

Linking Natural Capital Governance to Climate Resilience through Gender-Inclusive Governance and Stakeholder Coordination in Trinidad and Tobago's Agrifood Organizations

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ABSTRACT

Climate-resilient agrifood systems require organizations to convert ecological information into coordinated and inclusive action, yet this organizational process remains insufficiently understood in Small Island Developing States. This study examines relationships among natural capital governance capability, stakeholder coordination, gender-inclusive governance, nature-based practice adoption, and perceived climate resilience performance in Trinidad and Tobago. A survey-based explanatory design informed by qualitative instrument development analyzed 260 responses using partial least squares structural equation modeling. Natural capital governance capability was positively associated with stakeholder coordination, which was positively associated with nature-based practice adoption. Practice adoption was positively associated with perceived climate resilience performance. Stakeholder coordination partially mediated the relationship between natural capital governance capability and practice adoption, while gender-inclusive governance positively moderated that relationship. The study contributes an integrated organizational capability framework that explains the statistical pathways through which ecological knowledge, coordination, inclusion, and nature-based practice are connected in a climate-exposed Small Island Developing State.

Keywords: Natural capital governance, Gender-inclusive governance, Stakeholder coordination, Nature-based solutions, Agrifood climate resilience

1. Introduction

Climate change has become an organizational challenge for agrifood systems because it affects production continuity, resource allocation, planning routines, stakeholder coordination, and long-term resilience [1]. This challenge is especially pronounced in Small Island Developing States because climate risks are often concentrated in coastal economies, resource-dependent livelihoods, and food systems that are sensitive to environmental disruption [1]. In Trinidad and Tobago, the National Adaptation Plan identifies vulnerability to extreme weather events, temperature changes, sea-level rise, changing rainfall patterns, inland and coastal flooding, stronger hurricanes, and coastal

ecosystem loss [1]. These risks are not peripheral to national development. They are concentrated in coastal zones, which contain 70 percent of the population and 81 percent of economic activity, making climate adaptation directly relevant to livelihoods, food systems, and sustainable organizational development [1].

The agrifood sector in Trinidad and Tobago is particularly relevant to this challenge because climate resilience depends on the quality of information available to decision makers and on the ability of organizations to use that information in practice [2]. FAO and Green Climate Fund readiness work in Trinidad and Tobago has emphasized the need to improve monitoring systems for climate change impacts on agriculture by strengthening data on agricultural activities, food import dependency, hydrological and meteorological data, greenhouse gas assessments, gender-sensitive climate impact reporting, and stakeholder capacity building [2]. This policy direction shows that the country needs more than additional climate data. It also needs agrifood organizations that can interpret natural capital and climate information, coordinate stakeholders, and translate knowledge into adaptive routines [2].

Natural capital governance offers a management-oriented way to understand this organizational challenge. The System of Environmental-Economic Accounting defines ecosystem accounting as an integrated statistical framework for organizing information about habitats, landscapes, ecosystem services, ecosystem assets, and their links with economic and human activity [3]. The National Adaptation Plan also treats Trinidad and Tobago's coastal resources as natural capital, including marine and coastal ecosystems, ecosystem services, and natural resources [1]. These foundations are important because agrifood organizations depend on land, water, soil, biodiversity, coastal protection, pollination, and other ecosystem services, even when those dependencies are not formally measured in day-to-day decision-making [3].

The value of natural capital information to management depends on whether organizations can incorporate it into decisions on production, investment, risk, resource use, and resilience [4]. Natural capital management accounting has been developed specifically to help organizations identify their dependencies on natural capital and use natural capital information in business decision-making rather than only in external reporting [4]. Recent environmental management accounting research similarly shows that environmental accounting tools are increasingly examined as instruments for strategic decision-making, organizational efficiency, legitimacy, and sustainable development [5]. For agrifood organizations, natural capital accounting should therefore be treated not only as a technical measurement framework, but also as a governance capability that can shape climate-related decisions [4]–[7].

Gender inclusion is also central to climate-resilient agrifood governance because resilience is shaped by who participates in decisions and whose knowledge is recognized [8]–[11]. FAO has reported persistent gender gaps in Caribbean agriculture and has noted that women account for 24.5 percent of agricultural jobs in Trinidad and Tobago [8]. Recent research on climate governance and agrifood systems further shows that women are uniquely vulnerable to climate change while also playing important roles in strengthening agrifood resilience [9]–[11]. These insights suggest that

gender inclusion should not be treated as a secondary social concern. It should be examined as an organizational governance condition that may influence the adoption of nature-based practices [9]–[11].

Nature-based climate-resilience provides the practical pathway for translating natural capital governance and gender inclusion into organizational action. In agricultural landscapes, nature-based solutions can reduce trade-offs among food production, climate adaptation, and conservation objectives, although implementation gaps remain significant [12], [13]. In agricultural supply chains, climate resilience also depends on proactive climate action, collaboration, diversification, digital transformation, and natural resource management [14]. These findings are relevant to Trinidad and Tobago because the country's adaptation agenda already recognizes agriculture, food security, coastal resources, biodiversity, water resources, and Tobago-specific concerns as connected adaptation priorities [1]. Consequently, these streams of work suggest that climate-resilient agrifood transformation requires more than climate information, natural capital measurement, gender-sensitive reporting, or nature-based adaptation considered separately. It requires an organizational explanation of how these elements are combined in decision-making and converted into coordinated practice.

Recent scholarship has advanced natural capital accounting, gender-responsive agrifood governance, nature-based solutions, and agricultural supply chain resilience, but these streams remain weakly integrated. Natural capital studies increasingly explain how ecological dependencies can enter organizational measurement and strategic decision-making, yet they provide limited evidence on the interorganizational mechanisms that convert this information into adaptation practice [3]–[7]. Gender and climate research demonstrates that women's agency and participation shape food system resilience, but it rarely tests gender-inclusive governance as a contingent organizational condition within an explanatory model of practice adoption [8]–[11]. Nature-based solutions research identifies persistent implementation barriers associated with fragmented governance, limited expertise, weak stakeholder engagement, and inadequate coordination, but it has not sufficiently connected these barriers to natural capital governance capability at the organizational level [12], [13]. Research on agricultural supply chain resilience similarly recognizes collaboration and dynamic capabilities, while offering limited evidence on how ecological information, inclusive governance, coordination, and nature-based practices operate as one connected process [14], [15].

These limitations create a conceptual gap, a mechanism gap, and a contextual gap. The conceptual gap concerns the absence of an integrated organizational capability framework that connects natural capital governance with gender inclusion and nature-based practice adoption. The mechanism gap concerns how ecological knowledge becomes collective action rather than remaining an accounting or reporting input. The contextual gap concerns the scarcity of organization-level evidence from Caribbean Small Island Developing States, where concentrated climate exposure and resource interdependence increase the importance of coordinated adaptation [1], [2]. The unresolved issue is therefore not whether natural capital information, participation, or nature-based practices matter independently. It is how agrifood organizations combine them to support perceived climate resilience performance.

This study addresses these gaps by examining the organizational process through which natural capital governance capability supports perceived climate resilience performance among agrifood organizations in Trinidad and Tobago. Stakeholder coordination is modeled as the mediating mechanism that converts ecological understanding into shared implementation. Gender-inclusive governance is modeled as the condition that strengthens the translation of natural capital capability into practice. Nature-based practice adoption is modeled as the operational pathway through which governance capability and coordination are associated with perceived resilience performance. The study addresses the following research question. How are natural capital governance capability, stakeholder coordination, and gender-inclusive governance related to nature-based practice adoption and perceived organizational climate resilience performance among agrifood organizations in Trinidad and Tobago?

The study contributes to management and organization research by reframing natural capital governance as an organizational capability rather than only a technical accounting or national statistical activity. It identifies stakeholder coordination as the conversion mechanism through which ecological knowledge becomes collective practice and positions gender-inclusive governance as a boundary condition that strengthens this conversion. It also provides organization-level evidence from Trinidad and Tobago and clarifies how nature-based practice adoption connects governance capability to perceived resilience performance. This integrated explanation extends recent work on natural capital measurement, inclusive agrifood governance, nature-based solution implementation, and collaborative resilience by specifying how these elements operate together within a climate-exposed Small Island Developing State [6], [7], [10], [11], [13], [15].

2. Literature Review

The literature review develops an organizational capability perspective on climate-resilient agrifood transformation. This perspective is appropriate because climate-resilient agrifood action requires organizations to interpret environmental information, coordinate resources across organizational boundaries, include relevant stakeholders in decision-making, and adapt routines under changing environmental conditions [16]. The review is organized around five connected constructs. Natural capital governance capability explains how organizations recognize ecological dependencies and incorporate natural capital information into decision-making. Gender-inclusive governance explains how participation, voice, and legitimacy shape climate-related decision-making. Stakeholder coordination explains how information and participation are converted into collective action. Nature-based practice adoption explains how organizations translate resilience knowledge into operational routines. Organizational climate resilience performance refers to the perceived capacity of organizations to maintain continuity, recover from disruptions, and adapt to climate-related risks. Together, these streams support a conceptual model in which natural capital governance capability influences stakeholder coordination, stakeholder coordination influences nature-based practice adoption, and nature-based practice adoption improves organizational climate resilience performance. Gender-inclusive governance is expected to strengthen the translation of natural capital governance

capability into resilience-oriented action.

From a dynamic capabilities perspective, climate resilience depends on an organization's ability to sense ecological threats and dependencies, mobilize resources and relationships in response, and reconfigure operational routines under changing environmental conditions [15,16]. Natural capital governance capability represents the sensing component because it makes ecological dependencies visible and decision-relevant. Stakeholder coordination supports resource mobilization by connecting knowledge, authority, technical support, and implementation capacity across organizational boundaries. Nature-based practice adoption represents operational reconfiguration because it embeds ecological responses in organizational routines. Gender-inclusive governance functions as a boundary condition that broadens the knowledge base and legitimacy available across these processes. This theoretical mapping explains why the constructs are connected in the proposed model rather than treating them as an empirical sequence without an organizational mechanism.

2.1 Natural Capital Governance Capability

Natural capital governance capability refers to an organization's ability to identify its dependencies on natural assets and ecosystem services, interpret those dependencies as decision-relevant information, and incorporate that information into planning, investment, risk management, and operational routines. Ecosystem accounting provides a formal basis for this logic by organizing information on ecosystems, ecosystem services, ecosystem assets, and their links to economic and human activity [3]. Natural capital management accounting extends this logic into organizational decision-making by helping organizations identify how their activities depend on natural capital and how those dependencies can be made visible in management processes [4]. Recent environmental management accounting research also shows that environmental accounting tools can support strategic decision-making, organizational efficiency, legitimacy, and sustainable development when used proactively rather than solely for external reporting [5].

This literature suggests that natural capital information has limited value unless organizations possess the governance capability to use it. In agrifood organizations, this capability is especially important because production decisions depend on land, water, soil, biodiversity, ecosystem services, and climate-sensitive resources [3,4]. Recent business-oriented natural capital research also argues that natural capital assessment can support managers, researchers, and public authorities when it is connected to organizational measurement and decision needs [7,17]. Therefore, this study conceptualizes natural capital governance capability as more than awareness of environmental resources. It is treated as an organizational capability that helps agrifood actors connect ecological dependencies to decisions about production continuity, adaptation, investment, and resilience.

2.2 Gender-Inclusive Governance

Gender-inclusive governance refers to the meaningful participation of women and underrepresented agrifood actors in decisions on production, resource management, climate adaptation, investment, and organizational resilience. This construct is necessary because climate resilience is shaped by participation and authority, not only by technical information [8]–[11]. FAO

has identified gender gaps in Caribbean agriculture and has reported that women account for 24.5 percent of agricultural jobs in Trinidad and Tobago [8]. Recent research also shows that women are uniquely vulnerable to climate change while playing important roles in strengthening climate resilience in agrifood systems [9]–[11]. These findings indicate that gender inclusion is not peripheral to resilience. It is part of the governance conditions that shape how climate knowledge is interpreted, whose priorities are recognized, and which adaptation options are considered legitimate.

The literature further suggests that gender-inclusive governance can strengthen organizational adaptation by expanding the knowledge base available to decision-makers. Women's participation can enhance the relevance of climate responses by bringing practical knowledge of production, household food security, local resource constraints, and community-level adaptation [9]–[11]. However, gender inclusion should not be treated as a symbolic indicator of social responsibility. It should be assessed as a decision-making condition that influences whether natural capital information is translated into action. In this study, gender-inclusive governance is therefore expected to strengthen the relationship between natural capital governance capability and the adoption of nature-based practices.

2.3 Stakeholder Coordination

Stakeholder coordination refers to the ability of agrifood actors to connect information, resources, institutional support, and practical action across organizational boundaries. This construct is necessary because climate resilience in agrifood systems cannot be produced by individual organizations acting alone. Trinidad and Tobago's agricultural climate monitoring agenda already emphasizes stakeholder capacity-building, gender-sensitive reporting, agricultural data, food import dependency data, hydrological and meteorological data, and greenhouse gas assessment [2]. These priorities imply that climate resilience depends on coordination among farmers, enterprises, cooperatives, extension actors, public institutions, civil society, development partners, and local communities.

Recent research on agricultural supply-chain resilience also supports this logic. It identifies collaboration, proactive climate action, diversification, digital transformation, and natural resource management as important strategies for resilience in the face of climate change [14]. These strategies require coordinated action because they depend on shared information, complementary resources, trust, and institutional alignment. In this study, stakeholder coordination is therefore conceptualized as the mediating mechanism through which natural capital governance capability leads to nature-based practice adoption. Organizations that understand their ecological dependencies may be more likely to coordinate with other actors because ecological risks often cross farm, enterprise, community, and policy boundaries.

2.4 Nature-Based Practice Adoption

Nature-based practice adoption refers to implementing practices that leverage ecological processes to reduce vulnerability, maintain production continuity, and strengthen adaptation in agrifood systems. These practices may include soil conservation, agroecological production,

biodiversity-supporting cultivation, water management, ecosystem restoration, climate-sensitive land management, and coastal ecosystem protection, where relevant to agrifood livelihoods. Nature-based solutions research shows that such approaches can support food production, climate adaptation, and conservation objectives, although implementation gaps and context-specific trade-offs remain important [12]. Recent reviews also indicate that nature-based solutions are increasingly being examined as pathways for improving food security, but they require careful design because outcomes vary by context, governance, and implementation capacity [13,18].

For agrifood organizations in Trinidad and Tobago, the adoption of nature-based practices is especially relevant, as the national adaptation agenda connects agriculture, food security, water resources, biodiversity, coastal resources, and ecosystem vulnerability [1]. Nature-based practices should not be viewed solely as environmental interventions. They should also be understood as organizational practices that require information, coordination, inclusion, and adaptive capacity. In this study, the adoption of nature-based practices is expected to improve organizational climate-resilience by helping organizations reduce resource-related vulnerability, maintain production continuity, and adapt to climate-related disruptions.

2.5 Organizational Climate Resilience Performance

Organizational climate resilience performance refers to the perceived capacity of an agrifood organization to maintain production continuity, respond to climate-related disruption, recover from shocks, adjust practices, and reduce resource-related vulnerability over time. This outcome is important because climate resilience cannot be assessed only by whether an organization recognizes risk or adopts isolated practices. It also depends on whether those practices strengthen the organization's ability to continue functioning under changing environmental conditions. Agricultural supply-chain resilience research emphasizes that climate-resilient performance depends on collaboration, adaptive practices, diversification, information sharing, and natural resource management [14]. Nature-based solutions research similarly indicates that resilience outcomes vary by context, governance, implementation capacity, and the alignment between ecological interventions and production needs [12], [13], [18]. In this study, organizational climate resilience performance is therefore treated as the outcome of a governance process in which natural capital capability, stakeholder coordination, gender inclusion, and nature-based practice adoption are connected.

3. Conceptual Framework and Hypotheses

The conceptual framework connects natural capital governance capability, stakeholder coordination, gender-inclusive governance, nature-based practice adoption, and organizational climate resilience performance. The framework addresses the gap in how natural capital information is translated into coordinated, inclusive action within agrifood systems. Natural capital governance capability is expected to strengthen stakeholder coordination because organizations that recognize ecological dependencies are more likely to understand that climate and resource risks cross farm, enterprise, community, and policy boundaries [3,4,14,15]. This leads to the first hypothesis:

H1: Natural capital governance capability has a positive effect on stakeholder coordination

among agrifood organizations.

Stakeholder coordination is expected to support the adoption of nature-based practices because coordinated actors can mobilize shared knowledge, trust, technical support, institutional access, and complementary resources [2,12,14]. This relationship is important because fragmented stakeholder engagement can limit the practical uptake of nature-based solutions, even when climate and environmental risks are recognized [12], [13], [18]. This leads to the second hypothesis:

H2: Stakeholder coordination has a positive effect on the adoption of nature-based practices.

The adoption of nature-based practices is expected to improve organizational climate resilience performance, as these practices can help reduce ecological vulnerability, maintain production continuity, and adapt to climate-sensitive agrifood conditions [12,14,18]. This leads to the third hypothesis:

H3: Nature-based practice adoption has a positive effect on organizational climate resilience performance.

Stakeholder coordination is also expected to mediate the relationship between natural capital governance capability and the adoption of nature-based practices. Natural capital information may help organizations recognize ecological dependencies, but information alone is unlikely to lead to adaptation unless organizations can coordinate with actors who control knowledge, resources, technical support, and implementation capacity [2,4,14,15]. This relationship is important because natural capital information may create awareness of ecological dependencies, but stakeholder coordination explains how that awareness is converted into shared adaptation practice. This leads to the fourth hypothesis:

H4: Stakeholder coordination mediates the relationship between natural capital governance capability and the adoption of nature-based practices.

To distinguish partial mediation from indirect-only mediation, the structural model also estimates the direct relationship between natural capital governance capability and nature-based practice adoption. This direct path is included as part of the mediation test rather than as an additional substantive hypothesis.

Finally, gender-inclusive governance is expected to strengthen the relationship between natural capital governance capability and the adoption of nature-based practices. Inclusive decision-making can broaden the knowledge base available to organizations, improve the legitimacy of adaptation choices, and make climate-resilience practices more responsive to the realities of women and underrepresented agrifood actors [8]–[11]. This leads to the fifth hypothesis:

H5: Gender-inclusive governance positively moderates the relationship between natural capital governance capability and the adoption of nature-based practices.

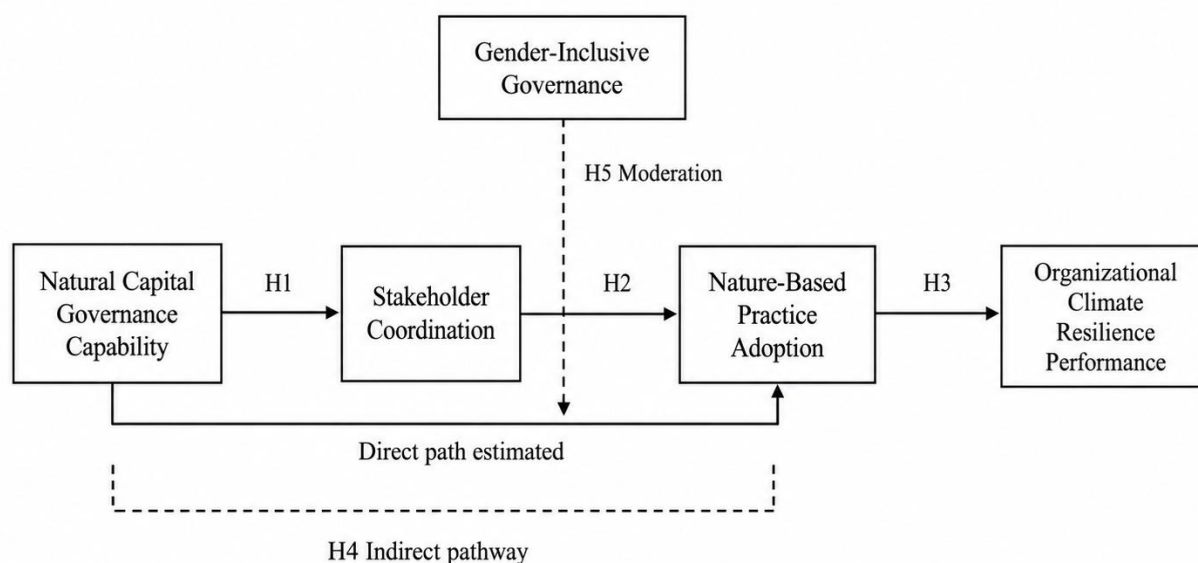


Figure 1. Conceptual framework linking natural capital governance capability, stakeholder coordination, gender-inclusive governance, nature-based practice adoption, and organizational climate resilience performance.

Note. H4 represents the indirect relationship between natural capital governance capability and nature-based practice adoption through stakeholder coordination. H5 represents the moderating relationship of gender-inclusive governance with the direct relationship between natural capital governance capability and nature-based practice adoption. The direct path is estimated to determine whether mediation is partial or indirect-only. Source: By author.

4. Research Design

This study used a survey-based explanatory design supported by a qualitative instrument-development phase. Semi-structured interviews were used to improve the contextual relevance and wording of the questionnaire, while survey data were used to test the hypothesized relationships among the five constructs. The following sections describe the research context, qualitative instrument development, quantitative sampling and data collection, data screening, measurement, quantitative analysis, validity safeguards, and ethical procedures.

4.1 Research Context

Trinidad and Tobago is an appropriate empirical context because national adaptation evidence indicates that climate risks affect agriculture, coastal resources, water resources, biodiversity, food security, and economic activity [1]. The country's agricultural climate monitoring agenda also emphasizes agricultural activity data, food import dependency data, hydrological and meteorological data, greenhouse gas assessments, gender-sensitive climate impact reporting, and stakeholder capacity building [2]. These priorities make the context suitable for examining how agrifood organizations use natural capital information, gender-inclusive governance, and stakeholder coordination to strengthen climate resilience [1], [2].

4.2 Qualitative Phase

The qualitative phase used semi-structured interviews with agrifood actors and institutional stakeholders. Semi-structured interviews were appropriate because they allowed consistent coverage of the main research themes while giving participants enough flexibility to explain their experiences in their own terms [19]. The interview guide was developed through prior literature review, preliminary guide formulation, pilot testing, and refinement, as these steps enhance the trustworthiness, clarity, and plausibility of qualitative interview research [19].

Participants included farmers, women-led agrifood enterprises, cooperatives, processors, extension actors, civil society representatives, public-sector stakeholders, and development actors involved in agriculture, food systems, climate adaptation, or natural resource governance. Purposeful sampling was used because the study required participants with direct knowledge of agrifood decision-making, resource management, gender participation, stakeholder coordination, and climate-related challenges [19]. The qualitative phase included 26 interviews selected to provide representation across the stakeholder categories relevant to questionnaire development to refine survey wording, improve construct relevance, and align the questionnaire with local agrifood decision-making language. Interviews lasted between 32 and 71 minutes and were audio-recorded with permission. The recordings were transcribed verbatim before analysis. Coding was conducted by one researcher using a manual, codebook-based thematic procedure supported by Microsoft Excel. Because a single coder was used, coding consistency was strengthened through a second coding pass, analytic memo review, and comparison of coded segments against the evolving codebook. Recruitment concluded when thematic saturation—operationalized as the absence of new questionnaire-relevant codes or item revisions across the final four interviews—indicated that additional interviews were no longer producing substantively new insights relevant to questionnaire development.

The interview guide examined how participants understood natural capital, how they used environmental and climate information, how women and underrepresented actors participated in decision-making, how stakeholders coordinated adaptation activities, and which nature-based practices were feasible in the local agrifood context. Interview data were analyzed thematically. The first stage identified descriptive themes related to information use, gender inclusion, coordination, barriers to adaptation, and the adoption of nature-based practices. The second stage connected these themes to the constructs in the conceptual model. The third stage used the findings to refine survey wording and remove items that were unclear, repetitive, or disconnected from local agrifood practice [19].

Table 1 summarizes how the qualitative phase informed instrument development. The table is not presented as standalone qualitative findings display. Instead, it shows how interview insights were used to improve item clarity, contextual relevance, construct coverage, and alignment with the decision-making language of agrifood actors in Trinidad and Tobago.

Table 1. Role of qualitative instrument development

Interview area	insight	Construct relevance	Instrument-development outcome
Natural capital and climate information use		Clarified how agrifood actors understood ecological dependencies, natural capital information, and environmental information use in decisions.	Refined the natural capital governance capability items to reflect recognition of ecological dependency, use of natural capital information, consideration of ecosystem services, and resilience planning.
Gender participation and decision voice		Clarified how women and underrepresented agrifood actors participated in climate-related, resource-related, and investment-related decisions.	Refined gender-inclusive governance items to emphasize meaningful participation, influence, knowledge recognition, information access, and inclusion in resilience decisions.
Stakeholder relationships and support		Clarified how agrifood actors coordinated with farmers, extension actors, public institutions, civil society, and development partners.	Refined stakeholder coordination items to capture information sharing, collaboration, technical support, trust, resource mobilization, and coordinated resilience action.
Feasible nature-based practices		Clarified locally meaningful practices related to soil, water, biodiversity, land use, ecosystem restoration, coastal protection, and watershed protection.	Refined nature-based practice adoption items by using locally recognizable practice language and removing wording that was too abstract or poorly aligned with agrifood practice.
Organizational resilience meanings		Clarified how agrifood actors understood continuity, recovery, adaptation, vulnerability reduction, livelihood protection, and long-term resilience.	Refined organizational climate resilience items to reflect production performance, climate-shock recovery, adaptive capacity, vulnerability reduction, and livelihood protection.

Source: By author.

4.3 Quantitative Phase

The quantitative phase used a structured questionnaire administered to agrifood organizations and value-chain actors in Trinidad and Tobago. Respondents included farmers, agrifood entrepreneurs, women-led enterprises, cooperatives, processors, agribusiness operators, extension-linked actors, and representatives of relevant organizations. The focal unit of analysis was the agrifood organization, enterprise, cooperative, public or civil-society organization, or organized production activity about which the respondent answered. Each respondent was instructed to answer consistently with reference

to one focal unit. Eligible respondents were owners, managers, organizational representatives, or other informed actors with direct knowledge of that unit's decision-making, resource use, stakeholder relationships, and climate-related practices. Only one eligible response per focal unit was retained. Where more than one response referred to the same focal unit, the most complete response from the respondent with the greatest relevant decision knowledge was retained.

Survey data were collected between April 2026 and June 2026. Invitations were distributed through farmers' associations and producer groups, women-led agrifood enterprise networks, cooperatives and community agrifood groups, processors, distributors and agribusiness contacts, extension, public-sector and technical networks, and civil society and development-partner networks. Eligible respondents were adults with direct knowledge of agrifood decision-making, resource use, stakeholder coordination, or climate-related practices in Trinidad and Tobago. The questionnaire was administered in mixed modes, including online surveys, email-based participation, and verbal support when needed. Verbal assistance was limited to reading the standardized item wording and response options without interpreting the questions, prompting particular answers, or changing the administration sequence. Whether assistance was provided was recorded in the survey documentation. Participation was voluntary.

Of 408 invitations, 304 respondents initiated the survey and 292 submitted a response. Twelve initiated records were not submitted. Screening excluded 32 submitted responses that did not meet the analytic eligibility criteria, leaving 260 complete and eligible cases. The resulting usable response rate was 63.7 percent. This sample was appropriate for the study's PLS-SEM model because the analysis estimated relationships among multiple latent constructs, including mediation and moderation effects [20]. The adequacy of the analytic sample was assessed through statistical power logic rather than through a simple rule of thumb, consistent with PLS-SEM guidance recommending more rigorous sample-size justification procedures [21]. The minimum required sample was calculated using an a priori linear multiple-regression power analysis in G*Power 3.1.9.7. The calculation specified an alpha level of .05, statistical power of .80, a minimum detectable effect of Cohen's $f^2 = .15$, and a maximum of four predictors for an endogenous construct. The resulting minimum requirement was 85 cases, which was below the final analytic sample of 260 cases.

4.4 Data Screening and Analytic Eligibility

Data screening was completed before model estimation. Initiated but unsubmitted records were excluded from the response dataset. Submitted responses were retained only when respondents met the eligibility criteria and complete data were available for every measurement indicator. All item values were checked against the permitted one-to-five response range. The retained dataset contained no missing measurement-item values, so no imputation was performed. All subsequent analyses were based exclusively on eligible and complete cases.

4.5 Measurement

The questionnaire measured five constructs using reflective indicators. Items were adapted from prior literature and refined through a qualitative instrument-development process. Natural capital

governance capability captured the extent to which organizations recognized ecological dependencies, used natural capital information, considered ecosystem services, and incorporated environmental dependencies into planning and resource decisions [3]–[7]. Gender-inclusive governance captured women’s participation, voice, influence, and access to climate-related and resource-related decisions [8]–[11], [22]. Stakeholder coordination captured collaboration, information sharing, resource mobilization, trust, and coordination with farmers, cooperatives, extension actors, public institutions, civil society, and development partners [2], [14], [15]. Nature-based practice adoption captured practices related to soil conservation, water management, biodiversity support, agroecological production, ecosystem restoration, climate-sensitive land use, and coastal or watershed protection, where relevant [12], [13], [17], [18]. Organizational climate resilience performance captured perceived capacity to maintain production continuity, reduce climate-related vulnerability, respond to shocks, adapt practices, and protect livelihoods [1], [14], [15]. All items were measured using a five-point Likert scale ranging from strong disagreement to strong agreement, with higher scores indicating a stronger presence of the relevant construct. The draft instrument was reviewed by six experts with expertise in natural capital and environmental accounting, climate adaptation and agrifood systems, gender-inclusive governance, survey methodology, and PLS-SEM, and pilot-tested with 18 agrifood actors who met the study’s eligibility criteria. The review and pilot process reduced the substantive item pool from 30 to 25 items, clarified ambiguous wording, removed repetitive or overly abstract items, reordered selected questions, and adapted terminology to the Trinidad and Tobago agrifood context. Items that were ambiguous, repetitive, overly abstract, or poorly aligned with the Trinidad and Tobago context were revised or removed before the full survey.

The constructs were specified reflectively because their indicators were conceptualized as manifestations of underlying organizational capabilities, governance conditions, practices, or perceived performance. Nature-based practice adoption was modeled as a common organizational propensity to embed ecological responses across operational domains rather than as an additive inventory of unrelated activities. The indicators were therefore expected to covary as manifestations of this underlying propensity.

Table 2. Measurement items and sources

Construct	Item codes	Item content domain	Source or basis	adaptation	Retained items	Loading range
Natural capital governance capability	NCGC1	Ecological recognition, use of natural capital information, service integration environmental	Adapted from ecosystem accounting, capital accounting, environmental management accounting literature [3]–[7]; refined	natural management and 5		.861 to .889
	NCGC5					

Construct	Item codes	Item content domain	Source or adaptation basis	Retained items	Loading range
		dependencies, resilience planning.	and through instrument development.	qualitative	
Gender-inclusive governance	GIG1 to GIG5	Women's participation, influence, knowledge recognition, access to information, inclusion in climate-related and resource-related decisions.	Adapted from gender participation, mainstreaming, women's agrifood-system and empowerment literature [8]–[11], [22]; refined through qualitative instrument development.	5	.826 to .883
Stakeholder coordination	SC1 to SC5	Information sharing, collaboration, trust, resource mobilization, and coordinated action.	Adapted from Trinidad and Tobago agricultural climate-monitoring priorities and agricultural supply-chain resilience literature [2], [14], [15]; refined through qualitative instrument development.	5	.866 to .899
Nature-based practice adoption	NBP1 to NBP5	Soil conservation, agroecological practice, water management, biodiversity support, ecosystem restoration, climate-sensitive land use, coastal or watershed protection, and nature-based routine adjustment.	Adapted from nature-based solutions, natural capital, and food-system sustainability literature [12], [13], [17], [18]; refined through qualitative instrument development.	5	.854 to .907
Organizational climate resilience performance	OCR1 to OCR5	Production continuity, vulnerability reduction, climate-shock recovery, adaptive capacity, livelihood protection, and long-term resilience	Adapted from Trinidad and Tobago adaptation priorities and agricultural supply-chain resilience literature [1], [14], [15]; refined through	5	.855 to .896

Construct	Item codes	Item content domain	Source or basis	adaptation	Retained items	Loading range
		under climate-related stress.	qualitative development.	instrument		

Note. All retained indicators were measured on a five-point Likert scale ranging from strong disagreement to strong agreement. Higher values indicate a stronger presence of the construct. Source: By author.

4.6 Data Analysis

Quantitative data were analyzed using PLS-SEM in SmartPLS 4 [23]. PLS-SEM was appropriate because the study estimated an explanatory structural model involving latent constructs, mediation, moderation, and interrelated organizational capabilities [20], [24]. The measurement model was assessed using indicator reliability, internal consistency, convergent validity, and discriminant validity [20], [24]. Discriminant validity was assessed using the heterotrait-monotrait ratio because prior methodological research shows that HTMT can detect discriminant-validity problems more effectively than traditional Fornell-Larcker and cross-loading procedures [25]. The structural model was assessed through path coefficients, effect sizes, explained variance, structural collinearity diagnostics, and bootstrapped confidence intervals [20], [24]. Statistical significance was assessed using percentile bootstrapping with 10,000 subsamples, two-tailed tests, and 95 percent confidence intervals. Mediation was tested by examining the indirect effect of natural capital governance capability on nature-based practice adoption through stakeholder coordination [26]. Moderation was tested by examining whether gender-inclusive governance strengthened the relationship between natural capital governance capability and the adoption of nature-based practices.

4.7 Common Method Bias and Validity Safeguards

Procedural safeguards were used to reduce common method bias. The questionnaire separated predictor and outcome constructs, used clear wording, avoided leading items, protected respondent anonymity, and stated that there were no right or wrong answers. These safeguards were appropriate because common method bias can arise when the same respondent, instrument, and measurement context inflate relationships among variables [27]. Statistical diagnostics were used as supplementary checks rather than as conclusive tests of common method bias. These diagnostics included full collinearity VIF values and the reliability and validity assessments reported for the measurement model [24], [27].

4.8 Ethical Considerations

Participants received information about the study purpose, voluntary participation, confidentiality, and the right to withdraw before data collection. Interview and survey data were anonymized before analysis. No personally identifying information was reported in the manuscript. Special care was taken when interviewing women-led enterprises, small farmers, and community-based actors, as these participants could discuss sensitive organizational, livelihood, or institutional

constraints.

5. Results

5.1 Sample Profile

Table 3 presents the profile of the 260 respondents included in the analysis. Farmers formed the largest stakeholder group, followed by women-led agrifood enterprises, processors and agribusinesses, extension or technical actors, civil society or development actors, cooperatives or producer groups, and public-sector or policy actors. Women represented 52.7 percent of respondents, and 31.5 percent of participating organizations were women-led. The geographic distribution included Trinidad, Tobago, and national or multi-location actors.

Table 3. Sample profile

Profile dimension	Category	n	Percent
Stakeholder group	Farmers	68	26.2
Stakeholder group	Women-led agrifood enterprises	46	17.7
Stakeholder group	Processors and agribusinesses	37	14.2
Stakeholder group	Extension or technical actors	34	13.1
Stakeholder group	Civil society or development actors	30	11.5
Stakeholder group	Cooperatives or producer groups	30	11.5
Stakeholder group	Public-sector or policy actors	15	5.8
Respondent gender	Women	137	52.7
Respondent gender	Men	107	41.2
Respondent gender	Preferred not to report	16	6.2
Organizational profile	Women-led organizations	82	31.5
Geographic location	Trinidad Central	67	25.8
Geographic location	Trinidad South	55	21.2
Geographic location	Trinidad North	47	18.1
Geographic location	Tobago	37	14.2
Geographic location	Trinidad East	27	10.4
Geographic location	National or multi-location actors	27	10.4

Note. Percentages may not total 100 because of rounding. Primary stakeholder group was coded as a mutually exclusive recruitment category. Women-led organization was coded separately as an organizational profile characteristic and could occur within any stakeholder group. The 46 cases categorized as women-led agrifood enterprises represent the primary recruitment category, while the 82 women-led organizations include women-led focal units across the full sample. Source: By author.

5.2 Measurement Model

The measurement model showed strong indicator reliability and internal consistency. All outer loadings exceeded .826, indicating that the observed items were strongly associated with their assigned constructs. Table 4 reports the construct-level reliability and convergent validity results. Cronbach's alpha ranged from .906 to .928, rho_A ranged from .920 to .936, composite reliability ranged from .930 to .946, and AVE ranged from .728 to .777. These results support the adequacy of the reflective measurement model, as each construct demonstrated strong internal consistency and accounted for a substantial proportion of variance among its indicators [20], [25].

Table 4. Measurement-model reliability and convergent validity

Construct	Items	Loading range	Cronbach's alpha	rho_A	Composite reliability	AVE	Assessment
Natural capital governance capability	5	.861 to .889	.925	.933	.943	.768	Retained
Gender-inclusive governance	5	.826 to .883	.906	.920	.930	.728	Retained
Stakeholder coordination	5	.866 to .899	.928	.936	.946	.777	Retained
Nature-based adoption	5	.854 to .907	.927	.935	.945	.773	Retained
Organizational resilience performance	5	.855 to .896	.923	.932	.942	.766	Retained

Note. AVE means average variance extracted. rho_A refers to Dijkstra-Henseler's rho. Loading ranges summarize the retained reflective indicators for each construct. Source: By author.

After reliability and convergent validity were established, discriminant-validity was assessed using the heterotrait-monotrait ratio. Table 5 reports the HTMT matrix for the five latent constructs. The maximum HTMT value was .651, which was below the conservative .85 threshold commonly used to identify concerns about discriminant-validity. This result indicates that the constructs were empirically distinguishable. This is important because the conceptual model depends on separating natural capital governance capability, gender-inclusive governance, stakeholder coordination, nature-based practice adoption, and climate resilience performance rather than treating them as one general sustainability orientation [23], [25].

Table 5. HTMT discriminant-validity matrix

Construct	NCGC	GIG	SC	NBP	OCRP
Natural capital governance capability	—	.365	.578	.459	.316
Gender-inclusive governance	.365	—	.328	.402	.168
Stakeholder coordination	.578	.328	—	.506	.512

Construct	NCGC	GIG	SC	NBP	OCRP
Nature-based practice adoption	.459	.402	.506	—	.651
Organizational climate resilience performance	.316	.168	.512	.651	—

Note. NCGC means natural capital governance capability. GIG means gender-inclusive governance. SC means stakeholder coordination. NBP means nature-based practice adoption. OCRP means organizational climate resilience performance. The diagonal is omitted because HTMT assesses discriminant-validity between different constructs. The maximum HTMT value was .651. Source: By author.

Collinearity diagnostics were acceptable. The maximum full collinearity VIF was 1.918, while the maximum structural VIF in the nature-based practice adoption equation was 1.469. These values did not indicate problematic predictor collinearity. Because no single statistical diagnostic can establish the absence of common method bias, the full collinearity result was interpreted only as supplementary evidence alongside the procedural safeguards described in Section 4.7. Predictive relevance was assessed using PLSpredict with 10 folds and 10 repetitions. The Q^2_{predict} values for the endogenous indicators ranged from .118 to .318. The PLS-SEM prediction errors were lower than the linear-model benchmark for 11 of 15 indicators. These results indicate [no, low, moderate, or high] out-of-sample predictive power.

5.3 Structural Model

The structural model supported the three direct-effect hypotheses. Table 6 presents the direct paths from natural capital governance capability to stakeholder coordination, from stakeholder coordination to nature-based practice adoption, and from nature-based practice adoption to organizational climate resilience performance.

Natural capital governance capability was positively associated with stakeholder coordination ($\beta = .535$, $p < .001$). The stakeholder coordination equation explained 28.6 percent of the variance in stakeholder coordination. This finding indicates that organizations with a stronger capability to recognize and use natural capital information also reported stronger coordination with other agrifood actors.

Stakeholder coordination was positively associated with the adoption of nature-based practices ($\beta = .315$, $p < .001$). This finding indicates that nature-based practices were more likely to be adopted when agrifood actors reported stronger coordination, information exchange, collaboration, and access to relevant support.

Adoption of nature-based practices was positively associated with organizational climate resilience performance, with $\beta = .602$ and $p < .001$. The organizational climate resilience performance equation explained 36.2 percent of the variance in organizational climate resilience performance. This was the strongest direct path in the model, indicating that organizations adopting nature-based practices reported stronger perceived capacity to maintain operations, recover from climate-related shocks, adjust practices, and reduce resource-related vulnerability.

Table 6. Structural-model results for direct effects

Hypothesis	Structural path	β	SE	t	P-value	95% CI	R ²	f ²	VIF	Decision
H1	Natural capital governance capability → Stakeholder coordination	.535	.049	10.973	< .001	[.440, .628]	.286	.402	1.000	Supported
H2	Stakeholder coordination → Nature-based practice adoption	.315	.056	5.594	< .001	[.208, .427]	.314	.100	1.450	Supported
H3	Nature-based practice adoption → Organizational climate resilience performance	.602	.045	13.254	< .001	[.510, .688]	.362	.569	1.000	Supported

Note. β means standardized coefficient. SE means bootstrapped standard error. CI means confidence interval. R² values refer to the endogenous construct in each structural equation. The R² value for nature-based practice adoption reflects the equation that includes stakeholder coordination, natural capital governance capability, gender-inclusive governance, and the interaction term. f² values report the path-specific effect size of each predictor. Source: By author.

5.4 Mediation and Moderation Analysis

The mediation analysis supported the indirect pathway from natural capital governance capability to nature-based practice adoption through stakeholder coordination. The indirect effect was positive and significant, with $\beta = .169$ and $p < .001$. The direct effect of natural capital governance capability on nature-based practice adoption also remained positive and significant when stakeholder coordination, gender-inclusive governance, and the interaction term were included in the model, with $\beta = .191$ and $p = .002$. These results indicate partial mediation. Natural capital governance capability was associated with nature-based practice adoption both directly and indirectly through stakeholder coordination.

The moderation analysis showed that gender-inclusive governance strengthened the relationship between natural capital governance capability and the adoption of nature-based practices. The interaction term was positive and significant, with $\beta = .110$ and $p = .014$. The lower-order effect of gender-inclusive governance on nature-based practice adoption was also positive and significant, with $\beta = .211$ and $p < .001$.

The simple-slope analysis clarified the meaning of the interaction. When gender-inclusive governance was low, the relationship between natural capital governance capability and nature-based practice adoption was weak and nonsignificant ($\beta = .075$, $p = .372$). At the mean level of gender-inclusive governance, the relationship was positive and significant, with $\beta = .191$ and $p = .003$. When gender-inclusive governance was high, the relationship was strongest, with $\beta = .306$ and $p < .001$.

This pattern indicates that natural capital governance capability became more actionable when women and underrepresented actors participated meaningfully in climate-related and resource-related decisions. The local effect sizes were .036 for the direct effect of natural capital governance capability, .056 for the lower-order effect of gender-inclusive governance, and .017 for the interaction term. The moderation effect was therefore statistically significant but substantively modest. Table 7 summarizes the mediation, direct-effect, moderation, lower-order, and simple-slope results.

Table 7. Mediation, moderation, and simple-slope results

Analysis	Effect tested	β	SE	t	P-value	95% CI	Decision
Mediation	Natural capital governance capability → Stakeholder coordination → Nature-based practice adoption	.169	.035	4.808	< .001	[.104, .243]	H4 supported
Direct effect in the mediation model	Natural capital governance capability → Nature-based practice adoption	.191	.061	3.106	.002	[.067, .308]	Direct effect retained
Moderation	Natural capital governance capability × Gender-inclusive governance → Nature-based practice adoption	.110	.045	2.467	.014	[.024, .199]	H5 supported
Lower-order effect	Gender-inclusive governance → Nature-based practice adoption	.211	.053	3.982	< .001	[.103, .314]	Supported
Simple slope	Natural capital governance capability → Nature-based practice adoption at low gender-inclusive governance	.075	.084	.895	.372	—	Not significant
Simple slope	Natural capital governance capability → Nature-based practice adoption at mean gender-inclusive governance	.191	.063	3.033	.003	—	Significant
Simple slope	Natural capital governance capability → Nature-based practice adoption at high gender-inclusive governance	.306	.083	3.685	< .001	—	Significant

Note. β means standardized coefficient. SE means standard error. CI means confidence interval. Confidence intervals are reported for mediation, direct, moderation, and lower-order effects when

available in the structural output. Simple-slope rows report SE and t values from the simple-slope output. Source: By author.

6. Discussion

This study examined the relationships among natural capital governance capability, stakeholder coordination, gender-inclusive governance, nature-based practice adoption, and perceived organizational climate resilience performance in Trinidad and Tobago. The findings support the argument that climate-resilient agrifood transformation is both a technical adaptation challenge and an organizational governance challenge. Natural capital governance capability was positively associated with stakeholder coordination. Stakeholder coordination was positively associated with nature-based practice adoption, which showed the strongest positive association with perceived resilience performance. The mediation analysis identified coordination as a partial pathway between natural capital capability and practice adoption. The moderation analysis showed that this relationship was stronger when gender-inclusive governance was higher.

6.1 Natural Capital Governance and Stakeholder Coordination

Natural capital governance capability was positively associated with stakeholder coordination. Recent natural capital research increasingly treats ecological dependencies as decision-relevant organizational information, but the literature remains concentrated on measurement design, accounting integration, and managerial use [4]–[7]. Fleming et al. show that agricultural natural capital accounting requires co-development with professional users, while Amicarelli et al. position natural capital as a strategic resource whose organizational value depends on consistent measurement and integration into risk management and value creation [6,7]. The present findings extend this work beyond internal measurement. They indicate that natural capital governance capability is associated with the relational capacity to coordinate actors across organizational boundaries. The contribution is therefore not that natural capital information improves resilience by itself. It is that the organizational interpretation of ecological dependencies appears to make interdependence more visible and coordination more likely.

This interpretation is important because agrifood resilience is not a problem that any single organization can address independently. Land, water, soil, biodiversity, coastal resources, and climate risks cross organizational and institutional boundaries [1,3]. An agrifood organization that understands its ecological dependencies is therefore more likely to recognize that adaptation requires collaboration with farmers, cooperatives, processors, extension actors, public institutions, civil society, and development partners. This finding contrasts with narrower uses of natural capital accounting that emphasize measurement without fully explaining how measurement becomes collective action. The evidence suggests that the organizational value of natural capital information depends on whether it helps actors recognize interdependence and coordinate around shared resource risks.

6.2 Stakeholder Coordination and Nature-Based Practice Adoption

Stakeholder coordination was positively associated with the adoption of nature-based practices. Recent evidence identifies a persistent gap between policy ambition and the implementation of nature-based solutions, with fragmented governance, limited expertise, insufficient finance, and weak stakeholder engagement among the recurrent barriers [13]. Research on agrifood supply chains likewise shows that resilience depends on collaborative networks and dynamic capabilities that allow actors to pool knowledge, manage risk, and reconfigure resources [14], [15]. The present result connects these streams. It suggests that stakeholder coordination is not merely a supportive context for the adoption of nature-based practices. It is an implementation capability that links ecological knowledge to shared decisions, technical support, and resource mobilization. This interpretation helps explain why awareness of climate and ecosystem risk may coexist with limited practice adoption when interorganizational coordination remains weak.

This finding should be interpreted as an implementation result rather than only a behavioral result. Nature-based practices often require changes in production routines, resource management, land use, water use, and relationships with external support actors [12,13,14,15]. These changes can be difficult for individual organizations to implement on their own. In Trinidad and Tobago, this matters because national climate-adaptation priorities connect agriculture, food security, coastal resources, biodiversity, water resources, and stakeholder capacity building [1], [2]. The finding therefore suggests that nature-based resilience should be managed as a coordinated organizational process rather than as a set of isolated environmental practices.

6.3 Nature-Based Practice Adoption and Resilience Performance

The third major finding is that nature-based practice adoption had the strongest positive association with perceived organizational climate resilience performance in the structural model. Organizations reporting greater adoption of soil, water, biodiversity, restoration, and related ecological practices also reported stronger production continuity, adaptive capacity, and capacity to respond to climate-related disruption. This pattern is consistent with agrifood resilience research that treats adaptive practices and natural resource management as important components of organizational and supply chain resilience [14], [15]. It also aligns with the Trinidad and Tobago context, where agriculture, water resources, coastal ecosystems, biodiversity, and food security are interconnected adaptation priorities [1].

At the same time, the finding should not be overstated. The model supports the view that nature-based practice adoption is associated with perceived organizational climate resilience performance. It does not prove that these practices eliminate climate vulnerability. Nature-based practices are context-dependent and may generate different outcomes depending on resource access, institutional support, local ecosystems, technical knowledge, and implementation capacity [12], [13], [18]. The implication is more specific. It shows that nature-based practices provide an organizational pathway through which agrifood actors can strengthen resilience performance, especially when supported by coordination and governance capabilities.

6.4 Stakeholder Coordination as A Mediation Mechanism

The mediation finding provides the clearest theoretical contribution of the study. Stakeholder coordination partially mediated the relationship between natural capital governance capability and nature-based practice adoption. This indicates that natural capital governance capability was associated with practice adoption both directly and indirectly through stakeholder coordination. The indirect pathway is especially important because it explains how natural capital information becomes organizational action. Natural capital information may help organizations understand ecological dependencies, but it does not automatically produce adaptation. Coordination represents the statistical and organizational pathway through which ecological knowledge is associated with shared practice.

This finding sharpens the contribution to management and organization research. Prior environmental management accounting and natural capital accounting literature emphasizes the decision value of environmental information [4,5]. This study agrees with that view but adds an important qualification. In climate-exposed agrifood systems, the value of natural capital information depends on the organizational and interorganizational processes through which it is mobilized. Information becomes actionable when actors can coordinate around shared risks, pool knowledge, access support, and align practices. This contribution is especially relevant to Small Island Developing States because climate risks are concentrated across interconnected ecological, economic, and livelihood systems [1].

6.5 Gender-Inclusive Governance as A Boundary Condition

The moderation finding adds a second contribution. Gender-inclusive governance strengthened the relationship between natural capital governance capability and the adoption of nature-based practices. The interaction effect was statistically significant but modest. This pattern should be interpreted carefully. Gender inclusion should not be presented as the sole driver of practice adoption. Rather, it serves as a strengthening condition, making natural capital governance capability more actionable. When gender-inclusive governance was low, natural capital governance capability showed a weak, nonsignificant relationship with the adoption of nature-based practices. When gender-inclusive governance was high, the relationship became stronger and statistically significant.

Recent gender and agrifood research argues that climate-resilient food systems require more than the recognition of women's vulnerability. They require institutional conditions that strengthen agency, decision-making power, and meaningful participation [10,11]. Bryan et al. emphasize the structural barriers that limit women's access to resources and authority, while Amoak and Najjar show that limited voice in agrifood governance constrains inclusive climate resilience [10,11]. The present moderation result adds organization-level evidence to this literature. Gender-inclusive governance did not replace natural capital capability or stakeholder coordination. It strengthened the relationship between ecological capability and practice adoption. This distinction is important because it positions inclusion as a boundary condition that affects whether available knowledge becomes actionable rather than as a symbolic indicator of social responsibility.

The moderation result also helps explain why knowledge of natural capital alone may be insufficient. If climate and resource decisions are made by a narrow set of actors, organizations may

fail to capture practical knowledge held by women, small producers, community actors, and other underrepresented groups. Inclusive governance widens the knowledge base, increases legitimacy, and may improve the fit between adaptation decisions and local resource realities [9]–[11], [22]. This does not mean that all forms of inclusion automatically improve resilience. It means that meaningful participation appears to strengthen the organizational pathway from natural capital capability to nature-based action.

6.6 Theoretical Contribution

The findings support a capability-based governance explanation of climate-resilient agrifood transformation. The model does not treat climate resilience as an automatic consequence of policy recognition, environmental information, or isolated technical practices. Instead, it specifies differentiated organizational roles for the constructs. Natural capital governance capability makes ecological dependencies decision-relevant. Stakeholder coordination represents the relational pathway through which knowledge and resources are mobilized. Nature-based practice adoption captures the operational embedding of ecological responses. Gender-inclusive governance conditions the strength of the relationship between ecological capability and implementation.

The distinctive contribution is not simply the inclusion of four established constructs in one model. It is the specification and empirical testing of their different roles as organizational capability, mediating pathway, operational practice, boundary condition, and perceived performance outcome. This role-based integration extends natural capital accounting research beyond measurement, stakeholder research beyond general participation, and gender-inclusive governance research beyond normative advocacy. It provides a management explanation of why ecological information may remain inactive when coordination and inclusive decision-making are weak, particularly in a climate-exposed Small Island Developing State.

6.7 Contextual and Practical Implications

The findings also contribute to the context in Trinidad and Tobago. National adaptation evidence identifies climate risks affecting agriculture, coastal resources, water resources, biodiversity, food security, and economic activity [1]. FAO and Green Climate Fund readiness work identifies the need to strengthen agricultural climate monitoring, food import dependency data, gender-sensitive climate reporting, and stakeholder capacity building [2]. This study responds to those priorities by demonstrating that monitoring and information systems must be integrated with organizational capabilities. Better data are necessary, but they are not enough. Agrifood organizations also need governance routines that allow them to interpret natural capital information, coordinate stakeholders, include diverse voices, and implement nature-based practices.

For agrifood organizations, the findings suggest that resilience planning should begin with a structured assessment of ecological dependencies, followed by coordination with relevant actors and deliberate inclusion of women and underrepresented groups in climate-related decisions. For cooperatives and producer groups, the findings suggest that coordination infrastructure can help convert awareness of natural capital into practical adaptation. For extension actors and public

institutions, the findings suggest that training and support should connect natural capital information with collaborative implementation. For development partners, the findings suggest that gender-inclusive governance should be viewed as a mechanism to improve the adoption of resilience practices rather than as a separate social objective.

6.8 Limitations

The study has several limitations that delimit the claims. The cross-sectional survey design does not establish temporal precedence, so the structural relationships should be interpreted as contemporaneous associations rather than causal effects. The outcome measure captures perceived organizational climate resilience performance rather than directly observed long-term resilience. The evidence is drawn from agrifood organizations and related actors in Trinidad and Tobago, which provides contextual depth but limits transferability to other Small Island Developing States. The reliance on self-reported data may introduce social desirability and common method bias despite the procedural and statistical safeguards. The qualitative phase was designed to refine the instrument rather than produce a standalone explanatory dataset, which limits the extent to which interview evidence can account for the observed structural relationships. Heterogeneity across stakeholder groups may also influence the results and should be examined through control variables or multigroup analysis in future studies.

7. Conclusion

This study examined how natural capital governance capability, stakeholder coordination, gender-inclusive governance, and nature-based practice adoption are related to perceived organizational climate resilience performance in Trinidad and Tobago's agrifood sector. The results show a coherent structural pattern. Natural capital governance capability was positively associated with stakeholder coordination, stakeholder coordination was positively associated with nature-based practice adoption, and practice adoption had the strongest positive association with perceived resilience performance. The mediation analysis indicated that coordination partially accounted for the relationship between natural capital capability and practice adoption. The moderation analysis indicated that this relationship was stronger at higher levels of gender-inclusive governance.

The study's main contribution is to explain climate resilience as a governance conversion process. Ecological knowledge becomes organizationally consequential when natural capital capability is connected to stakeholder coordination, inclusive decision-making, and operational practice. This role-based explanation extends management and organization research beyond separate treatments of environmental measurement, participation, and adaptation. It also indicates that resilience initiatives should integrate ecological assessment with coordination infrastructure and meaningful participation rather than treating information generation as an endpoint.

Future research should test the framework longitudinally and across Caribbean Small Island Developing States using objective indicators of production continuity, recovery, ecological condition, and livelihood protection. Comparative designs could establish whether stakeholder coordination and gender-inclusive governance operate similarly under different institutional, land tenure, climate

finance, and extension service arrangements. Further studies should also examine digital climate information systems and multilevel governance as antecedents of natural capital capability. These directions would move the field from cross-sectional evidence on perceived resilience toward a cumulative explanation of how inclusive organizational capabilities produce observable adaptation outcomes over time.

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Conflicts of Interest

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