“Antes éramos de tierra firme”: community perspectives on the past, present, and future of Isla Narganá and Isla Corazón de Jesús, Comarca Guna Yala in the face of a changing climate

Izabella R. Klosterman
SIT Study Abroad

Follow this and additional works at: https://digitalcollections.sit.edu/isp_collection

Part of the Civic and Community Engagement Commons, Climate Commons, Community-Based Research Commons, Environmental Education Commons, Environmental Indicators and Impact Assessment Commons, Environmental Policy Commons, Latin American Studies Commons, and the Quantitative, Qualitative, Comparative, and Historical Methodologies Commons

Recommended Citation
https://digitalcollections.sit.edu/isp_collection/3618

This Unpublished Paper is brought to you for free and open access by the SIT Study Abroad at SIT Digital Collections. It has been accepted for inclusion in Independent Study Project (ISP) Collection by an authorized administrator of SIT Digital Collections. For more information, please contact digitalcollections@sit.edu.
“Antes éramos de tierra firme”: community perspectives on the past, present, and future of Isla Narganá and Isla Corazón de Jesús, Comarca Guna Yala in the face of a changing climate

Izabella R. Klosterman
Skidmore College
SIT Study Abroad, Panamá: Tropical Ecology, Marine Ecosystems, and Biodiversity Conservation
May 2, 2022
Abstract
The objective of this research was to learn about Isla Narganá and Isla Corazón de Jesús, Comarca Guna Yala residents’ perspectives on climate change and, to learn about what needs to be done to mitigate the effects of climate change on the islands. In April 2022, eighteen semi-structured interviews were conducted in Spanish with residents of the islands. Interviews revealed that flooding caused by sea level rise, intensification of precipitation events, extreme heat, and biodiversity loss were the most reported impacts of climate change on participants’ lives. Poor waste management opportunities were also discussed as a critical environmental issue affecting the communities. In response to said environmental issues, community members reported negative feelings. Participants also reported that there is a lack of discussion related to climate change among the community. In terms of climate mitigation, participants discussed planned relocation to the mainland territory of Guna Yala. Participants also expressed the importance of educating the community, especially children, about climate change and related issues. This paper serves to share the stories, experiences, and ideas of community members on the islands. In the greater academic context of climate research, this paper aims to bring these perspectives into the academic discussion and deepen the understanding of what it means to be a frontline community.
Acknowledgements

First and foremost, I would like to give a tremendous thank you to Doribeth and Abdiel Campos, and Ana de Díaz and her family, for welcoming me into their homes and lives with such benevolence. Without their guidance, support, and wisdom this project truly would not have been possible— ¡Nuedi, gusarmalo! I would also like to thank my advisor, Aly Dagang, for her endless patience, time, and counsel during my independent study project. A further thank you is deserved to SIT Study Abroad and to the Panamá program staff and professors for providing me with this invaluable experience. And last but not least, thank you to Rhett Adams for teaching me to persevere and believe in myself during our time on Isla Narganá.
# Table of Contents

Abstract ................................................................................................................................................. 1  
Acknowledgements ................................................................................................................................. 2  
Introduction ........................................................................................................................................... 4  
  Literature Review ................................................................................................................................. 5  
  Site description ................................................................................................................................. 8  
Research Question ................................................................................................................................. 9  
Objectives ............................................................................................................................................... 9  
Methodology .......................................................................................................................................... 9  
  Interviews .......................................................................................................................................... 9  
  Ethics ............................................................................................................................................... 10  
  Limitations ....................................................................................................................................... 10  
Life on the islands ............................................................................................................................... 11  
  In the past ....................................................................................................................................... 11  
  In the present .................................................................................................................................. 11  
How is climate change affecting the islands? ..................................................................................... 11  
Waste .................................................................................................................................................... 13  
How is climate change affecting the people? .................................................................................... 13  
What needs to happen? ....................................................................................................................... 14  
  Conclusion ....................................................................................................................................... 15  
  Further research ............................................................................................................................ 15  
Personal Reflection ............................................................................................................................. 15  
Works Cited .......................................................................................................................................... 17  
Appendices ........................................................................................................................................... 19  
  Appendix I ....................................................................................................................................... 19  
  Appendix II ..................................................................................................................................... 20
Introduction

Earlier this year, the Intergovernmental Panel on Climate Change (IPCC) released its Sixth Assessment Report (AR6), Climate Change 2022: Mitigation of Climate Change. The AR6’s subsequent document, the Summary for Policymakers, focuses on the interdependence of climate, ecosystems, and people, and assesses the risk, vulnerability, adaptation, and mitigation of these interconnected pieces of the world (IPCC, 2022). Compared to previous IPCC reports, the Summary for Policymakers states that the breadth and intensity of climate change impacts are larger than previously understood (IPCC, 2022). The most prevalent impacts of climate change are increases in temperature and frequency of heat waves, heavy precipitation events, drought intensity and duration, tropical cyclone intensity, and sea level (Levy and Patz, 2015). The findings from the AR6 should be cause for alarm. Climate science has been a delicate balance of estimates, degrees of confidence and certainty, and constant research. The IPCC (2022) states, with very high confidence, that “Global warming, reaching 1.5°C in the near-term [2021-2040], would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans” (p. 15). Further, the IPCC (2022) warns that future impacts and risks from climate change depend heavily on near future mitigation and adaptation, because future impacts and risks “escalate with every increment of global warming” (p. 16). Considering the unstoppable and irreversible nature of time, there becomes no better moment to focus on climate mitigation and adaptation than now.

Climate change framed as a human rights violation raises important perspectives and considerations in how the global issue is approached. Levy and Patz (2015) discuss how climate change threatens the right to security and an adequate standard of living for health and wellbeing, as outlined in the Universal Declaration of Human Rights. Beyond the effects of climate change, the United Nations Framework Convention on Climate Change concludes that all climate change-related actions should “fully respect human rights,” and that these human rights considerations should “guide the development, implementation, and monitoring of policies, institutions, and mechanisms related to climate that have been established under the UNFCCC” (Levy and Patz, 2015, p. 311). Just recently, in 2020, the United Nations Human Rights Committee declared that forcibly returning a person to an area where their life would be threatened by climate change may violate article six of the International Covenant on Civil and Political rights—the right to life (Uddin et al., 2021).

The adverse impacts of climate change are not felt universally or equally. Roudiak-Gould (2013) illustrates the visibility of climate change for frontline communities, stating that “Not only is global warming visible in principle, it is currently being seen—plainly, brightly, pervasively” (p. 125). The urgency of the climate crisis, and its disproportionate effects on communities around the world is the motivating factor behind this research. The purpose of this paper is to gain insight into Isla Narganá and Isla Corazón de Jesús, Comarca Guna Yala residents’ perspectives on climate change, and to learn about what needs to happen to mitigate the effects of climate change in the communities.

The following sections detail a literature review on the Comarca Guna Yala, climate change impacts on island communities, frontline communities and climate resilience, displacement and planned relocation, and global Indigenous peoples’ involvement in climate policy.
Literature Review

**Comarca Guna Yala**

In 1954, the Comarca Guna Yala became the first semiautonomous Indigenous territory in Panamá (Apgar et al., 2015). In 1996, the Comarca Madungandi was created, and most recently, in 2000, the Comarca Wargandi was created (Martinez, 2013). The total population of the Comarca Guna Yala is approximately 37,000 people, with around 50% of the population under 18 years old (Hurtado et al., 2018). Dulegaya is the native language of the Guna people (Hopkins, 2014). The Comarca Guna Yala is composed of over 400 coral islands, which are known as the San Blas Archipelago (Apgar et al., 2015), and encompasses approximately 300,000 hectares of forest and 480 kilometers of coastline (Calzada et al., 2015). Prior to living on the islands, the Guna people lived on the mainland of what is now Panamá and Colombia. Testimony provided by some elders revealed that when the communities lived on the mainland, they would change locations every 10 or 20 years (Martinez, 2013). It was in the 17th century when the Guna began to establish on the Atlantic coast (Martinez, 2013). There are a few estimates as to why this transition from mainland to island occurred. It may have been for purely economic reasons, to evade the impact of epidemics and malaria on the mainland, or due to the abundance of marine resources (Martinez, 2013).

The Congreso General Guna is the governing institution, which is composed of representation by each of the 49 communities in the Comarca (Apgar et al., 2015). Each community is governed by one or several Sailas, or chiefs (Personal communication, 2022). Apgar et al. (2015) describe how “these collective governance processes at both the community and Comarca levels are the vehicles for enacting and guiding the relationship between the social and environmental spheres of their territory” (p. 3).

**A Changing Climate**

Approximately 10% of the global population lives in low-lying coastal regions that are vulnerable to flooding from sea level rise (Siegent et al., 2020). Anthropogenic climate change causes the slow-onset and long-lasting effect of sea level rise (Martyr-Koller et al., 2021). Swapna et al. (2020) raise the point that global sea level rise is not equal around the world, meaning that there can be considerable regional variations in sea-level rise. The rise in sea level is attributed to a number of reasons. Swapna et al. (2020) explain that ocean warming, causing the thermal expansion of sea water, has significantly increased sea level. In fact, of all the excess anthropogenic heat, 90% goes to the oceans and the remaining goes to melting ice and warming the atmosphere and land (Swapna et al., 2020). Additionally, 21% of global sea-level rise since 1993 is due to melting glaciers, and that ice sheets are also “losing mass at an accelerated rate,” also contributing to global sea level rise (Swapna et al., 2020, p. 177).

Global warming “will likely lead to an increased proportion of [tropical cyclones] of higher severity (category 4 & 5) with more damaging wind speeds, higher storm inundation, and more extreme rainfall rates” (Knutson et al., 2021, p. 1). Knutson et al. (2021) also conclude that rising sea levels will worsen flooding from tropical storms and, increased atmospheric moisture from global warming will probably cause increased rainfall. These aspects of a changing climate are serious threats for low-lying island communities (Riyas et al., 2019).

Ishizawa and Miranda (2016) discuss the unique vulnerability of Central America in the face of natural disasters due to its distinctive geographic and hydro-meteorological
characteristics. Specifically, they discuss social and economic vulnerabilities. The model used in their analysis is a hurricane windstorm model that has been validated and calibrated for the Central American region. In a global context, Hallegatte et al. (2020) stress that economically vulnerable people struggle more to manage and recover from natural disasters. Further, 91.4% of people in the Comarca Guna Yala are poor, according to Panamá’s Ministry of Finance (Hurtado et al., 2018). Ishizawa and Miranda’s (2016) analysis concludes that major hurricanes have substantial impacts on income and poverty, affecting human development indicators and possibly reversing social and economic gains made in the region. Granted, they do clarify that Honduras, Guatemala and Nicaragua are the countries most impacted by major hurricanes, while Costa Rica and Panama have not seen a major hurricane in the last 30 years (Ishizawa and Miranda, 2016). Further analysis by the IPCC Summary for Policymakers (2022) indicates with high confidence that the increase in natural disasters “[has] exposed millions of people to acute food insecurity and reduced water security;” additionally, “sudden losses of food production and access to food compounded by decreased diet diversity have increased malnutrition in many communities (high confidence), especially for Indigenous Peoples, small-scale food producers and low-income households (high confidence)” (p. 11). This information illustrates the possibly devastating effects of increased storms driven by climate change on the Comarca Guna Yala.

Frontline Communities and Resilience

The term frontline community describes socially- and economically- disadvantaged communities that experience unequal and more severe climate impacts (Hughes et al., 2016). The vulnerability associated with frontline communities can be understood as a complex assessment influenced by social, political, and economic factors (Thomas et al., 2018). Defining and conceptualizing frontline communities deepens the conversation around community resilience, as it explicitly acknowledges their specific vulnerabilities in the climate crisis.

Summers et al. (2016) consider the many ways in which climate resilience is discussed in academic literature. They define resilience as “the ability of a system to recover from perturbation; the ability to restore or repair or bounce back after a change due to an outside force” (Summers et al., 2016, p. 151). Resilience can also be understood as the complex relationship between vulnerability and recoverability (Summers et al., 2016). However, within the context of climate resilience, the concept can perhaps best be understood as the intersection of society and the environment, and their governance (Summers et al., 2016). As climate change continues to threaten communities, as discussed above, climate resilience has become an increasingly important topic. Apgar et al. (2015) describe how “Guna leaders traditionally foster community adaptation primarily through facilitation and guidance during the communal gatherings that are central to collective governance in communities and at the Comarca level” (p. 4). Their study also explored several mechanisms for building resilience within the Guna communities. One concept they discuss is how diversity in personhood increases the adaptive capacity of the collective (Apgar et al., 2015). Additionally, they discuss the importance of informal social networking in creating adaptive and innovative communities (Apgar et al., 2015). Apgar et al. (2015) also briefly discuss two cultural practices that illustrate how skills are developed that create transformative change in Guna culture. The Bab Igar framework teaches that individuals are part of the whole, guiding collective decision making. The War Uet ritual
creates a collective experience, enabling collective reflection and motivating transformation (Apgar et al. 2015). These aspects of Guna culture potentially create a capacity of climate resilience that will be crucial moving forward. Evidence shows that more relevant and effective climate resilient development actions are born from a strong relationship between scientific, Indigenous, and local knowledge, because they are more locally appropriate (IPCC, 2022).

Displacement and Planned Relocation

The IPCC (2022) state that displacement due to climate extremes is disproportionately affecting Small Island States. Estimates indicate that approximately 28,000 Guna peoples will need to relocate in the coming years (Pérez and Tomaselli, 2021). Some communities have already started to plan for relocation, such as the islands of Ustupu, Goetupu, Ugupseni y Gardi Sugdub (Martínez, 2013). Relocation inevitably brings social, cultural, and economic changes (Craighead and Yacelga, 2021). Pérez and Tomaselli (2021) describe how, during the past ten years of relocation preparation, the Gardi Sugdub community faced tension and conflict both within the community and with other communities, as well as the Panamanian government. Gardi Sugdub’s experience evidences the ways in which resettlement is more than just mobilization. It is deconstruction and reconstruction. It is “place attachment, livelihoods, cultural integrity, human rights, and a sense of belonging” (Pérez and Tomaselli, 2021, p. 360). Jessa (2020) argues that climate migration is often approached with a “top-down” mentality, however, the historical and cultural context of the Guna suggest that a grassroots approach will facilitate the best adaptive capacities. Thus, it becomes critical to empower agency and preserve autonomy in planned relocation efforts (Jessa, 2020).

Craighead and Yacelga (2021) raise an important consideration for the planned relocation of the Guna; relocation must balance the Guna peoples’ right to self-determination and autonomy, yet also consider possible ecological impacts. The mainland territory in the Comarca is one of the largest regions of intact forest in Panamá, meaning the area has the highest potential for jaguar conservation (Craighead and Yacelga, 2021). Craighead and Yacelga (2021) urge planned relocation strategies to consider human-jaguar coexistence as critical to maintaining a healthy ecosystem and thus, facilitate climate resiliency. When planning for climate adaptation, the situation in Guna Yala spotlights the importance of considering not only physical feasibility, but also identity and culture, autonomy, ecosystem health, and their complex relationships with each other.

Indigenous Peoples’ Involvement in Climate Policy Around the Globe

There are many challenges that Indigenous and traditional communities face in global climate conversations and actions. One issue is community involvement in decision-making. A study by Adeyeye et al. (2019) analyzes procedural equity in the forest and landscape restoration debates at the 2016 World Conservation Congress. They argue that participation in global governance has privileged state representatives, funding agencies and international intergovernmental specialists over Indigenous communities (Adeyeye et al., 2019). The privilege in representation manifested as keynote speakers and special guests being disproportionately composed of state representatives and other intergovernmental specialists, which lends more access and power to those actors in decision-making (Adeyeye et al., 2019). Even when Indigenous peoples were given opportunities to speak, there was an observed lack of audience
attentiveness during Indigenous peoples’ presentations in comparison to speeches given by government representatives and conservationists (Adeyeye et al., 2019). The accounts of the 2016 World Conservation Congress demonstrate the exclusion in participation and, the further disregard when Indigenous and traditional communities are given the space to participate. Indigenous peoples face exclusion in the creation and execution of international treaties as well. For example, Indigenous peoples are only referenced in the non-binding sections of the 2015 Paris Agreement (Leanness, 2017). To overcome obstacles faced by Indigenous peoples in global climate actions, Adeyeye et al. (2019) emphasize the importance of procedural equity in participation of governing processes. The term climate justice encompasses procedural equity, distributive justice, and recognition (IPCC, 2022). Working towards climate justice ensures that those who are most vulnerable in the climate crisis are included in decision-making, share both burdens and benefits of climate actions, and above all are treated fairly and respectfully.

*Gaps for Further Research*

The research discussed previously seeks to illustrate the broader context of how climate change is affecting communities around the world, especially low-lying island communities. However, there is a gap missing in the picture. Who exactly are the people discussed in climate research? Etchart (2017) writes about the frustrations of Indigenous peoples in involvement in climate action, stating that Indigenous peoples have been given the status of victims of climate change, rather than actors “in the quest to combat climate change” (p. 2). By sharing the stories of frontline communities, academic discussions can be deepened with the accounts of the human lives and identities of those communities, and thus shed more light on how climate change is affecting people around the world.

*Site description*

The study site included Isla Narganá and Isla Corazón de Jesús in the Comarca Guna Yala, Panamá. Though the islands are connected by a concrete footbridge, they are independent islands with separate governing bodies. The Diablo River flows from the mainland and meets the ocean approximately 20-minute boat ride from the islands (Personal communication, 2022). Figure 1 illustrates the study site’s position in the rest of the Comarca, as well as the general islands themselves.
Research Question
In my study, my guiding research question asks: How do the community members of Isla Narganá and Isla Corazón de Jesús feel about climate change and are they involved in climate action?

Objectives
- Gain insight into Isla Narganá and Isla Corazón de Jesús residents’ perspectives on climate change
- Learn about what needs to be done to mitigate the effects of climate change in the communities

Methodology
Interviews
Over the course of six days in April 2022, 18 semi-structured interviews were conducted with community members of Isla Narganá and Isla Corazón de Jesús in the Comarca Guna Yala. Six teachers, two farmers, two female heads of houses, one retired professor, one speech therapist, one psychologist, one occupational therapist, one store owner, one local government official, one cabinetmaker and one secretary were interviewed. Semi-structured interviews
consist of an interview guide that provides some order to the interview, yet the structure is open to the flow of conversation (Bernard, 1998). The interview guide can be found in Appendix I. The interviews were conducted entirely by myself in Spanish, aside from one instance in which a question was translated to Dulegaya by a family member of the participant. Interviews began with a brief introduction of myself and the purpose of my study (Appendix II), followed by the participants’ verbal consent. Participants were recruited using the snowball-sampling method. The snowball sampling method begins with a few key individuals and asking them to recommend other people who may be interested in participating, then repeating the process with each new participant (Bernard, 1998). Any willing participant was interviewed, as long as they were a current resident of either island and were 18 years of age or older.

Ethics

Considering my study involved human subjects, approval by the Institutional Review Board was obtained to ensure safe and ethical research design and participant protection. Before each interview, I obtained informed verbal consent from the participant. All data collection was anonymous and confidential. Participants’ occupation and parental status were the only personal identifiers collected.

Limitations

Despite efforts to investigate my question to its fullest extent and with minimal biases, certain limitations were present. In terms of procedure, the language barrier occasionally proved to be a challenge. Though I am fluent in Spanish, there were instances in which I did not fully understand the participants, or they did not fully understand me. Language becomes a bit more of a challenge considering many participants’ native language is Dulegaya. Additionally, no interview was recorded. Conducting interviews and taking notes did somewhat limit the extent of my ability to fully engage in each task. However, as I conducted more interviews, I was better able to interview, listen, and simultaneously take notes.

Similarly, I found limitations in the snowball-sampling method. Sometimes, participants referred me to a friend or family member saying something along the lines of, “they know a lot about this topic, you’ll want to talk to them.” Sometimes, a potential participant would turn down an interview because they felt they knew someone else who would be better able to help me. Despite everyone’s best efforts and intentions to help my research, my investigation required no prior knowledge of the topic. I think that the snowball-sampling method could have led to some bias in who participated in my study. As an amateur social scientist, I realized the challenge of establishing my research in a community with the least bias possible.

In the context of the study site, it is important to note that the findings are solely applicable to Isla Narganá and Isla Corazón de Jesús. Some participants vocalized that Isla Narganá and Isla Corazón de Jesús are more influenced by Western culture, whereas other islands in the Comarca are more traditional. The terms “Western” and “traditional” are direct translations from participants. The differences between the islands in the study versus the entire Comarca, as expressed by participants, highlights the importance of not generalizing the findings of this study.
All things considered, the following sections attempt to illustrate the vast wealth of knowledge, perspectives, ideas, and overall vibrant human experiences that the participants shared with me.

Life on the islands
In the past
When asked about what life was like on the islands, many older participants reflected back to an unspecified time—simply the past. Life was quiet. Everyone in the community shared with each other, and there was a sense of unity. On participant A’s account, there were no drugs, alcohol, or problems. Participant R states that one wouldn’t see grasses or puddles in the street, because immediately after it rained the puddles were filled with sand. Nangan used to be so clean because everyone swept. Participant J shares that everything their ancestors prepared, cooked, and ate was fresh. Plastic did not exist with their ancestors. Everything could be thrown in the ocean because it was all organic matter. The roofs of homes were more commonly built with palm, making them cooler. Some participants who had reflected on what the islands used to be like also reported that life has since changed.

In the present
Though much has changed on the islands, many still report that life is quiet. Many participants enjoy their free time fulfilling family responsibilities such as taking care of children, taking care of the home, and connecting with family. Other popular activities among the participants include playing sports, reading, sewing, going to the beach or the river, participating in church activities, and watching movies. Participants K and I use their free time to prepare for work, J likes to farm, and E likes to fish. The economy of the islands depends on agriculture and fishing.

Participant F discusses the lack of culture and tradition, explaining that children only speak Spanish at home now, not Dulegaya. They credit the changes on the islands to the development of Western culture. Similarly, consumption has changed; food is more expensive, food comes in plastics and other inorganic materials, everything costs money, and there is less sharing. The consumption of more plastic products and inorganic materials has resulted in a waste issue on the islands. Similarly, homes are more often built with tin roofing rather than the palm roofing.

Gaining a small window of insight into what life is like on the islands, and the ways in which it has changed, helps to give context into how climate change impacts life on the islands.

How is climate change affecting the islands?
The most prevalent effect of climate change reported by participants is flooding related to sea level rise and heavy rains. During the interview process, 15 of the 18 participants mentioned that sea level rise is a visible effect of climate change in their community. Sea level rise is shrinking beaches around Guna Yala, and sinking others. One participant said that “if everything follows predictions, islands will be lost.” Another participant predicts that in 20 or 30 years hurricanes and cyclones “never seen before will come to the islands.” Participant B reports that Isla Carti, Comarca Guna Yala experiences severe flooding due to sea level rise,
which has caused people to begin to move to the mainland. On Isla Narganá, the flooding is considerable, especially in September and October\textsuperscript{2}. Participant E states that flooding is worst in December and January. Participant O states that the flooding is less predictable now. High tide flooding was not always the case\textsuperscript{6,7}. However now, flooding fills the islands with water\textsuperscript{4} up to ones ankles\textsuperscript{1}, spreading trash around\textsuperscript{3,7} and creeping into government buildings\textsuperscript{13}. Those without a gas stove cannot cook because their fires are flooded\textsuperscript{10}. Homes built from sticks degrade faster due to the flooding\textsuperscript{7}.

What is worse, according to Participant O, is when there are both heavy rains and high tide. Eight out of 18 participants said that changes in precipitation events, due to climate change, affect their community. Participant G recounts that when there is flooding from the rains Isla Narganá is like a pool. Many participants state that they experience abrupt changes in weather, from heat and sun to heavy rain\textsuperscript{1,10,13,16}. The fast and strong changes bring fever and sickness\textsuperscript{1,10,16}. The heavy precipitation events also affect the river, and thus affect freshwater access. Many have noticed that the river is drying up, further affecting freshwater availability\textsuperscript{10,11,18}. Heavy rains damage the pipes that bring water from the river to Isla Corazón de Jesús, meaning that sometimes Participant G is left without running water. On Isla Narganá, which has no running water, heavy rains hinder whether people are able to collect water from the river\textsuperscript{5,16}. Heavy rains also affect people’s ability to subsistence fish\textsuperscript{16}.

Agriculture is also affected by the changes in precipitation events. However, the changes in precipitation events means heavy rains during dry season\textsuperscript{2,9,10,11}. April is dry season\textsuperscript{10}, and therefore sowing time\textsuperscript{2}. The heavy rains during the dry season are especially devastating because seeds are planted directly into the ground, so when there is a flooding event the seeds are at risk of washing away\textsuperscript{10}. Participant D reports that there should be a rice crop this year, but it is gone because of the flooding from the heavy rains. In addition to the sowing season being affected, crops are not as plentiful\textsuperscript{11}. To get to the farms on the mainland, people travel up the river.

Participant O described the intense thirst associated with the increasingly severe temperatures. Of the 18 participants, ten mentioned that severe heat, due to climate change, affects their lives. The heat is described as extreme\textsuperscript{4,15} and too much\textsuperscript{9}. Participants B, M, and R share that the islands were not always so hot. The heat affects wellbeing\textsuperscript{4,16} and makes it hard to work\textsuperscript{6,13}. It is also not just the heat that is strong. Due to the ozone layer being affected by climate change\textsuperscript{11}, the sun is strong on the islands\textsuperscript{14}. The lack of ozone layer protection concerns the residents\textsuperscript{7,14}, especially in terms of skin cancer risk\textsuperscript{3,18}. Participants G and N take extra measures to protect against the sun, such as wearing sunscreen and protective layers.

Several participants also expressed that biodiversity loss affects their lives. Before, everything was abundant\textsuperscript{11}. However, a lack of protection for marine wildlife\textsuperscript{6} and a loss of habitat\textsuperscript{16} has diminished marine wildlife populations. For example, a small sardine species used to be found all around the islands\textsuperscript{11}. Fishermen would use those sardines to catch other marine animals, but the sardines are gone from around the area and the fisherman are left to find new bait\textsuperscript{11}. Participant G states that an unhealthy ocean affects the fish, and an unhealthy earth affects hunting, causing food scarcity. Changing wind patterns\textsuperscript{1-11} have also affected peoples’ ability to fish\textsuperscript{15}, further threatening the islands’ food system and economy. The changing winds also bring trash from other islands onto Isla Narganá and Isla Corazón de Jesús\textsuperscript{6}. 
The stories and perspectives shared by the participants is striking testimony to the topics discussed in the literature review.

Waste

Many generations ago, everything the Guna consumed was organic⁴. Everything could be thrown in the ocean, where it would quickly biodegrade³.⁴. Participant E recounts that other more traditional islands are cleaner, with no trash or grass in the streets. Now, with changing times on the islands, products are increasingly made of plastic and other inorganic materials³. The islands are facing a waste management issue. No other environmental issue was raised as unanimously across participants, with 17 of 18 participants stating that poor waste management affects their community. Trash can be found dotting the streets¹, floating in the ocean³,⁹,¹⁵, and even in the river⁶.¹¹. The wind brings more trash from other islands⁶. Sometime in the past, there was a banner over the river that warned against throwing trash in the water⁶. This banner is gone now⁰. On Narganá, there is no formal waste management plan. The flooding of the islands spreads the trash, and community members can only wait for the tide to recede⁷. Approximately five or 10 years ago, a nearby section of mangrove was cleared as a trash dumping site⁶. On Isla Corazón de Jesús, trash bins dot the island for designated trash collection. Periodically, a man walks around the island to collect trash from people, which is then taken to the mainland site and burned¹⁵. When trash is collected and burned, it pollutes the air⁵. When trash is thrown on the ground and in the ocean, it pollutes the ocean⁵. Participant G addresses the struggle between burning the trash or dumping it into the ocean, asking, “what’s worse?”

Participants discussed some past efforts to address the waste management issue. Once, a group of health professionals came to the islands to discuss the waste issue and how it affects human health³. Participant D mentioned a recycling program that was once on the Isla Narganá that they were very interested in, but the program faded and is now no longer in place. Five participants expressed the desire for the implementation of a waste management plan, especially a recycling program. In 2021, the 8th graders at Colegio Felix Esteban Oller discussed the issue of waste management¹⁶. They reportedly wanted a recycling program at the school¹⁶. Participant N expressed the need to educate people on recycling and reusing, and especially encouraging creativity.

How is climate change affecting the people?

When participants were asked about how they felt about climate change, nearly all described negative emotions. In single-word responses, five participants said they felt “bad,” four said they felt “worried,” four said they felt “sad,” one said they felt “bothered,” one said they felt “terrible,” and one said they felt “powerless.” Participant R shares that they sometimes are afraid when the tide is high. Some believe that there is nothing more that can be done¹¹,¹⁷, and that the community must accept the changing climate¹³. Others express concern for the future of the children⁶,¹⁷.

Seven participants said that nobody is working on climate change related issues in the community. Four participants said they did not know of anybody working on climate change related issues. Participants F and R said that people talk about climate change, but nothing more. Participant E said that people had come to the islands to work on climate change related
issues in the past, but there are no ongoing projects. Participants B, C and M said that teachers are working on climate change issues by teaching children about climate change.

Participant K said that the Sailas work on climate change related issues. Every two or three months, the Sailas from each community come together to talk about issues affecting the Comarca. Sometimes they talk about climate change. Participant B said that the Sailas talk about finances, work, and order in the community instead of environmental issues. Half of the participants reported that their community does not discuss climate change. Participant K explained that there are two groups in the community: those who talk about climate change and those who don’t. The differing groups creates tension in the community.

Of the 13 participants who reported having children, 12 said that they talk to their children about climate change and the environment. Some parents tell their children about how life has changed. Participant B shares that when the tide floods the island, their kids ask why it happens, to which they explain that the flooding is caused by climate change. Others try to teach their children about the importance of taking care of the planet, especially how to sort organic matter from inorganic, and the importance of not throwing waste into the ocean. Participant N notes that though they do not have children of their own, they frequently talk about environmental issues with their aunts. Their aunts are creative and good at recycling, a practice that is important in Participant N’s life.

So, where is it that people are learning about climate change? Eleven participants learned at school, three self-educated through reading articles and watching programs on television, two learned at specific events related to climate change, and two did not respond.

What needs to happen?

Considering all the changes occurring on the islands, how those changes impact the lives of the community members, and how they feel about those changes, the ultimate question asks: what needs to happen? Participant I feels that there is too much to do. Participants J and Q responded that they cannot change the sun or the rain. Despite feelings of powerlessness expressed by participants, the question of “what needs to happen?” becomes a vessel of hope. Participant I and Q added that we must educate the children, and Participant J contemplated that the community will eventually move to the mainland.

Over 75% of participants stated that education is needed in the community. Participants mentioned giving workshops, talks, and in general providing more information about climate change and taking care of the environment. While Participant D said that the community believes outsiders more, Participant B said that outside organizations should instead empower community members to create change because “you don’t have to go far for a solution.” Participant J believes that the technology of today and the practices of their ancestors should unite to enact the best change.

Most participants focused on the education of children because they believe the children are the future and will change the community, but also that the minds of children are easier to teach. Adults will nod and say yes, but it is harder to change their lifestyles and habits. Participants believe in educating the youth to inspire them, and to eventually prepare them to move when the time comes. Many expressed that climate education should come from both school and from home. Participant O said that teaching kids at school is particularly effective because children come from all around the surrounding area to attend school on Isla Narganá.
By educating the children at school, students could go back to their islands and share their knowledge, amplifying the impact of educating youth\(^\text{10}\). Participants E, I, and N highlight the need to educate parents, so that environmentally conscious habits can start in the home.

The second most discussed climate action proposed by participants was planned relocation, from the islands to the mainland. Participant Q shares that sometimes the Sailas discuss moving, to see what people think. Some community members are open to leaving, and others are not\(^\text{11}\). Four participants motioned to a nearby mountain, saying that eventually the community will find higher ground in the mountains\(^\text{4, 5, 6, 11}\). Participant Q declared that “antes éramos de tierra firme” (before, we were from mainland). The necessary preparations should begin on the islands\(^\text{6}\), as some other communities are already preparing to leave\(^\text{10, 14}\).

**Conclusion**

This research paper sought to understand Isla Narganá and Isla Corazón de Jesús residents’ perspectives on climate change and, to learn about their perspectives regarding what needs to happen to mitigate the impacts of climate change. Participants reported that climate change affects their lives and islands in several ways, most prominently by flooding caused by sea level rise, intensification of precipitation events, extreme heat, and biodiversity loss. Poor waste management was the most reported environmental issue affecting the communities. Community members reported negative emotions in response to how their island is affected by climate change. Participants also described the lack of climate change related discussion within the community. Most participants expressed that planned relocation will be a part of the future of the islands. Participants also report that educating the community, especially children, is an important piece of climate action on the islands. In the larger academic context of climate research, this study sought to share the stories of an especially climate-vulnerable community, and thus bring their perspective into the academic discussion. Thomas et al. (2018), underscore that using an iterative process between researchers and community members, which shapes how knowledge is made available and used, “increases the likelihood that the information will meaningfully contribute to adaptive responses to climate change” (p. 13). This study aims to contribute to this iterative process, in the hopes of inspiring radical climate action.

**Further research**

The research in this study only spotlights half of the community. As mentioned previously, approximately half of the population of the Comarca is under 18 years old (Hurtado et al., 2018). The findings from this research could be furthered by conducting a similar study with children on the islands. Many participants discussed the importance of the next generation, especially educating the youth. Investigating how youth are conceptualizing the same questions would illuminate more clearly what is needed to help them amid the climate crisis.

**Personal Reflection**

So often in academic literature, the interactions between human society and climate change are abstracted and turned into concepts, particularly in the case of frontline communities. From my position in the United States of America, one of the worst polluting countries in the world, I had learned about global frontline communities in a faraway context. For
years, I have been taught about sea level rise, tropical cyclones, and sinking islands that affect island-based communities. I must admit that from my position and exposure to academic literature, university courses, and U.S. and global news, these communities had been reduced to an abstract victim. So, who are frontline communities beyond the label of climate victim? My research sought to understand that question.

Even before conducting interviews, I realized the challenge of conducting research with minimal expectations or biases. I must be honest and accept that I had certain expectations and biases. Out of my own naïveté I thought that during my interviews we would be talking about carbon emissions and greenhouse gases, about industry, and about how only a certain few countries are at fault. I had an idea that as a frontline community they must be so mad, like me. But that is not what I found. There are no cars, no industry, no mega corporations, or Walmarts bulldozing wetlands on Isla Narganá or Isla Corazón de Jesús. Their climate is changing, and so are their lives; this is true. But not with the same glaring climate guilt that I experience in my community. It was a real check to my position and my research approach. I hope that others who read this paper in a similar position as my own can also learn from the new perspectives presented in this paper. When participants began to tell me about the predicted move to mainland and the required preparation, I felt that same climate grief. And yet, I began to realize that at some point I must turn and look at the future square. It is time to accept a changing climate and prepare for the future.
Works Cited

Footnotes
1. Participant A, Personal Interview, 2022
2. Participant D, Personal Interview, 2022
3. Participant H, Personal Interview, 2022
4. Participant R, Personal Interview, 2022
5. Participant J, Personal Interview, 2022
6. Participant E, Personal Interview, 2022
7. Participant B, Personal Interview, 2022
8. Participant C, Personal Interview, 2022
9. Participant L, Personal Interview, 2022
10. Participant O, Personal Interview, 2022
11. Participant Q, Personal Interview, 2022
12. Participant K, Personal Interview, 2022
13. Participant F, Personal Interview, 2022
14. Participant N, Personal Interview, 2022
15. Participant G, Personal Interview, 2022
16. Participant M, Personal Interview, 2022
17. Participant C, Personal Interview, 2022
18. Participant I, Personal Interview, 2022

Works Cited


Appendices

Appendix I

Guía de entrevista

- ¿Cómo es la vida en [Isla Narganá / Isla Corazón de Jesús]? ¿Cómo era la vida?
- ¿Qué te gusta hacer en tu tiempo libre?
- ¿Puedes enseñarme una frase en Guna?
- ¿Qué significan para usted las palabras "cambio climático"? ¿Qué asocias con las palabras "cambio climático"?
- ¿Recuerdas haber aprendido sobre el cambio climático? ¿Dónde aprendiste sobre el cambio climático?
  - ¿Cómo te hizo sentir eso?
- ¿El cambio climático afecta su vida diaria? Si es así, ¿cómo?
- ¿El cambio climático afecta a su comunidad? ¿El cambio climático afecta a tu isla?
- ¿Cómo te sientes acerca del cambio climático?
- ¿Tiene hijos?
- ¿Hablas con tus hijos sobre el cambio climático?
- ¿Siente que su comunidad discute el cambio climático?
  - ¿Cómo discute su comunidad el cambio climático?
- ¿Crees que se debería hacer algo por el cambio climático?
- ¿Qué ve en su comunidad que está mitigando los efectos del cambio climático?
- ¿Crees que tienes un papel en la lucha contra el cambio climático? Si es así, ¿cuál es ese papel?
- ¿Hay otras preocupaciones ambientales en su mente? / ¿Cuál crees que es el tema ambiental más importante en tu comunidad?
- ¿Cuál es la relación entre el gobierno Guna y el gobierno panameño en temas ambientales?
- ¿Cuánto tiempo has vivido en [Isla Narganá / Isla Corazón de Jesús]?
- ¿Cuál es su ocupación?

Interview Guide

- What is life like in [Isla Narganá / Isla Corazón de Jesús]? What was life like?
- What do you like to do in your free time?
- Can you teach me a phrase in Guna?
What do the words “climate change” mean to you? What do you associate with the words “climate change”?
Do you remember learning about climate change? Where did you learn about climate change?
  ○ How did that make you feel?
Does climate change affect your daily life? If so, how?
Does climate change affect your community? Does climate change affect your island?
How do you feel about climate change?
Do you have children?
Do you talk to your children about climate change?
Do you feel that your community discusses climate change?
  ○ How does your community discuss climate change?
Do you think something should be done for climate change?
What do you see in your community that is mitigating the effects of climate change?
Do you believe you have a role in fighting climate change? If so, what is that role?
Are there other environmental concerns on your mind? / What do you think is the most important environmental issue in your community?
What is the relationship between the Guna government and the Panamanian government on environmental issues?
How long have you lived on [Isla Narganá / Isla Corazón de Jesús]?
What is your occupation?

Appendix II

¡Hola! Me llamo Izabella, y soy estudiante del SIT en el programa Panamá: Ecología Tropical, Ecosistemas Marinos, y Conservación de la Biodiversidad. Soy estudiante universitaria de los Estados Unidos, y estudio el medio ambiente y español.

Lo invito a participar en una encuesta que estoy llevando a cabo como parte de mi experiencia educativa en Panamá. La School of International Training. Su participación es voluntaria.

Ahora voy a leerle información sobre la investigación que estoy conduciendo. Por favor pregúnteme sobre cualquier cosa que no entienda antes de decidir si quieres participar. Si decides participar, puede darme su consentimiento verbal para participar en la investigación.

Hello! My name is Izabella, and I am a student with the SIT Panamá: Tropical Ecology, Marine Ecosytems, and Biodiversity Conservation program. I am a university student from the United States of America, where I study Environmental Studies and Spanish.

I would like to invite you to participate in a study I am conducting for my study abroad program in Panamá with the School of International Training. Your participation is voluntary.

I will now read you some information about the research I will do. Please ask questions about anything you do not understand before deciding whether to participate. If you decide to participate, you will give me your verbal consent to participate in the study.