Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

The Role of Local Communication and Perception in Understanding Vulnerability to Climate Change

Antonio Fabela Regis Jr

cc21resch16001@iith.ac.in

Department of Climate Change, Indian Institute of Technology Hyderabad https://orcid.org/0000-0002-7932-4221

Research Article

Keywords: climate communication, social perception, awareness, concern, vulnerability

Posted Date: April 1st, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9277955/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Abstract

This study explores how local communication networks and community perceptions shape vulnerability to climate change for small island communities. Using a mixed-methods design with 146 face-to-face and digital surveys and five key informant interviews, four dimensions were evaluated: (1) awareness, concern, and self-rated knowledge of climate change; (2) awareness and direct experience to fourteen specific climate impacts; (3) information channels, including digital media, traditional outlets, and interpersonal networks; and (4) perceived causes, responsibilities, and adaptation strategies. Results show high overall awareness (94%) and concern (86%), but variable personal knowledge, wherein younger adults and women report greater understanding about climate change. Impacts like heatwaves and flooding, which were highly visible and immediate, exhibited strong awareness–experience correlations ($r \geq 0.43$), as compared to the slow-onset hazards such as sea level rise and saltwater intrusion, which were less directly experienced despite high awareness. Digital platforms (social media, Internet news) and community-based channels (community meetings, local NGOs, word-of-mouth) each reach distinct demographic segments, with local storytelling and village assemblies proving effective at contextualizing gradual changes. Qualitative responses underscore the importance of integrating traditional ecological knowledge with scientific data to foster actionable understanding. Stakeholders agree that government leadership (88% support) must be bolstered by private sector innovation and NGO facilitation, while individuals emphasize grassroots education and enforcement of environmental laws. The findings demonstrate that leveraging trusted local channels to align messages with lived experience is critical for accurate risk perception and collective adaptation. This integrated communication-perception approach offers a scalable model for enhancing climate resilience in similarly vulnerable small-island communities.

Introduction

Small island communities are among the most vulnerable regions to the impacts of climate change due to their unique geographic, ecological, and socio-economic characteristics, as well as very limited resources. These islands often experience more severe consequences from rising sea levels, increased frequency and intensity of tropical storms, coastal erosion, and saltwater intrusion in freshwater sources (Hay et al. 2013, Hernández-Delgado 2015, Kuruppu & Willie 2015, Lazrus 2012). The limited land area and resources, and high population densities in some regions exacerbate the challenges of adapting to these changes, making small islands highly susceptible to climate-related displacement and economic instability (Betzold 2015, Robinson 2019, Wong 2011). Additionally, fragile ecosystems of small islands, such as coral reefs and mangroves, are particularly at risk, threatening biodiversity, fisheries, and tourism —key economic sectors for many island nations (Cartwright 2019, Hernández-Delgado 2015, Leal Filho et al. 2021).

The Philippines is an archipelagic country in Southeast Asia. It considered to be one of the most disaster-prone areas in the world, facing frequent typhoons from the Pacific Ocean, earthquakes, and volcanic activity due to its location along the Pacific Ring of Fire (Kurata et al. 2023, Vicario-Merino et al.

2019). Eventually, climate change has intensified these natural hazards, producing more destructive storms, increased flooding, unstable coastal areas, a shortage of clean and potable water, prolonged droughts, and loss of biodiversity, to name a few. For the small islands in the Philippines, these changes threaten their physical environment and local communities' livelihoods and cultural heritage. Many of these islands rely heavily on agriculture and fisheries, which are highly sensitive to climatic shifts. Rising sea levels also directly threaten low-lying islands, where coastal erosion, saltwater intrusion, and habitat loss are becoming increasingly common.

Siargao Islands, or collectively known as the Siargao Island Protected Landscape and Seascape (SIPLAS), in the Philippines is known for its biodiversity, including coral reefs, mangroves, and unique terrestrial ecosystems. Due to its ecological importance, it has been declared as part of the National Integrated Protected Areas System (NIPAS). Yet, the island faces several climate-related threats, including typhoons, flooding, and coastal erosion. The vulnerability of island communities like SIPLAS is exacerbated by the lack of sufficient infrastructure, resources, and education on climate risks, which can prevent effective adaptation (Duvat et al. 2017, Kuruppu & Willie 2015). Many communities on the island, particularly those in low-lying coastal areas, are already feeling the effects of these changes, with notable damage to livelihoods, such as loss of fisheries and agriculture. Understanding how these communities perceive and communicate these risks locally is essential to formulating targeted and effective climate adaptation policies.

Vulnerability to climate change is not solely a function of environmental conditions; it is shaped by social factors such as wealth, education, and access to information (Li et al. 2023, Thomas et al. 2019). Studies from the Pacific Islands (Hernández-Delgado 2015, Weir et al. 2017) and Caribbean communities (Shelton et al. 2024, Siegel et al. 2019) highlight how social vulnerability can exacerbate environmental risks. In these regions, people's perceptions of climate change often influence their willingness and ability to adapt to climate change. With its relatively low-income population, limited access to formal climate education, and reliance on traditional knowledge, SIPLAS provides an important case study of how such factors can impact vulnerability.

Local communication systems are integral to the way climate risks are conveyed within communities. Such systems, including traditional media and interpersonal communication, have been shown to increase resilience by spreading knowledge of early warning systems and adaptation strategies in coastal communities (Ling et al. 2022, Saldívar-Lucio et al. 2021). Similarly, traditional knowledge-sharing methods, such as storytelling and public meetings, have proven to be effective in educating communities about climate change and fostering collective action (Ensor & Harvey 2015, Hosen et al. 2020). SIPLAS' reliance on community-based communication methods like word-of-mouth, local radio, and barangay (village) meetings provides an opportunity to leverage these informal networks for climate change education and awareness.

Effective climate change communication is critical to successful adaptation. Leiserowitz et al. (2018) demonstrated that communities with higher climate change awareness and understanding levels are

more likely to engage in proactive adaptation measures. This research will examine how local leaders, community groups, and local media in SIPLAS contribute to disseminating information about climate risks. Given the relatively low levels of formal education in rural areas, informal networks such as family groups, community gatherings, and religious institutions may play an outsized role in shaping local perceptions of climate change. The research will assess the capacity of these networks to translate climate risks into actionable knowledge that empowers communities to make informed decisions.

This study draws from social-ecological systems theory, which recognizes the interdependence of social and ecological systems (Nel et al. 2021, Kurniawan et al. 2019). This framework is especially relevant to island communities like in SIPLAS, where the environment is closely tied to the community's identity and survival. According to the resilience theory, the capacity of a community to respond to environmental changes is not only dependent on external factors such as government policies or financial support but also on internal factors such as local knowledge, community cohesion, and communication strategies (Folke et al. 2016). By applying this framework, the study explored how SIPLAS' communities use local communication systems to understand and mitigate climate risks and how perceptions of vulnerability can foster or hinder adaptation efforts.

This paper aims to contribute to broader global discussions on community-driven approaches to climate adaptation, particularly for small island communities, to enhance resilience when combined with external support (Shackleton et al. 2015). This research provides insights into how local knowledge and communication can be integrated into formal climate adaptation strategies. Furthermore, it offers recommendations for other island communities facing similar challenges, demonstrating how bottom-up communication and local knowledge systems can enhance climate change resilience in vulnerable regions.

Methods

Study area

SIPLAS is located in the province of Surigao del Norte, within the Caraga Region of the Philippines. It is administratively subdivided into nine municipalities: General Luna, Dapa, Del Carmen, Pilar, San Benito, Burgos, San Isidro, Santa Monica, and Socorro. The island supports diverse coastal and marine ecosystems, including mangrove forests, coral reefs, and seagrass beds, which play key roles in biodiversity conservation, fisheries, and coastal protection, reflecting its environmental significance and ongoing conservation initiatives. SIPLAS anchors its economy on fisheries, agriculture, and an expanding tourism sector, particularly centered in General Luna. Rapid tourism development in recent years has introduced challenges related to sustainability, resource management, and environmental resilience.

For this study, SIPLAS represents an important case study for examining the interrelationship between ecological systems and human development through social communication and perception, making it

highly relevant for interdisciplinary research focused on environmental management, sustainable development, and climate adaptation in the country, as well as for island communities.

Community entry protocol and survey roll-out

Community entry protocol and survey roll-out
A community entry protocol was done 5 days prior to the scheduled interview. Introductory letters containing information about the study, the investigators, and the survey procedure were sent to the local government units and the PAMB-SIPLAS office for information and authorization. Short meetings were also held during the introduction with the respective offices to ensure the research team's safety and the survey's transparency. From January 8–12, 2024, the survey and key informant interviews were rolled out only in areas where the LGUs granted permission and authorization: General Luna, Dapa, Del Carmen, and San Isidro.

Field Survey Interview

Digital and paper survey interviews were administered among the respondents. The interviews were carried out after a proper contextual introduction to inform the participants of the study's purpose for their consent and willingness to participate, as well as to avoid any conflict of interest and infringement of privacy. By administering the questionnaires face-to-face, researchers could clarify respondents' doubts, ensuring that the responses were complete and accurate. This method also allowed for more personal interaction, which led to more honest and reflective answers from participants. The in-person administration helped mitigate potential biases that might arise from misunderstandings or misinterpretations of the questions. The survey questionnaires (Appendix 1) had two versions, English and Bisaya (local dialect); however, for more specific respondents, field associates also translated the questions and responses into Surigaonon, the vernacular mostly used by the local community. All the data from the paper survey was transcribed into Google Forms to unify the results alongside the digital survey results. Five Key Informant Interviews (KII) were also conducted following the survey questionnaires to further the documentation on a general overview based on experienced and qualified respondents from the local government, NGO, and business associations.

The study employed a qualitative research design, focusing on interviews to gather and analyze data on climate change perceptions among representatives from different demographics in SIPLAS. Random survey interviews (n = 146) were conducted to capture a representative cross-section of the population, including a wide range of socio-demographic characteristics: gender, age, civil status, education, employment, and income. This was crucial for understanding the diversity of different segments of the population and their perception, awareness, knowledge, and experience of climate change and its impacts.

The study used standardized questionnaires meticulously designed to determine awareness, concern, knowledge, and opinion about climate change and the community's general perception and experience, summarized in Table 1 (the different dimensions used in the study). First, awareness, personal knowledge, and, concern measured by three items that assess whether respondents have heard of climate change, their self-rated depth of understanding, and the intensity of their concern. Second, awareness and experience of climate impacts are explored through three sub-scales: a fourteen-item checklist of known climate impacts (e.g., drought, sea-level rise, coastal erosion), a parallel fourteen-item checklist of personally experienced impacts, and an eight-item impact perception scale that probes expectations of future harm to self, family, livelihood, health, environment, economy, and peace and order, as well as open-ended observations of local changes. Third, communication channels and information sources are captured across sixteen possible mediums—ranging from traditional outlets like newspapers, television, and radio to digital platforms (Internet, Facebook, YouTube, Twitter, LinkedIn, TikTok, WhatsApp) and interpersonal or institutional sources (family and friends, co-workers, school, NGOs, government announcements, and other outlets)—to map how individuals learn about climate issues. Fourth, community perceptions are assessed via two interlinked sets of questions: a four-item climate change perception scale exploring whether respondents view climate change as a problem, believe it is human-caused, can be resolved, and attribute specific causal factors; and an eleven-item responsibility and governance section that asks which stakeholders (government, private companies, individuals, business owners, NGOs) are responsible, whether climate change should be a government priority, awareness and effectiveness of local policies, belief in nature-based protection, and recommendations for action in their own words. This comprehensive approach ensured that the data collected was detailed and multifaceted, providing a holistic view of climate change perceptions (Fig. 3).

Table 1
Climate Change Perception Framework: Four core components measured by 70-item questionnaire, integrating cognitive (knowledge), affective (concern), experiential (impacts), and behavioral (responsibility) dimensions of climate perceptions.

Component	Sub-components	No. of questions	Key Content
1. Awareness, Knowledge, Concern	-	**3**	Heard of climate change, self-rated understanding, personal concern level
2. Climate Impacts	Known impacts (14) Experienced impacts (14) Future expectations (8)	**36**	Drought, sea-level rise, erosion; personal experience; expected harm to self/family/livelihood
3. Communication Sources	Traditional (3) Digital (8) Interpersonal (5)	**16**	Newspapers/TV/radio; social media; family/NGOs/government
4. Perceptions & Responsibility	Climate perception (4) Governance (11)	**15**	Problem/causation/solvability; stakeholder responsibility, policy effectiveness, NbS belief
TOTAL		**70 items**	Comprehensive coverage of awareness → impacts → sources → attitudes

Data analysis

The data analysis for the study was primarily carried out using Google Forms and MS Excel for replicability and transparency. The responses were converted into numerical values and were analyzed in Excel using descriptive statistics and Pearson Correlation to identify consensus and correlations. The analysis focused on understanding how socio-demographic characteristics influenced perceptions of climate change, applying descriptive statistics and correlation analysis. The study also examined the role of media communication, personal values, and psychological factors in shaping these perceptions. The analyses provided valuable insights into the social dimensions of climate change, highlighting the importance of tailored communication and intervention strategies to address climate change effectively.

Results

Climate change awareness, concern, and personal knowledge

The results of the interviews indicated a high level of awareness (94%) and concern (86%) about climate change among the respondents (Fig. 4). The respondents also rated their knowledge about climate change highly, ranging from moderate understanding (3) to very knowledgeable (5), suggesting that the respondents were not only aware and concerned, but also knowledgeable about climate change and its impacts on the community.

Personal knowledge about climate change showed respondents' moderate to high level of personal knowledge and strong understanding of climate change. Unlike the awareness and concern ratings, the knowledge ratings exhibit greater variability, ranging between 2 and 5, suggesting that while respondents are generally knowledgeable about the topic, there is a broader spectrum of personal knowledge levels compared to their uniform awareness and concern.

The survey analysis conveyed a strong positive correlation between awareness and concern ($r = 0.43$, $p = < 0.001$), signifying that the respondents were aware of climate change and were also likely to be concerned about it. There was a weak positive relationship between awareness and knowledge rating ($r = 0.33$, $p = 0.005$), suggesting that respondents who are aware of climate change tend to rate their knowledge about it higher. There is also a moderate positive correlation between concern and knowledge rating, implying that individuals who are concerned about climate change also tend to rate their knowledge about it higher ($r = 0.53$, $p = < 0.001$),). The p-values indicate that the correlations are statistically significant, all correlations are shown in Appendix 4.

Climate awareness, concern, and knowledge of different demographics

Figure 5 describes the differences in awareness, concern, and knowledge levels for different demographics in the study. The analysis indicated that awareness and concern regarding climate change are consistently high across various demographics, including gender, age, income, employment status, education level, and civil status. These high levels of awareness and concern reflect a widespread recognition of the issue, which is a positive indicator of any efforts aimed at addressing climate change. However, personal knowledge ratings exhibit more variability, with an average rating of approximately 4, suggesting a strong understanding; can discuss in detail and provide examples based on the criteria provided.

Gender, Age and Civil Status

Females showed higher awareness and concern about climate change compared to males, with 74 females aware and 68 concerned, versus 56 males aware and 52 concerned. Females rate their

knowledge predominantly at level 3, while males rate it at level 2. This suggests that females may have greater exposure to environmental issues. Women tend to be more concerned about environmental issues, including climate change, compared to men, attributed to various factors, such as differences in socialization, value systems, and perceived risks (UN Women 2022, Pearson et al.2017).

Younger age groups, particularly those aged 22–35, exhibited the highest awareness (56 individuals) and concern (53 individuals) about climate change, followed by the 16–21 age group. Older age groups, such as those 46–60 and 60+, show lower awareness and concern levels. Personal knowledge ratings are highest among the 22–35 age group, indicating that younger individuals are more engaged and informed, likely due to greater exposure to environmental education and media coverage (Clayton et al. 2023, Milfont et al. 2021, Lee et al. 2020).

Civil status also influenced awareness and knowledge about climate change, shaping climate perception within communities by influencing individuals' social responsibilities, resource access, and risk priorities. Single individuals demonstrated the highest levels of awareness and concern about climate change. Single people may have more autonomy and flexibility in decision-making, allowing them to engage more deeply with issues like environmental sustainability (Scannell & Gifford 2013). They also rate their knowledge highest at level 3, indicating confidence in their understanding. Without the immediate demands of caregiving or family responsibilities, they might have more time and cognitive bandwidth to stay informed, participate in activism, or adopt eco-friendly habits. Additionally, younger adults, who are statistically more likely to be single, are more exposed to climate education, digital media, and peer-driven social movements, reinforcing their environmental engagement (Corner et al. 2015). Single individuals may also perceive climate change as a direct threat to their future lifestyle and economic stability, heightening their concern and motivation for change. Married individuals follow, benefiting from household discussions but facing more time constraints. Married individuals or those with dependents may perceive climate threats more acutely due to concerns for family safety and economic stability, which in turn affects their support for climate adaptation strategies and policies (Lee et al. 2015). Those in relationships or living together show lower awareness and concern, possibly due to differing priorities and shared responsibilities.

Education, Employment and Income

College-educated individuals showed the highest awareness and concern about climate change, followed by high school graduates. Those with vocational or non-formal education also showed notable awareness and concern. Personal knowledge ratings are highest among college-educated individuals, indicating that higher education correlates with greater awareness and understanding of climate change issues. Individuals with higher levels of education were more likely to understand the scientific basis of climate change, recognize its long-term risks, and engage in informed discussions (De Wetering et al. 2022, Sauer et al. 2021). On the other hand, individuals with lower education levels may have a limited or superficial understanding of climate change and its impacts and implications, mainly influenced by

personal experience or media portrayals, and are less likely to be actively concerned or engaged in climate-related behaviors (Thao et al. 2024).

Employed individuals exhibit the highest awareness and concern about climate change, followed by self-employed and students, while retired individuals show the lowest awareness and concern levels. Personal knowledge ratings are highest among employed individuals, suggesting that those actively engaged in the workforce are more likely to be informed about climate change due to workplace initiatives and access to information.

Higher-paying or specialized jobs, often associated with better access to education, provide greater exposure to climate change information, leading to heightened awareness and concern. Conversely, individuals in lower-income or informal jobs may have limited access to educational resources, affecting their understanding of climate issues (Cevik and Jalles 2023, Rezai et al. 2018). Moreover, communities reliant on climate-sensitive industries like ecotourism and fisheries tend to develop a stronger connection to environmental issues due to firsthand impacts (Lachs and Oñate-Casado 2020).

Despite widespread awareness and concern, knowledge about climate change is not uniform across all groups. While some respondents report a strong understanding of climate-related issues, others admit to having only a basic or limited grasp of the topic. The knowledge gap is particularly evident among individuals with lower educational attainment or limited exposure to formal climate education. Another critical aspect of the findings is the role of demographic factors in shaping climate change knowledge. Younger respondents, especially those between 22 and 35 years old, exhibit higher levels of awareness, while older individuals, particularly those above 60 years old, report lower knowledge ratings, possibly due to less exposure to climate-related education earlier in life.

Climate change awareness and experience

Awareness and Experience of Climate Change Impacts

There is a vast difference between awareness and experience of the different impacts of climate change, revealing significant insights into public perception and direct encounters with various environmental phenomena, as shown in Fig. 6. Heatwaves, with a high awareness of 95% and relatively high experience of 60%, indicate that these events are widely recognized and frequently felt by the population. This high level of awareness can be attributed to the immediate and severe health risks posed by extreme temperatures, which are often highlighted in media reports. Similarly, intense rainfall and flooding show high awareness (88% and 85%, respectively) and experience (70% and 65%), reflecting their common occurrence and the substantial damage they cause to infrastructure and communities. These events are often dramatic and disruptive, leading to heightened public consciousness and direct experiences.

Conversely, rising sea levels and saltwater intrusion exhibit moderate to lower awareness and experience. Sea level rise, with 85% awareness but only 45% experience, suggests that while the concept is understood, its gradual nature means fewer people have directly felt its impacts. Saltwater intrusion,

with the lowest awareness (65%) and experience (25%), is likely less recognized due to its specific impact on coastal and agricultural areas, making it less visible to the general population.

The relationship between awareness and experience of climate change impacts

The survey also revealed that individuals who are aware of certain impacts are more likely to report having experienced them. The highest correlations were observed for heatwaves (**r** = 0.52) and flooding (**r** = 0.43), suggesting that these events' frequent and noticeable nature makes them more likely to be both recognized and experienced by individuals (Table 2). Typhoons (**r** = 0.44) and sea level rise (**r** = 0.33) also showed moderate correlations, indicating a reasonable level of consistency between awareness and experience. On the other hand, drought (**r** = 0.15) and storm surge (**r** = 0.26) exhibited lower correlations, implying that awareness of these impacts does not necessarily translate to personal experience. This discrepancy could be attributed to the less immediate or less visible nature of these impacts compared to others. The lowest correlation was observed for fish kills (**r** = 0.08), indicating that these events are less commonly experienced directly by individuals or are less recognized, even if they occur.

The discussion also notes that some impacts, such as sea level rise and saltwater intrusion, have high awareness but lower reported experiences. This could be due to the gradual nature of these impacts, making them less immediately noticeable to individuals. On the contrary, impacts like heatwaves and intense rainfall have high awareness and experience, indicating that these are more immediate and noticeable to the respondents.

Table 2. Summary of correlation values between awareness and experience of the different impacts of climate change. Items highlighted in green means strong correlation, while in red means low.

Climate Change Impacts	Awareness (Mean)	Experience (Mean)	Correlation (*r*-value)
Drought	0.9	0.67	0.15
Heatwaves	0.8	0.67	0.52
Sea level rise	0.88	0.71	0.33
Storm surge	0.91	0.74	0.26
Typhoons	0.93	0.89	0.44
Fish kills	0.77	0.4	0.08
Intense rainfall	0.96	0.93	0.26
Flooding	0.93	0.9	0.43
Landslides caused by rain	0.93	0.65	0.24
Saltwater intrusion	0.68	0.37	0.35
Coastal erosion	0.78	0.51	0.39
Health complications	0.87	0.72	0.29
Migration	0.78	0.43	0.25
Loss of biodiversity	0.84	0.67	0.33

Awareness and Experience in Different Demographics

The results also demonstrated how awareness and experience of climate change impacts are distributed among different demographics, as presented in Fig. 7. Gender-wise, females generally exhibit higher perception scores than males, indicating that women are more likely to believe climate change will affect them, their families, livelihoods, health, environment, economy, and peace and order. This heightened awareness among women could be attributed to their roles in managing household resources and caring for family health, making them more sensitive to environmental changes (Demir et al. 2023, Memon et al. 2022).

Age-wise, younger respondents (22–35 years old) show the highest perception scores, suggesting that they are more aware and concerned about the impacts of climate change due to increased exposure to climate change education and information through digital media (Ayalon and Roy 2020, Lee et al. 2020). In contrast, older respondents (60 + years old) have the lowest perception scores, possibly due to less exposure to climate change information or a perception that the impacts will not significantly affect them within their lifetime. Middle-aged groups (36–45 years old) fall in between, showing moderate levels of awareness and concern.

Respondents with higher education levels (Masters and PhD) and higher income brackets (more than Php 100,000 per month) exhibit the highest perception scores, indicating a strong correlation between education, and income, and their crucial roles in shaping climate change perception and awareness. This trend suggests that higher education and income provide better access to information and resources, leading to greater awareness and concern about climate change impacts (Kinol et al. 2023, Demaidi and Al-Sahili 2021). Employment type further influences perception, with government employees showing the highest awareness, likely due to their involvement in policymaking and implementation.

Communication Channels / Sources of Information

Channels of climate communication in the community

The data from the survey showed diverse patterns in how different demographics access information about climate change (Fig. 8). From the result of the survey interviews, the various sources of information were classified into three categories: Digital (Internet, Facebook, Youtube, Twitter, Linkedin, Tiktok and Whatsapp), Traditional (Television, AM/FM Radio and Newspaper) and Peers (Government, Family & Friends, Co-workers & colleagues, School and Non-Government Orgs).

Different demographics have different sources of information, as shown in Fig. 9. Gender-wise, both males and females predominantly use digital media, particularly social media platforms like Facebook, which are the most used sources. Age-wise, younger individuals (16–21 years old) are more inclined towards digital media and social platforms such as YouTube and TikTok. The 22-35-year-old group also relies heavily on digital media and traditional media. Education and employment status further influence

information sources. College-educated individuals predominantly use digital media and traditional media, while employed individuals show a similar pattern with digital media and traditional media. Higher-income groups access a wider range of information sources, with digital media and traditional media being the most prominent.

Traditional media remains a relevant and trusted source of information about climate change, particularly among females, young adults, college-educated individuals, employed persons, and middle-income groups. Females exhibit the highest engagement, while age-wise, young adults (22–35 years old) are the most frequent users of traditional media, followed by teenagers (16–21 years old) and middle-aged individuals (36–45 years old). Although older adults (46–60 years old and above) also rely on traditional media, their engagement is comparatively lower, indicating a preference for other sources.

Community perception

Impact perception in the community

The study also analyzed whether the respondents perceive climate change affecting their personal life, family, livelihood, health, the environment, the economy, and peace and order. Figure 10 shows the impact perception among the different demographics. The mean climate change perception score analysis reveals notable differences among genders, particularly with females consistently scoring higher across all categories. This indicates a stronger concern among women regarding climate change, especially in terms of Personal and Family. In contrast, males exhibited lower scores, particularly in Health and Peace & Order.

Older individuals (60 + years) consistently demonstrated the highest concern across several categories. This heightened concern among older adults may be attributed to their longer life experiences and greater awareness of environmental changes over time. Younger groups (16–21 years) showed strong concern in personal and ecological areas, but slightly less in economic and peace & order aspects. Middle-aged groups (36–45 years) exhibited moderate concern across all categories, reflecting a balanced awareness of climate change impacts.

Respondents who are in a relationship, married, or living with a partner reported higher scores, particularly for Family and Livelihood, suggesting that individuals with familial responsibilities are more attuned to the potential effects of climate change on their loved ones and livelihoods. In contrast, divorced and separated individuals exhibited lower concern levels, notably in economic and peace & order, possibly due to different priorities and life circumstances.

Educational attainment is strongly correlated with climate change concerns. Respondents with higher education levels (College, Masters, PhD) demonstrated stronger concern for broader issues such as economic and environmental impacts. Conversely, respondents with only elementary or high school education showed lower concern across most categories.Business owners, employed, and self-employed individuals reported higher concern for economic and environmental issues, likely due to their

direct involvement in economic activities and resource management. Higher-income groups reported increased concern about economic and environmental impacts, reflecting their awareness of the broader systemic implications of climate change. Lower-income groups, on the other hand, have higher immediate concerns on Health and Livelihood.

Perceived impacts of climate change in the community

To further understand community perception about climate change, the study visualized in a thought cloud the individual response on the survey question *“What are some notable changes in your surroundings that you think are an impact of climate change?*". As shown in Fig. 11, most of the respondents reported experiencing extreme weather events, such as "frequent flooding" and "stronger typhoons," which have become increasingly common in their regions. These changes are often linked to destroying natural habitats and altering local ecosystems, leading to significant disruptions in daily life. For instance, one respondent noted, "My area is always flooding now, even just with quick bursts of rain," highlighting the immediate threat to homes and livelihoods, particularly in coastal areas. Additionally, the loss of biodiversity is a recurring concern, with individuals mentioning the "destruction of natural habitat on a large scale" and its detrimental effects on the ecological balance, further exacerbating local communities' challenges.

The responses also indicated that weather pattern shifts affect agricultural practices and water supply, resulting in food scarcity and economic strain. One respondent expressed that "changes in weather patterns" have led to "food scarcity," emphasizing the unpredictability of conditions that complicate farming and fishing activities essential for local sustenance.

Perceived causes of climate change

Based on the respondents knowledge, they have also identified a range of human activities and systemic issues as primary contributors to the climate change problem summarized in Fig. 12. Many respondents point to "fossil fuel emissions" and "industrialization" as significant factors driving climate change. One individual noted that "big corporations using single-use plastics" contribute heavily to pollution, while another highlighted the role of "burning fossil fuels" and "deforestation" in exacerbating environmental degradation. This perspective underscores a widespread recognition that corporate practices and industrial activities are harmful to the environment and reflect a broader disregard for sustainable practices. The emphasis on human behavior is evident, with one respondent stating, "Humans do not deserve planet Earth," suggesting a deep frustration with the collective impact of human actions on the planet.

Additionally, the responses indicate that a lack of awareness and education about climate change plays a crucial role in perpetuating the problem. Many individuals express concern over "uninformed communities" and the need for "general education of everyone" regarding climate change and its effects. One respondent emphasized that "individual consciousness of their actions" is essential in addressing the crisis, highlighting the importance of personal responsibility in mitigating climate change. Furthermore, systemic issues such as "capitalism" and "greed" are frequently mentioned as underlying

causes that drive unsustainable practices. A respondent pointed out that "most global warming has been caused by Western countries," indicating a belief that historical and economic factors contribute significantly to the current climate crisis.

Strategies for adaptation to climate change

Strategies and actions that individuals believe are necessary to combat climate change effectively were also highlighted in the study. A common theme among the responses is the need for increased education and awareness about climate issues(Fig. 13). Many respondents emphasize the importance of integrating climate change topics into the education system, with one stating, "Institutionalize climate change topics in the education system as early as kindergarten."

In addition to education, there is a strong call for stricter regulations and enforcement of existing environmental laws. Respondents frequently mentioned the need for "stronger policing and implementation of laws that protect nature," indicating a belief that current regulations are insufficient to address the scale of the climate crisis. One individual noted, "The government should STRICTLY implement laws for the care of nature," reflecting a desire for accountability and action at the governmental level. This sentiment is echoed by others who advocate for penalties and new regulations targeting industries that contribute significantly to pollution and environmental degradation, holding corporations and individuals accountable for their environmental impact.

More importantly, the responses suggested that collective action and community involvement are crucial in addressing climate change. Many individuals express the need for "collaborative efforts" among various stakeholders, including government agencies, NGOs, and local communities. One respondent highlighted the importance of "involving all stakeholders, including community members, private individuals (MSMEs), NGOs, academe, and decision-makers in the climate change talks and interventions." This collaborative approach fosters a sense of shared responsibility and encourages diverse perspectives in developing effective solutions. Additionally, respondents advocate for grassroots initiatives, such as tree planting and waste management programs, to promote environmental conservation at the local level, suggesting that by engaging communities in hands-on activities, individuals can contribute to meaningful change while fostering a sense of ownership over their environment.

Stakeholders and their roles for climate adaptation

The responses reflect a strong awareness of the impacts of climate change, with a consensus on the need for education, government action, and community involvement in mitigation efforts. The causes are primarily linked to human activities and a lack of awareness, while the effects are predominantly related to extreme weather events and biodiversity loss.

The majority of respondents (94%) believed that climate change should be a government priority, as shown in Fig. 14, with a strong sentiment that government entities should take the lead in addressing

climate change. In Table 3, key stakeholders are identified alongside the roles and functions that are perceived to be their responsibilities in addressing the climate change issue in SIPLAS. Many respondents also indicated that private companies and non-governmental organizations (NGOs) should play a role in addressing climate change. In Table 3, key stakeholders are identified alongside the roles and functions that are perceived to be their responsibilities in addressing the climate change issue in SIPLAS. Respondents believed that while the government may lead, collaboration with businesses and NGOs is essential for effective solutions. Figure 14 emphasizes the suggestions from the respondents on the role of every stakeholder, indicating that individuals also have a role to play in combating climate change. This highlights the importance of personal responsibility and community action in addition to governmental and organizational efforts.

Table 3
Summary of the identified key stakeholders in SIPLAS, and their respective roles in addressing climate change, highlighting the collaborative effort needed across different sectors.

Stakeholder	Role/Responsibility	Rationale
Government	Lead in policymaking and regulation	The majority of respondents believe climate change should be a government priority.
Private Companies	Innovate and implement sustainable practices	Essential for developing and adopting eco-friendly technologies and practices.
Non-Governmental Organizations (NGOs)	Advocate for change and support community initiatives	Play a crucial role in raising awareness and mobilizing community action.
Individuals	Engage in sustainable practices and support broader efforts	Personal responsibility is vital for collective action against climate change.

Discussion

Climate change awareness, concern, and personal knowledge

The results of the survey interviews in SIPLAS provided critical insights into the public's engagement with climate change, revealing substantial awareness and concern across diverse demographic groups. This widespread acknowledgment of climate change as a pressing issue is an encouraging indicator of public receptivity to environmental discourse (Roper 2012, Owens 2000). The strong positive correlation between awareness and concern suggests that as individuals become more informed about climate change, their level of concern increases accordingly (Bergquist and Warshaw 2019, Yilmaz and Can 2019). However, the moderate correlation between awareness and knowledge ratings indicates that familiarity with climate change does not necessarily equate to a comprehensive understanding of the topic. While many respondents are aware of climate change in a general sense, their depth of knowledge varies considerably. This disparity in understanding has significant implications for the effectiveness of

climate communication and policy engagement. It highlights the presence of a knowledge gap that may hinder informed decision-making, limit the uptake of adaptive behaviors, and reduce support for evidence-based climate policies (McLoughlin 2021, Ross et al. 2020, Carvalho et al. 2017).

Demographic factors such as education, income, and age have played a pivotal role in shaping climate change knowledge, as demonstrated by individuals with higher levels of education and financial stability reporting greater understanding (Ağırbaş and Saricam 2022, Kabir et al. 2016). This was likely due to greater access to scientific information and exposure to environmental and climate discourse. Conversely, those with lower educational attainment or limited financial resources often lack similar access, which contributes to informational inequities. Age-related trends are also notable; younger respondents, particularly those aged 22 to 35, demonstrate higher knowledge levels, likely reflecting their exposure to climate change education through formal schooling and digital media. In contrast, older adults, especially those over the age of 60, report lower knowledge ratings, suggesting a generational gap rooted in historical educational curricula and media consumption patterns.

Climate change awareness and experience

Respondents demonstrated high awareness of various climate-related risks, such as extreme heat, floods, and intense rainfall, yet their direct experience with these impacts varies. The findings suggested that frequent and immediate climate threats are more likely to be recognized and reported than slow-onset changes such as sea level rise and saltwater intrusion. This difference can be attributed to the nature of the different impacts of climate change. Extreme weather events like typhoons and floods are highly visible and immediate, making them more memorable and easier to identify. On the other hand, gradual environmental changes such as rising sea levels and coastal erosion occur over longer periods, making them less noticeable to individuals who do not actively monitor them. The lower correlation between awareness and experience for these slower processes suggests that while people might conceptually understand them, they may not fully grasp the urgency of their long-term effects.

Additionally, the study reveals that demographic factors influence how individuals perceive and experience climate change. Residents of coastal areas and low-lying islands are more likely to report experiencing saltwater intrusion and coastal erosion. In contrast, those living inland are more concerned with extreme heat and drought. Similarly, individuals working in climate-sensitive industries such as agriculture and fisheries report greater exposure to climate change impacts compared to those in urban settings.

Communication Channels / Sources of Information

Access to multiple sources of information, particularly the internet, newspapers, and social media, is linked to higher awareness and reporting of climate change impacts. Information from the internet, television, government announcements, and non-governmental organizations (NGOs) was observed to be the main channels for climate change-related information. The study identified the Internet as the dominant source of information, with many respondents relying on digital platforms such as social

media, news websites, and online reports for climate updates. Younger individuals, in particular, preferred digital sources, whereas older respondents are more likely to rely on television, radio, and newspapers. In SIPLAS, while digital communication is powerful, traditional media and community-based discussions remain essential for engaging populations with limited internet access, considering that most of the island has only gained access to internet services in recent years.

The digital divide remains a significant factor in SIPLAS, where internet infrastructure has only recently become widely available. While digital communication has the potential to transform climate change awareness and education, traditional media and localization, community-based discussions continue to play a critical role. These methods are essential for reaching remote areas and individuals with limited or no access to digital tools. Public meetings, radio broadcasts, and announcements through community leaders or NGOs are particularly effective in such settings, ensuring that climate information is accessible, contextually relevant, and actionable.

Community perception

The perceived impacts of climate change within the community are multifaceted, with many respondents reporting extreme weather events such as frequent flooding and stronger typhoons. These changes are often linked to destroying natural habitats and altering local ecosystems, leading to significant disruptions in daily life. Additionally, the loss of biodiversity is a recurring concern, particularly large-scale destruction of natural habitats and their detrimental effects on the ecological balance, further exacerbating the challenges faced by local communities. Shifts in weather patterns were also observed to affect agricultural practices and water supply, which were perceived to drive food scarcity and economic strain, as unpredictable conditions complicate farming and fishing activities essential for local sustenance.

In terms of perceived causes of climate change, respondents identified a range of human activities and systemic issues as primary contributors (Appendix 6). Many pointed to fossil fuel emissions and industrialization as significant factors driving climate change. The role of big corporations using single-use plastics, the burning of fossil fuels, and deforestation was also highlighted as exacerbating environmental degradation. This perspective underscores a widespread recognition that corporate practices and industrial activities are harmful to the environment and reflect a broader disregard for sustainable practices. Additionally, the responses indicate that a lack of awareness and education about climate change plays a crucial role in perpetuating the problem. Many individuals expressed concern over uninformed communities and the need for general education regarding climate change and its effects. Furthermore, systemic issues such as capitalism and greed were frequently mentioned as underlying causes that drive unsustainable practices, with some respondents pointing out that most global warming has been caused by Western countries, indicating a belief that historical and economic factors contribute significantly to the current climate crisis.

The respondents also emphasized that governments should lead in addressing climate change through policymaking, regulation, and enforcement, while also recognizing the roles of businesses, individuals,

and NGOs, underscoring the need for collective action. Strengthening partnerships between governments, private companies, and communities is crucial for comprehensive climate resilience. Education and awareness, particularly for younger generations, are essential components of this effort.

Conclusion

This paper describes the important role of local communication and perception in understanding and addressing vulnerability to climate change, which is no longer just peripheral but central to understanding and addressing climate vulnerability for small island communities, as with the case for SIPLAS. The study observed high levels of awareness and concern about climate change among the respondents, yet knowledge levels vary significantly across different demographics. It also indicated that perceptions of climate change in SIPLAS vary across age, gender, education, and income, which influence both the level of concern and the capacity to act. It was also observed how perception, shaped by personal experiences, socio-demographic identity, and cultural context, determined how individuals understand their vulnerability and respond to climate threats. These perceptions are not just reflections of reality but also drivers of behavioral change, affecting community mobilization, support for policy interventions, and uptake of adaptation strategies.

The findings also delved into local communication channels, recognizing that the value of both knowledge and lived experience strengthens climate resilience in the community. The study described the integral role of local communication systems: digital, traditional, and peer/community-based media in disseminating climate information and fostering collective action in the community. In SIPLAS, effective climate change communication is essential for successful adaptation, as communities with higher levels of awareness and understanding are more likely to engage in proactive measures. Local communication channels are not merely passive information relays—they actively shape how communities perceive and prioritize risks.

Lastly, the study identified different stakeholders and their roles in climate adaptation in the community. The respondents believed that the government has the most essential responsibility for climate governance, considering its ability to implement and enforce policies and actions within its jurisdiction. People also believe that in support of the government’s initiatives, only through cooperation among the different stakeholders can true sustainable development be achieved.

Recommendations

Climate adaptation efforts for SIPLAS should prioritize inclusive, multi-channel communication strategies to bridge the gap between scientific knowledge and local understanding. Communication campaigns should be tailored to different demographics, particularly focusing on older adults, individuals with lower educational attainment, and economically marginalized groups, who exhibit lower levels of climate knowledge despite high concern. Leveraging traditional media (radio, community announcements) alongside digital platforms (social media, online videos) ensures broader reach,

especially in remote or underserved areas. Local communication must be participatory and culturally resonant, incorporating indigenous languages and storytelling practices that reflect community values and traditions. Capacity-building programs should also be embedded within local governance structures and educational systems, institutionalizing climate literacy through formal curricula and informal community workshops from early childhood to adulthood.

In parallel, climate change adaptation strategies must actively integrate local perceptions and traditional ecological knowledge into policymaking and program implementation. Community members possess intimate, place-based knowledge of environmental changes, such as shifting weather patterns, declining biodiversity, or coastal degradation, which can enrich scientific assessments and improve the contextual accuracy of adaptation plans. To facilitate this, stakeholder collaboration should be strengthened through participatory planning processes that empower local leaders, women, youth, and marginalized groups to voice their perspectives.

Declarations

Ethics Declaration

Due to the sensitivity of the issues discussed, responses to all questions were not made mandatory, and respondents were given the freedom to respond only when they were comfortable. Respondents were also given the opportunity to ask questions. The survey and research procedures were reviewed and approved by the Institutional Ethics Committee at the Indian Institute of Technology Hyderabad.

Supplementary data

The data that support the findings of this study are available in the supporting information of this article. Additional data is available from the corresponding author upon reasonable request.

References

1. Ağırbaş, N., & Saricam, S. (2022). An examination of the state of awareness of the problem of climate change in Turkey for those living in cities: The case of Eskişehir Province. Integrated Environmental Assessment and Management, 19. https://doi.org/10.1002/ieam.4664.
2. Ayalon, L., & Roy, S. (2023). The Perceived Contribution of Older People to Climate Change Impact, Mitigation, and Adaptation: Measurement Development and Validation. Innovation in Aging, 7. https://doi.org/10.1093/geroni/igad095.
3. Bergquist, P., & Warshaw, C. (2019). Does Global Warming Increase Public Concern about Climate Change?. The Journal of Politics, 81, 686 - 691. https://doi.org/10.1086/701766.
4. Carvalho, A., Van Wessel, M., & Maeseele, P. (2017). Communication Practices and Political Engagement with Climate Change: A Research Agenda. Environmental Communication, 11, 122 -

135. https://doi.org/10.1080/17524032.2016.1241815.

5. Cevik, S., & Jalles, J. (2023). For whom the bell tolls: Climate change and income inequality. *Energy Policy*. https://doi.org/10.1016/j.enpol.2023.113475.
6. Clayton, S., Pihkala, P., Wray, B., & Marks, E. (2023). Psychological and Emotional Responses to Climate Change among Young People Worldwide: Differences Associated with Gender, Age, and Country. Sustainability. https://doi.org/10.3390/su15043540.
7. Corner, A., Roberts, O., Chiari, S., Völler, S., Mayrhuber, E. S., Mandl, S., & Monson, K. (2015). How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators. Wiley Interdisciplinary Reviews: Climate Change, 6(5), 523–534. https://doi.org/10.1002/wcc.353
8. Demaidi, M., & Al-Sahili, K. (2021). Integrating SDGs in Higher Education—Case of Climate Change Awareness and Gender Equality in a Developing Country According to RMEI-TARGET Strategy. Sustainability, 13, 3101. https://doi.org/10.3390/SU13063101.
9. Demir, R., Yalazı, R., & Dinç, A. (2023). The relationship between women's climate change awareness and concerns about climate change in Turkiye.. Public health nursing. https://doi.org/10.1111/phn.13269.
10. Hay, J. E., Forbes, D. L., & Mimura, N. (2013). Understanding and managing global change in small islands. *Sustainability Science*, *8*(3), 303–308. https://doi.org/10.1007/s11625-013-0220-x
11. Hernández-Delgado, E. A. (2015). The emerging threats of climate change on tropical coastal ecosystem services, public health, local economies and livelihood sustainability of small islands: Cumulative impacts and synergies. *Marine Pollution Bulletin*, *101*(1), 5–28. https://doi.org/10.1016/j.marpolbul.2015.09.018
12. Kabir, M., Rahman, M., Smith, W., Lusha, M., Azim, S., & Milton, A. (2016). Knowledge and perception about climate change and human health: findings from a baseline survey among vulnerable communities in Bangladesh. BMC Public Health, 16. https://doi.org/10.1186/s12889-016-2930-3.
13. Kinol, A., Miller, E., Axtell, H., Hirschfeld, I., Leggett, S., Si, Y., & Stephens, J. (2023). Climate justice in higher education: a proposed paradigm shift towards a transformative role for colleges and universities. Climatic Change, 176. https://doi.org/10.1007/s10584-023-03486-4.
14. Kurniawan, F., Adrianto, L., Bengen, D., & Prasetyo, L. (2019). The social-ecological status of small islands: An evaluation of island tourism destination management in Indonesia. Tourism Management Perspectives. https://doi.org/10.1016/J.TMP.2019.04.004
15. Kuruppu, N., & Willie, R. (2015). Barriers to reducing climate enhanced disaster risks in Least Developed Country-Small Islands through anticipatory adaptation. *Weather and Climate Extremes*, *7*, 72–83. https://doi.org/10.1016/j.wace.2014.06.001
16. Lachs, L., Oñate-Casado, J. (2020). Fisheries and Tourism: Social, Economic, and Ecological Trade-offs in Coral Reef Systems. In: Jungblut, S., Liebich, V., Bode-Dalby, M. (eds) YOUMARES 9 - The Oceans: Our Research, Our Future. Springer, Cham. https://doi.org/10.1007/978-3-030-20389-4_13

17. Lazrus, H. (2012). Sea Change: Island Communities and Climate Change. *Annual Review of Anthropology*, *41*(1), 285–301. https://doi.org/10.1146/annurev-anthro-092611-145730
18. Lee, K., Gjersoe, N., O'Neill, S., & Barnett, J. (2020). Youth perceptions of climate change: A narrative synthesis. *Wiley Interdisciplinary Reviews: Climate Change*, 11. https://doi.org/10.1002/wcc.641.
19. Lee, K., Gjersoe, N., O'Neill, S., & Barnett, J. (2020). Youth perceptions of climate change: A narrative synthesis. Wiley Interdisciplinary Reviews: Climate Change, 11. https://doi.org/10.1002/wcc.641.
20. 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(11), 1014–1020. https://doi.org/10.1038/nclimate2728
21.
22. McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. The Sociological Quarterly, 52(2), 155–194. https://doi.org/10.1111/j.1533-8525.2011.01198.x
23. McLoughlin, N. (2021). Communicating efficacy: How the IPCC, scientists, and other communicators can facilitate adaptive responses to climate change without compromising on policy neutrality. Climatic Change, 169. https://doi.org/10.1007/s10584-021-03232-8.
24. Memon, F., Abdullah, F., Iqbal, R., Ahmad, S., Hussain, I., & Abdullah, M. (2022). Addressing women's climate change awareness in Sindh, Pakistan: an empirical study of rural and urban women. Climate and Development, 15, 565 - 577. https://doi.org/10.1080/17565529.2022.2125784.
25. Milfont, T., Zubielevitch, E., Milojev, P., & Sibley, C. (2021). Ten-year panel data confirm generation gap but climate beliefs increase at similar rates across ages. *Nature Communications*, 12. https://doi.org/10.1038/s41467-021-24245-y.
26. Nel, R., Mearns, K., Jordaan, M., & Goethals, P. (2021). Towards understanding the role of islandness in shaping socio-ecological systems on SIDS: The socio-ecological islandscape concept. Ecol. Informatics, 62, 101264. https://doi.org/10.1016/j.ecoinf.2021.101264
27. Owens, S. (2000). 'Engaging the Public': Information and Deliberation in Environmental Policy. Environment and Planning A, 32, 1141 - 1148. https://doi.org/10.1068/a3330.
28. Pearson, A., Ballew, M., Naiman, S., & Schuldt, J. (2017, April 26). Race, Class, Gender and Climate Change Communication. Oxford Research Encyclopedia of Climate Science. Retrieved 21 Apr. 2025, from https://oxfordre.com/climatescience/view/10.1093/acrefore/9780190228620.001.0001/acrefore-9780190228620-e-412.
29. Rezai, A., Taylor, L., & Foley, D. (2018). Economic Growth, Income Distribution, and Climate Change. *Ecological Economics*, 146, 164-172. https://doi.org/10.1016/J.ECOLECON.2017.10.020.
30. Roper, J. (2012). Environmental risk, sustainability discourses, and public relations. Public Relations Inquiry, 1, 69 - 87. https://doi.org/10.1177/2046147X11422147.
31. Ross, A. V., LaRocque, R., Fortinsky, R., & Nicholas, P. (2020). Addressing Climate Change Communication: Effective Engagement of Populations for Climate Action in the US and Globally.

Annals of global health, 86(1), 54. https://doi.org/10.5334/aogh.2900

32. Sauer, K., Capps, D., Jackson, D., & Capps, K. (2021). Six minutes to promote change: People, not facts, alter students' perceptions on climate change. *Ecology and Evolution*, 11, 5790 - 5802. https://doi.org/10.1002/ece3.7553.
33. Scannell, L., & Gifford, R. (2013). Personally relevant climate change: The role of place attachment and local versus global message framing in engagement. Environment and Behavior, 45(1), 60–85. https://doi.org/10.1177/0013916511421196
34. Thao, N., Khoi, D., Van Viet, L., Wellens, J., Lang, M., & Tychon, B. (2024). Comparing local people's perceptions of climate change and drought with scientific observations in the lower Mekong Basin: a case study in Dak Lak province, Vietnam. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-024-05543-z.
35. UN Women 2022. Explainer: How gender inequality and climate change are interconnected. February 28, 2022. Explainer: How gender inequality and climate change are interconnected | UN Women – Headquarters
36. Van De Wetering, J., Leijten, P., Spitzer, J., & Thomaes, S. (2022). Does environmental education benefit environmental outcomes in children and adolescents? A meta-analysis. *Journal of Environmental Psychology*. https://doi.org/10.1016/j.jenvp.2022.101782.
37. Yilmaz, V., & Can, Y. (2019). Impact of knowledge, concern and awareness about global warming and global climatic change on environmental behavior. Environment, Development and Sustainability, 22, 6245 - 6260. https://doi.org/10.1007/s10668-019-00475-5.

Figures

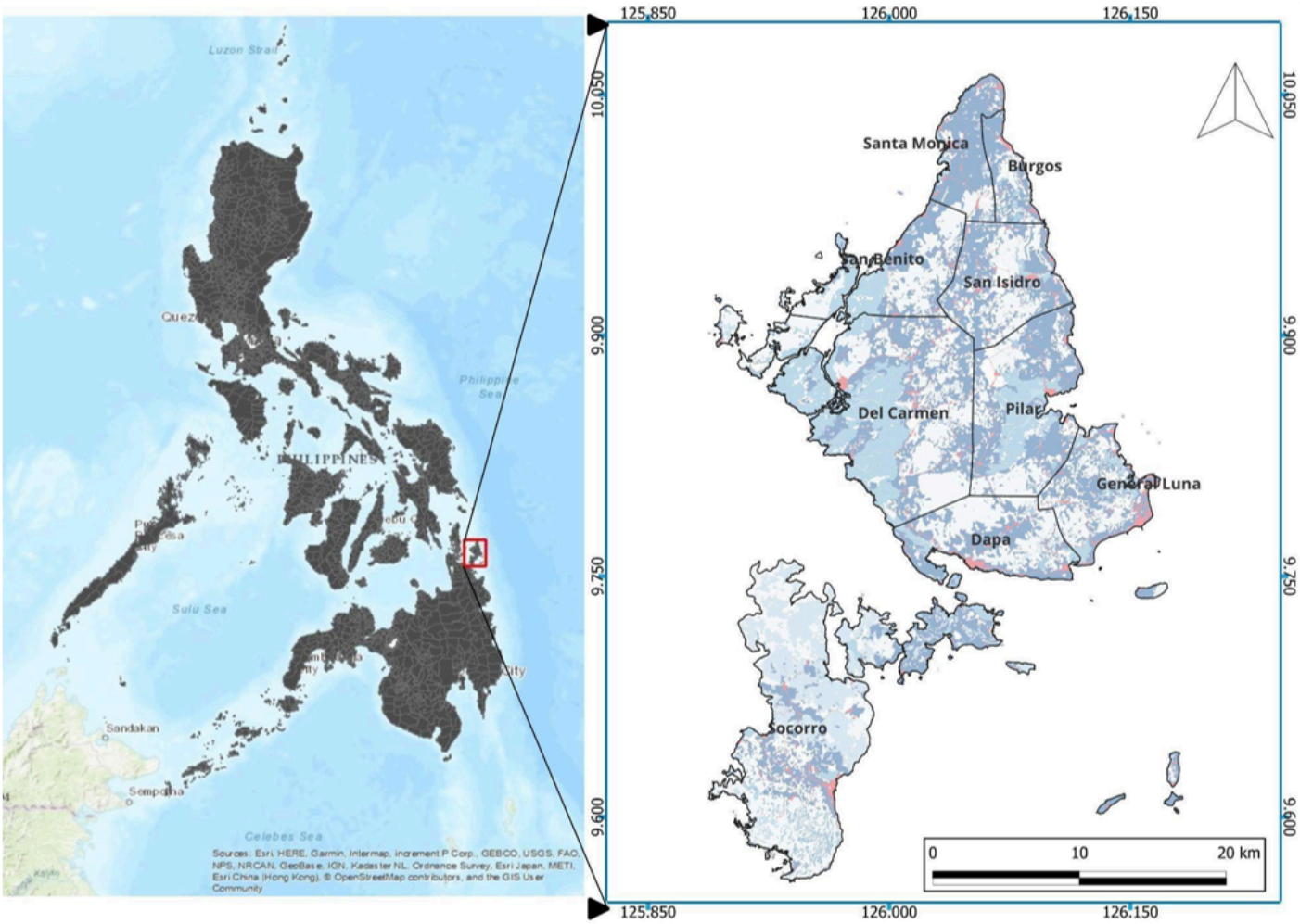


Figure 1

Map location of Siargao Island Protected Landscape and Seascape (SIPLAS) encompassing 9 municipalities (Local Government Units) and the Protected Area Management Board (PAMB) SIPLAS. Study area Survey dates: January 8-12, 2024



Figure 2

Courtesy call with the Municipal Mayor of Del Carmen Hon. Alfredo Coro II and MENRO Gina Barquilla for a Key Informant Interview, and a Community survey interview with the local residents from Pacifico, San Isidro.

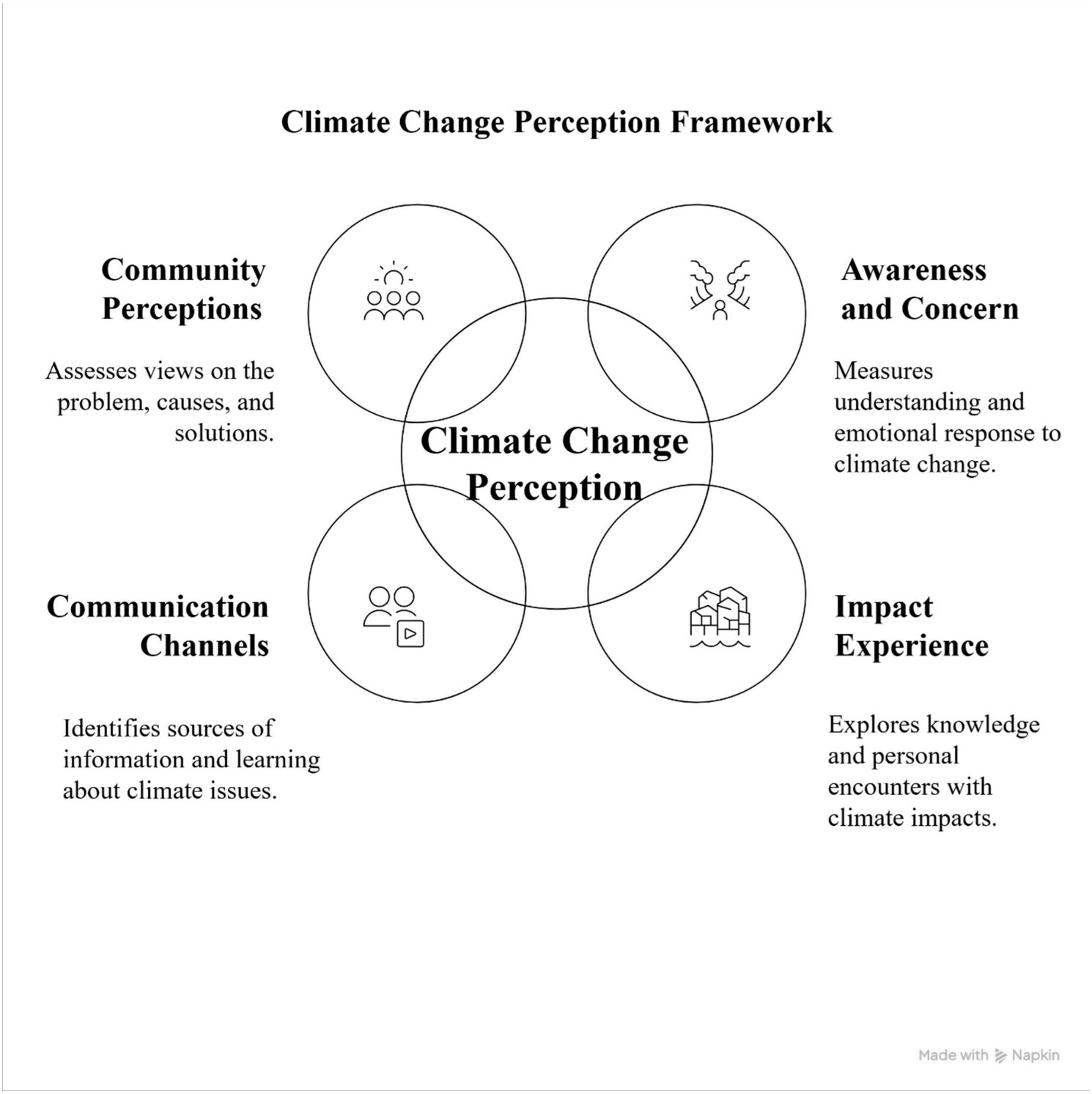


Figure 3

Conceptual model of climate change perception assessment showing four interconnected domains—Awareness & Concern, Community Perceptions, Communication Channels, Impact Experience—around a central "Climate Change Perception", underpinning a 70-item questionnaire used in the study

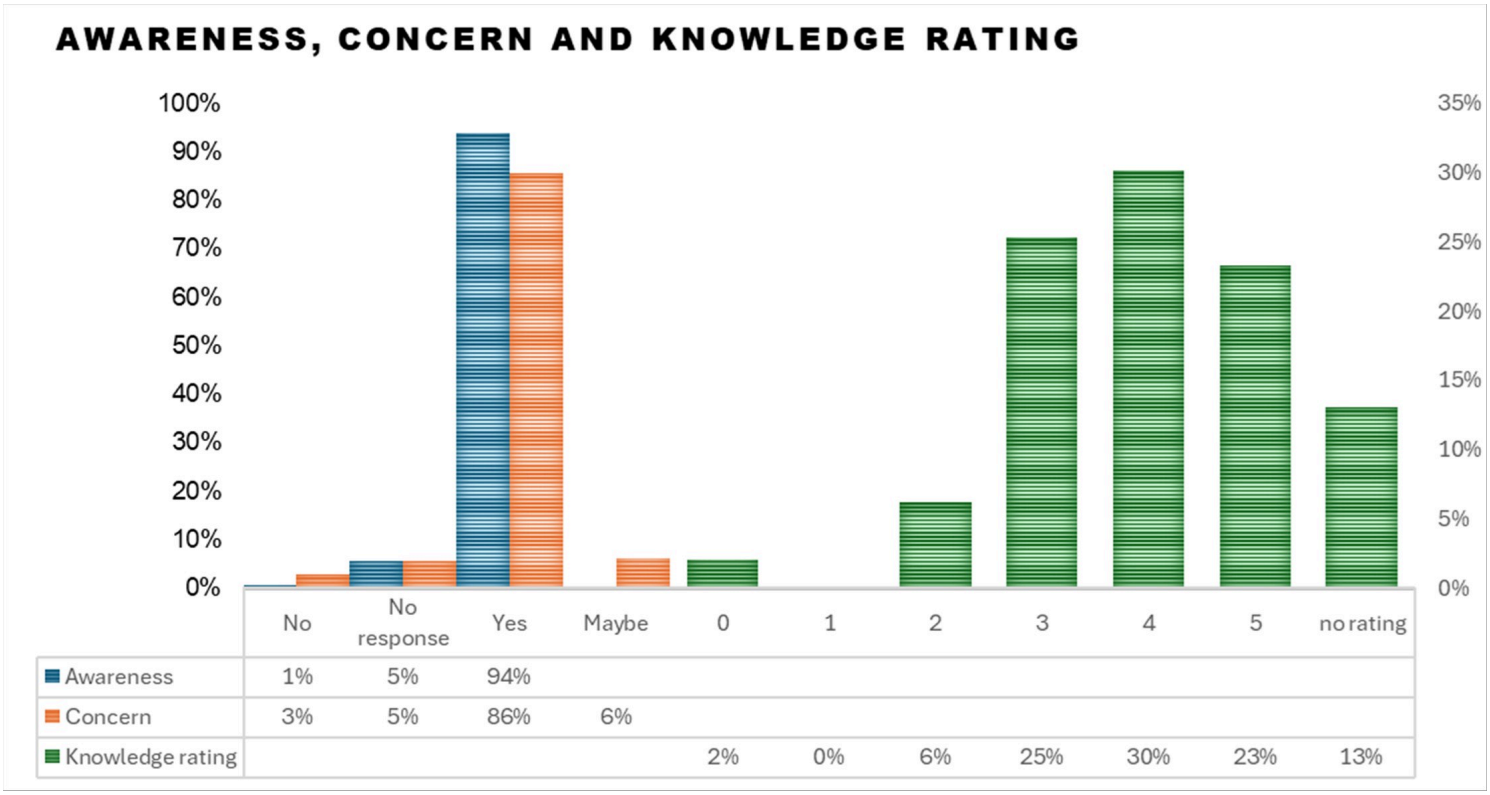


Figure 4

Distribution of awareness, concern, and knowledge ratings among the respondents. Knowledge rating basis: 0 - Never heard of the topic, 1 - Heard of the topic but have little understanding, 2 - Basic understanding of the topic; can identify key concepts, 3 - Moderate understanding; can explain the topic to others, 4 - Strong understanding; can discuss in detail and provide examples, and 5 - Very knowledgeable; expert and able to analyze and critique the topic.

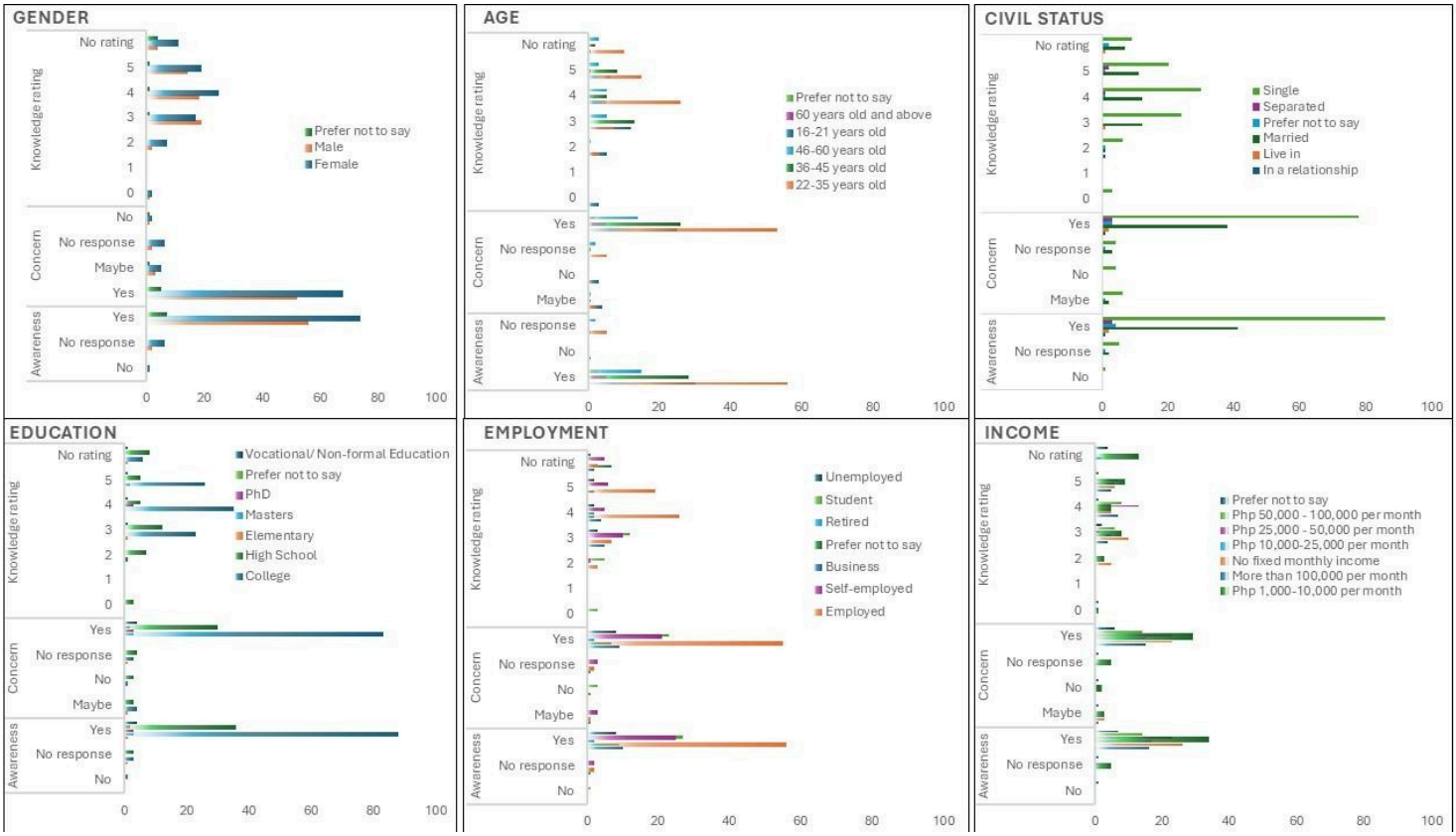


Figure 5

Distribution of awareness, concern, and knowledge levels in different demographics.

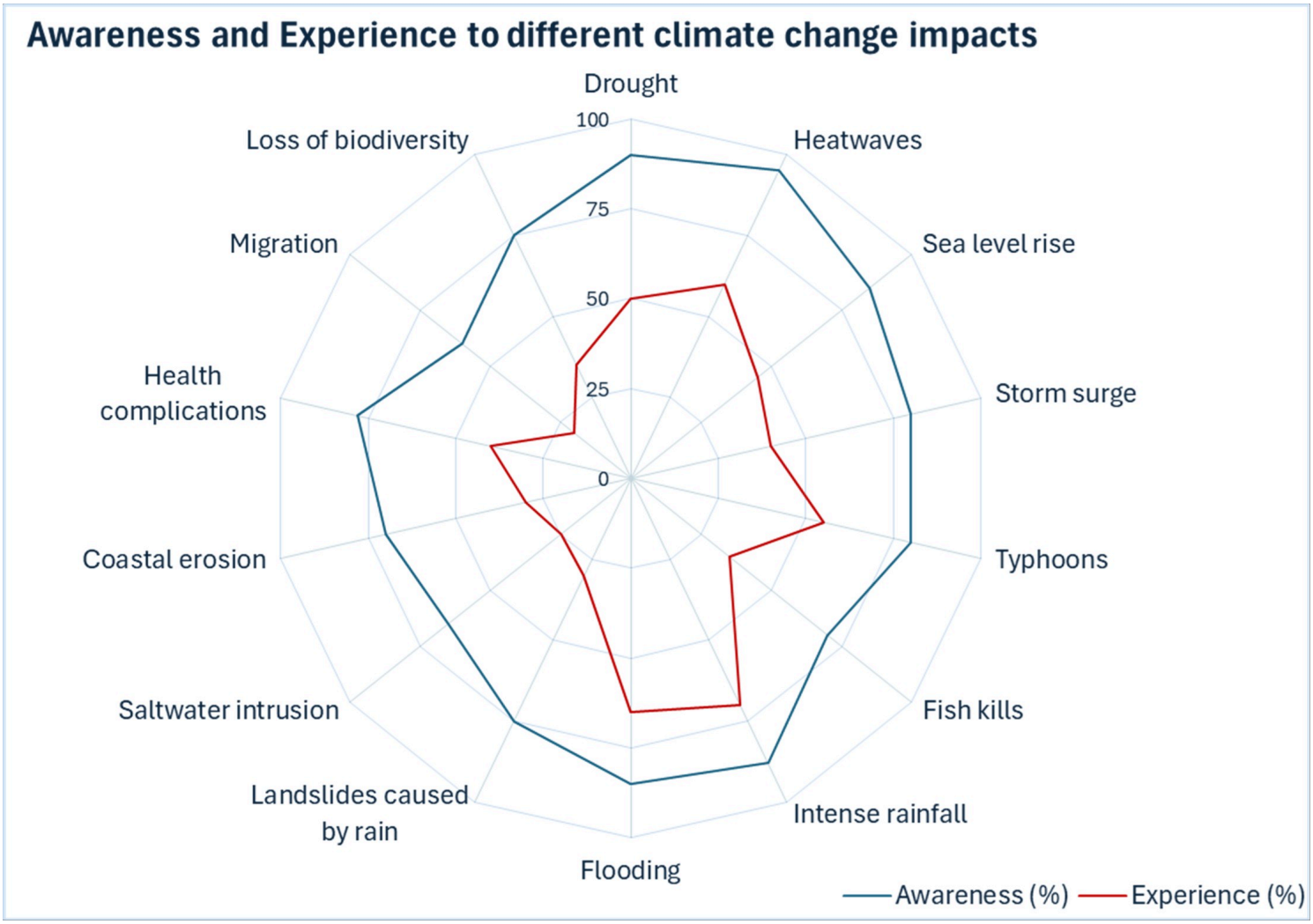


Figure 6

Comparative Analysis of Awareness and Personal Experience of Climate Change Impacts

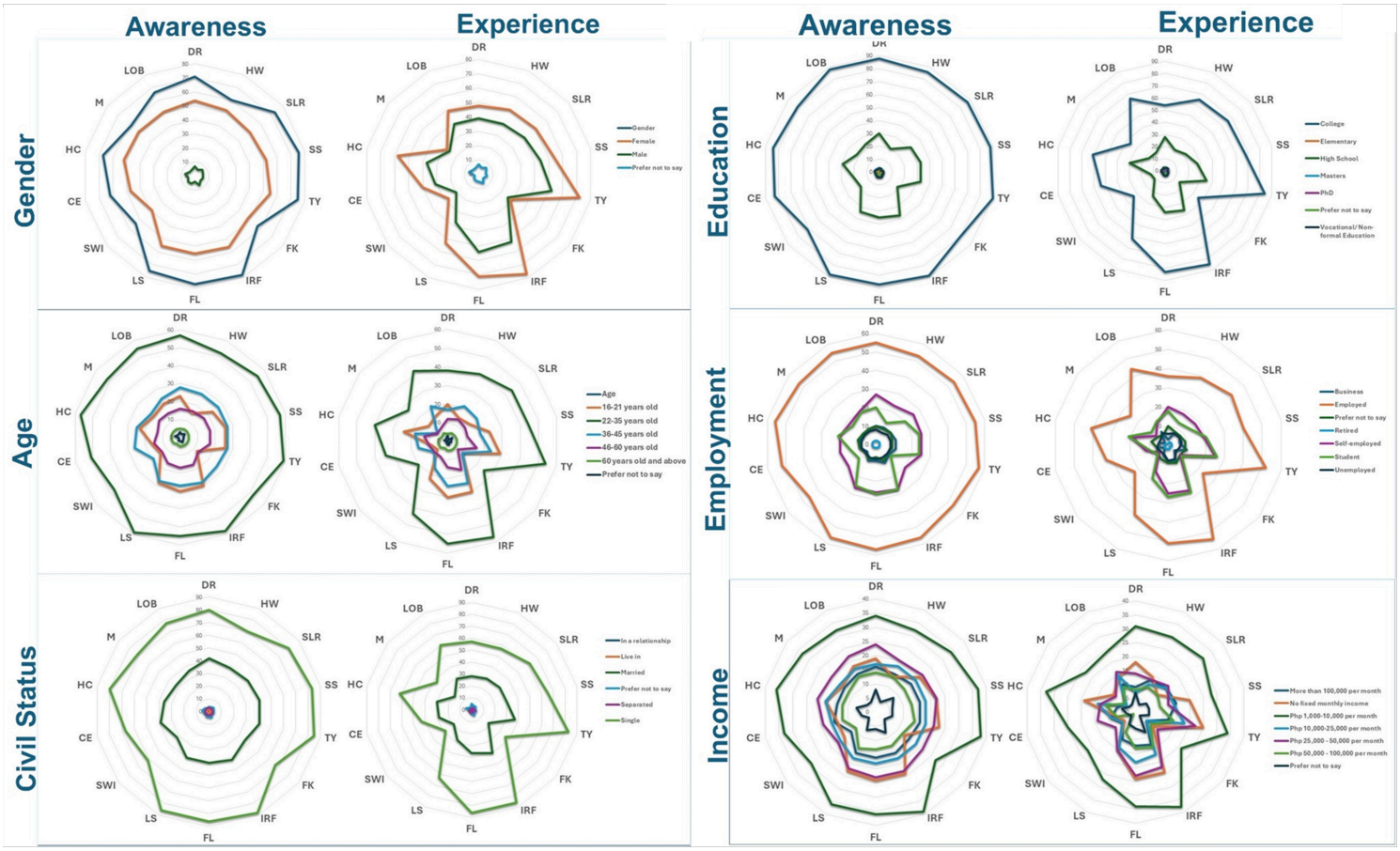


Figure 7

Distribution of awareness and experience of the impacts of climate change among different demographics. Legends- Drought **(DR),** Heatwaves **(HW),** Sea level rise **(SLR),** Storm surge **(SS),** Typhoons **(TY),** Fish kills **(FK),** Intense rainfall **(IRF),** Flooding **(FL),** Land slides caused by rain **(LS),** Salt water intrusion **(SWI),** Coastal erosion **(CE),** Health complications **(HC),** Migration **(M),** Loss of biodiversity **(LOB)**

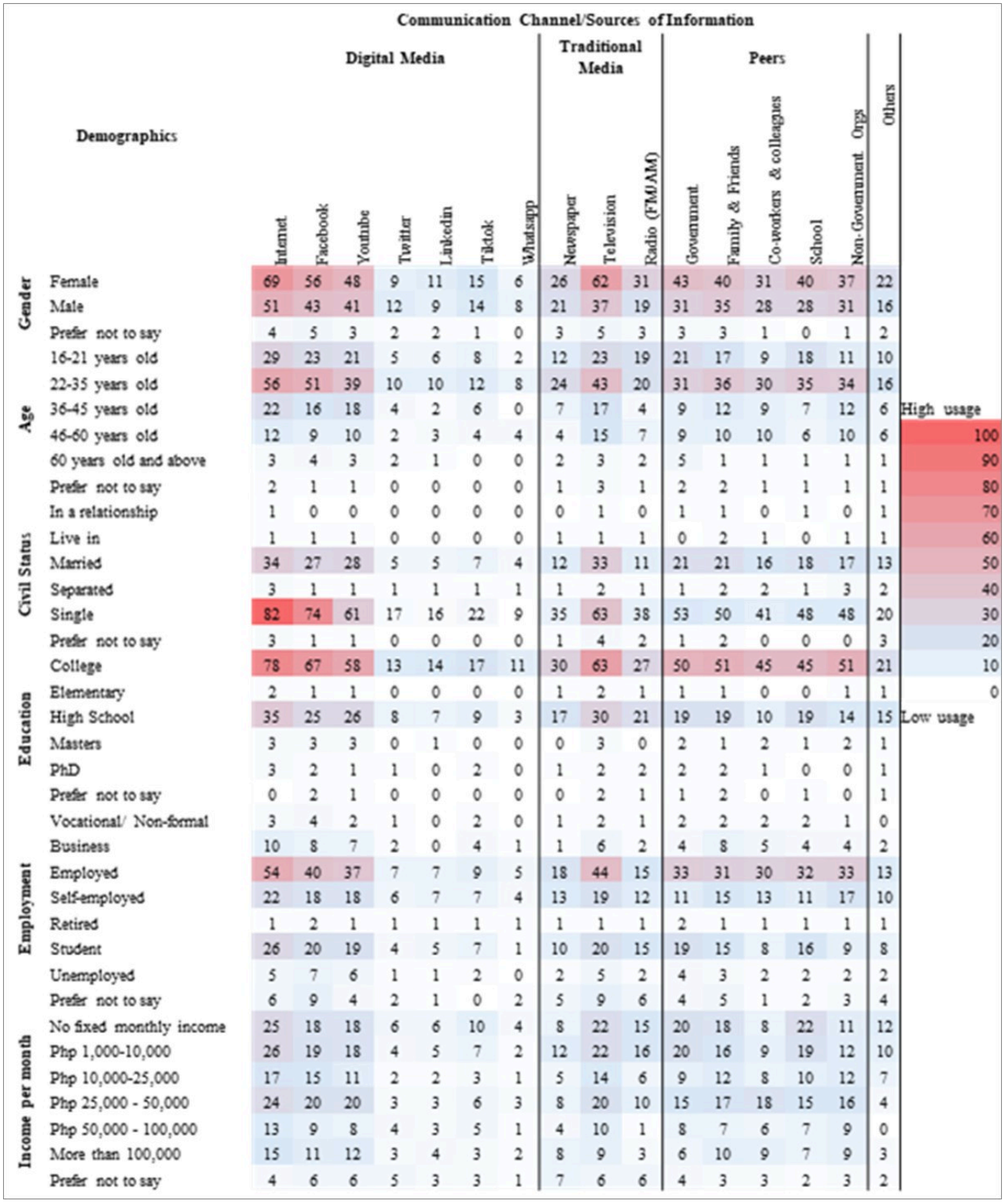


Figure 8

Heatmap representing various demographic groups, corresponding to specific communication channels. Each cell's color intensity and numerical value reflect the frequency of respondents in each group who identified a given channel as their key information source. The shade of color red indicates higher reported usage, while blue hues indicate lower reported usage.

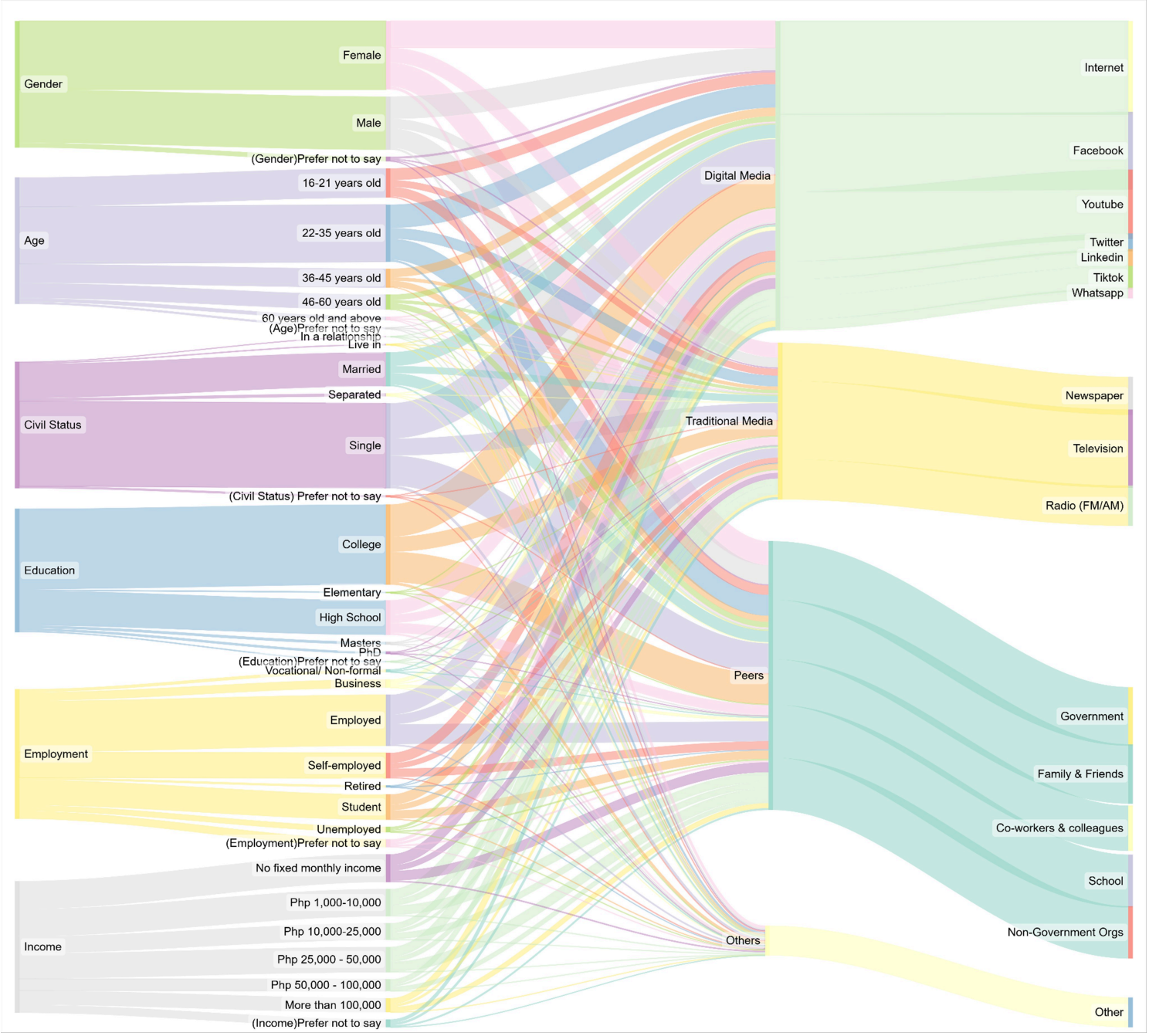


Figure 9

Distribution of different demographics among the sources of information on climate change classified into categories: digital, traditional, and peers. The 4th category, “Others,” are the sources which were not mentioned in the survey options, such as *church, social gatherings, events, campaigns, advertisements, and political affiliations.*

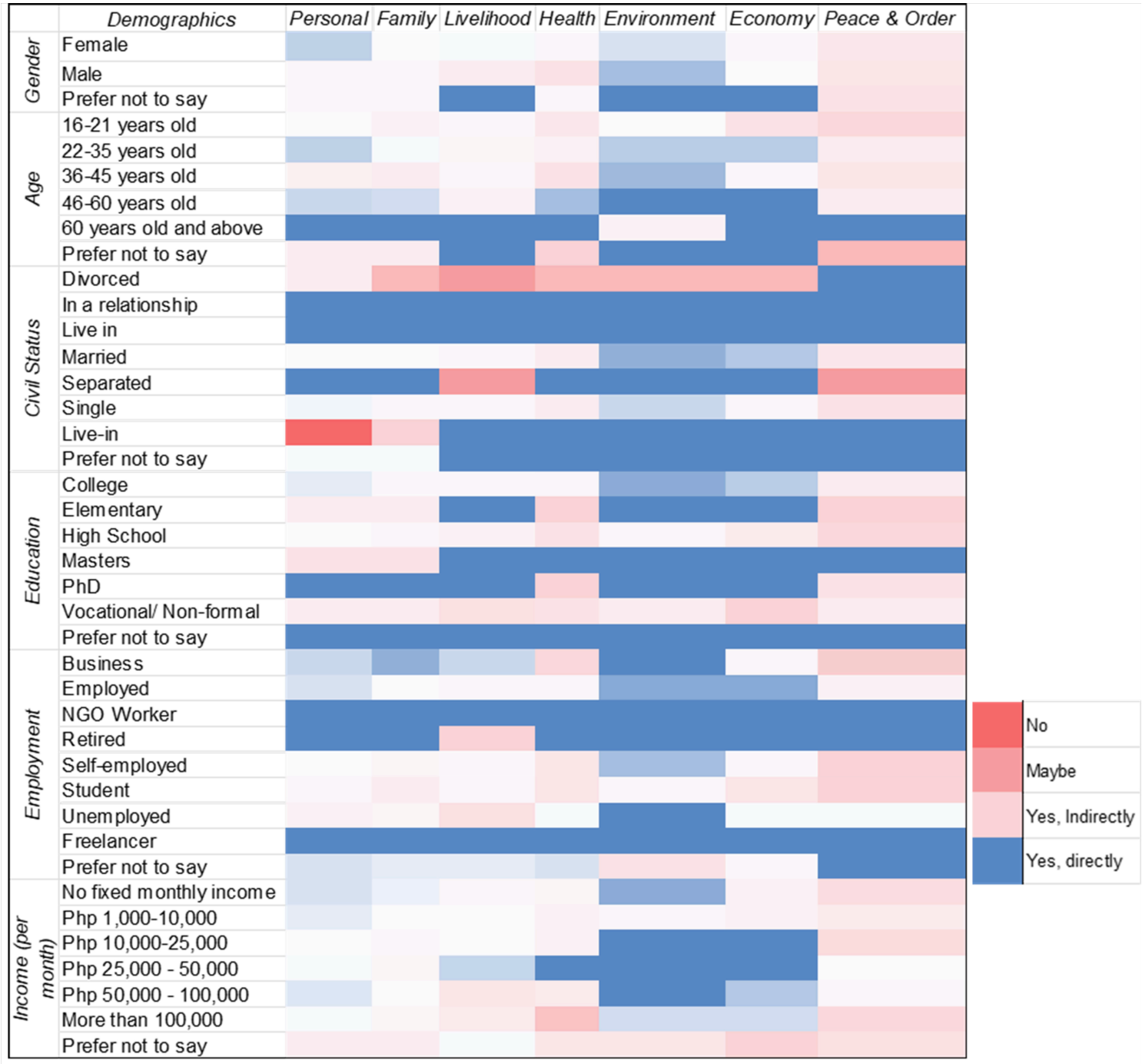
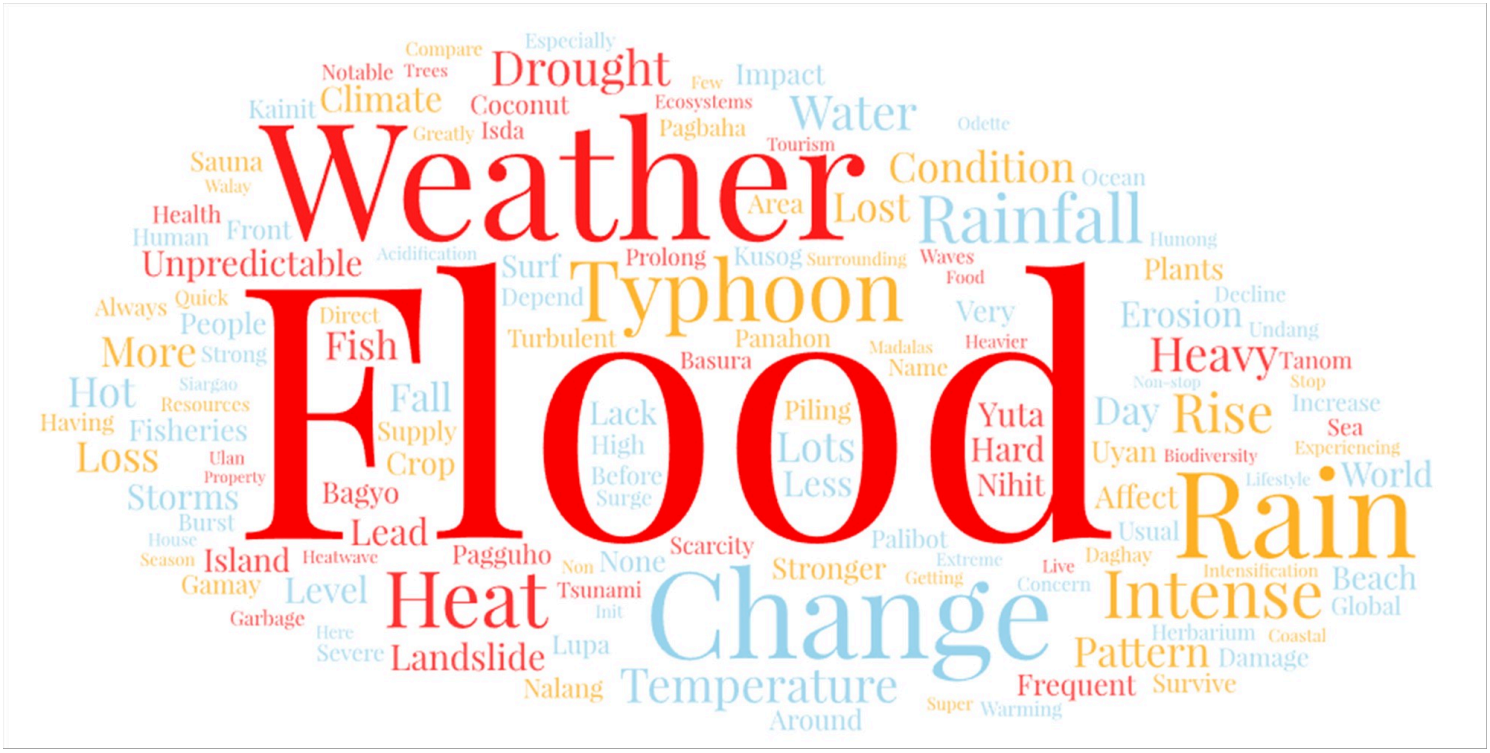


Figure 10

Impact perception response to the question: *"Do you think climate change affects your: personal life, family, livelihood, health, and the: environment, economy, and peace & order?"*


Flood
Weather
Rain
Change
Heat
Pollution
Human
People
Typhoon
Drought
Rainfall
Water
Climate
Intense
Factory
Fossil
Nature
Deforestation
Cutting
Mining
Illegal
Trees
Use
Burn
Emission
Temperature
Landslide
Storms
Fisheries
Unpredictable
Heavy
Rise
Day
Erosion
Plants
Condition
Lost
Surf
Depend
Turbulent
Panahon
Basura
Name
Lack
High
Before
Surge
Lots
Less
Piling
Yuta
Hard
Nihit
Fish
Fall
Supply
Crop
Bagyo
Lead
Island
Pagguho
Scarcity
None
Stronger
Palibot
Tsunami
Level
Gamay
Garbage
Severe
Lupa
Nalang
Around
Pattern
Damage
Frequent
Survive
Affect
Usual
Uyan
Biodiversity
Intensification
Beach
Global
Herbarium
Coastal
Increase
Sea
Experiencing
Lifestyle
World
Tanom
Stop
Non-stop
Decline
Undang
Hunong
Plants
Heavier
Madalas
Waves
Food
Surrounding
Prolong
Kusog
Area
Ocean
Odette
Tourism
Pagbaha
Ecosystems
Few
Impact
Coconut
Isda
Greatly
Kainit
Sauna
Walay
Health
Human
Front
Acidification
Compare
Trees
Notable
Especially
Always
Quick
People
More
Strong
Hot
Siargao
Resources
Having
Loss
Ulan
Property
Burst
House
Season
Heatwave
Gamay
Here
Direct
Very
Extreme
Getting
Concern
Live
Daghay
Palibot
Around
Super
Warming
Pabrika
Walay
Resource
Carbon
Mountains
Plant
Illegal
Time
Much
Existing
Faster
Earth
Business
Mao
Climate
Change
Quickly
Cause
Commercial
Government
Western
Increase
Unsustainable
Induced
Garbage
Aware
Guidelines
Big
Sakyanan
Vehicles
New
Habitat
Impact
Population
Improper
Act
Ignore
Huge
Fast
Part
Later
Slash
Wide
Adopt
Coal
Place
Best
See
Solid
Gas
Effect
Excessive
Fish
Mena
Implementation
Mitigation
Flood
Making
Global
Waste
Rules
Activity
Made
Capitalism
Living
Issue
Many
Dioxide
History
Problem
Industries
Tawo
Large
Things
Disposal
Temperature
Warming
Corporations
Life
Fuel
Land
Correct
Tungod
World
Irresponsible
Gases
Poor
Segregated
Logging
Evolve
Flying
Trash
Facing
Lack
Down
Adapt
Planet
Scale
Pag
Use
Burn
Impact
Habitat
New
Big
Sakyanan
Vehicles
Emission
Commercial
Cause
Trees
Aware
Induced
Garbage
Unsustainable
Increase
Western
Government
Guidelines
Companies
Climate
Mao
Business
Conversion
Management
Dangerous
Carbon
Resource
Greenhouse
Building
Pabrika
Mountains
Plant
Illegal
Throwing
Dynamite
Actions
Time
Much
Existing
Faster
Earth
Fish
Excessive
Effect
Mena
Implementation
Mitigation
Illegal
Solid
Gas
Best
Coal
Place
Ignore
Huge
Fast
Part
Later
Slash
Wide
Adopt
See
Little
Higher
Politics
Balance
Single
Mayahon
Always
Land
Correct
Tungod
Fuel
Cutting
Disposal
Temperature
Warming
Corporations
Life
Factory
Fossil
Nature
Deforestation
Behavior
Small
Disipina
Slow
Basura
Looking
Know
Evolve
Logging
Poor
Segregated
Lack
Down
Adapt
Planet
Scale
Pag
Use
Improper
Population

Thought cloud summarizing the different responses (*n*=116) to the survey question about “Who or what do you think causes the Climate Change problem?”



Figure 13

Thought cloud summary for the responses (*n*=95) on the survey question: “*What other things do you think need to be done?” (to resolve issues with climate change)*

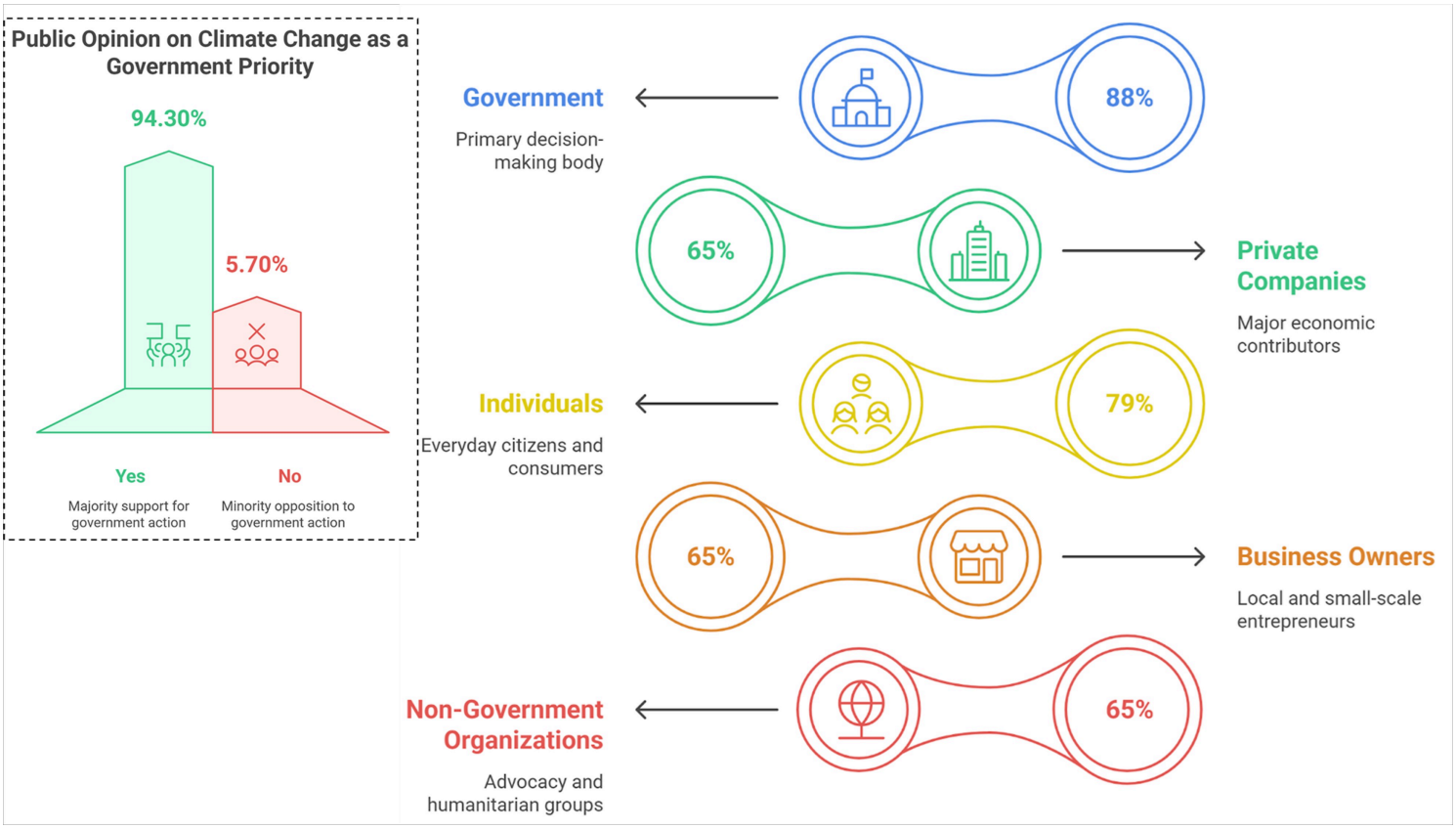


Figure 14

Who should be responsible for solving the climate change problem? Should climate change be a government priority?

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Impactperceptioninthecommunity.pdf
- Appendix.docx