



Understanding Local Perceptions of Climate Change Vulnerability in the Caribbean: The Case Study of Southern Haiti's Coastal Communities

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Understanding Local Perceptions of Climate Change Vulnerability in the Caribbean: The
Case Study of Southern Haiti's Coastal Communities

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A Thesis in the Field of Sustainability
for the Degree of Master of Liberal Arts in Extension Studies

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Abstract

Climate change poses severe risks to coastal communities in the Caribbean, where hurricanes, flooding, coastal erosion, sea-level rise, livelihood insecurity, and limited institutional capacity often intersect. Haiti is highly vulnerable to climate-related hazards, yet empirical research on how Haitian coastal communities perceive their vulnerability to climate change remains limited. This thesis examined how residents of coastal communities in southern Haiti perceive climate change vulnerability, local climate impacts, and preparedness actions.

The study focused on coastal communities across five administrative departments of Haiti: Grand-Anse, Nippes, Ouest, Sud, and Sud-Est. A cross-sectional household survey was conducted with 449 adult respondents. The analysis examined the roles of demographic factors, occupation in climate-sensitive livelihoods such as farming and fishing, climate change awareness, disaster experience, fatalism, self-efficacy, locality type, and administrative department. Data were analyzed using descriptive statistics, bivariate tests, linear regression models, and logistic regression.

The findings show that perceived vulnerability, local climate perception, climate awareness, and preparedness action were related but distinct dimensions of climate response. Disaster experience was the strongest predictor of perceived vulnerability to climate change. In the adjusted linear regression model, each 1-unit increase in the disaster experience index was associated with a 0.43-point increase in the Perceived Vulnerability to Climate Change Scale (PVCCS). Occupation in climate-sensitive

livelihoods, such as farming and fishing, was also associated with higher perceived vulnerability, and administrative department showed substantial geographic variation.

Local climate perception followed a different pattern. Anthropogenic awareness was positively associated with local climate perception, while perceived information sufficiency was negatively associated with it. This suggests that respondents who perceived climate change as visible and personally relevant also tended to feel less sufficiently informed to understand it.

One of the most important findings was that greater disaster experience was associated with lower odds of reporting personal preparedness action (OR = 0.52). This challenges the assumption that disaster exposure automatically leads to preparedness. Overall, the findings suggest that adaptation planning in southern Haiti should not treat awareness, perceived vulnerability, and preparedness as interchangeable. Effective adaptation programs should provide practical support, strengthen community-based preparedness, address information gaps, support climate-sensitive livelihoods, and incorporate local knowledge into context-specific strategies.

Dedication

To my loving wife, Wadarlyne, whose patience, love, and support have sustained me throughout this journey; to my children, Benjamin and Ann, who continue to inspire me to work for a better future; to my courageous mother, Ojotine Aubourg, whose strength and example have shaped the person I am; and to all those who work toward a more sustainable planet.

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Chapter I

Introduction

Climate change is one of the most pressing sustainability challenges of the twenty-first century, with significant implications for ecosystems, economies, and communities worldwide. Its effects are especially acute in coastal communities, where hurricanes, flooding, coastal erosion, sea-level rise, changing rainfall patterns, and livelihood insecurity often intersect. These risks are not only physical or environmental; they are also social, economic, institutional, and psychological. Understanding how coastal residents perceive climate change vulnerability is therefore essential for designing adaptation strategies that are locally relevant, socially equitable, and practically effective.

The Caribbean is particularly exposed to climate-related hazards because of its geography, coastal settlement patterns, economic dependence on climate-sensitive sectors, and limited institutional and financial capacity in many island states (Nurse et al., 2014; Scott et al., 2012). Although Caribbean countries contribute only a small share of global greenhouse gas emissions, they face disproportionate risks from sea-level rise, extreme weather events, ecosystem degradation, and climate-related livelihood disruption (United Nations Economic Commission for Latin America and the Caribbean [ECLAC], 2024). This disparity highlights an important climate justice concern: communities that have contributed least to global climate change often face some of its most severe consequences.

Haiti represents an especially important case for understanding local perceptions of climate change vulnerability in the Caribbean. The country has contributed minimally

to global greenhouse gas emissions, yet it remains highly vulnerable to climate-related hazards because of its geographic exposure, socioeconomic fragility, environmental degradation, limited adaptive capacity, and institutional constraints (UNDP, 2023; UNEP, 2023; World Bank, 2021). Haiti's coastal communities are particularly at risk because many are exposed to tropical storms, flooding, coastal erosion, sea-level rise, declining agricultural productivity, water stress, and livelihood insecurity. These communities are also shaped by infrastructure limitations, poverty, and uneven access to information and institutional support.

Despite Haiti's high vulnerability, empirical research on how Haitian coastal communities perceive climate change remains limited. Existing studies on climate perception have focused more heavily on Europe, North America, and selected Caribbean countries. In Haiti, research has tended to emphasize environmental degradation, disaster risk, agriculture, and institutional vulnerability, while paying less attention to how coastal residents understand climate change, assess their own vulnerability, interpret disaster experience, and evaluate preparedness (Jules et al., 2023; Rubenstein, 2012; Tiepolo et al., 2017). This gap matters because adaptation programs are more likely to be effective when they reflect the lived experiences, local knowledge, information needs, and practical constraints of the communities they serve.

Research Significance and Objectives

This research addressed a critical gap in understanding how residents of Haiti's coastal communities perceived climate change vulnerability, local climate impacts, and preparedness actions. Specifically, I investigated how demographic factors, occupation in climate-sensitive livelihoods, climate change awareness, disaster experience, fatalism,

self-efficacy, locality type, and administrative department relate to perceived vulnerability, local climate perception, support for adaptation, and personal preparedness actions. By examining how perceived vulnerability was shaped by disaster experience, climate awareness, livelihood exposure, demographic characteristics, and geographic context, this thesis contributes to research on climate change perception and vulnerability, environmental psychology, and climate justice. The findings also provide practical evidence for policymakers, local authorities, nongovernmental organizations, and program implementers seeking to design adaptation strategies that are more locally grounded, socially equitable, and responsive to the lived realities of coastal communities in southern Haiti.

Therefore, my research objectives were to:

- investigate how coastal communities in southern Haiti perceive the causes and impacts of climate change in relation to demographic factors such as age, gender, education, urbanicity, and occupation;
- examine how geographic context, particularly locality type and administrative department, influence climate change awareness and perceived vulnerability among residents of coastal communities in southern Haiti;
- analyze the relationships between disaster experience, perceived vulnerability, support for climate-related policies, and preparedness actions at the personal and community levels; and
- provide insights for policymakers and program implementers to develop context-specific and socially equitable climate adaptation strategies.

Background

A conceptual and empirical background is necessary to situate climate change vulnerability within broader questions of climate justice. This literature review therefore begins with climate justice and climate vulnerability, then examines climate impacts in Haiti's coastal communities. I then review the main factors that shape climate change perceptions—including awareness, disaster experience, fatalism, self-efficacy, livelihood exposure, and geographic context—before turning to climate perception research in Caribbean and Haitian contexts.

Climate Change, Vulnerability, and Climate Justice

Scientific observations confirm that global warming is contributing to melting ice, rising sea levels, biodiversity loss, and shifting rainfall patterns (U.S. Environmental Protection Agency [EPA], 2025; Rotman, 2015). Current estimates indicate an overall increase of approximately 1.1–1.2°C since the late nineteenth century. Lindsey and Dahlman (2024) estimated an average increase of 0.06°C per decade, totaling about 1.1°C over 150 years. Bardan (2025) also showed that 2024 was the warmest year on record since 1880, with Earth's average surface temperature rising by approximately 1.47°C above the preindustrial average.

A strong scientific consensus has emerged that human activities are the primary driver of recent global warming. Cook et al. (2013), for example, examined 11,944 climate-related papers published between 1991–2011 and found that 97.1% of those expressing a position supported the consensus on anthropogenic global warming. The Intergovernmental Panel on Climate Change (IPCC, 2023) similarly concluded that human activities have contributed approximately 1.1°C of warming since the

preindustrial era. NASA (2024) also reported that the planet's average surface temperature has risen by about 1°C since the late nineteenth century, primarily because of increased carbon dioxide emissions and other human activities.

Although climate change is global, responsibility for greenhouse gas emissions and exposure to climate impacts are unevenly distributed. Ge et al. (2014) showed that ten countries accounted for approximately 69% of global anthropogenic emissions over the previous two decades. China, the United States, and India were among the largest emitters, collectively accounting for an estimated 42.6% of global greenhouse gas emissions (Friedrich et al., 2023). In contrast, Caribbean nations collectively accounted for less than 1% of global emissions, yet they face some of the most severe consequences of climate change, including the existential threat posed by sea-level rise (Economic Commission for Latin America and the Caribbean [ECLAC], 2024). This disparity highlights a major climate justice concern: those least responsible for climate change are often among the most vulnerable to its impacts.

The effects of global warming have significant implications for ecological systems and human well-being. Rising global temperatures have been associated with more frequent and intense weather and climate extremes, sea-level rise, biodiversity disruption, and growing risks to food security, water security, and human health (IPCC, 2023). The IPCC's 2023 synthesis of the Sixth Assessment Report concluded that human-caused climate change is already affecting ecosystems and people across regions, and that risks increase with every increment of warming, especially for vulnerable populations and ecosystems. These risks are especially serious for coastal communities,

where flooding, coastal erosion, storm surge, saltwater intrusion, water insecurity, and livelihood disruption often intersect.

International efforts to address climate change have intensified in recent years. The Paris Agreement, adopted in 2015, established a global framework to reduce emissions and limit global temperature increase to well below 2°C above preindustrial levels (United Nations, 2015). Countries have pursued mitigation strategies such as renewable energy transitions, energy efficiency, and carbon capture technologies, while adaptation measures have increasingly emphasized resilient infrastructure and ecosystem-based approaches (IPCC, 2023; Morecroft et al., 2019; Stagrum et al., 2020). However, the pace of global action remains insufficient. Friedlingstein et al. (2022) showed that carbon dioxide emissions reached a post-pandemic peak in 2021 and remained inconsistent with Paris Agreement targets. Similarly, the Joint Research Centre (2025) found that G20 climate strategies were insufficient to achieve the goals of the Paris Agreement.

The lack of adequate global climate action poses significant risks for vulnerable populations, particularly in coastal communities. Amaratunga (2022) projected that sea-level rise could threaten 95% of coastal regions during the twenty-first century. The IPCC (2023) also warned that nearly all coastal regions would face relative sea-level rise, coastal flooding, or coastal erosion. In the Caribbean, Scott et al. (2012) found that approximately 60% of resort properties were at risk of damage from beach erosion and inundation resulting from a 1-meter rise in sea level, with 29% potentially facing partial or complete inundation. Rubenstein (2012) argued that small island states are especially

vulnerable because of their exposure to direct climate impacts, fragile ecosystems, high population densities, limited water resources, and inadequate institutional capacity.

Climate Change Impacts in Haiti's Coastal Communities

Haiti illustrates the unequal geography of climate vulnerability. Although Haiti accounts for only 0.02% of global greenhouse gas emissions, it remains one of the island states most vulnerable to climate change due to its geographic, economic, and social conditions (UNDP, 2023). Its mean annual temperature is projected to rise by 0.5°C–0.7°C by 2030 and 0.9°C–1.4°C by 2050, while annual rainfall is projected to decrease by 3% by 2030 and 6%–9% by 2050, with increased rainfall variability and more intense wet-season rainfall (UNEP, 2023). These projected changes are expected to increase climate-related hazards, including hurricanes, droughts, and floods, with major implications for agriculture, food security, water resources, and infrastructure.

Haiti's coastal communities are particularly exposed to climate-related risks. Coastal cities contain much of the country's population, economic infrastructure, and transportation networks, making them especially vulnerable to tropical storms, sea-level rise, flooding, and coastal erosion. Declining rainfall, inadequate water infrastructure, and increased rainfall variability also threaten both the availability and quality of fresh water resources. These risks are intensified by poverty, fragile infrastructure, environmental degradation, and limited institutional capacity.

The Government of Haiti has recognized the urgent need to strengthen climate resilience through national policy documents and adaptation initiatives. The National Adaptation Plan, developed in 2022 following the Paris Agreement, outlines medium- and long-term strategies as well as urgent short-term actions to integrate climate change

into national development. Covering the years 2022–2030, the plan focuses on critical sectors such as agriculture, health, infrastructure, and water resources and includes 340 actions, including 21 high-priority initiatives estimated to require USD 980 million for implementation. However, while the National Adaptation Plan seeks to strengthen adaptive capacity and support sustainable development, local perceptions and the specific vulnerabilities of individuals living in Haiti’s coastal communities remain insufficiently documented. This gap highlights the need for empirical research on how coastal residents understand climate risks, perceive vulnerability, and evaluate preparedness actions.

Factors Influencing Perceptions of Climate Change

Research on perceptions of climate change highlights the importance of individual and collective understandings in shaping policy responses, adaptation strategies, and behavioral change. These perceptions influence how risks are interpreted, the level of urgency attributed to climate threats, and the willingness to support or engage in mitigation and adaptation strategies. Understanding the factors that shape these perceptions is therefore critical to designing effective, context-sensitive climate policies and communication strategies.

Climate change perception is not shaped solely by factual knowledge or scientific literacy. Instead, it emerges from cognitive, emotional, experiential, and sociocultural processes. Perception research has long emphasized that individuals respond to environmental issues not only through objective risk assessments, but also through beliefs, cultural norms, and lived experiences (Kamau, 2010). These perceptions shape how environmental challenges are understood, prioritized, and acted upon at both individual and community levels.

Several psychological constructs are especially relevant to climate perception and adaptation. Psychological distancing can lead people to perceive climate change as distant in time or space, reducing personal concern and weakening the sense of urgency to act (Wolf & Moser, 2011). Fatalistic beliefs may also reduce engagement when individuals perceive climate change as distant, inevitable, or beyond meaningful personal control (Wolf & Moser, 2011). In Haiti, repeated exposure to disasters, including the 2010 earthquake, hurricanes, floods, and droughts, may also shape how individuals interpret risk, control, and preparedness. Such experiences can reinforce perceptions that disasters are unavoidable or beyond individual control, making fatalism an important construct to examine in relation to climate perception and preparedness. Similarly, low self-efficacy can limit adaptive behavior when individuals believe that personal or local action cannot meaningfully reduce risk (Wallnoefer & Riefler, 2022). These concepts help explain why awareness of climate change may not automatically translate into preparedness actions.

Direct experience with climate-related hazards can also shape climate risk perception. Nelson et al. (2023) and Wallnoefer and Riefler (2022) emphasized that climate knowledge, direct experience, social norms, and cultural values interact to shape how risks are perceived and interpreted. Lee et al. (2015), using Gallup World Poll data from 119 countries, found that education was the strongest predictor of climate change awareness globally, while the predictors of concern varied by region. In Latin America and Europe, concern was closely associated with belief in anthropogenic climate change, while in many African and Asian countries, concern was more strongly associated with direct experience of changing weather patterns and temperature anomalies. These

findings underscore the importance of localized climate communication strategies that reflect both knowledge and lived experience.

Social and cultural context also influences climate concern. Wallnoefer and Riefler (2022), in a review of more than 70 psychological and sociocultural constructs, found that individuals are more likely to engage with climate issues when pro-environmental attitudes are reinforced by their social groups. Conversely, when climate change is minimized within a peer group or cultural setting, individuals may downplay the threat even when they are aware of its scientific basis. In some contexts, climate change is also interpreted through spiritual or cultural frameworks. Golo and Yaro (2013), for example, found that many residents in Ghana attributed climate change to divine or spiritual forces. Such findings are especially important for climate perception research in the Global South, where local knowledge, religious beliefs, disaster experience, and institutional constraints may shape how communities interpret climate risk and preparedness. They also highlight the importance of grounding adaptation policies in social realities and local meaning systems.

Demographic and geographic characteristics may also shape climate change perceptions. Age, gender, education, occupation, and locality type can influence access to information, exposure to climate-related hazards, livelihood dependence, and perceived capacity to prepare for or respond to climate risks. In particular, urban, semi-urban, and rural residents may experience climate vulnerability differently because of differences in settlement patterns, infrastructure, access to services, livelihood systems, and exposure to hazards. For this reason, locality type is an important factor to consider alongside other demographic and geographic variables.

Livelihood exposure is another important factor. In resource-dependent communities, climate change may be understood through its effects on income, food security, and daily work. Nelson et al. (2023) found that direct experience with extreme weather events and strong emotional responses heightened perceived vulnerability among commercial fishers on the U.S. West Coast. Adger (2006), in a study of agricultural communities in Vietnam's coastal zone, found that farmers' perceptions of climate change were closely linked to observed environmental changes and lived experience. More than 60% of farmers reported making changes to farming practices, including adopting salt-tolerant crops, altering planting schedules, or investing in irrigation systems. These findings are directly relevant to Haiti's coastal communities, where agriculture, fishing, and other climate-sensitive livelihoods are central to household well-being.

Climate Change Perceptions in the Caribbean

Existing research in the Caribbean and other coastal contexts indicates that climate risk perception is shaped by lived experience, cultural knowledge, institutional trust, education, media access, and access to credible climate information (Nelson et al., 2023; Wallnoefer & Riefler, 2022).

Caribbean scholarship further shows that climate change knowledge, concern, and perceived vulnerability vary across communities and livelihood groups. Baptiste (2017) found that climate change knowledge, concerns, and behaviors were important among Caribbean fishers, while Yawson et al. (2024) showed that coastal residents' attribution of environmental change to climate change varied across Caribbean coastal communities.

Together, these studies highlight the need for inclusive, place-based, and livelihood-sensitive climate communication strategies in the region.

Locally focused Caribbean studies also demonstrate the need for place-based climate perception research. Baptiste (2017) found that climate change knowledge, concerns, and behaviors varied among Caribbean fishers, while Yawson et al. (2024) showed that education, work experience, and proximity to the coast influenced whether residents attributed environmental changes such as coral reef degradation, declining fish stocks, and beach erosion to climate change. These findings suggest that climate perception is shaped by livelihood, place-based experience, and local environmental conditions, reinforcing the importance of context-specific climate communication and adaptation planning.

Together, these studies show that Caribbean climate perception is shaped by both individual characteristics and local context. However, the Caribbean is diverse, and findings from English-speaking island states or other coastal communities cannot be assumed to represent Haiti. Haiti's language, governance context, disaster history, socioeconomic conditions, environmental degradation, and institutional constraints make it an important and distinct case for climate perception research.

Perceptions of Climate Change in Haiti

Although research on climate change in Haiti has examined environmental degradation, disaster risk, agricultural vulnerability, food security, water resources, and institutional capacity, relatively little empirical work has focused on how Haitian residents perceive climate change vulnerability, interpret climate-related risks, or connect these risks to preparedness action. Tiepolo et al. (2017), for example, examined climate-

related vulnerabilities in southern Haiti, focusing on the communes of Les Anglais, Chardonnières, and Tiburon. Their findings identified chronic infrastructure deficits, unsustainable agricultural practices, and inadequate access to water as key stressors that amplify communities' exposure to climate risks. The study showed how extreme rainfall, prolonged drought, declining agricultural productivity, and livelihood insecurity increase the need for integrated local planning frameworks.

Jules et al. (2023) examined co-design strategies between researchers and farmers in Saint-Michel-de-l'Attalaye to support adaptive agricultural responses. The study found that farmers proposed incremental innovations, such as crop diversification and adjustments in livestock size, to cope with changing climatic conditions. Although these practices aimed to strengthen food security and household income, some also risked increasing greenhouse gas emissions, raising concerns about maladaptive outcomes. The study emphasized the importance of adaptation strategies that reflect local socioeconomic realities while supporting long-term climate resilience.

Despite these contributions, research specifically examining climate change perceptions in Haiti remains limited compared with research on sectoral vulnerability and adaptation needs. Existing studies provide important evidence on environmental degradation, disaster risk, agricultural vulnerability, food security, water resources, and institutional capacity, but fewer studies have directly examined how Haitian residents understand climate change, how they perceive their own vulnerability, how disaster experience shapes risk perception, or what factors influence preparedness actions. This gap is especially important in coastal communities, where exposure to sea-level rise, coastal erosion, flooding, tropical storms, and livelihood disruption is high.

The reviewed literature shows that perceptions of climate change are shaped by cognitive, emotional, social, experiential, livelihood, and geographic factors. Studies from global and regional contexts have demonstrated the importance of education, awareness, disaster experience, livelihood exposure, social norms, institutional trust, fatalism, and self-efficacy. Yet these patterns remain insufficiently studied in Haiti's coastal communities. This gap matters because adaptation strategies are more likely to be effective when they are grounded in how local residents understand climate risks, assess vulnerability, and evaluate their own capacity to prepare and respond.

Research Questions, Hypotheses, and Specific Aims

In response to the research gaps identified above, this study examined how demographic, geographic, psychological, and experiential factors shaped perceptions of climate change vulnerability among residents of coastal communities in southern Haiti. The research questions and hypotheses focused on the relationships among demographic characteristics, climate change awareness, disaster experience, fatalism, self-efficacy, locality type, administrative department, perceived vulnerability, support for adaptation, and preparedness actions:

RQ1: How do demographic and contextual factors, including age, gender, education, occupation, and locality type, influence perceptions of climate change vulnerability among residents of coastal communities in southern Haiti?

- H1a: Older individuals will report higher Perceived Vulnerability to Climate Change Scale (PVCCS) scores, controlling for other demographic variables.

- H1b: Individuals identifying as female will report higher PVCCS scores, controlling for other demographic variables.
- H1c: Formal education level will positively predict Climate Change Awareness Index (CCAI) scores, controlling for other demographic variables.
- H1d: Individuals in climate-sensitive livelihoods will report higher perceived vulnerability than individuals in less directly affected occupations, controlling for other demographic variables.

RQ2: To what extent does climate change awareness influence perceived vulnerability, and does this relationship vary across urban, semi-urban, and rural settings?

- H2a: Higher levels of climate change awareness will be associated with higher perceived vulnerability to climate impacts.
- H2b: The relationship between climate change awareness and perceived vulnerability will be moderated by fatalism, such that the association will be weaker among individuals with firmer fatalistic beliefs.
- H2c: Perceived vulnerability will vary across urban, semi-urban, and rural settings.

RQ3: To what extent do experiences with natural disasters predict willingness to support climate-related policies and participate in preparedness actions at both the personal and community levels?

- H3a: Greater experience with natural disasters will be associated with increased willingness to support future climate-related policies. This relationship will be moderated by fatalism, such that the association will be weaker among individuals with more firmly held fatalistic beliefs.

- H3b: Greater experience with natural disasters will be associated with increased willingness to engage in preparedness actions at both the personal and community levels. This relationship will be moderated by perceived self-efficacy, such that the association will be stronger among individuals with higher levels of self-efficacy.
- H3c: Higher scores on the Disaster Experience Index (DEI) will be associated with higher Perceived Vulnerability to Climate Change Scale (PVCCS) scores.

Specific Aims

To address these questions and hypotheses, I:

1. Developed a structured survey instrument to measure climate change awareness, perceived vulnerability, disaster experience, fatalism, self-efficacy, support for adaptation, and personal preparedness actions among residents of coastal communities in southern Haiti.
2. Sampled adult residents across selected coastal communities in five administrative departments—Grand-Anse, Nippes, Ouest, Sud, and Sud-Est—to capture variation across geographic and locality contexts.
3. Collected household-level survey data through face-to-face interviews using computer-assisted personal interviewing.
4. Analyzed the relationships among demographic characteristics, locality type, administrative department, occupation, climate change awareness, disaster

experience, fatalism, self-efficacy, perceived vulnerability, support for adaptation, and personal preparedness actions.

5. Identified policy-relevant patterns across demographic and geographic groups to inform context-specific and socially equitable adaptation strategies for coastal communities in Haiti.

Chapter II

Methods

This study used a cross-sectional survey design to examine how residents of coastal communities in southern Haiti perceived climate change vulnerability, local climate impacts, and preparedness actions. The design was appropriate because the study aimed to measure perceptions, experiences, attitudes, and reported behaviors in a relatively large sample at a single point in time. The survey approach also allowed comparisons across demographic groups, geographic locations, occupation in climate-sensitive livelihoods, and levels of disaster experience.

The study was primarily quantitative in design. The survey instrument included structured questions and Likert-type items measuring demographic characteristics, geographic context, climate change awareness, perceived vulnerability, disaster experience, fatalism, self-efficacy, support for adaptation, and personal preparedness actions. These variables aligned with the research questions and hypotheses examined.

Study Area

The study focused on coastal communities in southern Haiti and the western coastal area of Ouest. The administrative departments included Grand'Anse, Nippes, Ouest, Sud, and Sud-Est. These areas were selected because they are exposed to climate-related hazards, including hurricanes, flooding, coastal erosion, sea-level rise, drought, rainfall variability, and livelihood disruption. They also represent diverse geographic and socioeconomic contexts, including urban, semi-urban, and rural communities.

The inclusion of multiple administrative departments allowed the analysis to examine whether climate change awareness, perceived vulnerability, local climate perception, and preparedness actions varied across place-based contexts. This was important because coastal communities in Haiti do not experience climate risk uniformly. Differences in infrastructure, livelihoods, disaster history, institutional presence, and access to information may shape how residents understand climate change and evaluate their own vulnerability.

Sampling Strategy and Participants

The study targeted adult residents aged 18 years or older living in selected coastal communities. Each respondent represented a distinct household. The target sample was approximately 450 respondents, with about 90 respondents allocated to each of the five administrative departments. The final analytical sample included 449 respondents.

The sampling strategy was designed to support comparisons across administrative departments and locality types. Within each administrative department, respondents were selected from urban, semi-urban, and rural communities to capture variation in geographic settings and settlement characteristics.

Within the selected communities, households were selected using a systematic field approach. Field teams began from an identified central point in each community and proceeded along a selected direction. Because settlement patterns varied by locality type, the household selection interval was adapted to the local context. In urban and semi-urban areas, field teams selected approximately every fifth household. In rural areas, where houses were more dispersed, teams selected approximately every second household. In each selected household, the respondent was either the household head or

another adult household member knowledgeable about household-level environmental conditions and decision-making.

Survey Instrument and Measures

The survey instrument was designed to measure the main constructs identified in the research questions and hypotheses. It included demographic variables, geographic variables, climate change awareness items, perceived vulnerability items, disaster experience items, fatalism items, self-efficacy items, support for adaptation, and personal preparedness actions. Demographic variables included age, gender, education level, and occupation. Geographic variables included administrative department and locality type, categorized as urban, semi-urban, or rural.

Climate change awareness was measured through items assessing whether respondents had heard of climate change, whether they believed human activities contribute to climate change, whether they perceived climate change as visible in their local area, whether they felt climate change directly affected their lives, and whether they felt sufficiently informed to understand climate change. These items were initially considered part of a broader Climate Change Awareness Index, but reliability testing showed they did not function as a single, internally consistent scale. As a result, the analysis treated awareness as a set of more specific dimensions, including prior exposure to the concept of climate change, anthropogenic awareness, local climate perception, and perceived information sufficiency.

Perceived vulnerability was measured through the Perceived Vulnerability to Climate Change Scale (PVCCS). This scale included items asking respondents to rate the perceived risk of climate-related hazards and impacts such as flooding, coastal erosion,

drought, sea-level rise, stronger hurricanes, rainfall changes, saltwater intrusion, crop failure, health problems related to climate change, and damage to housing or infrastructure. Higher scores indicated greater perceived vulnerability to climate change. The PVCCS was designed to capture perceived vulnerability across multiple climate-related hazards rather than to evaluate each hazard separately as an independent outcome.

Disaster experience was measured using items related to direct exposure to climate-related or natural hazard events, including the types of events experienced, household-level effects, and frequency or severity of exposure. These items were combined into a disaster experience index. Fatalism was measured using items related to the belief that climate change is in God's hands and that there is little point in preparing because disasters will happen anyway. Self-efficacy was measured through items assessing confidence in protecting one's family and confidence in community action. Because the self-efficacy items represented distinct dimensions, family-level self-efficacy and community-level self-efficacy were analyzed separately.

Preparedness- and adaptation-related outcomes included support for government and nongovernmental adaptation actions, as well as reported personal preparedness actions. Personal preparedness actions were treated as a binary outcome in the multivariate analysis. The survey instrument was designed to be accessible to respondents with varying literacy levels and to reflect the social and environmental realities of coastal communities in Haiti.

Data Collection Procedures

Data were collected through face-to-face interviews. This mode was selected because it was the most appropriate way to reach respondents in communities where

internet access, telephone-based sampling, and postal contact methods were not reliable.

In-person interviews also helped address potential literacy constraints by allowing trained field assistants to administer the questionnaire directly in Haitian Creole, the language used for all interviews, and to clarify the survey process without changing the meaning of the questions.

The survey was administered using computer-assisted personal interviewing (CAPI) through SurveyCTO. Field assistants used tablets to record responses during interviews. The CAPI approach reduced the need for paper-based data entry, minimized transcription errors, and enabled more efficient preparation of data for cleaning and analysis. The use of SurveyCTO also facilitated standardized questionnaire administration, skip patterns, and basic data quality controls during fieldwork. Compared with a self-administered questionnaire, the interviewer-administered format was more appropriate for a population that could include respondents with limited literacy or limited familiarity with written survey forms.

Participation was voluntary. Respondents were informed about the purpose of the study, the nature of their participation, and their right to decline to participate or to stop the interview. Eligibility was limited to adults aged 18 years or older living in the selected coastal communities; therefore, the only exclusion criterion was being under 18 years of age.

Data Preparation and Coding

After data collection, the raw survey dataset was imported into R for cleaning, inspection, and analysis. The dataset was first examined to assess its structure, variable names, missing values, response formats, and overall completeness. This initial

inspection helped identify variables that required recoding, renaming, or transformation before statistical analysis.

Demographic variables were recoded into analytically meaningful categories. Age was grouped into age categories; gender was recoded into male and female categories; education level was classified into ordered educational attainment groups; and respondents were categorized by administrative department and locality type. Occupation was recoded into climate-sensitive and non-climate-sensitive categories. Respondents engaged in farming or fishing were classified as being in climate-sensitive livelihoods because these livelihoods are directly exposed to climate variability, environmental degradation, and climate-related hazards.

Several survey items were converted into numeric Likert-type variables for analysis. Most perception, awareness, fatalism, self-efficacy, and adaptation-support items were coded on a 1-to-5 scale, with higher values indicating stronger agreement, greater perceived vulnerability, or higher perceived capacity, depending on the item. Disaster experience items were coded separately and used to construct the disaster experience index. Where appropriate, categorical responses were also recoded into binary or grouped variables to support descriptive statistics, bivariate analyses, and regression modeling.

The cleaned dataset was used to construct key analytical variables, including PVCCS, the disaster experience index, fatalism-related measures, local climate perception, anthropogenic awareness, perceived information sufficiency, family-level self-efficacy, community-level self-efficacy, and personal preparedness actions. The final

cleaned dataset included 449 complete respondent entries and was used for all descriptive, bivariate, and multivariate analyses.

The disaster experience index was constructed from four components: whether the respondent had experienced a natural disaster, the number of types of disaster experienced, the number of reported household effects, and the reported frequency of disaster events. These components were not standardized before aggregation. Instead, they were averaged directly using the `rowMeans()` function in R. Missing component values were excluded from the respondent-specific mean through the use of `na.rm = TRUE`. The resulting observed index ranged from 0.00 to 3.50, with higher scores indicating greater reported disaster exposure, including more types of disasters, more household effects, and more frequent events.

Construction and Reliability Testing of Measures

Before conducting the main analyses, I assessed the internal consistency of the proposed composite measures in R using Cronbach's alpha from the `psych` package. Cronbach's alpha evaluates the extent to which items within a proposed scale are correlated with one another and appear to measure the same underlying construct.

The reliability results were interpreted alongside the items' conceptual meaning rather than relying solely on a numerical threshold. As a general rule, proposed indices with alpha values at or above the commonly used 0.70 threshold were considered sufficiently reliable for use as composite measures, provided that the items were also conceptually coherent. Measures below this threshold were not automatically discarded, but they were not treated as fully reliable unified scales. Instead, they were either

analyzed cautiously as exploratory variables or separated into more conceptually specific dimensions.

The PVCCS was retained as the main composite measure of perceived vulnerability because it demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.72$) and was conceptually coherent. The proposed Climate Change Awareness Index (CCAI) was not retained as a single composite measure because reliability testing showed inadequate internal consistency. The full four-item CCAI produced very weak reliability in its original form ($\alpha = 0.09$). After reverse-keying the perceived information sufficiency item, reliability improved ($\alpha = 0.42$), but remained below the commonly used threshold for retaining the index as a unified scale. A revised three-item awareness scale also failed to reach a satisfactory reliability level ($\alpha = 0.48$). Climate-related awareness was therefore analyzed through more specific variables, including prior exposure to the concept of climate change, anthropogenic awareness, local climate perception, and perceived information sufficiency.

Fatalism was measured using two items, but the two-item fatalism measure showed weak internal consistency and was therefore used cautiously as an exploratory variable. The two self-efficacy items also showed weak internal consistency and represented distinct dimensions. Family-level self-efficacy and community-level self-efficacy were therefore analyzed separately. This reliability testing process ensured that composite indices were retained only when they were both conceptually coherent and statistically defensible.

Data Analysis

The survey data were analyzed using descriptive, bivariate, and multivariate statistical techniques. All final analyses were conducted in R. The analytical process followed several stages: data cleaning and preparation, construction and reliability testing of measures, descriptive statistics, bivariate analyses, multivariate regression modeling, and model diagnostics.

Descriptive Statistics

Descriptive statistics were used to summarize the characteristics of the final analytical sample and the distributions of key variables. Categorical variables, including gender, age group, education level, administrative department, locality type, occupation in climate-sensitive livelihoods, disaster experience, support for adaptation action, and personal preparedness actions, were summarized using frequencies and percentages. Continuous or index-based variables, including PVCCS, disaster experience, anthropogenic awareness, local climate perception, perceived information sufficiency, fatalism, family-level self-efficacy, and community-level self-efficacy, were summarized using means, medians, standard deviations, minimums, and maximums.

These descriptive analyses provided an overview of the sample composition and established baseline patterns in climate awareness, local climate perception, perceived vulnerability, disaster experience, and preparedness-related attitudes.

Bivariate Analyses

Bivariate analyses were conducted to examine unadjusted relationships between key predictors and outcome variables. Because many variables were ordinal, categorical,

or derived from Likert-type survey items, non-parametric tests were used where appropriate.

Mann-Whitney U tests were used for two-group comparisons, including gender differences and differences between respondents in climate-sensitive livelihoods and those in non-climate-sensitive livelihoods. Kruskal-Wallis tests were used to compare variables with more than two groups, including age group, education level, administrative department, and locality type. When Kruskal-Wallis tests were statistically significant, pairwise Wilcoxon tests with Bonferroni correction were used as post hoc tests to identify which groups differed.

Spearman rank correlations were used to examine associations between ordinal or index-based variables, such as the relationship between disaster experience and perceived vulnerability. Fisher's exact tests were used for selected categorical associations when chi-square assumptions were not satisfied because of small expected cell counts. For larger categorical tables where exact Fisher computation was not feasible, simulated p-values were used. Bivariate analyses were interpreted as exploratory because they did not control for potential confounding factors.

Multivariate Regression Models

Multivariate regression models were estimated to examine whether key predictors remained associated with climate change perceptions and preparedness outcomes after adjusting for demographic, geographic, occupational, and experiential factors. Three main models were estimated.

The first model used ordinary least squares linear regression to predict perceived vulnerability to climate change, measured by PVCCS. Predictors included the disaster

experience index, fatalism, occupation in climate-sensitive livelihoods, age group, gender, education level, administrative department, and locality type, used here as the operational measure of urbanicity and categorized as urban, semi-urban, or rural. This model assessed whether disaster experience, occupation type, demographic characteristics, administrative department, and locality type predicted perceived vulnerability after controlling for other respondent characteristics.

The second model used ordinary least squares linear regression to predict local climate perception. Predictors included the disaster experience index, anthropogenic awareness, perceived information sufficiency, age group, gender, education level, administrative department, and locality type. This model examined factors associated with respondents' perceptions of climate change as locally visible and personally relevant.

The third model used binary logistic regression to predict personal preparedness actions. Because the outcome was binary, logistic regression was appropriate. Predictors included the disaster experience index, family-level self-efficacy, community-level self-efficacy, fatalism, age group, gender, education level, administrative department, and locality type. Results from the logistic regression were interpreted using odds ratios. Odds ratios above 1 indicated higher odds of reporting personal preparedness actions, while odds ratios below 1 indicated lower odds, holding other variables constant.

Categorical predictors were entered as factor variables. In the linear regression models, coefficients represented the expected change in the outcome associated with a one-unit increase in a predictor or with membership in a given category compared with the reference group, holding other variables constant. In the logistic regression model,

exponentiated coefficients were interpreted as odds ratios. Reference categories were reported with the regression tables to support interpretation.

Model Diagnostics and Robustness Checks

After estimating the multivariate regression models, diagnostic checks were conducted to assess whether the models met key analytical assumptions and whether the main findings were robust to potential violations. For the two linear regression models, residual diagnostic plots were examined, including residuals-versus-fitted, Q-Q, and scale-location plots. These plots were used to assess linearity, normality of residuals, and potential heteroscedasticity.

Multicollinearity was assessed for all multivariate models using variance inflation factors (VIFs), which indicate whether predictors are highly correlated with one another. Because several predictors were categorical variables with multiple levels, generalized variance inflation factors (GVIFs) were also examined. Adjusted GVIF values, calculated as $GVIF^{1/(2 \times df)}$, were used to allow comparison across predictors with different degrees of freedom. Values close to 1.0 were interpreted as indicating low multicollinearity.

For the two linear regression models, robust standard errors were estimated using the HC3 heteroscedasticity-consistent correction as a robustness check. HC3 is a conservative method for estimating standard errors when residual variance may not be constant across observations. HC3 robust standard errors were used because survey-based Likert-type outcomes and composite indices may show mild departures from ideal linear regression assumptions, including heteroscedasticity or non-normal residuals. The purpose of this robustness check was to determine whether the statistical significance and

substantive interpretation of the main predictors changed when more conservative standard errors were applied.

For the logistic regression model, diagnostics focused on multicollinearity and the stability of coefficient estimates. Because the purpose of the multivariate analysis was explanatory rather than predictive, emphasis was placed on the direction, magnitude, and statistical significance of associations rather than on prediction accuracy alone. Detailed diagnostic plots, variance inflation factor tables, and robustness results were retained for review and reported in the appendices.

Ethical Considerations

The study involved human participants and therefore required attention to informed consent, voluntary participation, confidentiality, and minimization of risk. Participants were adults aged 18 or older. Before the interview, respondents were informed about the purpose of the study, the voluntary nature of participation, and their right to decline to answer any question or stop the interview at any time. Participation did not require respondents to provide information beyond the scope of the survey.

The survey focused on perceptions, experiences, and preparedness related to climate change and disasters. Although these topics were not intended to be highly sensitive, some questions could prompt respondents to recall past disaster experiences or household losses. Field assistants were expected to administer the questionnaire respectfully and to avoid pressuring respondents to answer questions they did not wish to answer.

Confidentiality was protected by treating survey responses as research data rather than public personal records. Identifying information was not used in the statistical

analysis, and results were reported in aggregate form. The use of CAPI also supported more secure and organized data handling by reducing the need for paper questionnaires and manual data entry.

Because the study was conducted in Haiti, cultural and linguistic accessibility was an important ethical consideration. The survey process was designed to be understandable to respondents in local communities, including those with limited literacy. In-person administration allowed field assistants to read questions aloud in Haitian Creole, the language used for all interviews, to ensure that respondents understood the survey process while maintaining standardized wording. These procedures were intended to respect participants, reduce misunderstanding, and support the ethical collection of data in diverse coastal communities.

Chapter III

Results

This chapter presents the results of the quantitative analysis examining local perceptions of climate change vulnerability among coastal communities in southern Haiti. The analysis is based on a cleaned dataset of 449 respondents drawn from five coastal administrative departments: Grand-Anse, Nippes, Ouest, Sud, and Sud-Est. The chapter first describes the final analytical sample, then presents the reliability and scale-construction results, descriptive statistics for the main variables, bivariate analyses, multivariate regression results, and model diagnostics. Together, these results provide the empirical basis for assessing how demographic, geographic, experiential, occupational, and psychosocial factors relate to perceived vulnerability, local climate perception, support for adaptation, and personal preparedness actions.

Final Analytical Sample

Table 1 presents the demographic and geographic characteristics of the final analytical sample. The sample was nearly balanced by gender, with 50.8% female and 49.2% male respondents. Geographic representation was also balanced across administrative departments and locality types, with each administrative department accounting for approximately one-fifth of the sample and each locality type accounting for roughly one-third. The largest age groups were respondents aged 35–44 years (26.9%) and 25–34 years (26.3%). Nearly half of respondents had secondary education (47.4%),

while 29.6% had primary education. Approximately one-third of respondents were engaged in climate-sensitive livelihoods, such as farming or fishing (35.2%).

Table 1. Sample characteristics.

Characteristic	n	%
Age group		
18-24	39	8.7
25-34	118	26.3
35-44	121	26.9
45-54	80	17.8
55-64	58	12.9
65+	33	7.3
Gender		
Female	228	50.8
Male	221	49.2
Education level		
No formal education	46	10.2
Primary	133	29.6
Secondary	213	47.4
University/Technical	57	12.7
Administrative department		
Grand-Anse	89	19.8
Nippes	89	19.8
Ouest	92	20.5
Sud	90	20.0
Sud-Est	89	19.8
Locality type		
Rural	149	33.2
Semi-urban	150	33.4
Urban	150	33.4
Occupation sensitivity		
Climate-sensitive	158	35.2
Non-climate-sensitive	291	64.8

Note. Percentages may not total 100 due to rounding.

Reliability and Scale-Construction Results

The reliability results showed that the proposed composite measures varied substantially in internal consistency. These measures included the Perceived Vulnerability to Climate Change Scale (PVCCS), the proposed Climate Change Awareness Index (CCAI), local climate perception, fatalism, and self-efficacy. Among these proposed measures, only the PVCCS reached an acceptable level of internal consistency, with Cronbach's alpha of 0.72. It was therefore retained as the main composite measure of perceived vulnerability.

The proposed Climate Change Awareness Index (CCAI) lacked adequate internal consistency and was not retained as a single composite index. The full four-item CCAI produced very weak reliability in its original form, $\alpha = 0.09$. After reverse-keying the perceived information sufficiency item, the reliability estimate improved to $\alpha = 0.42$, but this value remained below an acceptable threshold for retaining the index as a unified scale. A revised three-item core CCAI, which excluded the information sufficiency item, also showed weak reliability ($\alpha = 0.48$) and was therefore not retained as a main composite measure.

Instead, climate-related awareness was analyzed through more specific variables. Prior exposure to the concept of climate change was measured separately by asking whether respondents had ever heard of "climate change." Anthropogenic awareness was measured through agreement that human activities are the main cause of climate change.

Local climate perception showed moderate internal consistency ($\alpha = 0.58$) and an inter-item correlation of 0.41. It was retained as a two-item exploratory index because the two items captured a conceptually coherent dimension of climate change perception:

whether respondents perceived climate change as locally visible and personally relevant. This index was based on respondents' agreement that they could see climate change in their own area and that it directly affected their lives. Perceived information sufficiency was analyzed separately as a single-item variable because it measured a different dimension: whether respondents felt they had enough information to understand climate change.

The fatalism measure showed weak internal consistency, $\alpha = 0.26$, and was therefore used cautiously as an exploratory variable. Self-efficacy was not retained as a combined index because the two items demonstrated extremely weak internal consistency ($\alpha = 0.002$) and represented distinct family- and community-level dimensions. These two self-efficacy items were therefore analyzed separately.

Table 2. Reliability and scale-construction results.

Measure	Items	Reliability Result	Analytical Decision
PVCCS	8	$\alpha = 0.72$	Retained as composite index
Full CCAI	4	$\alpha = 0.09$; $\alpha = 0.42$ with reverse-keying	Not retained as a single index
Revised core CCAI	3	$\alpha = 0.48$	Not retained as main index
Local climate perception	2	$\alpha = 0.58$; inter-item $r = 0.41$	Retained as two-item exploratory index
Fatalism	2	$\alpha = 0.26$	Used cautiously as exploratory variable
Self-efficacy	2	$\alpha = 0.002$	Family-level and community-level items analyzed separately

Note. Reliability results guided the decision to retain PVCCS as the main composite vulnerability measure and to analyze weaker measures cautiously or separately.

Descriptive Statistics of Main Variables

Table 3 presents descriptive statistics for the main analytical variables.

Respondents reported moderate-to-high perceived vulnerability to climate change, with an average PVCCS score of 3.37 on a five-point scale. This suggests that respondents generally perceived themselves or their communities as vulnerable to climate-related risks.

Disaster experience was widespread in the sample. Nearly all respondents reported having experienced at least one natural disaster. The disaster experience index had an average score of 2.40, with observed scores ranging from 0.00 to 3.50. In this index, a score of 0.00 represents no reported disaster experience across the coded components, while higher scores represent greater exposure to disasters. The average score of 2.40, therefore, suggests that respondents generally reported relatively high disaster experience, taking into account whether they had experienced a disaster, the types of disasters experienced, the effects on their households, and the frequency of such events.

Climate-related perception also showed important patterns. Local climate perception, measured through respondents' agreement that they could see climate changes in their own area and that climate change affected their lives directly, was high, with an average score of 4.13 on a 1-to-5 scale. Anthropogenic awareness, measured by agreement that human activities are the main cause of climate change, had an average score of 3.65 on the same scale. By contrast, perceived information sufficiency had a lower average score of 2.76, suggesting that many respondents did not feel sufficiently informed about climate change.

Fatalism had an average score of 2.81 on a 1-to-5 scale, indicating a moderate level of fatalistic belief among respondents. Family-level self-efficacy had an average score of 2.53 on the same scale, suggesting relatively low-to-moderate confidence in respondents' ability to protect their families from climate-related risks. By contrast, community-level self-efficacy was higher, with an average score of 3.98, suggesting greater confidence in collective or community-level action than in individual or household-level protection.

Table 3. Descriptive statistics for main variables.

Variable	Mean	SD	Median	Min	Max
PVCCS	3.37	0.62	3.50	1.00	4.62
Disaster experience index	2.40	0.60	2.50	0.00	3.50
Anthropogenic awareness	3.65	0.92	—	—	—
Local climate perception	4.13	0.59	—	—	—
Information sufficiency	2.76	1.19	—	—	—
Fatalism index	2.81	0.87	—	—	—
Family-level self-efficacy	2.53	0.97	—	—	—
Community-level self-efficacy	3.98	0.48	—	—	—

Note. Values are reported on the scales used in the analysis. Dashes indicate that median, minimum, and maximum values were not reported for single-item variables in this table.

Figures 1 and 2 provide descriptive context for the group differences examined in the bivariate analyses. As shown in Figure 1, mean perceived vulnerability varied by administrative department. Respondents in Grand-Anse had the highest mean PVCCS score, 3.75, while those in Ouest had the lowest, 3.00. Respondents in Nippes, Sud, and Sud-Est reported intermediate mean scores of 3.42, 3.37, and 3.34, respectively.

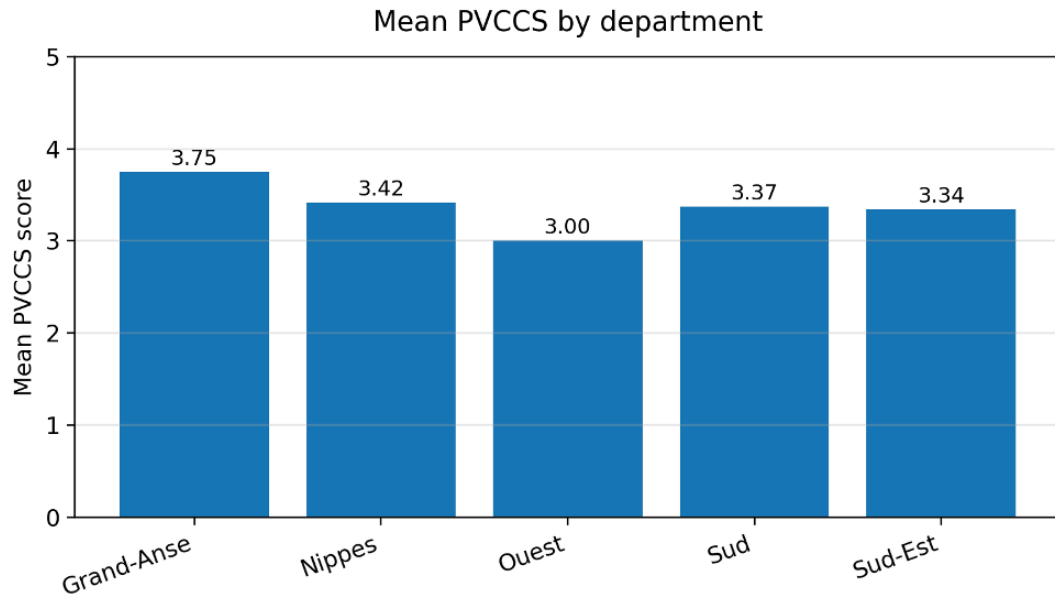


Figure 1. Mean PVCCS by administrative department.

Figure 2 shows that local climate perception was high across all age groups. The highest mean score was observed among respondents aged 55–64 (4.37), while the lowest was among respondents aged 25–34 (3.99). Despite this variation, all age groups reported relatively high local climate perception.

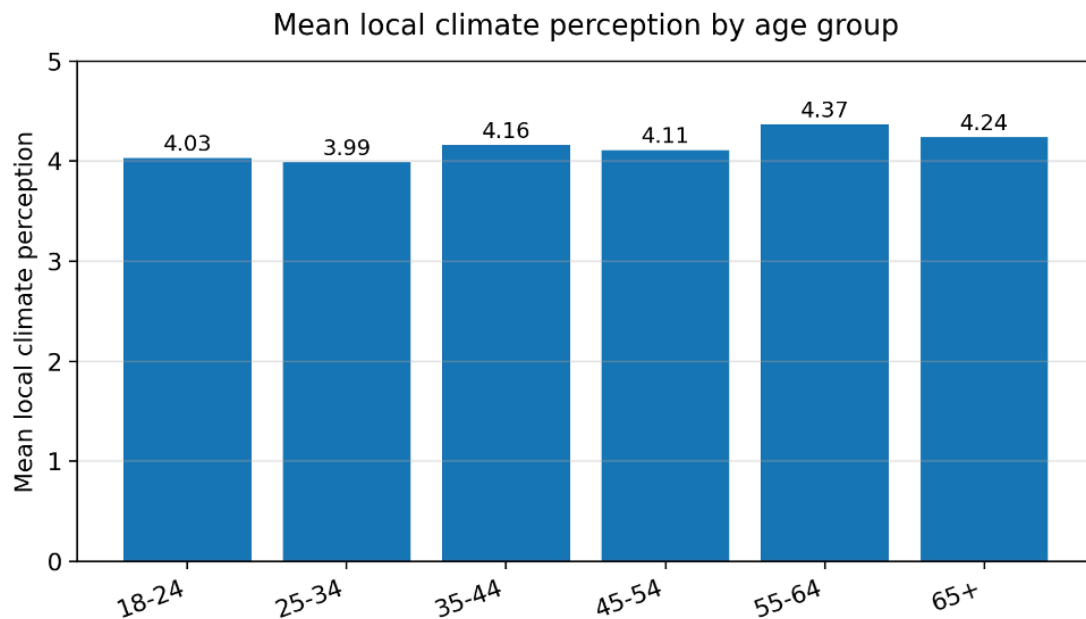


Figure 2. Mean local climate perception by age group.

Support for adaptation action was also high across the sample. Most respondents supported government action to reduce climate-related risks, with 425 (approximately 94.7%) reporting support. Support for NGO or outside-group action was similarly high, with 433 respondents, or approximately 96.4%, expressing support. In addition, 355 respondents (approximately 79.1%) reported being willing to take personal preparedness actions.

Bivariate Results

The bivariate analyses revealed several important differences in perceived vulnerability and perceptions of local climate across occupational, age, geographic, and experiential factors (Table 4).

Table 4. Summary of key bivariate results.

Relationship tested	Test	Statistic	p-value	Interpretation
Occupation in climate-sensitive livelihoods → PVCCS	Mann-Whitney U	$W = 25,626$	.044	Climate-sensitive livelihoods reported higher PVCCS
Age group → local climate perception	Kruskal-Wallis	$\chi^2(5) = 18.919$	.002	Significant; 55–64 higher than 25–34
Administrative department → PVCCS	Kruskal-Wallis	$\chi^2(4) = 72.800$	< .001	Strong departmental differences
Disaster experience index ↔ PVCCS	Spearman correlation	$\rho = .484$	< .001	Moderate positive association
Fatalism ↔ PVCCS	Spearman correlation	$\rho = .130$	.006	Weak positive association
Education level × heard of climate change	Fisher exact, simulated	—	< .001	Significant association

Note. PVCCS = Perceived Vulnerability to Climate Change Scale. Fisher's exact p-value was estimated using simulation because chi-square assumptions were not fully satisfied. Post hoc comparisons were conducted when overall group differences were statistically significant.

Gender was not significantly associated with either PVCCS or local climate perception and is therefore not included among the key bivariate results summarized in Table 4. However, perceived vulnerability differed significantly by livelihood type. Respondents in climate-sensitive livelihoods reported higher perceived vulnerability than respondents in non-climate-sensitive livelihoods, with mean PVCCS scores of 3.45 and 3.33, respectively. The median PVCCS score was also higher among respondents in climate-sensitive livelihoods (3.62) than among those in non-climate-sensitive livelihoods (3.38). The Mann-Whitney U test confirmed that this difference was statistically significant ($W = 25,626$, $p = .044$).

Age group was significantly associated with local climate perception, but not with PVCCS. The Kruskal-Wallis test showed a significant difference in local climate

perception across age groups ($\chi^2(5) = 18.919$, $p = .002$). Post hoc pairwise comparisons indicated that respondents aged 55–64 reported significantly higher local climate perceptions than those aged 25–34. The mean local climate perception score was 4.37 for respondents aged 55–64, compared with 3.99 for respondents aged 25–34.

The administrative department was strongly associated with perceived vulnerability. The Kruskal-Wallis test showed a statistically significant difference in PVCCS scores across the five administrative departments ($\chi^2(4) = 72.800$, $p < .001$), indicating substantial administrative departmental variation in perceived vulnerability. Respondents in Grand-Anse reported the highest mean PVCCS score, 3.75, while those in Ouest reported the lowest, 3.00. Respondents in Nippes, Sud, and Sud-Est reported intermediate mean scores of 3.42, 3.37, and 3.34, respectively.

Post hoc pairwise Wilcoxon comparisons with Bonferroni correction were conducted to identify specific administrative departmental differences. These comparisons showed that respondents in Grand-Anse reported significantly different PVCCS scores from respondents in all four other administrative departments: Nippes, Ouest, Sud, and Sud-Est. Respondents in Ouest also differed significantly from respondents in Nippes, Sud, and Sud-Est. By contrast, respondents in Nippes, Sud, and Sud-Est did not differ significantly from one another after adjustment.

Education level was not significantly associated with either PVCCS or local climate perception. However, education level was significantly associated with whether respondents had heard of climate change. The Fisher exact test with simulated p-values showed a statistically significant association between education level and prior awareness of the term “climate change” ($p < .001$). Descriptive cross-tabulations showed that prior

awareness increased with education level: 39.1% of respondents with no formal education had heard of climate change, compared with 49.6% with primary education, 72.3% with secondary education, and 87.7% with university or technical education. This suggests that education was associated with exposure to climate change terminology, even though it did not yield significant differences in perceived vulnerability or local climate perception in this sample.

Table 5. Prior awareness of climate change by education level.

Education level	No	Not sure	Yes	Total
No formal education	27 (58.7%)	1 (2.2%)	18 (39.1%)	46 (100.0%)
Primary	62 (46.6%)	5 (3.8%)	66 (49.6%)	133 (100.0%)
Secondary	57 (26.8%)	2 (0.9%)	154 (72.3%)	213 (100.0%)
University/Technical	6 (10.5%)	1 (1.8%)	50 (87.7%)	57 (100.0%)

Note. Percentages are row percentages within each education level. The Fisher exact test with simulated p-values indicated a statistically significant association between education level and prior awareness of the term “climate change,” $p < .001$.

Disaster experience was moderately and positively associated with perceived vulnerability. Spearman's correlation analysis showed a statistically significant positive relationship between the disaster experience index and PVCCS ($\rho = 0.484$, $p < .001$). The magnitude of the correlation coefficient indicates a moderate association: respondents with higher disaster experience scores tended to report higher perceived vulnerability to climate change (Figure 3). Overall, the mean PVCCS tended to increase with higher disaster experience scores, suggesting that respondents with greater disaster exposure generally reported higher perceived vulnerability. However, the pattern was not perfectly linear. Mean PVCCS declined from the lowest disaster experience scores to an index score of approximately 1.0, then increased steadily at higher index levels. This early

fluctuation should be interpreted with caution because relatively few respondents appear to fall into the lowest disaster-experience categories, and means based on small groups can be more sensitive to individual variation. Despite this fluctuation, the broader upward pattern shown in Figure 3 remains consistent with the positive association observed in the Spearman correlation analysis.

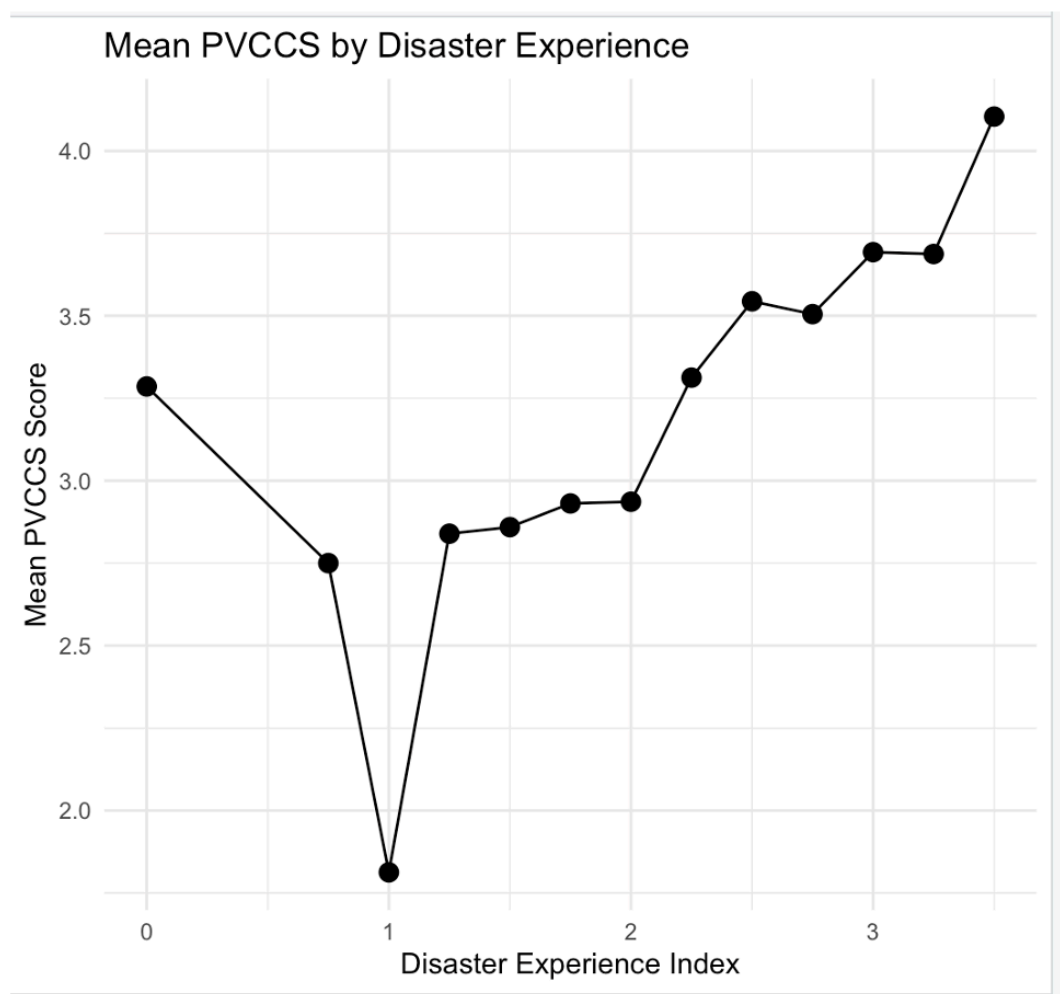


Figure 3. Mean PVCCS by disaster experience index.

Fatalism was significantly associated with PVCCS in the bivariate analysis ($\rho = 0.130$, $p = .006$). This association was statistically significant at the 0.05 level, although the small correlation coefficient indicates a weak relationship.

Multivariate Regression Results

Three multivariate regression models were estimated to examine whether the relationships observed in the bivariate analyses remained significant after controlling for demographic, geographic, occupational, and experiential factors. The first model predicted perceived vulnerability, the second predicted local climate perception, and the third predicted personal preparedness actions.

Predictors of Perceived Vulnerability

Model 1 predicted perceived vulnerability to climate change using PVCCS as the dependent variable. The model was statistically significant and explained approximately 32.6% of the variation in PVCCS scores, as indicated by an adjusted R^2 of .326. This means that the demographic, geographic, occupational, and experiential predictors included in the model jointly accounted for about one-third of the observed differences in perceived vulnerability among respondents. Robust standard errors were used to provide more conservative inference because diagnostic plots indicated mild departures from ideal linear regression assumptions. The full regression table is presented in Appendix 7, while Figure 4 provides a visual summary of the main coefficient estimates.

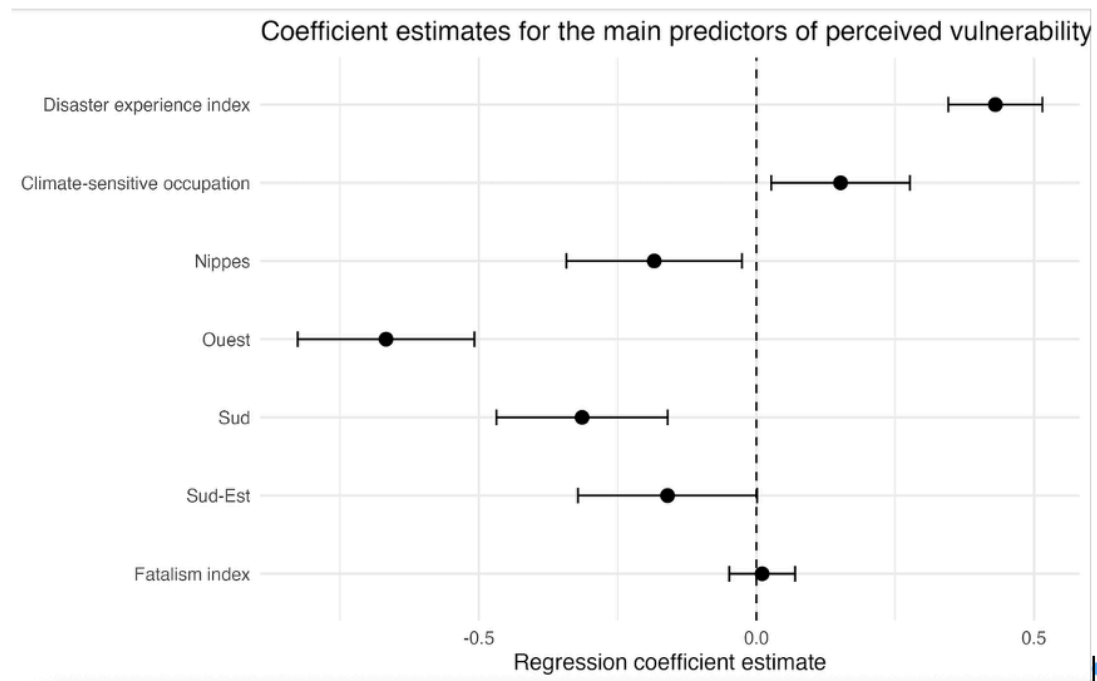


Figure 4. Coefficient estimates for the main predictors of PVCCS.

Figure 4 visually summarizes the main coefficient estimates and their 95% confidence intervals. The figure shows that the confidence intervals for disaster experience, occupation in climate-sensitive livelihoods, Nippes, Ouest, and Sud did not cross zero, indicating statistically significant associations. By contrast, fatalism was close to zero and was not statistically significant. As presented in the full regression model in Appendix 7, age group, gender, education level, and locality type were also not statistically significant predictors of PVCCS after adjustment.

Note. Points represent coefficient estimates from Model 1, and horizontal bars represent 95% confidence intervals. Coefficients to the right of zero indicate predictors associated with higher PVCCS scores, while coefficients to the left of zero indicate

predictors associated with lower PVCCS scores. Predictors whose confidence intervals do not cross zero are statistically significant at the 0.05 level. Administrative department coefficients are interpreted relative to Grand-Anse, the reference category. The full regression table is presented in Appendix 7.

Disaster experience was the strongest predictor of perceived vulnerability. A one-unit increase in the disaster experience index was associated with approximately a 0.43-point increase in PVCCS, holding other variables constant. Livelihood type also remained a significant predictor. Respondents in climate-sensitive livelihoods reported PVCCS scores approximately 0.15 points higher than respondents in non-climate-sensitive livelihoods, after adjustment for demographic, geographic, and experiential factors.

The administrative department was also associated with perceived vulnerability after adjustment. Compared with respondents in Grand-Anse, respondents in Nippes, Sud, and Ouest reported lower PVCCS scores. The largest difference was observed among respondents in Ouest, followed by respondents in Sud and Nippes. The coefficient for Sud-Est was also negative but marginal.

Predictors of Local Climate Perception

Model 2 predicted local climate perception. The model was statistically significant, although its explanatory power was more modest than that of the PVCCS model. Based on an adjusted R^2 value of .112, the model explained approximately 11.2% of the variation in local climate perception. The full regression results are presented in Appendix 7, while Figure 5 provides a visual summary of the main coefficient estimates.

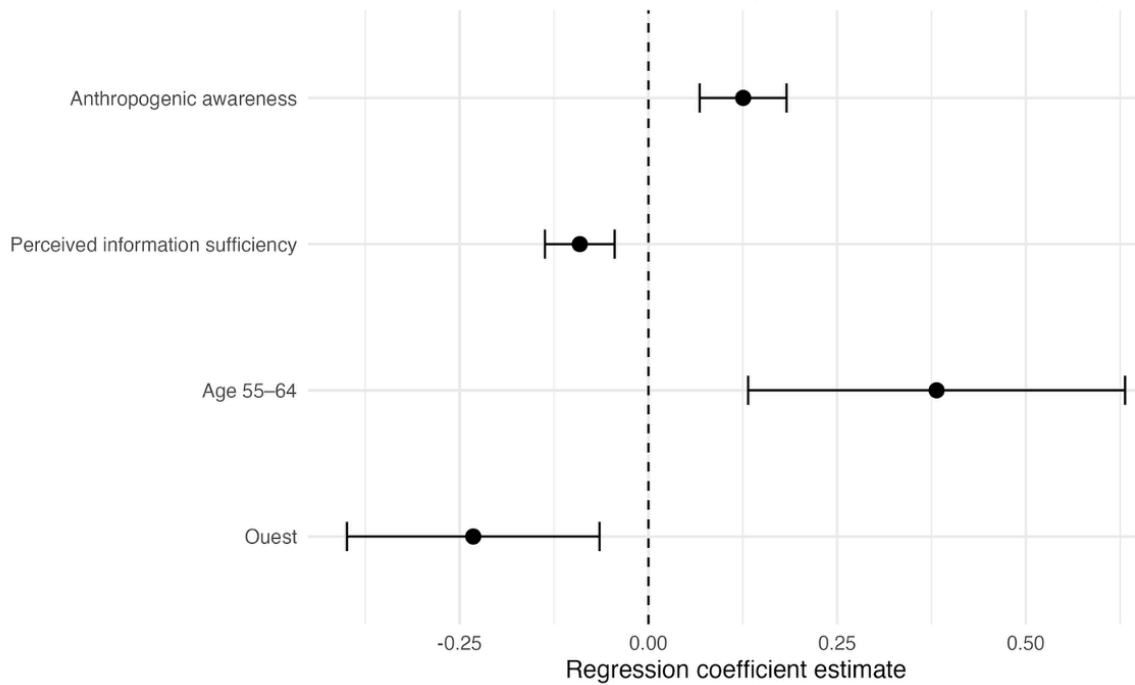


Figure 5. Coefficient estimates for the main predictors of local climate perception

Anthropogenic awareness was a positive and statistically significant predictor of local climate perception. Respondents who more strongly agreed that human activities contribute to climate change were more likely to perceive climate change as locally visible and personally relevant ($\beta = 0.126$, 95% CI [0.068, 0.183], $p < .001$). Perceived information sufficiency was negatively associated with local climate perception ($\beta = -0.091$, 95% CI [-0.137, -0.045], $p < .001$). In practical terms, respondents who perceived climate change as more visible and personally relevant also tended to report feeling less sufficiently informed to understand climate change.

Age and administrative department also showed significant associations with perceptions of local climate. Respondents aged 55–64 reported significantly higher local climate perception than respondents aged 18–24 ($\beta = 0.382$, 95% CI [0.132, 0.631], $p =$

.003). In contrast, respondents in Ouest reported significantly lower local climate perception than respondents in Grand-Anse ($\beta = -0.232$, 95% CI [-0.399, -0.065], $p = .007$). Disaster experience was not a statistically significant predictor in this model. As presented in the full regression results in Appendix 7, gender, education level, and locality type were also not statistically significant predictors of local climate perception after adjustment.

Predictors of Personal Preparedness Actions

Model 3 used logistic regression to predict personal preparedness actions. Because the dependent variable was binary, the results were interpreted using odds ratios. In this model, odds refer to the ratio of respondents who reported taking personal preparedness actions to those who did not. Odds ratios above 1.0 indicate higher odds of reporting personal preparedness actions, while odds ratios below 1.0 indicate lower odds. The full logistic regression results are presented in Appendix 7, while Figure 6 provides a visual summary of the main odds ratios and their 95% confidence intervals.

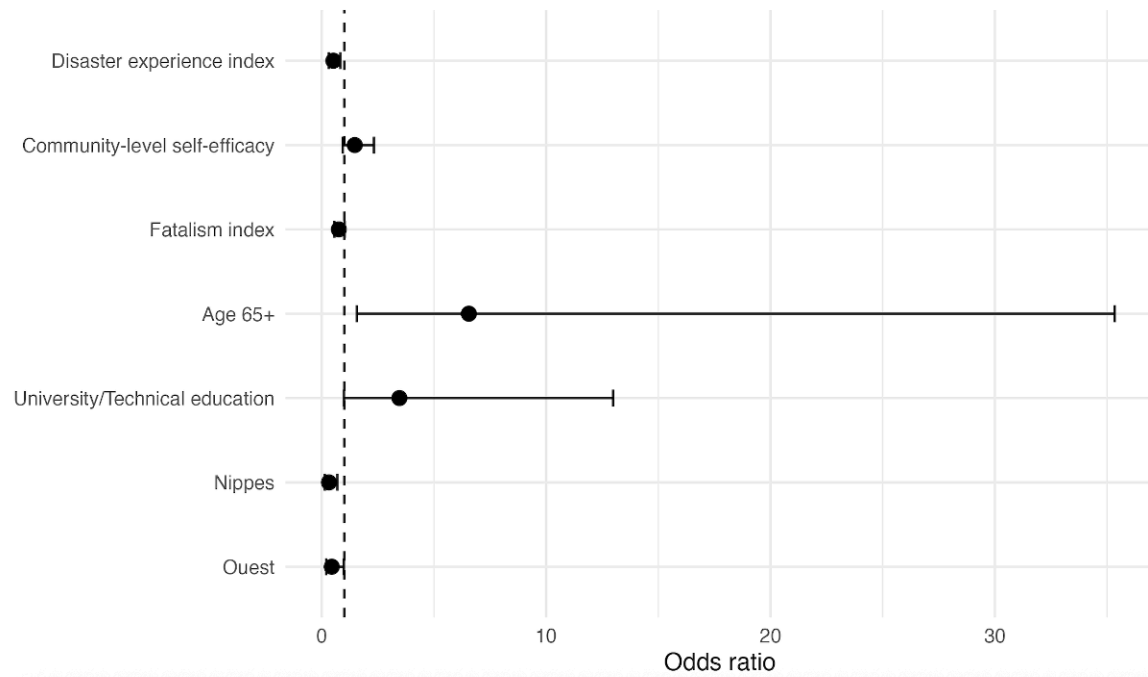


Figure 6. Odds ratios for the main predictors of personal preparedness actions.

Model Diagnostics and Robustness Check

Disaster experience was significantly associated with personal preparedness actions, but the relationship was negative. Higher disaster experience was associated with lower odds of reporting personal preparedness actions (OR = 0.517, 95% CI [0.314, 0.824], $p = .007$). As shown in Figure 6, the odds ratio for disaster experience was below 1.0, and its confidence interval did not cross 1.0, indicating a statistically significant negative association. This finding should be interpreted cautiously. It may suggest that respondents with greater disaster exposure face greater resource constraints, feel less able to prepare, or experience fatigue or discouragement after repeated exposure to disasters. It may also reflect accumulated experience over time, as older respondents and long-term

residents may have had more opportunities to observe climate-related changes and experience disasters.

Age and administrative department were also significant predictors. Respondents aged 65 and above had significantly higher odds of reporting personal preparedness actions than those aged 18–24 (OR = 6.56; 95% CI [1.56, 35.3]; $p = .016$). However, the wide confidence interval indicates substantial uncertainty around the size of this estimate. Administrative departmental differences were also observed. Compared with respondents in Grand-Anse, respondents in Nippes had significantly lower odds of reporting personal preparedness actions (OR = 0.319, 95% CI [0.141, 0.700], $p = .005$), as did respondents in Ouest (OR = 0.446, 95% CI [0.196, 0.988], $p = .049$).

Several predictors were marginal but did not reach the conventional 0.05 significance threshold. Community-level self-efficacy was positively associated with preparedness actions (OR = 1.47, 95% CI [0.941, 2.33], $p = .091$), while fatalism was negatively associated (OR = 0.760, 95% CI [0.562, 1.03], $p = .074$). Respondents with university or technical education also had higher odds of reporting preparedness actions than respondents with no formal education (OR = 3.46; 95% CI [0.989, 13.0]; $p = .056$), although this association was marginal. Family-level self-efficacy, gender, locality type, and most age, education, and administrative department categories were not statistically significant predictors of personal preparedness actions, as presented in the full logistic regression results in Appendix 7.

Model diagnostics were conducted to assess whether the regression results were affected by multicollinearity, non-normal residuals, or heteroscedasticity. The full

diagnostic plots and variance inflation factor tables are presented in Appendix 6, and the full regression tables are presented in Appendix 7.

Multicollinearity was not a major concern in any of the three regression models. In Model 1, the adjusted GVIF values ranged from 1.048 to 1.262. In Model 2, they ranged from 1.018 to 1.085. In Model 3, they ranged from 1.015 to 1.099. Across all three models, all adjusted GVIF values were below 1.27, indicating very low multicollinearity among the predictors. These results supported the inclusion of the demographic, geographic, occupational, experiential, and perception-related predictors in the multivariate models.

For the two linear regression models, diagnostic plots indicated mild departures from ideal linear regression assumptions. In Model 1, which predicted perceived vulnerability to climate change, the residual plots suggested some curvature, the Q-Q plot showed departure from normality in the lower tail, and the scale-location plot suggested mild heteroscedasticity. Similar but modest patterns were observed in Model 2, which predicted local climate perception. These patterns were not unexpected because both dependent variables were derived from Likert-type survey items and composite indices.

To assess whether these diagnostic concerns affected the interpretation of the linear regression findings, HC3 robust standard errors were estimated for Models 1 and 2. The substantive conclusions remained unchanged. In Model 1, disaster experience, occupation in climate-sensitive livelihoods, and administrative department remained significant predictors of PVCCS after applying robust standard errors. The model explained approximately 32.6% of the variation in PVCCS scores, adjusted $R^2 = .326$. In Model 2, anthropogenic awareness, perceived information sufficiency, the 55–64 age

group, and residence in Ouest remained significant predictors of local climate perception. The model explained approximately 11.2% of the variation in local climate perception, adjusted $R^2 = .112$. These results indicate that the main linear regression findings were robust to the mild diagnostic concerns identified in the residual plots.

For Model 3, which used logistic regression to predict personal preparedness actions, multicollinearity diagnostics also did not indicate major concerns. The adjusted GVIF values ranged from 1.015 to 1.099, indicating very low multicollinearity in the logistic regression model. Because the dependent variable was binary, linear regression residual diagnostics were not applied in the same way. The logistic regression model had a residual deviance of 419.46 on 429 degrees of freedom, compared with a null deviance of 460.76 on 448 degrees of freedom, and an Akaike Information Criterion (AIC) value of 459.46. The results were interpreted using odds ratios, as reported above and in the full logistic regression table in Appendix 7.

Overall, the diagnostic and robustness checks supported the stability of the main findings. Although the two linear regression models showed mild departures from ideal assumptions, the use of HC3 robust standard errors did not change the substantive interpretation of the results. Multicollinearity was not a major concern in any model, and the key findings from Models 1, 2, and 3 remained substantively consistent after diagnostic and robustness checks.

Chapter IV

Discussion

This chapter discusses the study's major findings in relation to the research questions, hypotheses, and the existing literature on climate change perception, vulnerability, and adaptation. The chapter first provides an overview of the main findings, then interprets the results by research question. I then discuss the relationship between the findings and existing literature, present implications for climate adaptation in southern Haiti, proposes policy and program recommendations, identify study limitations, suggest directions for future research, and conclude with the study's broader contribution.

Overview of Major Findings

This study examined how residents of coastal communities in southern Haiti perceive climate change vulnerability, local climate change impacts, and personal preparedness actions. The results showed that climate-related perception and response did not follow a single, uniform pattern. Instead, perceived vulnerability, local climate perception, climate awareness, and personal preparedness actions functioned as related but distinct dimensions of climate response. The factors that explained perceived vulnerability were not always the same as those that explained local climate perception or preparedness actions. This distinction is important because it shows that recognizing climate change locally, feeling vulnerable to its impacts, and being prepared to act should not be treated as interchangeable outcomes.

Taken together, the results revealed three major patterns that help explain how coastal residents in southern Haiti understand climate vulnerability and preparedness. First, perceived vulnerability to climate change was shaped primarily by disaster experience, livelihood type, and administrative department. Respondents with greater disaster experience reported higher perceived vulnerability, even after adjustment for demographic and geographic factors. Respondents in climate-sensitive livelihoods also reported higher vulnerability, suggesting that livelihood exposure plays an important role in how climate-related risks are understood. Administrative department differences were also substantial, with respondents in Grand-Anse reporting higher perceived vulnerability than respondents in several other administrative departments, particularly Ouest.

Second, local climate perception followed a different pattern. It was associated with anthropogenic awareness, perceived information sufficiency, age, and administrative department, but not with disaster experience. Respondents who more strongly agreed that human activities contribute to climate change were more likely to perceive climate change as visible in their area and personally relevant to their lives. At the same time, respondents with stronger local climate perceptions tended to report feeling insufficiently informed about climate change. This suggests that perceiving climate change locally may increase awareness of the need for more practical, accessible, and locally relevant climate information.

Third, personal preparedness actions did not follow the expected pattern. Disaster experience was associated with lower odds of reporting personal preparedness actions, contrary to the expectation that direct disaster experience would increase preparedness. This finding suggests that repeated or severe exposure to disasters may heighten

perceived vulnerability without necessarily increasing adaptive capacity. In this context, disaster experience may coexist with resource constraints, fatigue, limited institutional support, or a reduced sense of personal control.

Overall, the findings suggest that climate adaptation strategies in southern Haiti should not assume that awareness, perceived vulnerability, and preparedness move in parallel. A person may recognize climate change locally but still feel underinformed. A person may feel highly vulnerable but lack the resources, institutional support, or confidence needed to prepare. Similarly, communities with strong disaster experience may not necessarily be the most prepared. These distinctions are critical for designing adaptation interventions that are locally relevant, socially equitable, and practically effective.

Interpretation of Findings by Research Question

This section interprets the findings in relation to the study's three research questions. Within each research question, the results are also discussed in relation to the corresponding hypotheses. This approach allows the discussion to remain organized around the broader analytical questions while still assessing the extent to which the specific hypotheses were supported.

RQ1: How do demographic factors influence perceptions of climate change vulnerability?

The first research question examined whether demographic and contextual factors such as age, gender, education, occupation, and locality type influenced perceived vulnerability and climate-related perception. The results showed mixed evidence

regarding the role of these factors, with occupation and locality-related context more relevant in some analyses than age, gender, or education.

Age showed a mixed pattern. The hypothesis that older respondents would report higher perceived vulnerability was not supported by the multivariate PVCCS model, in which age was not a statistically significant predictor. However, age was significant in the model predicting local climate perception: respondents aged 55–64 reported higher levels of local climate perception than those aged 18–24. This suggests that age may matter more for recognizing local environmental change than for rating overall climate vulnerability. Older respondents may have observed environmental and climatic shifts over a longer period, allowing them to compare current conditions with past local experience.

The analysis of gender did not provide support for the expectation that women would report higher perceived vulnerability. Gender was not a statistically significant predictor of perceived vulnerability or local climate perception in the adjusted models. This finding does not imply that gender is unimportant in climate vulnerability more broadly. Rather, it suggests that, in this sample, gender differences were not strong enough to explain variation in perceived vulnerability once disaster experience, occupation, administrative department, and other covariates were included.

Education also showed a mixed pattern. Education level was significantly associated with whether respondents had heard of climate change, suggesting that formal education may influence exposure to climate change terminology. However, education did not significantly predict PVCCS or local climate perception in the adjusted models. In the southern Haitian coastal context, formal education may shape familiarity with climate

change as a concept, but it does not necessarily translate into higher perceived vulnerability or stronger local climate perception. Lived experience, livelihood exposure, and geographic location appeared to play stronger roles in shaping perceived vulnerability than formal education alone.

Livelihood type provided the strongest demographic evidence under RQ1. Respondents in climate-sensitive livelihoods reported significantly higher perceived vulnerability than respondents in non-climate-sensitive livelihoods. This finding partially supports H1d: individuals in climate-sensitive livelihoods reported higher perceived vulnerability than those in less directly affected occupations, although the proposed CCAI was not retained as a final composite measure. For these respondents, climate change may be understood less as an abstract environmental issue and more as a direct threat to income, food security, and daily work.

Taken together, the findings for RQ1 indicate that demographic factors had uneven explanatory power. Age, gender, and education did not consistently predict perceived vulnerability in the adjusted models, although age and education were relevant for specific dimensions of climate perception or awareness. Occupation, however, emerged as the clearest demographic predictor of perceived vulnerability. This suggests that in the southern Haitian coastal context, perceptions of vulnerability may be shaped less by demographic identity alone and more by the interaction among livelihood exposure, lived experience, and geographic context.

RQ2: To what extent does climate change awareness influence perceived vulnerability and local climate perception?

The second research question examined whether climate change awareness influenced perceived vulnerability and local climate perception. The findings provided mixed evidence regarding the relationship between climate change awareness, perceived vulnerability, and local climate perception. Anthropogenic awareness was positively associated with local climate perception, but awareness-related variables did not clearly predict perceived vulnerability. Therefore, the expectation that greater climate awareness would be associated with stronger local climate perception was supported, while the expectation that awareness would translate into higher perceived vulnerability received limited support.

The findings also showed that climate awareness is not a single, unified construct. The originally proposed Climate Change Awareness Index was not retained as a composite measure because its items did not demonstrate sufficient internal consistency. This was both a methodological and substantive finding. Belief in the human causes of climate change, perceived information sufficiency, observation of local climate changes, and perceived direct effects of climate change did not function as a single unified awareness scale. Instead, these items appeared to capture distinct dimensions of climate-related understanding and perception.

Anthropogenic awareness provided the clearest evidence that climate awareness influenced local perceptions of climate. Respondents who more strongly agreed that human activities contribute to climate change were more likely to perceive climate change as visible in their area and personally relevant to their lives. This suggests that understanding the human causes of climate change may help respondents connect broader climate processes to their own local environmental experience.

However, awareness-related variables did not clearly translate into higher perceived vulnerability. Local climate perception and perceived vulnerability appear to be related but distinct. A respondent may observe environmental changes or recognize the local relevance of climate change without necessarily rating multiple climate hazards as direct sources of vulnerability. Conversely, a respondent may report high perceived vulnerability because of lived exposure to disasters, livelihood insecurity, or geographic risk, even if their conceptual understanding of climate change remains limited.

The negative association between perceived information sufficiency and local climate perception is especially important. Respondents who perceived climate change as more visible and personally relevant also tended to report feeling insufficiently informed to understand it. This finding suggests that local experience may increase awareness of information gaps. People who see the effects of climate change in their communities may also become more aware of the limits of the information available to them. This points to a need for climate communication that is not only general but also practical, accessible, and locally relevant.

Overall, the findings for RQ2 suggest that climate change awareness matters, but its influence is specific rather than uniform. Anthropogenic awareness was associated with stronger local climate perception, whereas perceived information sufficiency was negatively associated with it. At the same time, awareness-related variables did not clearly predict perceived vulnerability. These results support the broader conclusion that climate awareness, local climate perception, and perceived vulnerability should be treated as related but distinct dimensions of climate response.

RQ3: To what extent does disaster experience predict support for adaptation and preparedness actions?

The third research question examined whether disaster experience predicted support for adaptation and willingness to engage in preparedness actions. The findings were mixed. Disaster experience strongly predicted perceived vulnerability, but it did not translate into higher personal preparedness actions. The results supported the hypothesis that disaster experience would be positively associated with perceived vulnerability. However, they did not support the hypothesis that disaster experience would increase preparedness actions, as it was associated with lower, rather than higher, odds of reporting personal preparedness actions.

Disaster experience was the strongest predictor in the PVCCS model, suggesting that lived exposure to disasters plays a central role in shaping perceptions of vulnerability. Respondents who experienced greater disaster exposure, more types of events, stronger household impacts, or more frequent events were more likely to perceive themselves or their communities as vulnerable to climate change.

However, disaster experience was negatively associated with personal preparedness actions in the logistic regression model. This finding is important because it shows that direct exposure to climate-related hazards may increase perceived vulnerability without necessarily increasing the ability or willingness to prepare. Highly exposed respondents may recognize climate risks but lack the financial resources, safe housing, transportation, savings, social support, or institutional assistance needed to prepare effectively. Repeated disaster exposure may also contribute to fatigue,

discouragement, or a belief that personal action is insufficient against large-scale hazards such as hurricanes, flooding, coastal erosion, or infrastructure collapse.

The findings regarding support for adaptation also warrant caution. Support for government and NGO adaptation action was very high overall, limiting the variation needed to detect meaningful differences among respondents. As a result, the analysis could not confidently assess whether disaster experience increased support for adaptation policies or whether fatalistic beliefs weakened this relationship. The results therefore did not clearly support this part of the hypothesis, not because respondents opposed adaptation policies, but because support was broadly high and did not vary enough to confirm the expected relationship.

Taken together, the findings for RQ3 suggest that disaster experience is more strongly connected to perceived vulnerability than to preparedness actions. Respondents who had experienced more disasters were more likely to feel vulnerable, but not necessarily to report taking personal preparedness measures. These patterns reinforce the need to distinguish between recognizing risk, supporting adaptation in principle, and having the practical capacity to prepare. In the Haitian coastal context, preparedness may be shaped not only by awareness or disaster experience, but also by resource constraints, institutional support, repeated exposure to shocks, and culturally grounded understandings of risk and control.

Table 6 summarizes the major patterns of hypothesis support across the study. Because several table rows combine related sub-hypotheses, the table is intended as a synthesis rather than a complete hypothesis-by-hypothesis assessment. A detailed assessment of individual hypotheses, including H1a–H3c, is presented in Appendix 8.

Table 6. Summary of main hypothesis patterns.

Area	Main finding	Status
Demographic predictors	Occupation in climate-sensitive livelihoods predicted higher perceived vulnerability to climate change (PVCCS). Age predicted local climate perception. Gender and education were not significant predictors of PVCCS in the adjusted model.	Partially supported
Climate awareness	Anthropogenic awareness predicted local climate perception, but awareness-related variables did not clearly predict PVCCS.	Partially supported
Disaster experience and vulnerability	Disaster experience was the strongest positive predictor of PVCCS.	Supported
Disaster experience and preparedness	Disaster experience was associated with lower odds of reporting personal preparedness actions.	Not supported; contrary direction
Geographic differences	Administrative department was a significant predictor across several outcomes, including PVCCS, local climate perception, and personal preparedness actions.	Supported

Note. This table summarizes major patterns across related hypotheses and does not provide a full hypothesis-by-hypothesis assessment. Detailed results for individual hypotheses, including H1a–H3c, are presented in Appendix 8.

Relationship to Existing Literature

The findings align with several themes in the climate perception literature while also contributing new evidence from Haiti, an understudied context in Caribbean climate research. Overall, the results support the view that perceptions of climate change are shaped by lived experience, livelihood exposure, geographic context, and access to meaningful climate information. At the same time, the findings complicate the assumption that awareness or disaster experience automatically leads to preparedness actions.

First, the strong relationship between disaster experience and perceived vulnerability is consistent with research emphasizing the role of lived experience in

climate risk perception. Direct experience with environmental hazards can make climate risks more personally relevant and easier to recognize. In southern Haiti, where disaster exposure is widespread, lived experience appears to be a powerful factor shaping perceptions of vulnerability. Respondents with greater disaster experience were more likely to report higher perceived vulnerability, suggesting that climate risk was understood not only as an abstract environmental issue, but also as something connected to household and community experience.

Second, the importance of occupation in climate-sensitive livelihoods is consistent with research on resource-dependent communities. Individuals whose livelihoods are tied to agriculture, fisheries, or other environmentally exposed sectors often understand climate change through its effects on income, food security, and daily work. The finding that occupation in climate-sensitive livelihoods predicted higher PVCCS supports the view that vulnerability is not only environmental, but also socioeconomic. In this sense, climate vulnerability in southern Haiti should be understood not only in terms of exposure to hazards, but also in terms of livelihood dependence and limited household capacity to absorb climate-related shocks.

Third, the mixed role of education adds nuance to studies showing that education is often associated with climate awareness. In this study, formal education was associated with having heard of climate change, but it did not significantly predict PVCCS or local climate perception in the adjusted models. This suggests that, in southern Haiti, education may influence familiarity with climate terminology, while perceived vulnerability may be more strongly grounded in direct experience, livelihood exposure, and geographic context. It is also possible that more educated respondents had greater access to resources

or lived in areas less directly exposed to climate-related hazards, which may have reduced their perceived vulnerability. Formal knowledge and lived vulnerability may therefore not always align, especially in settings where communities experience climate-related hazards firsthand.

Fourth, the negative relationship between disaster experience and personal preparedness actions complicates assumptions in the adaptation literature. Some research suggests that disaster experience can motivate preparedness, but this study suggests that experience alone may be insufficient. In contexts marked by poverty, repeated disasters, weak infrastructure, and limited institutional support, disaster experience may heighten vulnerability without increasing the capacity to act. This distinction is critical for climate justice and adaptation planning because it shows that risk perception alone may not be enough to produce preparedness. Households may recognize the seriousness of climate threats yet lack the resources, confidence, or institutional support to prepare effectively.

Finally, the administrative departmental differences observed in this study highlight the importance of place-based climate perception research. Grand-Anse had the highest perceived vulnerability, while Ouest had the lowest. These differences suggest that climate adaptation planning should avoid treating southern Haiti's coastal communities as a homogeneous group. Even within the same broad coastal region, communities may differ substantially in perceived vulnerability, preparedness, and information needs. This reinforces the need for adaptation strategies that are locally grounded and responsive to the specific social, geographic, and institutional conditions of each administrative department.

Taken together, these findings confirm, complicate, extend, and in some respects challenge existing research on climate perception and adaptation. The study confirms the importance of lived experience and climate-sensitive livelihoods in shaping perceived vulnerability. It complicates the role of education by showing that formal education may increase familiarity with climate change terminology without necessarily increasing perceived vulnerability. It extends the literature by providing empirical evidence from Haiti, a highly climate-vulnerable but understudied Caribbean context. Finally, it challenges the assumption that disaster experience automatically translates into preparedness actions, showing instead that highly exposed households may recognize risk yet lack the resources, confidence, or institutional support needed to prepare effectively.

Implications for Climate Adaptation in Southern Haiti

The findings have several implications for climate adaptation planning in southern Haiti. Overall, they suggest that adaptation programs should not assume that awareness of climate change, perceived vulnerability, and preparedness actions necessarily move in tandem. Many residents may recognize climate-related risks and feel vulnerable, yet lack the resources, information, or institutional support needed to prepare effectively.

First, adaptation programs should prioritize communities with high disaster experience and high perceived vulnerability, particularly where livelihoods are climate-sensitive. The strong relationship between disaster experience and PVCCS suggests that people who have experienced repeated or severe disasters are likely to recognize their vulnerability. However, the findings also show that recognition of vulnerability does not automatically lead to preparedness actions. Adaptation programs should therefore combine risk communication with practical support, such as preparedness training,

household-level planning tools, safer shelter options, livelihood protection measures, and access to emergency resources.

Second, climate communication should be locally grounded. The high level of local climate perception suggests that many respondents already observe environmental changes and feel that climate change affects their lives. Communication strategies should therefore move beyond general explanations of climate change and focus on locally relevant questions: what changes are occurring, why they are happening, what households and communities can realistically do, and where they can access support. This approach would make climate information more actionable and more responsive to local experience.

Third, information campaigns should address the gap between local climate perception and perceived information sufficiency. Respondents appeared to perceive climate change locally yet felt insufficiently informed to understand it. This suggests a need for climate information that is practical, accessible, and delivered in culturally and linguistically appropriate forms. Information should be available in Haitian Creole, adapted to varying literacy levels, and communicated through trusted local channels, including community organizations, local leaders, schools, churches, radio, and municipal structures.

Fourth, adaptation strategies should distinguish between individual and collective preparedness. Family-level self-efficacy was relatively low, while community-level self-efficacy was higher. This suggests that respondents may have more confidence in collective action than in individual household action. Programs that strengthen community-based preparedness, local committees, early warning systems, evacuation

planning, mutual aid, and neighborhood-level response mechanisms may therefore be more effective than strategies that rely only on individual responsibility.

Fifth, geographic targeting matters. Administrative department was one of the most important predictors across the models, while locality type was less consistently significant. Adaptation planning should therefore consider administrative department-specific risk profiles, institutional conditions, livelihood systems, infrastructure gaps, and recent disaster histories. A uniform intervention across all coastal communities may fail to address the distinct needs of Grand-Anse, Nippes, Ouest, Sud, and Sud-Est.

Taken together, these implications point to the need for an adaptation approach that is locally grounded, socially equitable, and practically oriented. In southern Haiti, strengthening climate resilience requires more than increasing climate change awareness. It also requires linking climate information to households' lived realities, supporting climate-sensitive livelihoods, expanding community-level preparedness capacity, and ensuring that highly exposed communities have the resources and institutional support needed to respond to risks they already recognize.

Policy and Program Recommendations

Based on the findings, several policy and program recommendations emerge for climate adaptation planning in southern Haiti. These recommendations emphasize the need for locally grounded, socially equitable, and practically actionable interventions.

First, climate adaptation programs should prioritize high-vulnerability administrative departments and communities. Grand-Anse, where perceived vulnerability was highest, may require particular attention in climate risk communication, preparedness support, and adaptation planning. However, the lower perceived vulnerability observed in

Ouest should not be interpreted as evidence of lower objective risk. It may instead reflect different patterns of risk perception, disaster experience, access to information, or perceived exposure. Policymakers and program implementers should therefore combine perception data with hazard maps, infrastructure assessments, and socioeconomic indicators when identifying priority areas.

Second, programs should target climate-sensitive livelihoods. Farmers, fishers, and other climate-exposed workers should receive tailored adaptation support because livelihood exposure was an important predictor of perceived vulnerability. Recommended interventions include locally relevant climate information, livelihood diversification options, resilient agricultural practices, improved water management, coastal protection measures, and access to financial or technical assistance. These interventions should be designed not only to increase awareness, but also to reduce the material vulnerability of households whose income and food security are directly affected by climate-related hazards.

Third, climate communication should be redesigned to close the information gap. The negative association between perceived information sufficiency and local climate perception suggests that respondents who perceived local climate impacts may also have felt insufficiently informed to understand climate change. Communication strategies should therefore be practical, localized, and action-oriented rather than purely scientific or abstract. Messages should explain observable local changes, connect them to climate processes, and identify realistic actions that households and communities can take. Communication should also be available in Haitian Creole, adapted to varying literacy

levels, and disseminated through trusted local channels, including radio, schools, churches, community organizations, local leaders, and municipal structures.

Fourth, preparedness programs should address barriers to action. Since disaster experience was associated with lower odds of personal preparedness actions, interventions should focus on why highly exposed individuals may not prepare. Barriers may include limited financial resources, insecure housing, weak infrastructure, lack of transportation, limited trust in institutions, fatalistic beliefs, or uncertainty about which actions are effective. Programs should therefore pair preparedness education with practical support, including evacuation planning, emergency savings mechanisms, shelter identification, household preparedness kits, safe-water storage, and assistance for vulnerable households.

Fifth, community-based adaptation should be strengthened. The relatively higher level of community self-efficacy suggests that collective approaches may resonate with respondents. Programs could support local disaster preparedness committees, community mapping of risk areas, participatory planning, early warning dissemination, evacuation drills, local emergency response networks, and mutual aid systems. Strengthening community-level preparedness may be especially important in areas where individual households lack the resources to prepare on their own.

Sixth, adaptation planning should integrate local knowledge. Residents' lived experiences provide valuable insight into environmental changes, disaster impacts, livelihood risks, and practical constraints. Including local perspectives can improve the legitimacy, relevance, and effectiveness of adaptation policies. Participatory planning processes should therefore involve farmers, fishers, women, youth, local authorities,

community-based organizations, and other groups directly affected by climate-related hazards.

Taken together, these recommendations suggest that climate adaptation in southern Haiti should move beyond awareness raising alone. Effective programs should connect climate information to local experience, reduce livelihood vulnerability, address practical barriers to preparedness, and strengthen community-based response systems. Such an approach would be more likely to translate perceived vulnerability into meaningful adaptive capacity.

Study Limitations

Several limitations should be acknowledged. First, the research used a cross-sectional design. As a result, the findings show associations among variables but cannot establish causal relationships. For example, disaster experience was associated with higher perceived vulnerability, but the analysis cannot determine whether disaster experience caused higher vulnerability perception or whether other related factors contributed to this association.

Second, the study relied on self-reported perceptions and intentions. Perceived vulnerability is important for climate adaptation planning because it shapes how people understand risk and respond to climate threats. However, perceived vulnerability is not the same as objective physical vulnerability. Future research could combine perception data with geographic, environmental, infrastructure, and socioeconomic risk indicators to compare perceived and objective dimensions of vulnerability.

Third, some constructs were measured with a limited number of items. The full Climate Change Awareness Index was not retained because its items did not demonstrate

sufficient internal consistency. Fatalism was also interpreted with caution due to weak reliability, and self-efficacy was separated into family- and community-level items because the items appeared to represent distinct dimensions. These measurement limitations suggest the need for future research to refine and validate scales for climate perception, fatalism, and self-efficacy in the Haitian context.

Fourth, although the sample was balanced across administrative departments and locality types, the findings may not be generalizable to all of Haiti. The research focused on coastal communities in southern Haiti and the western coastal area of Ouest. Inland communities, northern administrative departments, and other coastal regions may have different patterns of hazard exposure, livelihood dependence, institutional support, and climate perception.

Fifth, the logistic regression model measured reported personal preparedness actions rather than directly observed behavior. Respondents' stated willingness or reported action may differ from actual preparedness practices. Future studies could strengthen this line of inquiry by incorporating observational measures, household preparedness inventories, or follow-up interviews on specific preparedness behaviors.

Finally, diagnostic plots for the linear regression models showed mild departures from ideal assumptions, including some evidence of non-normal residuals and heteroscedasticity. HC3 robust standard errors were used to address concerns about heteroscedasticity, and the main results remained substantively stable. Nevertheless, the findings should be interpreted with appropriate caution, particularly where effect sizes were modest or confidence intervals were wide.

Another limitation concerns the role of information sources. Although the survey included questions about sources of climate information, including radio, television, social media, word of mouth, NGOs, community leaders, and religious institutions, these variables were not included in the main regression models. Therefore, the study can conclude that education was associated with prior awareness of climate change terminology, but it cannot determine whether this association was independent of media exposure or other information channels. Future research should examine how education, media access, trust in information sources, and NGO presence interact to shape climate change awareness in Haitian coastal communities.

Taken together, these limitations do not undermine the value of the findings, but they clarify the scope within which the results should be interpreted. The study provides important evidence on climate change perception in an understudied Haitian coastal context, while also pointing to the need for future research using longitudinal designs, refined measurement instruments, and integrated perception and risk data.

Recommendations for Future Research

Future research should build on this study in several ways. First, longitudinal research would help examine how climate perceptions change over time, especially after major climate-related events or adaptation interventions. Such research could help determine whether disaster experience leads to lasting changes in perceptions of vulnerability, whether preparedness behavior changes with repeated exposure, and whether adaptation programs influence awareness, self-efficacy, and action over time.

Second, future studies should further validate climate perception measures in Haiti. The weak reliability of the full Climate Change Awareness Index suggests that

climate awareness may not operate as a single construct in this context. Researchers should develop and test culturally appropriate measures that distinguish among climate knowledge, causal beliefs, local climate perception, information sufficiency, concern, perceived vulnerability, and action capacity. Such measurement work would strengthen future quantitative research on climate perception in Haiti and other Caribbean settings.

Third, qualitative research would help explain why disaster experience was negatively associated with personal preparedness actions. Interviews, focus groups, or participatory methods could explore whether this relationship reflects resource limitations, fatalistic beliefs, institutional distrust, emotional fatigue, repeated losses, insecure housing, or uncertainty about which preparedness actions are realistic and effective. Qualitative evidence would provide deeper insight into the mechanisms behind the quantitative findings.

Fourth, future research could combine survey data with geospatial, environmental, and infrastructure data. Linking perceived vulnerability with indicators such as flood exposure, coastal erosion, elevation, distance from the coast, road access, housing quality, infrastructure condition, and historical disaster impacts would strengthen understanding of the relationship between perceived and physical vulnerability. This would also help identify areas where perceived risk and objective risk converge or diverge.

Fifth, additional research should examine the role of institutions and trust in shaping preparedness. Preparedness may depend not only on individual awareness or disaster experience, but also on whether communities trust government agencies, NGOs, local authorities, early warning systems, and emergency response structures.

Understanding institutional trust would be especially important for designing adaptation programs that communities are willing and able to use.

Finally, comparative research across Caribbean countries could determine whether the patterns observed in southern Haiti are unique or part of broader regional dynamics. Studies comparing Haiti with other Caribbean coastal communities could clarify how poverty, governance, disaster history, livelihood systems, migration, language, and institutional capacity shape climate perception, vulnerability, and adaptation behavior across the region.

Together, these directions would strengthen the empirical, methodological, and policy relevance of climate perception research in Haiti and the wider Caribbean. They would also help move the field beyond documenting perceptions toward understanding how awareness, vulnerability, trust, resources, and institutional support interact to shape meaningful adaptation action.

Conclusions

This study contributes to understanding how coastal communities in southern Haiti perceive climate change vulnerability, local climate impacts, and preparedness actions. The findings show that disaster experience, livelihood exposure, and geographic context are central to perceived vulnerability. At the same time, the results demonstrate that climate awareness, perceived vulnerability, local climate perception, and preparedness actions are related but distinct dimensions of climate response. Residents may recognize climate change locally and feel vulnerable to its impacts, yet lack the information, resources, institutional support, or confidence needed to prepare effectively.

The strongest predictor of perceived vulnerability was disaster experience, confirming the importance of lived experience in climate risk perception. Occupation in climate-sensitive livelihoods and administrative department also played significant roles, showing that vulnerability is shaped not only by exposure to hazards, but also by livelihood dependence and place-based conditions. Local climate perception followed a different pattern. It was associated with anthropogenic awareness, perceived information sufficiency, age, and administrative department, suggesting that recognizing climate change locally involves more than direct exposure to disasters alone.

The finding that disaster experience was associated with lower odds of personal preparedness actions highlights a critical challenge for adaptation policy. In highly vulnerable communities, repeated exposure to disasters may increase perceived risk without increasing adaptive capacity. This finding challenges the assumption that awareness or experience alone is sufficient to produce preparedness. Effective adaptation must therefore go beyond awareness raising. It must address practical constraints, strengthen local institutions, support community-level action, and provide accessible, culturally appropriate, and locally relevant climate information.

Overall, the study demonstrates the importance of incorporating local perceptions into climate adaptation planning. Coastal communities in southern Haiti are not passive recipients of climate risk. They observe environmental change, interpret vulnerability through lived experience, and hold valuable knowledge about local conditions. Policies and programs that listen to these perspectives are more likely to be socially equitable, context-specific, and effective in strengthening climate resilience in Haiti and the broader Caribbean region.

Appendix 1

Survey Instrument

Survey Questionnaire: Climate Change Perceptions in Southern Haiti

A. Climate Change Awareness (CCAI)

1. Have you ever heard of 'climate change'?

☐ Yes ☐ No ☐ Not sure

2. What causes climate change? (Select all that apply)

☐ Deforestation ☐ Greenhouse gases ☐ Punishment from God ☐ Natural cycles ☐ Don't know ☐ Other: _____

3. Please rate your agreement with the following statements:

a. Human activities are the main cause of climate change.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

b. I have enough information to understand climate change.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

c. I can see changes in the climate in my own area.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

d. Climate change affects my life directly.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

B. Perceived Vulnerability (PVCCS)

4. How much do you feel at risk from the following?

a. Flooding

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

b. Coastal erosion

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

c. Drought

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

d. Sea level rise

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

e. stronger hurricanes or storms

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

f. Change in rainfall pattern

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

g. Saltwater intrusion

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

h. Damage to housing or infrastructure

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

i. Crop failure

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

j. Health problem related to climate change

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

k. Other _____

☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely

5. Do you think your community is prepared for future climate impacts?

☐ Yes ☐ No ☐ Not sure

Note. These items were combined to construct the Perceived Vulnerability to Climate Change Scale (PVCCS). The analysis used the composite PVCCS score to assess overall perceived vulnerability across multiple climate-related hazards.

C. Disaster Experience Index (DEI)

6. Have you ever experienced a natural disaster in your community?

☐ Yes ☐ No

7. Which disasters have you experienced? (Select all that apply)

☐ Flood ☐ Hurricane ☐ Earthquake ☐ Storm-induced landslides ☐ Other:

8. What were the effects on your household? (Select all that apply)

☐ Loss or damage to property ☐ Damage to crops ☐ Displacement ☐ Injury ☐

Death of family member ☐ Other _____ -

☐ None

9. How often do such events occur in your area?

☐ Rarely ☐ Every few years ☐ Every year ☐ Multiple times a year

Note. These items were used to construct the Disaster Experience Index (DEI). The index captured not only whether respondents had experienced a disaster, but also the number of disaster types experienced, the reported household effects, and the perceived frequency of disaster events.

D. Adaptation and Policy Support

10. Do you support, or would you be willing to support, government actions to reduce climate change impacts?

☐ Yes ☐ No ☐ Not sure

If No or Not sure, why not? What concerns or doubts do you have?

11. Do you support, or would you be willing to support, actions by non-governmental organizations or outside groups to reduce climate change impacts?

12. how likely would you be to participate in educational sessions to prepare yourself and property against the risk of CC?

11. Would you personally take action to prepare for climate events?

☐ Yes ☐ No ☐ Maybe

If No or Maybe, why wouldn't you take action or why are you unsure?

12. How likely are you to join community preparedness efforts?

☐ Not likely ☐ Somewhat likely ☐ Very likely

If Not likely, why would you not participate in community preparedness efforts?

E. Psychological Factors

13. Fatalism – Please rate your agreement with the following:

a. Climate change is in God's hands; humans can't do anything.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

b. There's no point in preparing; disasters will happen anyway.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

14. Perceived Self-Efficacy – Please rate your agreement with the following:

a. I believe I can protect my family from disasters.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

b. My community can reduce climate risks if we act together.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

F. Media and NGO Influence

15. Where do you usually hear about climate change? (Select all that apply)

☐ Radio ☐ TV ☐ Social media ☐ Word of mouth ☐ NGOs ☐ Never heard

16. How much do you trust these sources for climate information?

a. Local radio ☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐

Completely

b. National TV ☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐

Completely

c. Community leaders ☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐

Completely

d. NGOs ☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Completely

e. Religious institutions ☐ Not at all ☐ Slightly ☐ Moderately ☐ Very ☐

Completely

17. Are NGOs working on climate/disaster issues in your community?

☐ Yes ☐ No ☐ I don't know

If yes, what kind of activities do they do? (Open-ended)

G. Open-Ended Questions

18. In your own words, how has the climate (example: length of hot seasons, rainfall and storms) changed in your area in the last 10 years?

19. What kind of support would help your community prepare better for climate impacts? If you or your community are already taking any action, what are you doing, and why?

H. Socio-demographic Information

20. What is your age group?

☐ 18–24 ☐ 25–34 ☐ 35–44 ☐ 45–54 ☐ 55–64 ☐ 65+

21. What best describes your gender?

☐ Male ☐ Female ☐ Other ☐ Prefer not to say

22. What is the highest degree or level of school you have completed?

☐ No formal education ☐ Primary ☐ Secondary ☐ University/Technical

23. Occupation:

☐ Farmer ☐ Fisher ☐ Trader ☐ Teacher ☐ Government worker ☐ Unemployed ☐ Other: _____

24. Administrative department:

☐ Ouest ☐ Nippes ☐ Sud-Est ☐ Sud ☐ Grand-Anse

25. Type of locality:

☐ Urban ☐ Semi-urban ☐ Rural

Appendix 2

Informed Consent Form

Informed Consent Form/Form Konsantman Enfòmè

Study Title / Tit Rechèch la

English: Understanding Climate Change Perceptions in Southern Haiti's Coastal Communities

Kreyòl: Pèspèktiv sou Chanjman Klimatik nan Kominote Kòt Sid Ayiti yo

Principal Investigator (PI) / Chèchè Prensipal

English: Francis Alphonse, ALM Candidate, Harvard University Extension

School

Kreyòl: Francis Alphonse, Kandida ALM, Harvard University Extension School

Thesis Director (TD) / Direktè Tèz

English: Dr. Linda Tomasso

Kreyòl: Dr. Linda Tomasso

Version Date / Dat vèsyon sa a: September 30, 2025 / 30 Septanm 2025

Key Information / Enfòmasyon Kle

What is this study? / Ki sa etid sa a ye?

English:

This is a one-time survey about how people in this community understand climate change and how it affects daily life.

Kreyòl:

Sa a se yon sondaj yon sèl fwa sou fason moun nan kominote sa a konprann chanjman klimatik ak kijan li afekte lavi chak jou.

What will you do? / Kisa w ap fè?

English:

You will answer questions in a face-to-face interview lasting about 30–35 minutes.

Kreyòl:

Ou pral reponn kesyon nan yon entèvyou fas-a-fas ki dire apeprè 30–35 minit.

Risks or discomforts / Risk oswa difikilte

English:

The risks are minimal. Some questions about disasters or losses may feel sensitive. You may skip any question.

Kreyòl:

Risk yo minim. Gen kèk kesyon sou eksperyans ak dezast ki ka fè ou santi w sansib; men ou ka sote nenpòt kesyon lè w vle.

Benefits / Benefis

English:

There is no direct personal benefit. Results may help improve community planning and preparedness.

Kreyòl:

Pa gen benefis pèsonèl dirèk; rezilta yo ka ede amelyore planifikasyon ak preparasyon nan kominote a.

Compensation / Konpansasyon

English:

There is no payment for participation.

Kreyòl:

Pa gen okenn peman pou patisipasyon.

Voluntary participation / Patisipasyon volontè

English:

Participation is voluntary. You may stop at any time without any consequences.

Kreyòl:

Patisipasyon an volontè. Ou ka sispann patisipe nenpòt lè san okenn konsekans.

Purpose of the Study / Objektif Rechèch la

English:

The purpose of this research is to understand how residents of coastal communities in Southern Haiti perceive climate-related risks and vulnerability. Your input will help inform future programs and policies to protect coastal communities from climate risks.

Kreyòl:

Objektif rechèch la se aprann kijan rezidan kominote kotyè (bò lanmè) nan Gran Sid Ayiti wè risk ak vilnerabilite ki gen rapò ak chanjman klimatik. Opinyon w ap ede enfòme pwogram ak politik a lavni pou pwoteje kominote kotyè (bò lanmè) yo kont risk klimatik.

What Happens If You Agree to Participate?

Kisa k ap pase si ou dakò patisipe?

English:

A trained interviewer will meet you privately at your home or another location you choose. You will be asked questions about:

- basic background information (such as age group),
- climate change knowledge,
- past experiences with extreme weather,
- and how you prepare for climate risks.

The survey will last about 30–35 minutes and will be conducted in Haitian Creole or French (English available upon request).

There will be no audio or video recording. Responses will be entered on a tablet.

Kreyòl:

Yon entèvyouè ki resevwa fòmasyon ap rankontre w an prive lakay ou oswa nan yon lòt kote ou chwazi. Yo ap poze ou kesyon sou:

- enfòmasyon sou ou (tankou kategori laj),
- konèsans sou chanjman klimatik,
- eksperyans pase ak move tan ekstrèm,
- ak kijan ou prepare pou risk klimatik.

Sondaj la dire apeprè 30–35 minit e li fèt an Kreyòl ayisyen oswa an franse (angle disponib si ou vle).

Pa gen anrejistreman odyo oswa videyo. Repons yo antre sou yon tablèt.

Privacy and Confidentiality

Prive ak Konfidansyalite

English:

You will be assigned a unique participant code. Your name will not be linked to your answers.

Data will be stored securely on encrypted tablets and Harvard secure systems.
Only authorized research team members will have access.

Results will be reported only in summary form. Data will be kept for up to 12 months after the study ends, after which the code key will be destroyed.

Kreyòl:

Ou ap resevwa yon kòd inik kòm patisipan; yo pap mete non ou sou repons yo.

Done yo kolekte sou tablèt kripte epi estoke sou sistèm sekirize Harvard. Se sèlman ekip rechèch ki otorize ki gen aksè.

Nou ap rapòte rezilta yo an gwoup sèlman. Done yo ap kenbe jiska 12 mwa apre etid la fini, apre sa kle kòd la ap detwi.

Use of Data in the Future

Itilizasyon Done yo Alavni

English:

Your responses (without your name) will not be shared outside the research team or used for future studies without new approval.

Kreyòl:

Repons ou yo (san non ou) pap pataje deyò ekip rechèch la ni itilize pou lòt etid san nouvo apwobasyon.

Sharing Results

Pataje Rezilta yo

English:

If you wish, you may receive a simple summary of the results (in Haitian Creole, French, or English). Results may also be shared with the community and in academic settings.

Kreyòl:

Si ou vle, ou ka resevwa yon rezime senp rezilta yo (an kreyòl, franse, oswa anglè). Nou ka prezante rezilta yo tou nan kominote a ak nan anviwònman akademik.

Contact Information

Kontak

English & Kreyòl:

Francis Alphonse (PI)

Email: francisalphonse2020@gmail.com

Phone/WhatsApp: +1 609-255-6188 / +509 3170-3014

Consent / Konsantman

☐ English: I have read (or had read to me) this form and my questions have been answered.

☐ Kreyòl: Mwen li (oswa yo li fòm sa a pou mwen) epi yo reponn kesyon mwen yo.

☐ English: I understand participation is voluntary and I may stop at any time.

☐ Kreyòl: Mwen konprann patisipasyon se volontè e mwen ka sispann nenpòt lè.

☐ English: I agree to have my responses used anonymously for research and reporting.

☐ Kreyòl: Mwen dakò pou repons mwen yo itilize san non mwen nan rechèch ak rapò yo.

Researcher Name / Non chèchè: _____

Signature / Siyati: _____

Date / Dat: ____ / ____ / ____

Witness (if oral consent) / Temwen (si konsantman oral):

- ☐ English: I confirm that I witnessed the oral consent process and that the participant voluntarily agreed to participate
- ☐ Kreyòl: Mwen konfime mwen te temwen pwosesis konsantman oral la epi patisipan an te dakò volontèman.

Name / Non: _____

Signature / Siyati: _____

Date (auto-captured by tablet) / Dat: ____ / ____ / ____

Short Oral Consent Script

Tèks Konsantman Oral Tou Kout

English:

Hello. We are doing a one-time survey (30–35 minutes) about weather and climate change in this community. Your answers will help us understand local needs. There is no payment and no cost. Some questions may feel sensitive; you may skip any question or stop at any time. We will not record your name with your answers; we use codes and keep data secure. Participation is your choice. Do you have any questions? Do you agree to participate?

Kreyòl:

Bonjou. Nou ap fè yon sondaj yon sèl fwa (30–35 minit) sou move tan ak chanjman klimatik nan kominote sa a. Repons ou yo ap ede nou konprann bezwen lokal yo. Pa gen peman, pa gen depans. Gen kèk kesyon ki ka sansib; ou ka sote nenpòt kesyon oswa sispann nenpòt lè. Nou pap anrejistre non ou ak repons yo; nou sèvi ak kòd epi nou kenbe done yo an sekirite. Patisipasyon se chwa ou. Èske ou gen kesyon? Èske ou dakò pou patisipe?

Appendix 3

Variable Dictionary and Coding Scheme

This appendix presents the main variables used in the analytical dataset. SurveyCTO metadata variables and administrative fields not used in the statistical analysis are not shown. Multiple-response items were converted into binary indicator variables, where 1 indicates that the response option was selected and 0 indicates that it was not selected.

Table 7. Variable dictionary and coding scheme.

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
SubmissionDate	character	6 janv. 2026 08:44:55 6 janv. 2026 16:22:16 6 janv. 2026 16:22:17 6 janv. 2026 16:22:18 6 janv. 2026 17:11:56	0	0
starttime	character	5 janv. 2026 17:25:05 6 janv. 2026 11:44:38 6 janv. 2026 12:12:53 6 janv. 2026 12:59:14 6 janv. 2026 13:36:16	0	0
endtime	character	5 janv. 2026 23:39:08 6 janv. 2026 16:03:08 6 janv. 2026 16:08:18 6 janv. 2026 16:14:37 6 janv. 2026 16:15:52	0	0
deviceid	character	56b8808097154bee 8f053d461a571dd9 5b815f5ccf864a92 a88c3e0c3cc41211	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
devicephonenum	logical	NA	449	100
username	character	francisalphonse2020@gmail.com	0	0
device_info	character	BLU M10L 13 SurveyCTO Collect 2.81.4 (461ba40) OUKITE C62 15 SurveyCTO Collect 2.81.4 (461ba40)	0	0
duration	numeric	2858 1817 2145 1811 1899	0	0
caseid	logical	NA	449	100
Q1	character	a b c	0	0
Q2	character	A1 A2 A2 A4 A1 A2 A4 A1 A2 A3 A1 A2 A3 A4	0	0
Q2_A1	numeric	1 0	0	0
Q2_A2	numeric	1 0	0	0
Q2_A3	numeric	0 1	0	0
Q2_A4	numeric	0 1	0	0
Q2_A5	numeric	0 1	0	0
Q2_A6	numeric	0 1	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q2.1	character	"\ànmi peyi a, absans leta. Pwofesi Yo rache tw\≤p w\≤ CH Pano sol\@y yo ka lak\≤z sa Moun yo mal konstwi Kay. Moun yo rache t...	431	96
Q3.a	character	e a d c b	0	0
Q3.b	character	d b e a c	0	0
Q3.c	character	d e a b c	0	0
Q3.d	character	d b e c a	0	0
a	character	e d a c b	0	0
b	character	e c d a b	0	0
c	character	d b c a e	0	0
d	character	a b c d e	0	0
e	character	d c e b a	0	0
f	character	d e c b a	0	0
g	character	c d b a e	0	0
h	character	c d b e a	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q4.4	character	b a	0	0
Q4.5	character	Fi√®vre Ensekirite alimant√© , diminisyon pwason nan lanm√© a. Dega mat√©ryel, ensekirite alimant√©. Pa gen dlo pou nou bw√®, p...	384	85.5
Q4.6	character	d e c	384	85.5
Q5	character	b c a	0	0
Q6	character	a b	0	0
Q7	character	a b c a b b c a b c e b	7	1.6
Q7_a	numeric	1 0	7	1.6
Q7_b	numeric	1 0	7	1.6
Q7_c	numeric	1 0	7	1.6
Q7_d	numeric	0 1	7	1.6
Q7_e	numeric	0 1	7	1.6
Q7.1	character	Non Non moun konn mouri Nn Yon moun te mouri nan lanm√® nou pa konn koz la. Maladi chabon, kolera	48	10.7

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q8	character	a b c e a b e a b c d e a b c d e f a c e	7	1.6
Q8_a	numeric	1 0	7	1.6
Q8_b	numeric	1 0	7	1.6
Q8_c	numeric	1 0	7	1.6
Q8_d	numeric	0 1	7	1.6
Q8_e	numeric	1 0	7	1.6
Q8_f	numeric	0 1	7	1.6
Q8_g	numeric	0 1	7	1.6
Q8.1	character	Toute b√®t moun. B√®t mouri, Dlo te pote m ale . Mental, P√®di b√®t B√®t konn mouri	416	92.7
Q9	character	c b a d	7	1.6
Q10	character	a c b	0	0
Q10.1	character	Pa gen leta Leta dwe bam yon kote pou m stab Leta pa janm fesa Si ent√®vansyon n pa deranje m Nou pa kw√® nan yo	425	94.7

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q11	character	a c b	0	0
Q12	character	c b a	0	0
Q13	character	a b c	0	0
Q13.1	character	Mwen pap gen ase mwayen pou sa Mwen pa gen ase mwayen pou sa. Ev√@nman klimatik yo d√©passe kapasite moun. Sa mande aksyon kolekti...	355	79.1
Q14	character	c b a	0	0
Q14.1	character	Mwen pap disponib M paka di anyen Mwen pa konn patisipe ladan yo	446	99.3
Q15.a	character	b d c a e	0	0
Q15.b	character	b a d c e	0	0
Q16.a	character	d b a c e	0	0
Q16.b	character	d e b c a	0	0
Q17	character	a b e a c a b c f c	0	0
Q17_a	numeric	1 0	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q17_b	numeric	1 0	0	0
Q17_c	numeric	0 1	0	0
Q17_d	numeric	0 1	0	0
Q17_e	numeric	1 0	0	0
Q17_f	numeric	0 1	0	0
Q18a	character	b c d e a	0	0
Q18b	character	b c d e a	0	0
Q18c	character	d c b a e	0	0
Q18d	character	c d b e a	0	0
Q18e	character	d c b e a	0	0
Q19	character	b a c	0	0
Q19.1	character	Abri provisoire Kanalizasyon, f _v ≤masyon PPI Irrigation Sansibilize	415	92.4
Q20	character	"L _v ® mwa jen rive chal _v ® a k _v ≤manse pou rive nan novanm. Depi 2015 nou pa ka dekri chanjman, m'en nou santi gen yon varyasyon. Tw _v ≤p l...	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q21	character	"Kanalize dlo sou wout yo. Betone wout yo. Pwoteje ravin yo. Leta oubyen ONG ta dwe trete rivy [√] ® curtis la. Mete gabyon, ak f [√] ® kira...	0	0
Q21.1	character	Poko gen aksyon. Anyen Pa gen aksyon Abri pwovizwa apr [√] ® katastr [√] ≤f paske sikl [√] ≤n te kraze Kay nou. Pa gen aksyon.	0	0
Q22	character	e c f b d	0	0
Q23	character	a b	0	0
Q24	character	b c a d	0	0
Q25	character	a g a b g a c d g c a b	0	0
Q25_a	numeric	1 0	0	0
Q25_b	numeric	0 1	0	0
Q25_c	numeric	0 1	0	0
Q25_d	numeric	0 1	0	0
Q25_e	numeric	0 1	0	0
Q25_f	numeric	0 1	0	0

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
Q25_g	numeric	1 0	0	0
Q25.1	character	B√≤s chapant. Taksi moto Chof√®. Gardinaj Direktris lek√≤l	324	72.2
Q26	character	a b d e c	0	0
Q27	character	b c a	0	0
Q28	character	a c b e d	0	0
Q28.1	character	Geran Ab√≤ne leta Ferme leta Kay eritye	445	99.1
Q29	character	4 12 7 1 5	0	0
Q30	character	a c b d e	0	0
instanceID	character	uuid:d45149d4-b319-4ea7-9fa6-31d9f84312da uuid:6e925971-3eab-43f8-8c09-b9677e2f79dd uuid:5b3efe6a-4148-4a86-8b63-e3b1b39ac52b uu...	0	0
formdef_version	numeric	2601051556 2601071640	0	0
KEY	character	uuid:d45149d4-b319-4ea7-9fa6-31d9f84312da uuid:6e925971-3eab-43f8-8c09-b9677e2f79dd uuid:5b3efe6a-4148-4a86-8b63-e3b1b39ac52b uu...	0	0
review_quality	character	GOOD OKAY POOR	16	3.6

Variable name	Type	Example values / coding observed in data	Missing n	Missing %
review_comments	character	francisalphonse2020@gmail.com (8 janv. 2026 14:55:56): [Submission approved. Classified as GOOD.] francisalphonse2020@gmail.com (8...	16	3.6
review_corrections	character	francisalphonse2020@gmail.com (19 janv. 2026 14:02:51): Q21.1 francisalphonse2020@gmail.com (19 janv. 2026 19:43:53): Q4.5 francis...	445	99.1

Note. Missing percentages are based on $N = 449$. Open-ended follow-up variables often exhibit high missingness because they were asked only when applicable or were optional. These variables were not treated as core dependent or independent variables in the main regression models. Multiple-response items were converted into binary indicators, with 1 indicating that an option was selected and 0 indicating that it was not.

This table summarizes the constructed variables and analytical indices used in the quantitative analysis. It identifies the source variables, explains how each variable or index was constructed, and indicates how it was used in the analysis.

Table 8. Constructed variables and analytical indices.

Constructed variable / index	Source variables	Construction / coding	Interpretation / use in analysis
PVCCS	Eight retained perceived-vulnerability items	Composite mean score across retained PVCCS items; higher scores reflect stronger agreement with vulnerability-related items.	Higher scores indicate greater perceived vulnerability to climate change. Main dependent variable in Model 1; used in bivariate analyses.
disaster_experience_index	Items measuring disaster experience, disaster types, household effects, and disaster frequency	Composite score combining disaster exposure components.	Higher scores indicate greater reported disaster experience. Main predictor in bivariate analyses and Models 1 and 3.
local_climate_perception	Two items: seeing climate change locally and perceiving direct effects on one's life	Mean of two Likert-type items; retained as an exploratory index.	Higher scores indicate stronger perception that climate change is locally visible and personally relevant. Dependent variable in Model 2; used in bivariate analyses.
anthropogenic_awareness	Item measuring agreement that human activities are the main cause of climate change	Single Likert-type item.	Higher scores indicate stronger agreement that human activities contribute to climate change. Predictor in Model 2; used to assess climate-awareness dimensions.

Constructed variable / index	Source variables	Construction / coding	Interpretation / use in analysis
information_sufficiency	Item measuring whether respondents felt they had enough information to understand climate change	Single Likert-type item.	Higher scores indicate greater perceived sufficiency of climate-change information. Predictor in Model 2; analyzed separately from CCAI.
fatalism_index	Two fatalism-related items	Mean of two items; interpreted cautiously because reliability was weak.	Higher scores indicate stronger fatalistic beliefs about climate risks or response capacity. Exploratory predictor in bivariate and multivariate analyses.
family_self_efficacy	Item measuring confidence in protecting one's family from climate-related risks	Single item; analyzed separately from community-level self-efficacy.	Higher scores indicate greater confidence in household or family-level protection. Predictor in Model 3.
community_self_efficacy	Item measuring confidence in community-level action	Single item; analyzed separately from family-level self-efficacy.	Higher scores indicate greater confidence in collective or community-level action. Predictor in Model 3.
occupation_sensitivity	Occupation item / occupation categories	Binary recode distinguishing climate-sensitive livelihoods, such as farming and fishing, from non-climate-sensitive livelihoods.	Identifies respondents whose livelihoods are more directly exposed to climate-related risks. Predictor/control variable in bivariate analyses and Model 1.

Constructed variable / index	Source variables	Construction / coding	Interpretation / use in analysis
personal_preparedness_action	Preparedness-action item	Binary recode indicating whether the respondent reported willingness or action to prepare for climate-related risks.	Indicates reported personal preparedness action. Dependent variable in Model 3.
heard_climate_change	Item asking whether respondents had heard of climate change	Categorical variable: Yes, No, or Not sure.	Captures prior exposure to the term climate change. Used in bivariate analysis with education level.
adaptation_support_government	Item measuring support for government action to reduce climate-related risks	Categorical or binary-coded support variable.	Indicates support for government-led adaptation or risk-reduction action. Descriptive and bivariate analysis of adaptation support.
adaptation_support_NGO	Item measuring support for NGO or outside-group action	Categorical or binary-coded support variable.	Indicates support for NGO or external adaptation support. Descriptive and bivariate analysis of adaptation support.

Note. CCAI = Climate Change Awareness Index; NGO = nongovernmental organization; PVCCS = Perceived Vulnerability to Climate Change Scale. Constructed variables were derived from the cleaned analytical dataset and the R recoding and scale-construction process.

This table summarizes the patterns of missing data in the main analytical dataset. Variables with no missing data are summarized collectively, while variables with notable missingness are listed separately. SurveyCTO administrative metadata fields were not used in the statistical analysis and are therefore summarized only as omitted metadata.

Table 9. Missing data summary.

Variable or variable group	Missing n	Missing %	Comment / treatment in analysis
Core closed-ended variables used in the primary analysis	0	0.0	No missing data for most core closed-ended analytical variables.
Q7 and Q7 binary indicators	7	1.6	Multi-response disaster/impact item and derived binary indicators; cases with missing responses were excluded from calculations using this item.
Q7.1	48	10.7	Open-ended follow-up item; missing values reflect nonresponse or skip-pattern structure and were not used in the main quantitative models.
Q8 and Q8 binary indicators	7	1.6	Multi-response household impact item and derived binary indicators; cases with missing responses were excluded from calculations using this item.
Q2.1	431	96.0	Open-ended specify/other response; high missingness reflects skip-pattern structure rather than missingness in a core analytical variable.
Q4.5	384	85.5	Open-ended follow-up response; high missingness reflects skip-pattern structure.
Q4.6	384	85.5	Follow-up categorical response; high missingness reflects skip-pattern structure.
Q8.1	416	92.7	Open-ended follow-up item; not used in the main quantitative models.

Variable or variable group	Missing n	Missing %	Comment / treatment in analysis
Q10.1	425	94.7	Open-ended follow-up item; not used in the main quantitative models.
Q13.1	355	79.1	Open-ended explanation for preparedness response; used qualitatively for interpretation, not as a model variable.
Q14.1	446	99.3	Open-ended follow-up item; high missingness reflects skip-pattern structure.
Q19.1	415	92.4	Open-ended follow-up item; not used in the main quantitative models.
Q25.1	324	72.2	Open-ended occupation specification; used only to support classification where relevant.
Q28.1	445	99.1	Open-ended follow-up item; not used in the main quantitative models.
Administrative metadata fields	Varied	Varied	SurveyCTO administrative fields such as device identifiers, case IDs, review comments, and correction logs were omitted from the analytical dataset.

Appendix 4

Scale Construction and Reliability Details

This appendix presents the scale construction and reliability results used to determine which composite measures were retained for the analysis. Cronbach's alpha was used to assess internal consistency where applicable. Measures with insufficient reliability were not retained as unified composite indices and were either analyzed as separate items or used cautiously as exploratory variables.

Table 10. Reliability results for proposed composite measures.

Proposed measure	Items tested	Reliability result	Decision
PVCCS	8	$\alpha = 0.72$	Retained as composite index
Full CCAI	4	$\alpha = 0.09$	Not retained as a single index
Full CCAI with reverse-keyed information sufficiency	4	$\alpha = 0.42$	Not retained as a single index
Revised core CCAI	3	$\alpha = 0.48$	Not retained as main index
Local climate perception	2	$\alpha = 0.58$; inter-item $r = 0.41$	Retained as two-item exploratory index
Fatalism	2	$\alpha = 0.26$	Used cautiously as exploratory variable
Self-efficacy	2	$\alpha = 0.002$	Family-level and community-level

Proposed measure	Items tested	Reliability result	Decision
			items analyzed separately

Note. CCAI = Climate Change Awareness Index; PVCCS = Perceived Vulnerability to Climate Change Scale.

Table 11. Scale-construction decisions.

Measure	Final analytical treatment	Rationale
PVCCS	Retained as the main perceived vulnerability index	Acceptable internal consistency and central relevance to the main outcome.
CCAI	Not retained as a single composite index	Weak internal consistency indicated that the items did not operate as one unified awareness scale.
Anthropogenic awareness	Analyzed as a single item	Captured a specific causal belief about human activities as a contributor to climate change.
Information sufficiency	Analyzed as a single item	Measured a distinct dimension: whether respondents felt sufficiently informed to understand climate change.
Local climate perception	Retained as an exploratory two-item index	The two items were conceptually coherent and showed a moderate inter-item association.
Fatalism	Used cautiously as an exploratory variable	Weak reliability; results involving fatalism were interpreted cautiously.
Self-efficacy	Split into family-level and community-level items	Items showed extremely weak internal consistency and represented distinct dimensions of perceived capacity to act.

Note. Measures not retained as composite indices were analyzed as single items or exploratory measures, depending on conceptual relevance and reliability results.

Appendix 5

Additional Descriptive Tables

This appendix presents additional descriptive tables used to support the results reported in Chapter III. These tables provide supplementary information on climate change awareness, support for adaptation action, personal preparedness action, and group-level differences in key analytical variables.

Table 12. Distribution of prior awareness of climate change.

Response	n	%
Yes	288	64.1
No	152	33.9
Not sure	9	2.0
Total	449	100.0

Note. Percentages may not total 100 due to rounding.

Table 13. Support for government and NGO adaptation action.

Adaptation actor / action	Support (n)	Support (%)	Other response (n)	Other response (%)
Government action to reduce climate-related risks	425	94.7	24	5.3
NGO or outside-group action to reduce climate-related risks	433	96.4	16	3.6

Note. Percentages are based on the full analytical sample (N = 449). “Other response” includes respondents who did not report support or who selected another response category. Percentages may not total 100 due to rounding.

Table 14. Personal preparedness action.

Response	n	%
Yes	355	79.1
No	94	20.9
Total	449	100.0

Note. Percentages may not total 100 due to rounding. Personal preparedness action indicates whether respondents reported willingness or action to take personal preparedness measures.

Table 15 presents the mean Perceived Vulnerability to Climate Change Scale (PVCCS) score by administrative department. Higher scores indicate higher perceived vulnerability.

Table 15. Mean PVCCS by administrative department.

Administrative department	n	Mean PVCCS
Grand-Anse	89	3.75
Nippes	89	3.42
Ouest	92	3.00
Sud	90	3.37
Sud-Est	89	3.34

Note. PVCCS = Perceived Vulnerability to Climate Change Scale. Means are reported on the scale used in the analysis. Higher values indicate greater perceived vulnerability.

Table 16 presents mean local climate perception scores by age group. Higher scores indicate stronger agreement that climate change is locally visible and personally relevant.

Table 16. Mean local climate perception by age group.

Age group	n	Mean local climate perception
18-24	39	4.03
25-34	118	3.99
35-44	121	4.16
45-54	80	4.11
55-64	58	4.37
65+	33	4.24

Note. Means are reported on the local climate perception scale used in the analysis. Higher values indicate stronger local climate perception.

Table 17. Education level by prior awareness of climate change.

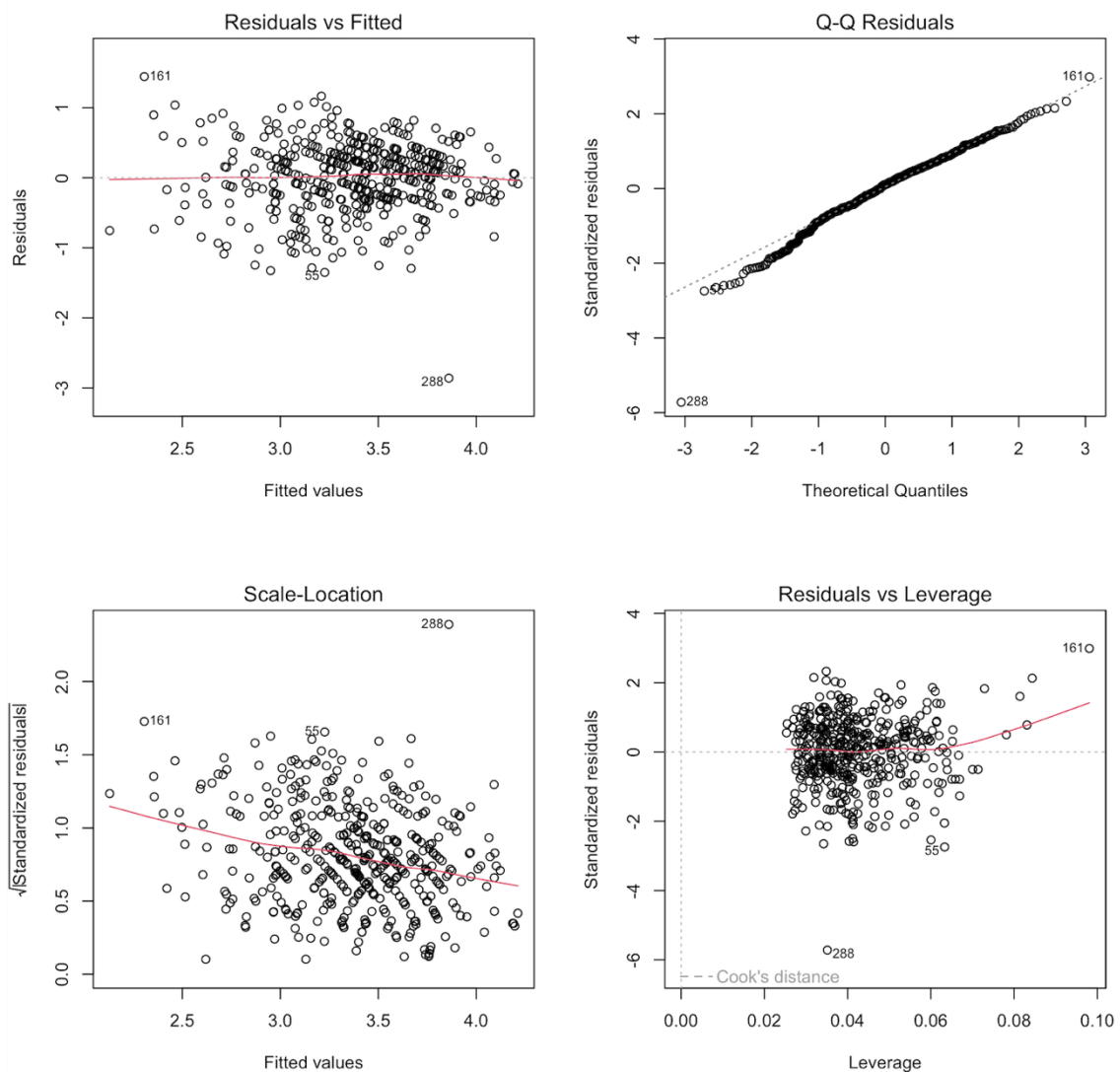
Education level	Total (n)	Heard of climate change Yes n (%)	No / Not sure n (%)
No formal education	46	18 (39.1)	28 (60.9)
Primary	133	66 (49.6)	67 (50.4)
Secondary	213	154 (72.3)	59 (27.7)
University/Technical	57	50 (87.7)	7 (12.3)
Total	449	288 (64.1)	161 (35.9)

Note. Prior awareness refers to whether respondents reported having heard of climate change. Percentages are calculated within each education category. The combined “No / Not sure” category is shown because the Results chapter emphasizes prior awareness versus lack of prior awareness.

Appendix 6

Model Diagnostics

This appendix presents diagnostic and robustness checks for the multivariate models reported in Chapter III. Diagnostics included multicollinearity checks using adjusted GVIF values, residual diagnostics for the linear regression models, HC3 robust standard errors, and model-fit information for the logistic regression model.



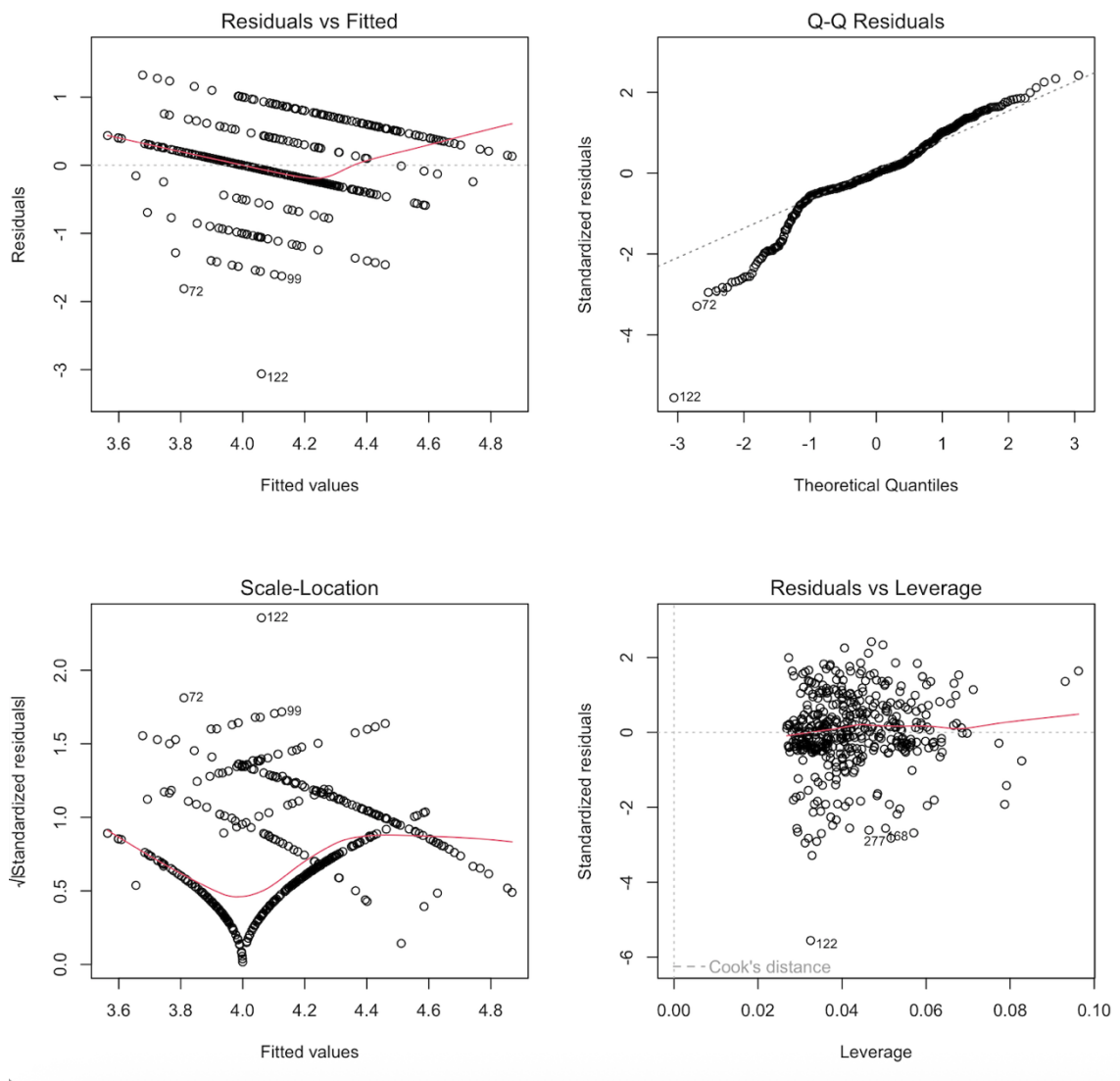


Figure 7. Diagnostic and robustness checks for the multivariate models.

Appendix 7

Full Regression Results

This appendix presents the full regression results for the three multivariate models. Model 1 predicts perceived vulnerability to climate change, Model 2 predicts local climate perception, and Model 3 predicts personal preparedness action.

Table 18. Full regression results for model 1: predictors of perceived vulnerability (PVCCS).

Predictor	Estimate	SE	t	p	95% CI
Intercept	2.701	0.207	13.063	<.001	[2.294, 3.107]
Disaster experience index	0.430	0.043	9.992	<.001	[0.346, 0.515]
Non-climate-sensitive livelihoods	-0.152	0.063	-2.387	.017	[-0.276, -0.027]
Fatalism index	0.010	0.030	0.342	.733	[-0.049, 0.070]
Age 25–34	-0.106	0.096	-1.101	.272	[-0.294, 0.083]
Age 35–44	0.050	0.097	0.513	.608	[-0.141, 0.241]

Predictor	Estimate	SE	t	p	95% CI
Age 45–54	-0.060	0.105	-0.570	.569	[-0.267, 0.147]
Age 55–64	-0.051	0.117	-0.436	.663	[-0.280, 0.178]
Age 65+	-0.184	0.131	-1.401	.162	[-0.443, 0.074]
Male	-0.009	0.055	-0.168	.866	[-0.118, 0.100]
Primary education	0.110	0.090	1.224	.222	[-0.067, 0.287]
Secondary education	0.031	0.094	0.331	.741	[-0.153, 0.215]
University/technical education	0.019	0.115	0.165	.869	[-0.207, 0.246]
Nippes	-0.184	0.080	-2.288	.023	[-0.342, -0.026]
Ouest	-0.667	0.081	-8.235	<.001	[-0.826, -0.508]
Sud	-0.314	0.078	-4.004	<.001	[-0.468, -0.160]
Sud-Est	-0.160	0.082	-1.950	.052	[-0.321, 0.001]
Semi-urban locality	-0.097	0.061	-1.606	.109	[-0.217, 0.022]
Urban locality	0.026	0.064	0.406	.685	[-0.099, 0.151]

Note. SE = standard error; CI = confidence interval. Reference categories are age 18-24, female, no formal education, Grand-Anse, rural locality, and occupation in climate-sensitive livelihoods where applicable.

Table 19. Full regression results for model 2: predictors of local climate perception.

Predictor	Estimate	SE	t	p	95% CI
Intercept	3.980	0.227	17.533	<0.001	[3.534, 4.426]
Disaster experience index	-0.057	0.048	-1.205	.229	[-0.151, 0.036]
Anthropogenic awareness	0.126	0.029	4.285	<.001	[0.068, 0.183]
Perceived information sufficiency	-0.091	0.023	-3.869	<.001	[-0.137, -0.045]
Age 25-34	-0.012	0.106	-0.118	.906	[-0.221, 0.196]
Age 35-44	0.126	0.106	1.182	.238	[-0.083, 0.334]
Age 45-54	0.084	0.116	0.724	.469	[-0.144, 0.311]
Age 55-64	0.382	0.127	3.005	.003	[0.132, 0.631]
Age 65+	0.223	0.145	1.541	.124	[-0.061, 0.507]
Male	0.008	0.055	0.147	.883	[-0.100, 0.116]
Primary education	0.142	0.099	1.437	.151	[-0.052, 0.336]
Secondary education	0.106	0.102	1.032	.303	[-0.096, 0.307]
University/technical education	0.184	0.124	1.491	.137	[-0.059, 0.428]
Nippes	-0.104	0.087	-1.198	.232	[-0.275, 0.067]
Ouest	-0.232	0.085	-2.725	.007	[-0.399, -0.065]
Sud	-0.022	0.086	-0.251	.802	[-0.191, 0.147]
Sud-Est	-0.114	0.090	-1.278	.202	[-0.290, 0.062]
Semi-urban locality	-0.078	0.066	-1.172	.242	[-0.208, 0.053]
Urban locality	-0.097	0.067	-1.458	.146	[-0.229, 0.034]

Note. SE = standard error; CI = confidence interval. Reference categories are age 18-24, female, no formal education, Grand-Anse, rural locality, and occupation in climate-sensitive livelihoods where applicable.

Table 20. Full logistic regression results for model 3: predictors of personal preparedness action.

Predictor	Odds ratio	SE	z	p	95% CI
Intercept	7.133	1.511	1.300	.194	[0.375, 144.025]
Disaster experience index	0.517	0.246	-2.684	.007	[0.314, 0.824]
Family-level self-efficacy	1.016	0.137	0.112	.911	[0.777, 1.334]
Community-level self-efficacy	1.471	0.228	1.689	.091	[0.941, 2.328]
Fatalism index	0.760	0.153	-1.786	.074	[0.562, 1.027]
Age 25–34	1.048	0.443	0.106	.915	[0.427, 2.458]
Age 35–44	2.438	0.472	1.888	.059	[0.950, 6.117]
Age 45–54	1.833	0.503	1.204	.228	[0.675, 4.910]
Age 55–64	2.539	0.576	1.617	.106	[0.822, 7.967]
Age 65+	6.557	0.778	2.416	.016	[1.558, 35.344]
Male	0.830	0.254	-0.734	.463	[0.503, 1.365]
Primary education	1.206	0.445	0.421	.674	[0.489, 2.833]
Secondary education	1.666	0.472	1.082	.279	[0.644, 4.145]
University/technical education	3.461	0.650	1.910	.056	[0.989, 12.982]
Nippes	0.319	0.407	-2.806	.005	[0.141, 0.700]
Ouest	0.446	0.410	-1.970	.049	[0.196, 0.988]
Sud	0.896	0.414	-0.264	.792	[0.396, 2.025]
Sud-Est	0.688	0.453	-0.826	.408	[0.282, 1.682]
Semi-urban locality	0.726	0.306	-1.043	.297	[0.396, 1.322]
Urban locality	0.828	0.318	-0.594	.552	[0.442, 1.545]

Note. Estimates are odds ratios. SE = standard error; CI = confidence interval. Reference categories are age 18-24, female, no formal education, Grand-Anse, and rural locality

Appendix 8

Full Hypothesis-by-Hypothesis Assessment

This appendix provides a detailed assessment of the study hypotheses in relation to the results reported in Chapter III and discussed in Chapter IV. The table summarizes the expected relationship, the main evidence from the analysis, the level of support, and the interpretation for each hypothesis.

Table 21. Full hypothesis-by-hypothesis assessment.

Hypothesis	Expected relationship	Evidence from analysis	Status	Interpretation
H1a	Older respondents would report higher perceived vulnerability to climate change.	Age was not a statistically significant predictor of PVCCS in the adjusted model. However, respondents aged 55–64 reported higher local climate perception than respondents aged 18–24.	Partially supported	Age did not explain perceived vulnerability, but it was relevant for recognizing local climate change. This suggests that older respondents may draw on longer local environmental experience when interpreting visible climate changes.
H1b	Women would report higher perceived vulnerability to climate change than men.	Gender was not significantly associated with PVCCS or local climate perception in the bivariate or adjusted multivariate results.	Not supported	In this sample, gender differences were not strong enough to explain variation in perceived vulnerability

Hypothesis	Expected relationship	Evidence from analysis	Status	Interpretation
				or local climate perception after other factors were considered.
H1c	Higher education would be associated with greater climate awareness and higher perceived vulnerability.	Education level was significantly associated with having heard of climate change, but it did not significantly predict PVCCS or local climate perception in the adjusted models.	Partially supported	Formal education appeared to increase exposure to climate change terminology, but it did not translate into higher perceived vulnerability or stronger local climate perception.
H1d	Respondents in climate-sensitive livelihoods would report higher perceived vulnerability than respondents in non-climate-sensitive livelihoods.	Occupation in climate-sensitive livelihoods was significantly associated with higher PVCCS in both bivariate analysis and the adjusted regression model.	Supported	Livelihood exposure appears to be an important driver of vulnerability perception. Respondents whose work depends on climate-sensitive activities perceived greater climate-related vulnerability.
H2	Greater climate change awareness would be associated with higher perceived vulnerability and stronger local climate perception.	Anthropogenic awareness significantly predicted local climate perception. Awareness-related variables did not clearly predict PVCCS, and the proposed CCAI was not retained as a unified index because of weak reliability.	Partially supported	Climate awareness mattered, but its influence was specific. Understanding human causes of climate change was related to local perception, while perceived vulnerability was more strongly shaped by disaster experience, occupation, and administrative department.
H3a	Greater disaster experience would be associated with stronger support for future	Support for government and NGO adaptation action was very high overall, leaving limited variation for detecting differences. The analysis did not	Not clearly supported	The lack of support should be interpreted cautiously because most respondents supported adaptation action. The outcome may have been

Hypothesis	Expected relationship	Evidence from analysis	Status	Interpretation
	climate adaptation action, with this relationship weakened by fatalistic beliefs.	provide clear evidence that fatalism moderated the relationship between disaster experience and support for adaptation.		too uniformly high to detect meaningful differences across groups.
H3b	Greater disaster experience would be associated with higher likelihood of personal preparedness action.	Disaster experience was significantly associated with lower odds of reporting personal preparedness action in the logistic regression model.	Not supported; contrary direction	Greater disaster exposure did not translate into greater preparedness. This suggests that highly exposed respondents may face resource constraints, fatigue, limited support, or reduced ability to act.
H3c	Greater disaster experience would be associated with higher perceived vulnerability to climate change.	Disaster experience was the strongest positive predictor of PVCCS in the adjusted regression model and was also moderately correlated with PVCCS in the bivariate analysis.	Supported	Lived exposure to disasters played a central role in shaping perceived vulnerability. Respondents with greater disaster experience tended to report higher perceived climate vulnerability.
H4a	Higher self-efficacy would be associated with greater preparedness action.	Community-level self-efficacy showed a positive but marginal association with preparedness action. Family-level self-efficacy was not statistically significant.	Partially supported	Confidence in collective action may matter for preparedness, but self-efficacy alone was not enough to explain preparedness behavior in the presence of material and institutional constraints.
H4b	Higher fatalism would weaken preparedness or adaptation-related outcomes.	Fatalism showed a weak positive bivariate association with PVCCS and marginal negative association with preparedness action in the logistic	Limited support	Fatalistic beliefs may be relevant, but the evidence was weak. Fatalism should be interpreted cautiously because the measure had low internal consistency.

Hypothesis	Expected relationship	Evidence from analysis	Status	Interpretation
		model, but it was not a strong or consistent predictor after adjustment.		

Note. PVCCS = Perceived Vulnerability to Climate Change Scale; CCAI = Climate Change Awareness Index. Status categories reflect the statistical results and interpretation reported in Chapters III and IV.

References

- Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268–281. <https://doi.org/10.1016/j.gloenvcha.2006.02.006>
- Amaratunga, D. (2022, May 27). How does climate change affect coastal regions? *Ww3.Rics.org*. <https://ww3.rics.org/uk/en/journals/land-journal/how-does-climate-change-affect-coastal-regions-.html>
- Amos, E., Akpan, U., & Ogunjobi, K. (2014). Households' perception and livelihood vulnerability to climate change in a coastal area of Akwa Ibom State, Nigeria. *Environment, Development and Sustainability*, 17(4), 887–908. <https://doi.org/10.1007/s10668-014-9580-3>
- Baptiste, A. K. (2017). Climate change knowledge, concerns, and behaviors among Caribbean fishers. *Journal of Environmental Studies and Sciences*, 8(1), 51–62. <https://doi.org/10.1007/s13412-017-0434-9>
- Bardan, R. (2025, January 10). *Temperatures rising: NASA confirms 2024 warmest year on record*. NASA. <https://www.nasa.gov/news-release/temperatures-rising-nasa-confirms-2024-warmest-year-on-record/>
- Birhanu Bayeh, & Alemayehu, M. (2019). Scientific community debates on causes and consequences of global warming: Review. *Journal of Agriculture and Environmental Sciences*, 4(1), 1–14. <https://doi.org/10.20372/jaes.v4i1.10256>
- Cook, J., Nuccitelli, D., Green, S. A., Richardson, M., Winkler, B., Painting, R., Way, R., Jacobs, P., & Skuce, A. (2013). Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters*, 8(2), 024024. <https://doi.org/10.1088/1748-9326/8/2/024024>
- Flick, K. (2021, March 15). *Impacts of climate change on Haiti*. ArcGIS StoryMaps. <https://storymaps.arcgis.com/stories/ce933e572c0c451a87c89f2ad3066fde>
- Friedlingstein, P., O'Sullivan, M., Jones, M. W., Andrew, R. M., Gregor, L., Hauck, J., Le Quéré, C., Luijkx, I. T., Olsen, A., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Alkama, R., & Arneeth, A. (2022). Global carbon budget 2022. *Earth System Science Data*, 14(11), 4811–4900. <https://doi.org/10.5194/essd-14-4811-2022>
- Friedlingstein, P., & Solomon, S. (2005). Contributions of past and present human generations to committed warming caused by carbon dioxide. *Proceedings of the*

- National Academy of Sciences*, 102(31), 10832–10836.
<https://doi.org/10.1073/pnas.0504755102>
- Friedrich, J., Ge, M., Pickens, A., & Vigna, L. (2023). *This interactive chart shows changes in the world's top 10 emitters*. World Resources Institute.
<https://www.wri.org/insights/interactive-chart-shows-changes-worlds-top-10-emitters>
- Ge, M., Friedrich, J., & Damassa, T. (2014). *6 graphs explain the world's top 10 emitters*. World Resources Institute. <https://www.wri.org/insights/6-graphs-explain-worlds-top-10-emitters>
- Golo, B.-W. K., & Yaro, J. A. (2013). *Reclaiming stewardship in Ghana religion and climate change*. Harvard.edu. <https://web-p-ebscohost-com.ezp-prod1.hul.harvard.edu/ehost/pdfviewer/pdfviewer?vid=0&sid=0b8be819-15e7-4af7-b3c7-5ee5aca7340e%40redis>
- Hillstrom, K., & Hillstrom, L. C. (2004). *Latin America and the Caribbean: A continental overview of environmental issues*. Internet Archive.
<https://archive.org/details/latinamericacari0000hill/page/274/mode/2up>
- Intergovernmental Panel on Climate Change. (2023). *Climate change 2023: Synthesis report*. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.
<https://doi.org/10.59327/ipcc/ar6-9789291691647>
- Joint Research Centre. (2025, January 31). *G20 climate strategies insufficient to meet Paris Agreement goals*. EU Science Hub. https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/g20-climate-strategies-insufficient-meet-paris-agreement-goals-2025-01-31_en
- Jules, J., Paul, B., Adam, M., & Andrieu, N. (2023). Co-conception avec les producteurs de stratégies d'adaptation au changement climatique : Le cas des exploitations agricoles en Haïti. *Cahiers Agricultures*, 32, 27.
<https://doi.org/10.1051/cagri/2023020>
- Kamau, M. W. (2010). *Perceptions of climate change, adaptation and the policy process within the Forestry Commission of Great Britain: A comparative study of England, Scotland and Wales*. University of Twente Student Theses.
<https://purl.utwente.nl/essays/90747>
- Kemp, S. (2023, February 14). *Digital 2023: Haiti*. DataReportal – Global Digital Insights. <https://datareportal.com/reports/digital-2023-haiti>
- Kuta, S. (2024, December 15). *Regions of the world, ranked by tourism growth*. Far & Wide. <https://www.farandwide.com/s/tourism-growth-regions-world-b286d5c323db4aee>

- Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C.-Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change*, 5, 1014–1020. <https://www-nature-com.ezp-prod1.hul.harvard.edu/articles/nclimate2728.pdf>
- Lindsey, R., & Dahlman, L. (2024, January 18). Climate change: Global temperature. NOAA Climate.gov. <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>
- Mertz, O., Halsnæs, K., Olesen, J. E., & Rasmussen, K. (2009). Adaptation to climate change in developing countries. *Environmental Management*, 43(5), 743–752. <https://doi.org/10.1007/s00267-008-9259-3>
- Morecroft, M. D., Duffield, S., Harley, M., Pearce-Higgins, J. W., Stevens, N., Watts, O., & Whitaker, J. (2019). Measuring the success of climate change adaptation and mitigation in terrestrial ecosystems. *Science*, 366(6471), eaaw9256. <https://doi.org/10.1126/science.aaw9256>
- NASA. (2024, October 23). *Evidence*. NASA Science. <https://science.nasa.gov/climate-change/evidence/>
- Nelson, L. K., Cullen, A. C., Koehn, L. E., Harper, S., Runebaum, J., Bogeberg, M., Strawn, A., & Levin, P. S. (2023). Understanding perceptions of climate vulnerability to inform more effective adaptation in coastal communities. *PLOS Climate*, 2(2), Article e0000103. <https://doi.org/10.1371/journal.pclm.0000103>
- Nurse, L. A., Agard, J., Briguglio, L., Duvat-Magnan, V., Pelesikoti, N., Tompkins, E., Webb, A., Campbell, J., Chadee, D., Maharaj, S., Morin, V., Van Oldenborgh, J., Payet, R., Scott, D., Spencer, T., Yasuhara, K., Barros, V. R., Field, C. B., Dokken, D. J., & Mastrandrea, M. D. (2014). *Small islands*. In *Climate change 2014: Impacts, adaptation, and vulnerability*. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap29_FINAL.pdf
- OECD. (2024, November). *Progress in national climate policy efforts remains insufficient to achieve 2030 targets*. OECD. <https://www.oecd.org/en/about/news/press-releases/2024/11/progress-in-national-climate-policy-efforts-remains-insufficient-to-achieve-2030-targets.html>
- Oreskes, N. (2004). The scientific consensus on climate change. *Science*, 306(5702), 1686. <https://doi.org/10.1126/science.1103618>
- Potter, R. B., Barker, D., Klak, T., & Conway, D. (2015). *The contemporary Caribbean*. Routledge. <https://doi.org/10.4324/9781315838144>
- Rotman, A.-L. (2015). *Global warming between reality, approach and acceptance*. Harvard Library. https://hollis.harvard.edu/primo-explore/fulldisplay?docid=TN_cdi_webofscience_primary_000416377000004Cit

ationCount&context=PC&vid=HVD2&lang=en_US&search_scope=everything&adaptor=primo_central_multiple_fe&tab=everything&query=any

- Rubenstein, M. (2012, February 1). *Climate change in Haiti*. State of the Planet. <https://news.climate.columbia.edu/2012/02/01/climate-change-in-haiti/>
- Scott, D., Simpson, M. C., & Sim, R. (2012). The vulnerability of Caribbean coastal tourism to scenarios of climate change related sea level rise. *Journal of Sustainable Tourism*, 20(6), 883–898. <https://doi.org/10.1080/09669582.2012.699063>
- Stagnum, A. E., Andenæs, E., Kvande, T., & Lohne, J. (2020). Climate change adaptation measures for buildings: A scoping review. *Sustainability*, 12(5), 1721. <https://doi.org/10.3390/su12051721>
- Suhaeb, F. W., Sopian Tamrin, & Jumadi. (2024). *Community adaptation strategies to climate change: Towards sustainable social development*. Migration Letters. https://www.researchgate.net/publication/378860625_Community_Adaptation_Strategies_To_Climate_Change_Towards_Sustainable_Social_Development
- Tiepolo, M., Pezzoli, A., & Tarchiani, V. (2017). *Renewing local planning to face climate change in the tropics*. Springer. <https://doi.org/10.1007/978-3-319-59096-7>
- U.S. Environmental Protection Agency. (2025, January 22). *Impacts of climate change*. U.S. Environmental Protection Agency. <https://www.epa.gov/climatechange-science/impacts-climate-change>
- UNDP. (2023, November 30). *Haiti*. UNDP Climate Promise. <https://climatepromise.undp.org/what-we-do/where-we-work/haiti>
- UNEP. (2023, October 1). *Climate change / Haiti: Interactive country fiches*. UNEP GRID-Geneva. <https://dicf.unepgrid.ch/haiti/climate-change>
- United Nations. (2015). *Paris Agreement*. https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- United Nations Economic Commission for Latin America and the Caribbean. (2024, January 5). *Caribbean outlook: Considering a Caribbean emissions trading scheme*. CEPAL. <https://repositorio.cepal.org/server/api/core/bitstreams/a1edf1e3-825d-4428-956d-f594b4a07c36/content>
- United Nations Environment Programme. (2018). *Weathering the storm: Powerful lessons from the Caribbean*. UNEP. <https://www.unep.org/news-and-stories/story/weathering-storm-powerful-lessons-caribbean>

- Venkataramanan, M., & Smitha. (2011). Causes and effects of global warming. *Indian Journal of Science and Technology*. <https://indjst.org/articles/causes-and-effects-of-global-warming>
- Wallnoefer, L. M., & Riefler, P. (2022). Concepts describing and assessing individuals' environmental sustainability: An integrative review and taxonomy. *Frontiers in Psychology*, 12, Article 770470. <https://doi.org/10.3389/fpsyg.2021.770470>
- Wolf, J., & Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, 2(4), 547–569. <https://doi.org/10.1002/wcc.120>
- World Bank. (2021). *Haiti: Vulnerability*. World Bank Climate Change Knowledge Portal. <https://climateknowledgeportal.worldbank.org/country/haiti/vulnerability>
- Yawson, D. O., Boateng, G. O., Payne, K., Joyette, A., & Armah, F. A. (2024). Attribution of environmental outcomes to climate change: Perceptions of coastal communities in the Caribbean. *Environmental Development*, 52, 101088. <https://doi.org/10.1016/j.envdev.2024.101088>