribution indicates that the sample consists entirely of individuals engaged in environmentally sustainable production activities, supporting the conceptual focus of the study on eco-conscious producer-consumers. Organic food producers represent the largest group (25.6%), followed by producers of eco-friendly cosmetics and personal care products (19.8%) and sustainable textile/fashion producers (16.7%). The sample additionally includes individuals operating in green technology, recyclable products, eco-

packaging, and environmentally sustainable household product sectors. This diversified production profile enhances the suitability of the sample for examining perceptions related to government regulation, corporate environmental responsibility, sustainable production practices, and environmental transparency.

Table 1. Sample Characteristics of Eco-Conscious Producer-Consumers.

Variable	Category	N	%
Age	18–25 years	84	19.8
	26–35 years	150	35.3
	36–45 years	128	30.1
	46 years and above	63	14.8
Gender	Male	249	58.6
	Female	176	41.4
Occupation Type (Eco-Product Producers)	Organic food producers	109	25.6
	Eco-friendly cosmetics and personal care producers	84	19.8
	Sustainable textile/fashion producers	71	16.7
	Green technology and recyclable product producers	66	15.5
	Eco-packaging and sustainable household product producers	55	12.9
	Other environmentally sustainable product producers	40	9.4
Frequency of Purchasing Eco-Friendly Products	Occasionally	117	27.5
	Frequently	216	50.8
	Always	92	21.6

The findings further demonstrate that respondents exhibit relatively high levels of environmentally responsible consumption behavior alongside their production-oriented sustainability activities. More than half of the participants (50.8%) reported frequently purchasing eco-friendly products, while 21.6% indicated that they consistently preferred environmentally sustainable alternatives. A further 27.5% reported purchasing eco-friendly products occasionally. These results suggest that the respondents are not only actively involved in environmentally sustainable production but also demonstrate a substantial commitment to sustainable consumption practices. Such dual engagement reinforces the appropriateness of the sample for investigating the relationships among governmental regulation, corporate environmental responsibility, sustainable production practices, digital environmental transparency, eco-anxiety, and sustainable consumption behavior.

3.4. Assessment of Common Method Bias and Non-Response Bias

Considering the cross-sectional nature of the study and reliance on self-reported questionnaire data, several diagnostic assessments were performed to examine the possibility of common method bias (CMB) and non-response bias.

Several procedural strategies were applied during the questionnaire design stage to minimize the potential influence of common method bias. Participants were assured of anonymity and confidentiality, while questionnaire items were designed and arranged carefully to reduce ambiguity, socially desirable responses, and systematic response biases.

Following data collection, common method bias was assessed using three complementary statistical procedures. First, Harman's single-factor test was performed to examine whether a single factor accounted for the majority of covariance among the measurement

items. The results showed that the first unrotated factor explained 35.2% of the total variance, which was below the commonly recommended 50% threshold, indicating that common method bias was unlikely to be a major concern.

Second, the Common Latent Factor (CLF) approach was applied to estimate the extent of shared method variance across the measurement model. The differences between standardized factor loadings with and without the common latent factor were examined to determine the potential influence of common method variance.

Third, full collinearity variance inflation factor (VIF) values were calculated to assess the potential presence of both common method bias and multicollinearity.

Potential non-response bias was examined by conducting independent-samples *t*-tests to compare early and late respondents across the main constructs of the study. The independent-samples *t*-test results showed no statistically significant differences between early and late respondents for the main constructs of the study ($p > 0.05$). Therefore, non-response bias was not considered a serious concern in the dataset. The results of these diagnostic procedures are reported in Tables 2 and 3.

Table 2. Common Method Bias Assessment (CLF Comparison).

Construct	Without CLF	With CLF	Difference
PGR	0.81	0.76	0.05
PCER	0.85	0.78	0.07
SPP	0.84	0.79	0.05
PDET	0.82	0.76	0.06
EA	0.75	0.72	0.03
SCB	0.88	0.80	0.08

Table 3. Full Collinearity VIF Assessment.

Construct	Full Collinearity VIF
PGR	2.113
PCER	2.672
SPP	2.340
PDET	2.183
EA	2.075
SCB	2.716

The differences between standardized factor loadings with and without the common latent factor ranged from 0.03 to 0.08. Since these differences were below the commonly used 0.20 threshold, the results suggest that common method variance did not substantially bias the measurement model.

4. Results

4.1. Reliability and Validity Analyses

The reliability and validity of the measurement model were evaluated prior to hypothesis testing. As reported in Table 4, the measurement model exhibited adequate reliability and convergent validity across all latent constructs. The obtained Cronbach's alpha (α) values (0.723–0.821), Composite Reliability (CR) scores (0.801–0.836), standardized factor loadings (0.602–0.842), and Average Variance Extracted (AVE) values (0.506–0.570) were within acceptable ranges. Collectively, these results indicate satisfactory measurement reliability and convergent validity across all latent constructs.

Discriminant validity was examined by applying the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio approach. The results presented in Table 5 demonstrate

that the square root values of AVE were higher than the corresponding inter-construct correlations. Furthermore, the HTMT results in Table 6 remained within the recommended limits, confirming adequate discriminant validity among the latent constructs.

Table 4. Measurement Model Reliability and Convergent Validity Assessment.

Construct	Item	Factor Loading	Cronbach's Alpha	Composite Reliability (CR)	AVE
Perceived Government Regulation	PGR1	0.681	0.798	0.812	0.541
	PGR2	0.785			
	PGR3	0.633			
	PGR4	0.814			
Perceived Corporate Environmental Responsibility	PCER1	0.696	0.804	0.815	0.523
	PCER2	0.703			
	PCER3	0.657			
	PCER4	0.841			
Sustainable Production Practices	SPP1	0.668	0.723	0.811	0.520
	SPP2	0.704			
	SPP3	0.692			
	SPP4	0.811			
Perceived Digital Environmental Transparency	PDET1	0.694	0.821	0.836	0.561
	PDET2	0.812			
	PDET3	0.667			
	PDET4	0.842			
Eco-Anxiety	EA1	0.736	0.764	0.801	0.506
	EA2	0.629			
	EA3	0.821			
	EA4	0.602			
Sustainable Consumption Behavior	SCB1	0.758	0.755	0.804	0.570
	SCB2	0.692			
	SCB3	0.703			
	SCB4	0.726			

Table 5. Assessment of Discriminant Validity of the Measurement Model.

Construct	PGR	PCER	SPP	PDET	EA	SCB
PGR	0.736					
PCER	0.396	0.723				
SPP	0.548	0.592	0.721			
PDET	0.471	0.633	0.514	0.749		
EA	0.384	0.447	0.592	0.463	0.711	
SCB	0.526	0.601	0.630	0.584	0.623	0.755

Table 6. HTMT-Based Discriminant Validity Evaluation.

Construct	PGR	PCER	SPP	PDET	EA	SCB
PGR	—	0.74	0.69	0.66	0.64	0.71
PCER		—	0.79	0.76	0.72	0.80
SPP			—	0.78	0.77	0.83
PDET				—	0.70	0.81
EA					—	0.79
SCB						—

Confirmatory Factor Analysis (CFA) was subsequently performed to evaluate whether the proposed measurement model adequately represented the observed data. As presented

in Table 7, all model-fit indices satisfied the recommended SEM criteria ($\chi^2/df = 2.14$, RMSEA = 0.048, CFI = 0.914, TLI = 0.925, GFI = 0.918, NFI = 0.943, and SRMR = 0.054), indicating that the measurement model adequately represented the observed data.

Table 7. Model Fit Indices.

Fit Index	Recommended Value	Model Value
χ^2/df	<3.00	2.14
RMSEA	<0.08	0.048
CFI	>0.90	0.914
TLI	>0.90	0.925
GFI	>0.90	0.918
NFI	>0.90	0.943
SRMR	<0.08	0.054

4.2. Evaluation of the Structural Model and Hypothesized Relationships

After confirming the adequacy of the measurement model, structural equation modeling was conducted to examine the hypothesized paths, including direct relationships, mediating mechanisms, and moderating effects. The resulting standardized regression estimates are shown in Figure 2.

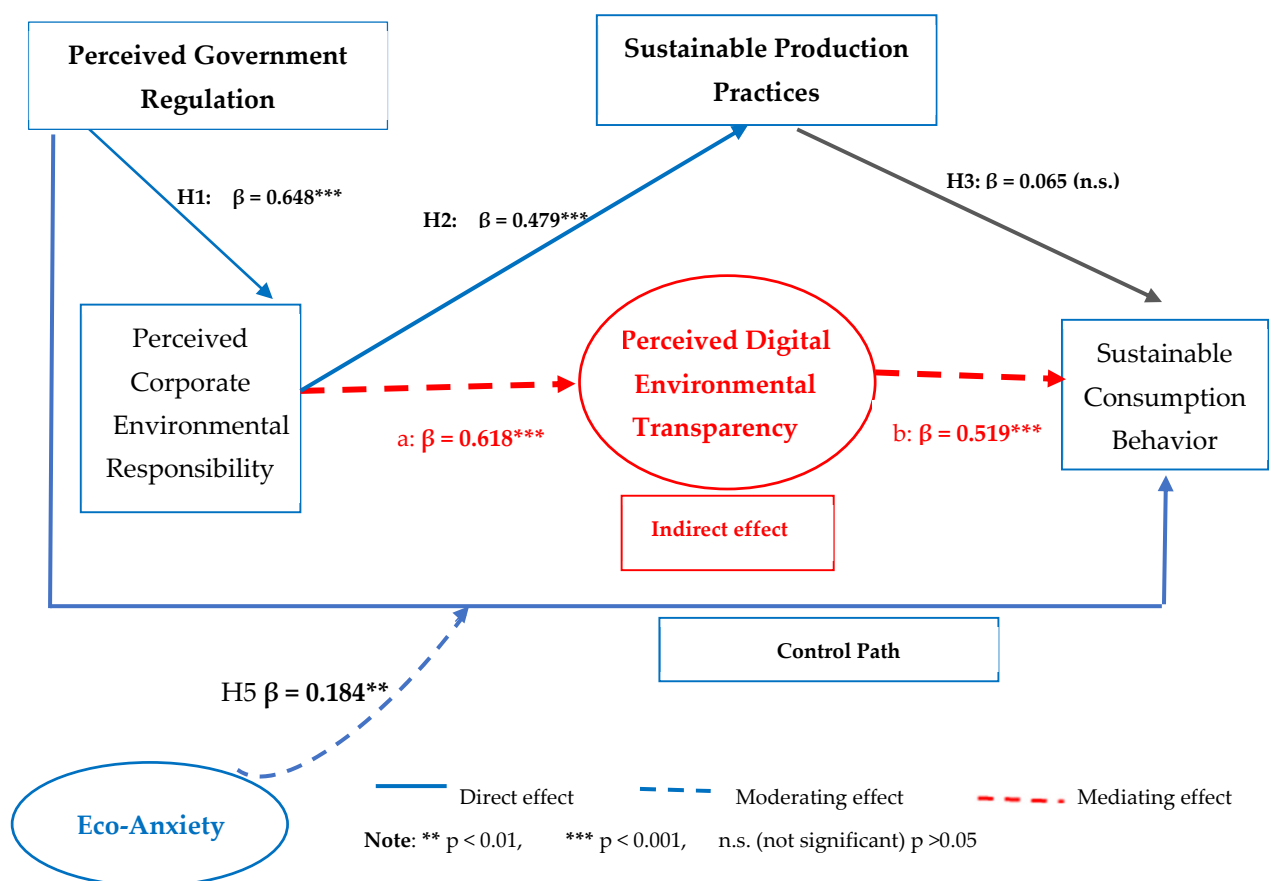


Figure 2. SEM Results Illustrating Direct, Mediating, and Moderating Relationships.

The direct structural relationships are summarized in Table 8. Perceived Government Regulation had a significant positive effect on Perceived Corporate Environmental Responsibility ($\beta = 0.648$, $p < 0.001$), supporting H1. Perceived Corporate Environmental Responsibility also exerted a significant positive effect on Sustainable Production Practices

($\beta = 0.479$, $p < 0.001$), supporting H2. In contrast, the effect of Sustainable Production Practices showed no statistically significant association with Sustainable Consumption Behavior ($\beta = 0.065$, $p = 0.397$); therefore, H3 was not supported.

Table 8. Results of the direct structural relationships.

Path Relationship	Path Coefficient (β)	S.E.	C.R.	p -Value	Hypothesis Result
PGR $\rightarrow$ PCER	0.648	0.072	8.994	<0.001	H1 Supported
PCER $\rightarrow$ SPP	0.479	0.066	7.296	<0.001	H2 Supported
SPP $\rightarrow$ SCB	0.065	0.077	0.847	0.397	H3 Not supported
PGR $\rightarrow$ SCB	0.353	0.060	7.718	<0.001	Control Path

The model's explanatory strength was assessed based on the obtained R^2 values for each endogenous variable. Perceived Government Regulation explained 42% of the variance in Perceived Corporate Environmental Responsibility ($R^2 = 0.42$), whereas Perceived Corporate Environmental Responsibility explained 23% of the variance in Sustainable Production Practices ($R^2 = 0.23$). Collectively, Perceived Government Regulation, Sustainable Production Practices, Perceived Digital Environmental Transparency, and the interaction term (PGR $\times$ EA) explained 56% of the variance in Sustainable Consumption Behavior ($R^2 = 0.56$).

To provide a more comprehensive evaluation of the structural model, additional SEM diagnostic indicators were examined. Standardized residual values were assessed to identify potential model misspecification. The results indicated that standardized residuals were within acceptable limits, suggesting no substantial discrepancies between the observed and model-implied covariance matrices.

In addition to statistical significance, the magnitude and practical relevance of the relationships were evaluated based on standardized path coefficients. The results showed that the strongest effects were observed for PGR $\rightarrow$ PCER ($\beta = 0.648$), PCER $\rightarrow$ PDET ($\beta = 0.618$), and PDET $\rightarrow$ SCB ($\beta = 0.519$), indicating meaningful effect sizes. These findings demonstrate that institutional pressures, corporate environmental responsibility, and digital transparency mechanisms play important roles in explaining sustainability-related behavioral outcomes.

The mediation analysis is presented in Table 9. Perceived Corporate Environmental Responsibility had a significant positive effect on Perceived Digital Environmental Transparency ($\beta = 0.618$, $p < 0.001$), which in turn significantly influenced Sustainable Consumption Behavior ($\beta = 0.519$, $p < 0.001$). Both the direct and indirect effects were statistically significant, indicating partial mediation. Accordingly, H4 was supported.

Table 9. Mediation Analysis Results.

Path	Standardized Effect (β)	S.E.	95% Bootstrap CI	p -Value
PCER $\rightarrow$ PDET (a)	0.618	0.071	[0.477, 0.742]	<0.001
PDET $\rightarrow$ SCB (b)	0.519	0.068	[0.384, 0.646]	<0.001
Direct Effect (c'): PCER $\rightarrow$ SCB	0.238	0.083	[0.091, 0.402]	0.002
Indirect Effect	0.321	0.069	[0.188, 0.471]	<0.001
(a $\times$ b): PCER $\rightarrow$ PDET $\rightarrow$ SCB	0.321	0.069	[0.188, 0.471]	<0.001
Total Effect (c): PCER $\rightarrow$ SCB	0.559	0.094	[0.372, 0.731]	<0.001

The moderation analysis results are reported in Table 10. The interaction term between Perceived Government Regulation and Eco-Anxiety had a positive and statistically significant effect on Sustainable Consumption Behavior ($\beta = 0.184$, $p < 0.01$), supporting H5.

Conditional effect analysis further indicated that the positive influence of Perceived Government Regulation on Sustainable Consumption Behavior became stronger as Eco-Anxiety increased, with the standardized effect increasing from $\beta = 0.276$ under low Eco-Anxiety to $\beta = 0.428$ under high Eco-Anxiety.

Table 10. Moderation Analysis Results.

Path Relationship	B	p-Value	Hypothesis Result
PGR $\times$ EA $\rightarrow$ SCB	0.184	<0.01	H5 Supported

To test the moderating role of eco-anxiety, composite scores were calculated for perceived government regulation and eco-anxiety after confirming the reliability and validity of the measurement model. Both variables were mean-centred before creating the interaction term in order to reduce multicollinearity. The interaction term was then computed by multiplying mean-centred perceived government regulation and mean-centred eco-anxiety scores. The moderation effect was tested by estimating the effect of the interaction term on sustainable consumption behavior.

5. Discussion

5.1. Interpreting the Relationship Between Perceived Government Regulation and Corporate Environmental Responsibility

The results indicate a significant positive relationship between perceived government regulation and perceived corporate environmental responsibility, providing support for H1. This finding suggests that eco-conscious producer-consumers view environmental regulation as an important institutional mechanism that encourages firms to adopt environmentally responsible practices and strengthen their sustainability commitments. The findings suggest that regulatory interventions contribute to shaping stakeholder perceptions of corporate environmental responsibility by increasing the perceived legitimacy of sustainability-oriented corporate actions.

This argument may be particularly relevant in sustainability-transition contexts, where stakeholders rely more heavily on governmental signals because market-based sustainability verification mechanisms are not yet fully institutionalized. Consequently, environmental regulations may serve not only as compliance requirements but also as visible indicators of sustainability priorities and corporate accountability.

The findings are consistent with Institutional Theory, which argues that organizations adapt their behavior in response to regulatory pressures and legitimacy expectations. They also support prior research demonstrating that environmental regulations encourage firms to strengthen environmental accountability, sustainability reporting, and environmentally responsible business practices. The current research advances prior studies by demonstrating that regulatory influences shape stakeholders' perceptions of corporate environmental responsibility through perceived institutional legitimacy.

A possible explanation for this result is that respondents perceive environmental regulations as credible signals of governmental commitment to sustainable development. When regulatory frameworks are viewed as effective and trustworthy, environmentally responsible corporate actions are more likely to be interpreted as genuine sustainability efforts rather than symbolic compliance activities. This suggests that regulatory legitimacy may play an important role in transforming institutional pressures into positive sustainability perceptions.

The dual-role nature of eco-conscious producer-consumers may further strengthen this relationship. Because these individuals participate in sustainability processes from

both production and consumption perspectives, they may be particularly attentive to the ways in which regulatory pressures shape corporate environmental responsibility.

5.2. Corporate Environmental Responsibility and Sustainable Production Practices

Support for H2 indicates that corporate environmental responsibility is closely associated with perceptions of sustainable production practices among eco-conscious producer-consumers. Rather than viewing environmental responsibility as an abstract organizational value, respondents appear to evaluate it through observable production processes, resource utilization, and environmental performance.

The strength of the PCER–SPP relationship suggests that respondents evaluate environmental responsibility primarily through operational manifestations rather than symbolic sustainability claims. Stakeholders may be increasingly unwilling to separate what organizations claim from what they actually do. In other words, environmental responsibility appears to gain credibility only when it is reflected in concrete production activities. From this perspective, sustainable production practices function as visible evidence that environmental commitments are being implemented rather than merely communicated.

Such an interpretation is particularly relevant in contemporary sustainability contexts, where organizations increasingly compete through environmental performance as well as environmental communication. Under these conditions, observable production practices become an important basis for stakeholder evaluations because they provide tangible evidence that corporate sustainability commitments are being implemented in practice. This helps explain why stronger perceptions of corporate environmental responsibility are closely associated with perceptions of sustainable production practices.

The findings contribute to the sustainability legitimacy literature by suggesting that eco-conscious producer-consumers perceive corporate environmental responsibility and sustainable production practices as complementary rather than independent organizational attributes. This perspective extends previous research by indicating that stakeholders evaluate environmental responsibility not only through organizational intentions but also through the extent to which sustainability commitments are reflected in production practices. Accordingly, sustainable production appears to function as an operational expression of corporate environmental responsibility from the perspective of eco-conscious producer-consumers.

This observation is particularly meaningful given the characteristics of the sample. Because eco-conscious producer-consumers participate in sustainability processes from both production and consumption perspectives, they are likely to possess greater familiarity with environmental standards, sustainability requirements, and production-related environmental impacts. Their evaluations therefore reflect not only consumer perceptions but also practical understanding of how sustainability commitments are implemented within production systems.

From a theoretical standpoint, the findings extend Institutional Theory beyond organizational adaptation processes. The results suggest that environmental responsibility may serve as an interpretive mechanism through which stakeholders assess the credibility of sustainable production practices. In this sense, sustainability legitimacy is not created solely through regulatory compliance or environmental communication but also through the perceived consistency between organizational values and operational behavior.

5.3. Understanding the Absence of a Direct Relationship Between Sustainable Production Practices and Sustainable Consumption Behavior

One of the more unexpected findings of this study is the absence of a significant direct relationship between sustainable production practices and sustainable consumption behavior, leading to the rejection of H3. This result is particularly noteworthy given the

characteristics of the study sample. Since eco-conscious producer-consumers simultaneously participate in environmentally responsible production and sustainable consumption activities, sustainable production practices could theoretically be expected to strengthen their consumption behavior. However, the findings indicate that sustainable production practices alone may not automatically translate into sustainable consumption decisions, even among individuals with relatively high sustainability awareness.

This finding differs from previous empirical studies that have reported a significant positive relationship between sustainable production practices and sustainable consumption behavior. Prior research suggests that environmentally responsible production systems, green technologies, and sustainable supply chain practices can enhance consumer trust, strengthen positive sustainability perceptions, and encourage the adoption of eco-friendly products. From this perspective, sustainable production has generally been considered an important driver of environmentally responsible consumption.

In contrast, the findings of the present study suggest that the influence of sustainable production practices may depend on the extent to which these practices are visible, understandable, and credible to stakeholders. One possible explanation is related to the characteristics of emerging sustainability-transition contexts such as Azerbaijan, where green markets, environmental communication systems, and sustainability evaluation mechanisms are still developing. In such contexts, consumers may require additional informational mechanisms to recognize and assess the value of firms' sustainability efforts. Although sustainable production creates environmental value, many production-related activities remain internal organizational processes that may not directly influence consumer decisions unless they are effectively communicated.

This explanation is consistent with Signaling Theory, which argues that organizational actions affect stakeholder perceptions when they are transformed into clear and trustworthy signals. Therefore, sustainable production practices may influence sustainable consumption not simply through their existence, but through mechanisms that increase transparency, reduce information asymmetry, and strengthen the credibility of sustainability claims. The significant role of perceived digital environmental transparency in this study further supports this interpretation, demonstrating that sustainability-related information plays a critical role in translating organizational efforts into behavioral responses.

Another explanation relates to the unique characteristics of eco-conscious producer-consumers. Unlike conventional consumers, these individuals possess practical experience with sustainability-oriented production activities and may therefore evaluate environmental claims more critically. For this group, sustainable production practices may represent an expected standard rather than a distinctive factor influencing consumption decisions. Consequently, production practices alone may be insufficient to generate behavioral change unless they are perceived as authentic, transparent, and environmentally meaningful.

Importantly, the rejection of H3 should not be interpreted as evidence that sustainable production practices are irrelevant for sustainable consumption behavior. The correlation results indicate a positive association between sustainable production practices and sustainable consumption behavior; however, this relationship becomes non-significant in the structural model when perceived government regulation, perceived digital environmental transparency, and other explanatory mechanisms are simultaneously considered. This suggests that the influence of sustainable production practices may be indirect, conditional, or partially absorbed by stronger institutional and informational mechanisms rather than completely absent.

Therefore, the findings indicate that sustainable production practices alone may not be sufficient to independently predict sustainable consumption behavior among eco-conscious producer-consumers. Instead, their behavioral influence may depend on whether

production-related sustainability efforts are supported by credible sustainability communication, transparent environmental information, and broader institutional signals.

Overall, the unsupported H3 provides an important theoretical insight by showing that the production–consumption link may be more complex than a direct linear relationship. While previous studies have emphasized the direct influence of sustainable production on consumer behavior, the present findings suggest that this relationship may depend on additional institutional and informational mechanisms that strengthen the visibility and credibility of sustainability practices. Thus, sustainable production becomes behaviorally influential when organizational practices are supported by transparency and trusted environmental signals.

5.4. Mediation Mechanism: The Role of Digital Environmental Transparency

The mediation results reveal that digital environmental transparency serves as an important mechanism through which perceptions of corporate environmental responsibility influence sustainable consumption behavior. While environmentally responsible firms are generally viewed more favorably, the findings suggest that sustainability commitments become substantially more influential when they are communicated through transparent, accessible, and credible digital channels. This indicates that stakeholders do not respond solely to perceptions of environmental responsibility itself; rather, they respond to how that responsibility becomes visible and understandable in practice.

The significant mediating effect provides additional insight into how corporate environmental responsibility is translated into sustainable consumption behavior. Instead of producing an immediate behavioral response, environmental responsibility appears to affect consumer decisions by reducing informational uncertainty and enabling stakeholders to evaluate organizational sustainability efforts more confidently. This finding helps explain why transparency serves as a key intermediary linking corporate sustainability initiatives with environmentally responsible consumption.

This mechanism is particularly relevant in contemporary digital environments, where sustainability-related information increasingly reaches consumers through websites, sustainability reports, social media platforms, and digital disclosure systems. Under these conditions, environmental transparency becomes more than a communication tool; it becomes part of the process through which sustainability credibility is established. Consumers therefore evaluate not only firms' environmental performance but also the transparency and consistency with which sustainability information is communicated.

The partial mediation observed in the model helps explain the mechanism through which corporate environmental responsibility influences sustainable consumption behavior. Although perceived digital environmental transparency explains a significant portion of this relationship, the remaining direct effect indicates that transparency does not fully account for how corporate environmental responsibility influences sustainable consumption. This finding suggests that additional mechanisms beyond digital environmental transparency may also contribute to the translation of corporate sustainability efforts into consumer behavior and deserve further investigation in future research.

The practical value of digital transparency becomes particularly evident when stakeholders cannot directly verify firms' environmental performance. Even eco-conscious producer-consumers, despite possessing greater sustainability knowledge than conventional consumers, rely on transparent digital information to assess whether environmental commitments are consistently reflected in organizational practices. This finding suggests that information accessibility remains essential even among relatively well-informed stakeholder groups.

The findings also offer a more nuanced understanding of Signaling Theory. Rather than simply confirming that firms use sustainability disclosures as signals, the results indicate that the effectiveness of these signals depends on their perceived transparency and credibility. In other words, sustainability signals appear to influence behavior not because information is available, but because stakeholders perceive that information as trustworthy and informative. This distinction helps explain why some sustainability initiatives generate behavioral responses while others fail to influence consumer decision-making.

5.5. Moderating Role of Eco-Anxiety

The moderating effect of eco-anxiety suggests that environmental regulation does not influence all individuals in the same way. Although governmental regulations create a common institutional framework that encourages sustainable behavior, their behavioral effectiveness appears to depend on how environmental risks are psychologically interpreted. The positive interaction effect observed in this study indicates that the influence of perceived government regulation on sustainable consumption behavior becomes substantially stronger among individuals experiencing higher levels of eco-anxiety.

This finding highlights an important limitation of purely institutional explanations of sustainable behavior. Although regulatory measures establish environmental standards and encourage sustainability-oriented action, their effectiveness ultimately depends on individuals' psychological engagement with environmental challenges. This suggests that institutional interventions alone may not generate uniform behavioral responses across different individuals.

One interpretation is that eco-anxiety increases the behavioral relevance of regulatory signals. Individuals who experience greater concern about climate change and ecological uncertainty may pay closer attention to sustainability-related policies and interpret environmental regulations as necessary responses to pressing environmental problems. Consequently, governmental initiatives become more influential because they resonate with existing environmental concerns and reinforce individuals' motivation to act sustainably.

The findings therefore point to an important interaction between institutional and psychological mechanisms. Rather than operating independently, environmental governance and eco-anxiety appear to work together in shaping sustainable consumption behavior. Government regulation provides external direction for sustainability-oriented action, whereas eco-anxiety strengthens individuals' willingness to respond to that direction. This interaction suggests that sustainability transitions may be most effective when institutional interventions are supported by heightened environmental awareness and concern.

The moderation analysis demonstrates that eco-anxiety operates as a motivating rather than inhibiting factor in sustainability-oriented behavior within the present context. Previous studies have occasionally argued that high levels of environmental anxiety may lead to emotional fatigue, avoidance, or feelings of helplessness. However, the evidence obtained from eco-conscious producer-consumers suggests a different pattern. For these individuals, environmental concern appears to function as a motivational resource that increases engagement with sustainability challenges rather than discouraging action. Their involvement in environmentally responsible production activities may strengthen perceptions of personal efficacy, making environmental concern more likely to result in constructive behavioral responses.

The results are particularly relevant in the context of emerging sustainability transitions. In sustainability-transition contexts such as Azerbaijan, where environmental governance and green transformation initiatives are becoming increasingly visible, regulatory efforts may achieve greater behavioral impact when accompanied by rising public

awareness of environmental risks. This implies that the success of sustainability policies may depend not only on regulatory design but also on the extent to which environmental issues become psychologically salient to citizens.

The findings indicate that eco-anxiety acts as a boundary condition influencing the behavioral effectiveness of governmental regulation. Specifically, higher levels of eco-anxiety strengthen the positive relationship between perceived government regulation and sustainable consumption behavior, suggesting that institutional sustainability initiatives become more effective when individuals perceive environmental issues as personally salient. By demonstrating this interaction, the study extends existing sustainability and environmental psychology research and underscores the importance of integrating institutional governance with psychological processes to better explain sustainability-oriented behavior.

6. Conclusions

This study set out to explain how institutional, organizational, informational, and psychological factors jointly shape sustainable consumption behavior among eco-conscious producer-consumers. By integrating governmental regulation, corporate environmental responsibility, sustainable production practices, digital environmental transparency, and eco-anxiety into a single framework, the study provides a more comprehensive understanding of how sustainability-related behavior develops within emerging sustainability ecosystems.

The empirical evidence suggests that sustainability-oriented behavior is not driven by isolated factors but emerges through a sequence of interconnected mechanisms. Governmental regulation strengthens perceptions of corporate environmental responsibility, while environmental responsibility contributes to stronger perceptions of sustainable production practices. However, a central implication emerging from this research is that sustainable production practices do not necessarily translate directly into sustainable consumption behavior. The absence of a significant direct relationship between these two constructs challenges a common assumption in sustainability research and suggests that organizational sustainability efforts become behaviorally influential only when stakeholders can recognize, evaluate, and trust them.

In this respect, digital environmental transparency occupies a central position within the proposed framework. The results indicate that sustainability initiatives become more effective when environmental commitments are communicated through transparent, accessible, and credible digital channels. Beyond its role as a communication tool, transparency functions as a mechanism that converts organizational sustainability efforts into credible signals influencing stakeholder perceptions and behavioral responses.

The study also demonstrates that the effectiveness of institutional sustainability mechanisms depends partly on individual psychological conditions. Eco-anxiety strengthens the relationship between governmental regulation and sustainable consumption behavior, indicating that regulatory interventions are more likely to influence behavior when environmental challenges are perceived as personally relevant. This finding highlights the importance of considering emotional engagement alongside institutional governance when explaining sustainability-oriented behavior.

The proposed framework highlights that sustainable consumption behavior develops through the alignment of regulatory expectations, corporate sustainability actions, credible information signals, and environmental awareness.

The practical implications of this research are particularly relevant for policymakers and firms seeking to strengthen sustainable consumption initiatives. For policymakers, the results underline the importance of strengthening environmental governance while simultaneously improving the accessibility and credibility of sustainability-related information. Regulatory frameworks are likely to be more effective when accompanied by transparent

disclosure systems and publicly accessible environmental information. Therefore, policymakers should encourage the development of standardized sustainability reporting mechanisms, digital environmental information platforms, and transparent disclosure guidelines that allow stakeholders to evaluate firms' environmental performance more effectively. Such initiatives can increase the credibility of sustainability claims and reduce information gaps between organizations and consumers.

For businesses, the evidence suggests that sustainability initiatives must be visible and verifiable if they are to influence stakeholder behavior. Investments in sustainability reporting, environmental disclosure, and digital traceability systems may therefore be just as important as investments in sustainable production itself. Firms should strengthen their sustainability communication strategies by using digital channels to provide clear, evidence-based, and regularly updated information about environmental practices, resource efficiency, green innovations, and sustainability achievements. By improving the transparency and credibility of environmental communication, firms can build stakeholder trust, reduce concerns regarding greenwashing, and transform sustainability efforts into stronger consumer engagement and sustainable consumption behavior.

More broadly, the results indicate that sustainability initiatives can generate stronger environmentally responsible behavior when they are supported by open and transparent communication. Therefore, alongside implementing sustainability practices, policymakers and businesses should ensure that sustainability-related information is clear, accessible, and easy for stakeholders to understand.

Limitations and Future Research Directions. Certain methodological limitations should be considered when evaluating the outcomes of this study. First, because the data were collected through a cross-sectional survey within one national context, causal inferences remain limited and the transferability of the results to other settings should be approached with caution. Since the variables were measured at one point in time, the findings demonstrate theoretically supported relationships rather than definitive cause-and-effect mechanisms. Future studies could employ longitudinal designs to examine how these relationships develop over time and experimental approaches to further validate the proposed causal pathways between institutional factors, sustainability signals, and consumer behavior.

Second, the study focuses specifically on eco-conscious producer-consumers operating in environmentally sustainable sectors. While this provides valuable insights into an important stakeholder group, the findings may not be generalizable to conventional consumers or other market participants. Future comparative research involving different consumer and producer groups could provide a broader understanding of sustainability-related behavior across diverse market contexts.

Finally, the proposed framework does not include all factors that may influence sustainable consumption behavior. Future research could build upon this framework by incorporating additional constructs such as environmental trust, environmental identity, perceived authenticity, digital sustainability literacy, social influence, or green self-efficacy to provide a more comprehensive understanding of sustainability-related behavioral mechanisms.

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Appendix A

Table A1. Measurement items.

Perceived Government Regulation
Environmental regulations effectively encourage firms to adopt environmentally responsible business practices.
Government sustainability policies provide clear guidance for improving firms' environmental performance.
Environmental regulations are effectively implemented and enforced by public authorities.
Government environmental governance creates favorable conditions for firms to operate in a more sustainable manner.
Perceived Corporate Environmental Responsibility
Environmentally responsible firms are committed to protecting the natural environment.
Environmentally responsible firms actively integrate sustainability into their business operations.
Environmentally responsible firms take responsibility for reducing the environmental impacts of their activities.
Firms that adopt environmental responsibility practices contribute positively to society and the environment.
Sustainable Production Practices
Firms implement environmentally sustainable production systems.
Production processes are designed to minimize negative environmental impacts.
Firms apply resource-efficient technologies in their production activities.
Environmentally responsible practices are integrated throughout firms' production operations.
Sustainable Consumption Behavior
I prefer purchasing environmentally friendly products whenever possible.
I consider environmental impacts when making purchasing decisions.
I intend to continue purchasing environmentally responsible products in the future.
I am willing to support environmentally responsible firms through my purchasing decisions.
Perceived Digital Environmental Transparency
Firms openly disclose environmental information through their digital communication channels.
Environmental information provided by firms is clear, comprehensive, and easy to understand.
Environmental information published by firms is easily accessible through digital platforms.
Firms regularly communicate verifiable information about their environmental performance through digital media.
Eco-Anxiety
I feel concerned about the long-term consequences of climate change.
Thinking about environmental degradation makes me feel anxious.
I feel emotionally affected by environmental problems.
Climate change makes me worry about the future.

References

1. Pineiro-Villaverde, G.; García-Álvarez, M.T. Sustainable consumption and production: Exploring the links with resources productivity in the EU-28. *Sustainability* **2020**, *12*, 8760. [[CrossRef](#)]
2. Markowski, Ł.; Kotliński, K.; Ostrowska, A. Sustainable consumption and production in the European Union—An attempt to assess changes and convergence from the perspective of Central and Eastern European countries. *Sustainability* **2023**, *15*, 16485. [[CrossRef](#)]

3. Organisation for Economic Co-operation and Development (OECD). *The Role of Economic Regulators in the Green Transition: Driving Sustainable Change in Network Sectors*; OECD Publishing: Paris, France, 2024. [\[CrossRef\]](#)
4. Lubowiecki-Vikuk, A.; Dąbrowska, A.; Machnik, A. Responsible consumer and lifestyle: Sustainability insights. *Sustain. Prod. Consum.* **2021**, *25*, 91–101. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Mammadli, M. Environmentally responsible business approaches in Azerbaijan. *Sustainability* **2022**, *14*, 6227. [\[CrossRef\]](#)
6. Mukhtar, B.; Hussain, A.; Hollebeek, L.D.; Arli, D. What drives sustainable consumption behavior? Empirical evidence from a three-stage hybrid analysis incorporating bibliometric, PLS-SEM, and NCA evidence. *J. Retail. Consum. Serv.* **2026**, *93*, 104870. [\[CrossRef\]](#)
7. Gunawan, A.I.; Gaffar, V.; Bansah, P.F.; Monoarfa, H. Responsible consumption behavior, crucial goals for sustainable development: A systematic review and future research prospects. *Int. J. Appl. Bus. Res.* **2024**, *6*, 99–120. [\[CrossRef\]](#)
8. Hasanov, R.I.; Azizli, N.N. Doughnut Economics: Exploring a New Alternative Sustainable Model. *Econ. Altern.* **2025**, *1*, 149–165. [\[CrossRef\]](#)
9. Cui, X.; Elahi, E.; Khalid, Z.; Xu, B. Environmental regulation, manufacturing technological progress and pollution emissions: Empirical evidence from China. *Sustainability* **2022**, *14*, 16258. [\[CrossRef\]](#)
10. Wang, C.; Du, D.; Liu, T.; Li, X.; Zhu, Y.; Du, W.; Xu, F.; Yan, M.; Chen, J. Environmental regulations, green technological innovation, and green economy: Evidence from China. *Sustainability* **2024**, *16*, 5630. [\[CrossRef\]](#)
11. Mammadli, M.; Namazova, N.; Zeynalova, Z. Digital Platform Capability and Enterprise Digital Transformation in Azerbaijan's Organic Product Value Chain. *Sustainability* **2026**, *18*, 634. [\[CrossRef\]](#)
12. Söderholm, P. The green economy transition: The challenges of technological change for sustainability. *Sustain. Earth* **2020**, *3*, 6. [\[CrossRef\]](#)
13. Cai, W.; Li, G. The Drivers of Eco-Innovation and Its Impact on Performance: Evidence from China. *J. Clean. Prod.* **2018**, *176*, 110–118. [\[CrossRef\]](#)
14. Zhuo, W. Environmental regulation and corporate sustainability: Evidence from green innovation. *Corp. Soc. Responsib. Environ. Manag.* **2023**, *30*, 1723–1737. [\[CrossRef\]](#)
15. Chen, Y.S. The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *J. Bus. Ethics* **2010**, *93*, 307–319. [\[CrossRef\]](#)
16. Dangelico, R.M.; Pujari, D. Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *J. Bus. Ethics* **2010**, *95*, 471–486. [\[CrossRef\]](#)
17. Zhao, X.; An, H. Research on the mechanism of heterogeneous corporate environmental responsibility in Z-generation consumers' sustainable purchase intention. *Sustainability* **2023**, *15*, 10318. [\[CrossRef\]](#)
18. Khairy, H.A.; Badwy, H.E.; Khreis, S. Perceived environmental corporate social responsibility and sustainable innovation in the hotel business: The mediating role of green intrinsic motivation. In *Navigating Trust in Sustainability Reporting and Assurance*; IGI Global: Hershey, PA, USA, 2025; pp. 317–356. [\[CrossRef\]](#)
19. Serrano-García, J.; Arbeláez-Toro, J.J.; Cardona-Cárdenas, J.D.; Marimon, F. Green research and development capacity and corporate environmental responsibility in the pursuit of green product innovation: A bibliometric analysis. *Int. J. Inf. Manag. Data Insights* **2025**, *5*, 100367. [\[CrossRef\]](#)
20. Chrisjatmiko, K. Towards green loyalty: The influences of green perceived risk, green image, green trust and green satisfaction. *IOP Conf. Ser. Earth Environ. Sci.* **2018**, *106*, 012085. [\[CrossRef\]](#)
21. Sheth, J.N.; Sethia, N.K.; Srinivas, S. Mindful consumption: A customer-centric approach to sustainability. *J. Acad. Mark. Sci.* **2011**, *39*, 21–39. [\[CrossRef\]](#)
22. Wang, F.; Zhou, W.; Zhang, Z. Greenwashing as a corporate strategy: A bibliometric analysis of risks, governance, and heterogeneity. *Int. J. Financ. Stud.* **2026**, *14*, 121. [\[CrossRef\]](#)
23. Dmuchowski, P.; Dmuchowski, W.; Baczevska-Dąbrowska, A.H.; Gworek, B. Environmental, social, and governance (ESG) model; impacts and sustainable investment—Global trends and Poland's perspective. *J. Environ. Manag.* **2023**, *329*, 117023. [\[CrossRef\]](#) [\[PubMed\]](#)
24. Clayton, S.; Karazsia, B.T. Development and validation of a measure of climate change anxiety. *J. Environ. Psychol.* **2020**, *69*, 101434. [\[CrossRef\]](#)
25. Hickman, C.; Marks, E.; Pihkala, P.; Clayton, S.; Lewandowski, R.E.; Mayall, E.E.; Wray, B.; Mellor, C.; van Susteren, L. Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *Lancet Planet. Health* **2021**, *5*, e863–e873. [\[CrossRef\]](#) [\[PubMed\]](#)
26. Gkargkavouzi, A.; Halkos, G.; Halkou, P. The influence of eco-anxiety on sustainable consumption choices: A brief narrative review. *Urban Sci.* **2025**, *9*, 286. [\[CrossRef\]](#)
27. Kollmuss, A.; Agyeman, J. Mind the Gap: Why Do People Act Environmentally and What Are the Barriers to Pro-Environmental Behavior? *Environ. Educ. Res.* **2002**, *8*, 239–260. [\[CrossRef\]](#)

28. Kerse, Y.; Kerse, G. The effect of eco-anxiety on pro-environmental behaviors and mental well-being: A parallel mediation model. *BMC Psychol.* **2025**, *13*, 1155. [[CrossRef](#)] [[PubMed](#)]
29. Elkhwesky, Z.; Castañeda-García, J.-A.; Derhab, N.; Patwary, A.K.; Hassan, H. Climate change anxiety, pro-environmental behavior, and environmental leadership in Egyptian hotels: A multi-generational cohort perspective. *Int. J. Hosp. Manag.* **2026**, *137*, 104678. [[CrossRef](#)]
30. Bansal, P.; Roth, K. Why companies go green: A model of ecological responsiveness. *Acad. Manag. J.* **2000**, *43*, 717–736. [[CrossRef](#)] [[PubMed](#)]
31. Delmas, M.A.; Toffel, M.W. Organizational responses to environmental demands: Opening the black box. *Strateg. Manag. J.* **2008**, *29*, 1027–1055. [[CrossRef](#)]
32. Pizzi, S.; Venturelli, A.; Variale, M.; Macario, G.P. Assessing the impacts of digital transformation on internal auditing: A bibliometric analysis. *Technol. Soc.* **2021**, *67*, 101738. [[CrossRef](#)]
33. Chen, Y.; Zhang, M.; Matthews, L.; Guo, H. Digital Transformation and Environmental Information Disclosure in China: The Moderating Role of Top Management Team's Ability. *Bus. Strategy Environ.* **2024**, *33*, 8456–8470. [[CrossRef](#)]
34. Bhuiyan, F.; Rana, T.; Baird, K.; Munir, R. Strategic Outcome of Competitive Advantage from Corporate Sustainability Practices: Institutional Theory Perspective from an Emerging Economy. *Bus. Strategy Environ.* **2023**, *32*, 4217–4243. [[CrossRef](#)]
35. Porter, M.E.; van der Linde, C. Toward a New Conception of the Environment–Competitiveness Relationship. *J. Econ. Perspect.* **1995**, *9*, 97–118. [[CrossRef](#)]
36. Tu, Y.; Lu, L.; Wang, S. Environmental Regulations, GHRM and Green Innovation of Manufacturing Enterprises: Evidence from China. *Front. Environ. Sci.* **2024**, *12*, 1308224. [[CrossRef](#)]
37. Su, L. Environmental Regulation and Corporate Green Innovation: Evidence from the Implementation of the Total Energy Consumption Target in China. *J. Bus. Econ.* **2025**, *95*, 499–526. [[CrossRef](#)]
38. Saari, U.A.; Damberg, S.; Frömbing, L.; Ringle, C.M. Sustainable Consumption Behavior of Europeans: The Influence of Environmental Knowledge and Risk Perception on Environmental Concern and Behavioral Intention. *Ecol. Econ.* **2021**, *189*, 107155. [[CrossRef](#)]
39. Hidayat, T.; Nashirah, A.F.; Pangestuti, I.R.D. Analyzing the Consumer Behavior and Implications of Sustainable Consumption among Generation Z. *Res. Horiz.* **2024**, *4*, 161–176.
40. Joshi, Y.; Rahman, Z. Factors affecting green purchase behaviour and future research directions. *Int. Strateg. Manag. Rev.* **2015**, *3*, 128–143. [[CrossRef](#)]
41. Szulc-Obłoz, A.; Żurek, M. The Role of the Real Impact of Sustainable Consumption Perception on Sustainable Behaviors: Evidence from a Post-Transitional European Economy. *Sustain. Dev.* **2026**, *34*, 1404–1418. [[CrossRef](#)]
42. Jacobs, K.; Petersen, L.; Hörisch, J.; Battenfeld, D. Green thinking but thoughtless buying? An empirical extension of the value-attitude-behaviour hierarchy in sustainable clothing. *J. Clean. Prod.* **2018**, *203*, 1155–1169. [[CrossRef](#)]
43. George, G.; Merrill, R.K.; Schillebeeckx, S.J.D. Digital sustainability and entrepreneurship: How digital innovations are helping tackle climate change and sustainable development. *Entrep. Theory Pract.* **2021**, *45*, 999–1027. [[CrossRef](#)]
44. Dobre, C.; Baba, C.M.; Anton, C.E.; Zamfirache, A.; Aldea, D. Sustainability Reporting and Environmental Responsibility: The Case of Romania. *Adm. Sci.* **2025**, *15*, 103. [[CrossRef](#)]
45. Ying, Y.; Jin, S. Impact of Environmental Regulation on Corporate Green Technological Innovation: The Moderating Role of Corporate Governance and Environmental Information Disclosure. *Sustainability* **2024**, *16*, 3006. [[CrossRef](#)]
46. Chen, Y.S.; Chang, C.H. Enhance Green Purchase Intentions: The Roles of Green Perceived Value, Green Perceived Risk, and Green Trust. *Manag. Decis.* **2012**, *50*, 502–520. [[CrossRef](#)]
47. Abu-Alhaija, A.S.; Elsayy, M.M. Digital Sustainability Orientation and Green Brand Advocacy in Social Media Marketing: The Mediating Role of Digital Green Innovation and the Moderating Effect of Consumer Environmental Consciousness. *J. Theor. Appl. Electron. Commer. Res.* **2026**, *21*, 156. [[CrossRef](#)]
48. Testa, F.; Sarti, S.; Frey, M. Are green consumers really green? Exploring the factors behind the actual consumption of organic food products. *Bus. Strategy Environ.* **2019**, *28*, 327–338. [[CrossRef](#)]
49. Robertson, J.L.; Barling, J. Greening organizations through leaders' influence on employees' pro-environmental behaviors. *J. Organ. Behav.* **2013**, *34*, 176–194. [[CrossRef](#)]
50. Shan, Z.; Han, X.; Zhang, Z. Environmental Regulation and Firm Productivity: Evidence from China's New Energy Industry. *Eurasian Econ. Rev.* **2025**, *15*, 871–906. [[CrossRef](#)]
51. Wang, H.; Qi, S.; Zhou, C.; Zhou, J.; Huang, X. Green credit policy, government behavior and green innovation quality of enterprises. *J. Clean. Prod.* **2022**, *331*, 129834. [[CrossRef](#)]
52. Mora-Sanguinetti, J.S.; Atienza-Maeso, A. "Green Regulation": A Quantification of Regulations Related to Renewable Energy, Sustainable Transport, Pollution and Energy Efficiency between 2000 and 2022. In *Documentos de Trabajo*; Banco de España: Madrid, Spain, 2023; Volume 2336.

53. Mosca, A.; Luciani, D.; Chiappini, S.; Miuli, A.; PsyClimate Research Group; Cianconi, P.; Pettorruso, M.; Janiri, L.; Martinotti, G. Eco-Anxiety and Mental Health: Correlates of Climate Change Distress. *Int. J. Environ. Res. Public Health* **2025**, *22*, 1768. [\[CrossRef\]](#) [\[PubMed\]](#)
54. Ferrajão, P.; Torres, N.; Martins, A.Q. Latent Profiles of Eco-Anxiety: Resilience, and Vulnerability Factors in a Portuguese-Sample. *Sustainability* **2026**, *18*, 4345. [\[CrossRef\]](#)
55. Davì, D.; Lo Destro, C.; Melchiori, F. How Does Eco-Anxiety Relate to Pro-Environmental Behavior? A Correlational Meta-Analysis with Clinical and Social Implications. *Soc. Sci.* **2026**, *15*, 88. [\[CrossRef\]](#)
56. Goh, S.K.; Balaji, M.S. Linking Green Skepticism to Green Purchase Behavior. *J. Clean. Prod.* **2016**, *131*, 629–638. [\[CrossRef\]](#)
57. Ghaleb, M.M.S.; Dekhonov, B. Environmental Protection and Consciousness Influence Sustainable Consumption: Mediated by Perceived Control and Moderated by Responsibility. *AgBioForum* **2024**, *26*, 108–121.
58. Yakin, V.; Çelik, S.; Gülay, G. Communicating or Not Communicating? A Consumer-Based Indicator for Sustainability Communication: Developing a Greenhushing Attitude Scale. *Systems* **2026**, *14*, 463. [\[CrossRef\]](#)
59. Yadav, R.; Pathak, G.S. Determinants of consumers' green purchase behavior in a developing nation: Applying and extending the theory of planned behavior. *Ecol. Econ.* **2017**, *134*, 114–122. [\[CrossRef\]](#)
60. Arif, M.; Zubair, S.K.; Ahsan, N.; Hayee, R.; Aqeel, Z. Antecedents of Sustainable Consumption Behavior: A Mediation and Moderation Model. *J. Soc. Sci. Rev.* **2025**, *5*, 418–434. [\[CrossRef\]](#)
61. Arli, D.; Tan, L.P.; Tjiptono, F.; Yang, L. Exploring Consumers' Purchase Intention toward Green Products in an Emerging Market: The Role of Consumers' Perceived Readiness. *Int. J. Consum. Stud.* **2018**, *42*, 389–401. [\[CrossRef\]](#)
62. Ye, S.Y. Understanding the Role of Environmental Concern in Green-Product Purchase Intention: Investigating Perceived Policy Effectiveness in the Theory of Planned Behaviour. In *Proceedings of the 2022 International Conference on Economics, Smart Finance and Contemporary Trade (ESFCT 2022)*; Atlantis Press: Paris, France, 2022; pp. 1281–1297. [\[CrossRef\]](#) [\[PubMed\]](#)
63. Joshi, Y.; Rahman, Z. Predictors of young consumer's green purchase behaviour. *Manag. Environ. Qual. Int. J.* **2016**, *27*, 452–472. [\[CrossRef\]](#)
64. Zhu, Q.; Sarkis, J.; Lai, K.H. Green Supply Chain Management: Pressures, Practices and Performance within the Chinese Automobile Industry. *J. Clean. Prod.* **2007**, *15*, 1041–1052. [\[CrossRef\]](#)
65. Zhu, Q.; Sarkis, J.; Lai, K.H. Confirmation of a Measurement Model for Green Supply Chain Management Practices Implementation. *Int. J. Prod. Econ.* **2008**, *111*, 261–273. [\[CrossRef\]](#)
66. Chan, R.Y.K. Determinants of Chinese Consumers' Green Purchase Behavior. *Psychol. Mark.* **2001**, *18*, 389–413. [\[CrossRef\]](#)
67. Yadav, R.; Pathak, G.S. Young Consumers' Intention towards Buying Green Products in a Developing Nation: Extending the theory of planned behavior. *J. Clean. Prod.* **2016**, *135*, 732–739. [\[CrossRef\]](#)
68. Hogg, T.L.; Stanley, S.K.; O'Brien, L.V.; Wilson, M.S.; Watsford, C.R. The Hogg Eco-Anxiety Scale: Development and Validation of a Multidimensional Scale. *Glob. Environ. Change* **2021**, *71*, 102391. [\[CrossRef\]](#)

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