ABSTRACT

Title of Thesis:	INDIGENOUS TERRITORIES: PRESERVING ANCESTRAL LINEAGES IN NICARAGUA THROUGH ECOLOGICAL HABITATION
	Jessica Rivera, Master of Architecture, 2022
Thesis Directed By:	Associate Clinical Professor, James Tilghman, Master of Architecture

Nicaragua's Miskitu Indigenous peoples of the North Caribbean Coast of Nicaragua possess a traditional and simple way of life. Colonialism and a historical record of social injustices have plagued their communities, their homes are not durable enough to withstand generations and natural disasters. This thesis project proposes a revised housing typology employing simple building systems and resilient materials. On an urban scale, the thesis project integrates key infrastructure proposals with a proposal for an agricultural sustenance system. Establishing an ecological environment for the Miskitu community, such as a garden of plants, vegetables, and fruits, would be vital to this community's well-being. The proposed design aims to respect their ancestral lifestyle, not Westernizing or modernizing their way of living. Using simple tactics and longstanding methods will help mitigate the high poverty rate and extend the ancestral lineage of the Miskitu peoples of Western Nicaragua.

INDIGENOUS TERRITORIES: PRESERVING ANCESTRAL LINEAGES IN NICARAGUA THROUGH ECOLOGICAL HABITATION

by

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Advisory Committee:
Professor Juan Luis Burke, Chair
Lindsey May, Committee Member
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Dedication

To my parents who were born in Nicaragua and to the Indigenous communities of Nicaragua.

Acknowledgments

By the grace of God and His guidance, I was able to explore further into this thesis and connect with the Indigenous people of Nicaragua via research. After gathering a large amount of information, I was able to truly comprehend the Indigenous community, particularly the Miskitu group, who they are as a people and the difficulties they face.

I would also like to acknowledge my parents who were born in Nicaragua and came to the United States as young adults. They were a key motivator in my decision to focus on Nicaragua as well as my Indigenous ancestry. It was an opportunity for me to feel connected to my parents and to my culture.

I would also like to show my gratitude to my chair, Professor Burke, for appreciating my vision and steering my thesis in the right direction. Professor Burke mentored me and gave me invaluable insight, which I believe would not have been achievable without him. I sincerely thank you for recognizing and enhancing my thesis to highlight the very evident challenges that Nicaragua's Miskitu community continues to confront.

Finally, I want to express my sincere appreciation to my advisor, Professor Tilghman, who embraced my thesis while it was still a notion. He believed it was a challenging subject that is not explored enough. Professor Tilghman encouraged me to explore beyond the scope while not disputing or altering my thesis.

Table of Contents

List of Figures

List of Abbreviations

CEJIL	The Center for Justice and International Law
CEJUDHCAN	The Center for Justice and Human rights of the Atlantic Coast of Nicaragua
CEMS	Continuous Emission Monitoring System
CONADETI	National Demarcation and Titling Commission
IACHR	The Inter-American Court of Human Rights
INAFOR	National Forestry Institute
INETER	Nicaraguan Institute of Territorial Studies
RACCN	North Caribbean Coast Autonomous Region
RACCS	South Caribbean Coast Autonomous Region
UNESCO	United Nations Educational, Scientific and Cultural Organization

Chapter 1: Introduction

"Land, then, is not merely soil; it is the/ foundation of energy flowing through a circuit of soils, plants, and animals.... An ethic to supplement and guide economic relation to land presupposes the existence of some mental image of land as a biotic mechanism. We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in."

-Aldo Leopold, A Sand County Almanac

The Nicaraguan government has a history of social and economic marginalization of the country's indigenous population. The communities are continually striving to protect their lands from being degraded and terminate settlers' occupation. The preservation of ancestral lineage and cultural identity in Indigenous communities such as the North Caribbean Coast Autonomous Region (NCCAR) is imperiled due to the influx of individuals invading these regions. In order to extend and preserve ancestral lineage, culture, and territory, this thesis will explore housing and community design approaches in this region, and more specifically in the Prinzapolka Municipality, to alleviate the increased concentration of poverty in Indigenous communities.

The second chapter, *Nicaragua's History and the Path of Exploitation*, will examine the country's history and the transformations it has undergone as a result of factors such as political turmoil, rebellions, famine, foreign

interference, and natural disasters. Most of these tragedies still affect the nation and its citizens. Nicaragua's beauty resides in the abundance of diversity and culture that saturates the country despite struggling economically and politically. However, like many other nations, Nicaragua suffers from socioeconomic inequality and societal intolerance, notably among individuals of the Caribbean coast, including the North Caribbean Coast Autonomous Region and the South Caribbean Coast Autonomous Region. The social ostracization stems mainly from a history of racism, marginalization, and oppression, as most of the Caribbean coast's inhabitants are of African and Indigenous descent. Ethnic origins predominantly classify Nicaragua, though geographically, distinct regional properties further divide the country. For instance, the Pacific region, often known as the Pacific lowlands, has relatively flat terrain except for a few volcanoes. The central region, often known as the central highlands, is characterized by rocky and mountainous topography as well as an arid and humid environment. Finally, the Caribbean region, also referred to as the Caribbean lowlands, is a hot and humid area where flooding is a common occurrence. Almost all of the Caribbean region's core is densely forested, but there are shallow bays, lagoons, and salt marshes along its coast. Nicaragua possesses characteristics that give it individuality, regardless of the fact that its struggles continue to influence the country as a whole. Nicaragua's high levels of poverty percentage, primarily in the two Autonomous regions, remains a key influence and impediment. Given that the poverty rate has fluctuated throughout the

years, there are still many issues that must be resolved for Nicaragua to advance as a country and support its residents.

The third chapter, *The Indigenous Communities of Nicaragua*, will delve more into the country's multiple Indigenous groups. In particular, there is a heavier focus on the Miskitu Indigenous community, as this is the driving force behind this thesis. First, it is pivotal to comprehend the Miskitu populace's legacy and initial presence in Nicaragua. The Miskitu have made great strides in sustaining their self-governance initiatives while being pressured by the Nicaraguan government to merge with the rest of civilization. Their adversity to survive as a community and the upkeep of their ancestral lands in the face of constant natural disasters and severe weather coincides with the ongoing fight to defend their Indigenous land rights. It is undeniable that Indigenous communities are in danger, which is not only confined to Nicaragua. The section *Proceeding Measures and Forward-Thinking* briefly comments on the thesis's directionality. The objective of the proposed design is to acknowledge that these lands are sacred not just to the existing inhabitants of these areas but also to earlier generations. A different approach and way of thinking are needed to preserve Indigenous culture, people, and the natural landscape. The architecture will reach its fullest potential when guided by what the community deems necessary based on historical and present opinions.

In chapter four, Traditional Housing Typologies in Nicaragua, will discuss the evolution of the traditional housing typology widespread in many Indigenous communities, notably the Miskitu community. The Moravians' arrival had a prominent impact on the development of traditional Miskitu homes. The missionaries hoped to impose their views on existing homes that were open and simple on the interior and instead push the use of walls to achieve privacy. Another typical housing style is the contemporary Miskitu house, which is effectively a house on stilts. Several of these homes also feature a separate kitchen that is linked to the main living structure by a bridge. Western influences have influenced the alterations that have created many of the Miskitu homes that stand today, which is becoming increasingly common. The University of Malaga, Spain, conducted a study of the Mayangna Indigenous community. The research team found only two traditional housing typologies in the studied village. These homes remained central to the traditional home layout by omitting interior walls and relying solely on natural materials. Even while contemporary homes are not completely opposite to traditional homes, there are specific differences, even if they are subtle. Does this beg the question of, are modifications being imposed by outside forces or initiated by locals based on their own volition?

The fifth chapter, *Approaching Indigenous Grounds*, will concentrate on how Indigenous communities might get involved in the process of preserving their lands and the biodiversity that exists within their settlements. As previously mentioned, approaching Indigenous territory requires a

different strategy than engaging with modern or western populations, such as those in the United States. As a result, it is critical to establish relationships with Indigenous peoples to learn about their conservation ideas and social customs and gather insight into what they require as a society to progress efficiently. According to this thesis, if the proposed design is successful, the Indigenous people's ancestral lineage will be extended. A couple of the concepts discussed in chapter five will serve as the foundation of the design concept. It is undeniably crucial to preserve the land; it is, however, necessary to comprehend why it is necessary to conserve the land in the first place. It should not be limited to biodiversity or the property itself; rather, it should go far deeper than that. What transpires to the people who reside on these grounds if they are not supported? The Indigenous people receive priority as the area would be nothing more than a barren landscape without them.

The final chapter, *Prinzapolka Municipality: Site History and Documentation*, will provide context and historical background of the municipality before venturing into the intricacies of the chosen site. Before initiating an architectural concept, variables such as location, population, climate, and geography must be considered. Prinzapolka, the chosen site, is named after the municipality and is a village on the region's outskirts. The site is encircled by two bodies of water, which will contribute substantially to the enhanced restoration of the community's traditional housing typology. Existing soil conditions and soil conditions following severe weather or natural disasters have a massive effect on homes. Proposing a design that is

more in sync with the environment and its destructive forces would ideally lead to a more resilient community that can withstand multiple catastrophes across time.

The overarching message, and the decision to focus on Indigenous communities, namely the Miskitu community, are due to pervasive underrepresentation. Few individuals are aware of or are informed about what unfolds in impoverished nations like Nicaragua. Since small communities lack essential means, they find the need for aid challenging for outsiders to notice. Numerous Indigenous peoples in Nicaragua live in harsh environments, and their way of life has remained virtually stagnant for millennia. Although the cries for help and the need for assistance are not visible within scope, they are undeniably present, which is why researching and identifying the presence of these communities is what will encourage change. Indigenous communities worldwide are facing resource scarcity, and their governments may choose to ignore or dismiss these issues.

> "...We are existent within knowledge of Land.
> We are existent within knowledge of stars.
> All Around and Below and Above.
> East, South, West, and North.
> This is our prayer. This is our knowledge.
> This is our source. This is our existence.
>
> Always the land is with us.

Always the stars are with us.

With our hands, we know the sacred earth.

With our spirits, we know the sacred sky.

We are with the land and stars.

We are with the stars and land.

With offering, all around outside.

With offering, all around inside.

This is the knowledge we have.

This is the existence we have.

In thankfulness, we give and we know.

In thankfulness, we receive and we know." [1]

-Simon Ortiz, 1993 (in Cajete 1995)

[1] Cajete, Gregory. "Philosophy of native science." *American Indian thought* (2004): pg. 289.

Chapter 2: Nicaragua's History and the Path to Exploitation

Nicaragua's Background

Nicaragua has been afflicted throughout history by political upheaval, rebellions, famine, foreign intervention, and natural disasters. Since colonial times, governments have been unable to create stability and long-term economic prosperity. Foreign engagement in Nicaraguan political and economic matters, notably by the United States, has elicited a range of populist and nationalist responses. The impact of the past may still be apparent in views regarding foreign influence today.[2]

Nicaragua's fertile Pacific coast has lured settlers from the start of the pre-colonial period, placing the majority of the country's population in the west. Nearly fifty-eight percent of the population resides in urban areas. The ethnic composition of Nicaragua is primarily Mestizo (mixed with Indigenous and White-European descent), accounting for around sixty-nine percent of the population. Spanish is the dominant language spoken by over ninety-seven percent of the population; however, the Caribbean lowlands speak English and other languages such as Miskitu.[3] Individuals who dwell in the Caribbean lowlands have always been distinct from the Spanish-heritain ge majority who

[2] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.
[3] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg. 4-12

live in the Pacific plains and central highlands in terms of geography, religion, languages, culture, ethnicity, and politics.[4]

Figure 1, Current Map of Nicaragua (Source: Author)

[4] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.

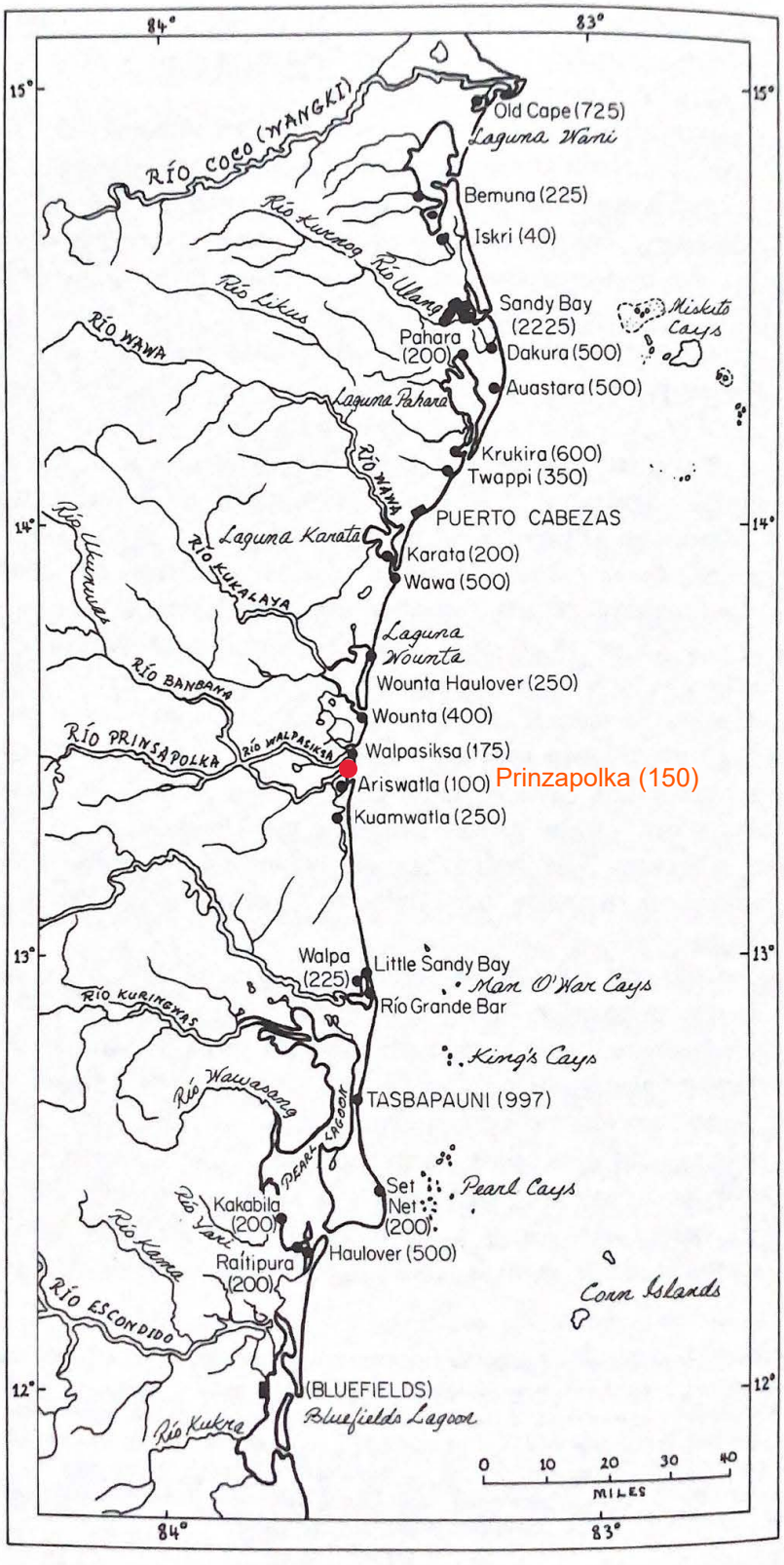

Figure 2, Population and Society Map (Source: Parsons, James J)

An Untouched Landscape

Six thousand years ago, the first inhabitants of Nicaragua were discovered near Lake Managua by the Ancient Footprints of Acahualinca. The well-preserved evidence of human footprints showed signs of both volcanic ash and mud.[5] However, owing to indeterminate recordkeeping, conclusive evidence that would identify the origins of the initial inhabitants remains unknown. What is certain is that the peoples of Nicaragua migrated from the south of Mexico several centuries before the Spanish conquest. Linguistic experts have discovered a cultural and linguistic connection between the Mayans and Aztecs in Nicaragua. One of the dialects identified was Pupil, a member of the Uto-Aztecan language family and commonly spoken in Nicaragua's western and central regions.[6]

Nicaragua's Caribbean lowlands have indeterminate information and several speculations about their first inhabitants. It is theorized that Nicaragua's Caribbean region had tribes with inhabitants who had migrated from South America. These semi-nomadic people did not have permanent settlements and relied heavily on hunting and fishing. Slash-and-burn agriculture was later practiced by these tribes in the Caribbean lowlands. The native inhabitants of the Caribbean influenced the eastern side of Nicaragua, most likely as a result of trade, which is evident because of the usage of thatched huts and canoes that are still seen in the eastern part of Nicaragua.[7]

[5] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg.5-10
[6] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.
[7] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.

The Colonization of Nicaragua

Upon the arrival of the Spanish to the western regions of present-day Nicaragua, three Indigenous groups, Chorotegano (Chorotegas), Niquirano (Nicaraos), and the Chontal, had already established grounds. Between the fourth and ninth centuries, the Chorotegas, who came from present-day Mexico to Nicaragua. Previous to the arrival of European colonizers, the cities of the Chrotegano community had plazas with markets, religious structures, and long wooden homes with thatched roofs.[8] Around the thirteenth century, the Nicarao arrived to the region. Agriculture was their specialty, and they even managed to create robust trade ties with the Indigenous people of Mexico and Peru. An important figure of the Niquirano community was Chief Nicarao, which Nicaragua is named after.[9] It is inconclusive as to when the Chontal arrived in the country.

Previous to the arrival of European settlers, an estimated population of present-day Nicaragua was somewhere around 825,000. That number drastically plummeted by the year 1581, with a total of only 50,000 to 60,000 Indigenous peoples remaining.[10] Ultimately, the depopulation resulted from a combination of atrocities performed by the Spaniards, such as harsh regimens of forced labor and the deadly exposure of diseases brought by Europeans, such as smallpox, typhus, measles, and influenza.

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[8] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4
[9] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4
[10] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010 pg. 15

A Geographical Divide

Broken into two words, the name Nicaragua comes from Chief Nicarao, and "agua," meaning water in Spanish, referring to Lake Nicaragua.[11] Honduras borders Nicaragua to the north, Costa Rica to the south, the Pacific Ocean to the west, and the Caribbean Sea to the east. Nicaragua is roughly the size of the state of New York, with a total area of 129,494 square kilometers, 120,254 square kilometers of which is land area, making it the largest country in Central America. Given its geographical divide, the country offers a diverse spectrum of climates and terrains. The three preeminent regions include the Pacific coastal plains (lowlands), the Central highlands (mountains), and the Caribbean lowlands. The Pacific lowlands reach roughly seventy-five kilometers inland from the Pacific coast. A large percentage of the terrain is flat, except for a series of new volcanoes, some of which are still active.[12]

Western Nicaragua is prone to earthquakes and volcanic eruptions due to its position where two major tectonic plates collide. Even though recurrent volcanic eruptions have caused agricultural damage owing to pollutants and ash, earthquakes have been incomparably more catastrophic to lives and properties. Annually, hundreds of earthquakes occur, some of which inflict severe damage. Managua, Nicaragua's capital, was nearly destroyed in 1931 and again in 1972.[13]

[11] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010 pg. 3-8
[12] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.
[13] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.

The central highlands are a triangular region northeast and east of the pacific lowlands. This rocky mountain landscape encompasses slopes ranging in elevation from nine hundred to eighteen hundred meters, a diverse forest of oak and pine, and deep valleys that flow primarily to the Caribbean. Few large streams travel west to the Pacific Ocean, and those that do are steep, abrupt, and only flow occasionally. The relatively arid western slopes of the central highlands, insulated from the humid winds of the Caribbean by the mountains' ridges, enticed farmers from the Pacific region since the colonial era and are now highly developed. Rain forests occupy the eastern slopes of the highlands, which pioneer agriculturalists and small Indigenous settlements sparsely populated.[14]

The eastern Caribbean lowlands of Nicaragua is known as the Miskitu Coast, where more than half encompasses the country's region yet is still sparsely inhabited. These lowlands are hot and humid lands encompassing the coastal plains and the eastern spurs of the central highlands. The soil is often leached and infertile, unlike the rich soil found only in the natural levees and small floodplains of numerous rivers, such as the Prinzapolka River and the Coco River. In addition, fertile soil exists in the plethora of minor streams that originate in the central highlands and flow through the region to the Caribbean coast's labyrinth of shallow bays, lagoons, and salt marshes.[15]

[14] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.
[15] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.

Not only were the areas divided geographically, but it is also imperative to note that the communities were also heterogeneous, leading to a boundary that split the Caribbean coast in two and Nicaragua itself. The autonomy statute for the Atlantic Coast regions of Nicaragua, enacted in 1987, formed two regional councils, the North Caribbean Coast Autonomous Region (RACCN) and the South Caribbean Coast Autonomous Region (RACCS).[16] The regional councils are multiethnic organizations that legitimately recognize the region's diverse Indigenous and ethnic communities. The Nicaraguan governments pledged to ensure the exercise of the collective and individual rights of the peoples of the Caribbean coast. Regional autonomy represents an opportunity for the country, particularly the Caribbean coast, to foster equality and acceptance among Nicaragua's diverse communities, minimizing economic and social disparities between the two regions and building national unity. It is a chance to create an inclusive, multiethnic, and multicultural nation.[17]

[16] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 1-2
[17] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 1-2

Figure 3, Government Map of Nicaragua (Source: A.H. Jocelyn)

Early Modern and Modern Economics

Since the early 1500s, when the Spanish first colonized Nicaragua, the

eastern coast has remained generally isolated due to its poor agricultural lands, harsh tropical climate, and immense tropical forests and river channels that divide the central highlands from the Atlantic Coast. Prior to the 1600s, when British traders began negotiating with Indigenous communities along the Atlantic coast, it is suspected that distinct groups around the rivers and ocean were classified based on kinship ties and linguistic dialects. Following the introduction of British traders, coastal communities acquired access to foreign items such as muskets. The Miskitu population eventually took over the coastal region as well as the other inland settlements.[18]

In the mid-nineteenth century, the British supported the Miskitu people as the governing populace under an indirect rule system, leading to the formation of the Miskitu coast.[19] When the British left at the end of the eighteenth century, it exposed an alluring vacancy that American entrepreneurs quickly filled. The Miskitu's status degraded, and the Indigenous inhabitants experienced a demotion of positions to low-wage laborers or small suppliers at the lower end of the economic pyramid. Mestizos immigrating from the western coast of Nicaragua held the highest positions of power, while Creoles or Afro-Nicaraguans thrived as merchants and traders. Over the next century, there were economic booms and

[18] Casillas, Christian E. *Rural electrification, climate change, and local economies: Facilitating communication in development policy and practice on Nicaragua's Atlantic Coast*. University of California, Berkeley, 2012. pg. 32-33
[19] Casillas, Christian E. *Rural electrification, climate change, and local economies: Facilitating communication in development policy and practice on Nicaragua's Atlantic Coast*. University of California, Berkeley, 2012. pg. 33-35

recessions, with businesses focusing on short-term capital gain by exploiting natural resources and Indigenous communities' cheap labor pool.[20]

The northern coast's ecology encompasses pine savannah and mineral resources, while the southern coast comprises tropical evergreens. Agroforestry crops such as timber, cacao, coconut, banana, and African oil palm thrive amid the Atlantic coast's abundant rainfall and clay soils. Until 1979, resource depletion, agricultural diseases, natural disasters, and political upheaval fueled the coast's extractive economy's recession fluctuations.[21]

Agriculture has historically been the foundation of Nicaragua's economy. Corn, rice, and beans are the critical sustenance crops for the overwhelming majority of the lower class living in rural areas. The country's affluent aristocrats have long supported the agro-export model, a Nicaraguan corporation producing finished products derived from raw materials cultivated in the country's most fertile areas.[22] Agricultural crops or cash crops, such as coffee, sugar, rice, and cotton, are nearly entirely farmed for export on large estates. Lands have been apportioned unequally in the country since colonial times. As cash crops became more vital to the economy's growth, the aristocrats devised legal and illicit techniques to claim more property at the

[20] Casillas, Christian E. *Rural electrification, climate change, and local economies: Facilitating communication in development policy and practice on Nicaragua's Atlantic Coast*. University of California, Berkeley, 2012. pg.31-32
[21] Casillas, Christian E. *Rural electrification, climate change, and local economies: Facilitating communication in development policy and practice on Nicaragua's Atlantic Coast*. University of California, Berkeley, 2012. pg. 31-32
[22] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg. 9

expense of the Catholic Church, the lower class in rural areas, and Indigenous peoples.[23]

The late-nineteenth-century coffee boom and the 1950s cotton boom marked a surge in land concentration at the possession of wealthy individuals. Consequently, a plethora of Nicaraguans have become enveloped in low-wage and transitory occupations, ultimately living in the trenches of poverty. In Nicaragua's society, the capacity to cultivate cash crops sequentially defines levels of wealth, where income disparity mirrors land ownership inequality.[24]

Nicaragua's heavy industries include bananas, sugarcane, cotton, rice, corn, tobacco, veal, pig, poultry, and dairy goods, with coffee, beef, shrimp, and lobster being its key exports. Among the light industries of Nicaragua are food production, chemicals, textiles, apparel, beverages, and footwear. Although its primary exports incorporate consumer items, machinery, and petroleum products from the United States, Mexico, Venezuela, Costa Rica, Guatemala, and China, a good percentage of its exports go to the United States, El Salvador, and Honduras. Nicaragua has established various export trade zones like many Latin America's poorest countries as part of a national economic development agenda. The goal of these free economic zones is to stimulate international investment and employment in the country.[25]

High rates of expansion and investment transformed Nicaragua's economy from a conventional agriculture-based economy reliant on a single

[23] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg. 9
[24] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg. 10-11
[25] Staten, Clifford L. *The history of Nicaragua*. ABC-CLIO, 2010. pg. 10-11

crop to one with a diversified agricultural sector and an emerging manufacturing industry from the mid-1940s to the mid-1970s.[26]

Demographic and Economic Information

Nicaragua is the second poorest country in the hemisphere, behind Haiti, but the first in Central America. In terms of cost evaluation across several nations, the World Bank has employed benchmark levels of one dollar and two dollars each day, which utilize the costs of certain products to compare the real purchasing power of the countries' currency, a concept known as purchasing power parity. A projection of more than half of the Central American households will be impoverished, with forty-four percent living on less than one dollar per day and seventy-five percent on less than two dollars per day.[27]

According to a 1998 study, the number of people living in poverty in Nicaragua increased by 25,697 from 2,190,787 in 1993 to 2,225,401 in 1998, accounting for fifty-one percent of the population. Per the investigation, the number of people living in poverty did not decrease, and several regions in Nicaragua had a rise in the number of persons living in poverty. In 1995, the RACCS had a population of about 270,323, with an increase of 45,492 people living in poverty. In comparison, the RACCN, which had a population of

[26] Tim Merrill, ed. *Nicaragua: A Country Study*. Washington: GPO for the Library of Congress, 1993.
[27] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 3-4

181,372 in 1995, had a decrease of 7,128 people living in poverty.[28] However, in 1995, the RACCN required twenty resources out of the total of one hundred available in Nicaragua, the most of any region. Some of the resources may include transit network infrastructure, as well as communications, public utilities, social and community infrastructure, which include education, health, and other public services. Each region's resources are required to lift the poor out of poverty and from the extreme poverty line.[29]

In general, these are the bare minimum of resources required in each department to provide the population with a basic level of living. The total suggested resources are the amount that local economies must develop and transfer to the poor or that the national economy must redistribute to these people each year until the local economy is competent. On a national scale, the minimum amount necessary to alleviate poverty or extreme poverty is around US$233 million. According to the data observed in 1999, the RACCN has the highest proportionate demand for these total minimal quantities of resources, with nine percent, followed by the RACCS, with ten percent. Furthermore, based on the minimum resources required by the extremely poor population to reach the extreme poverty limit of around US$200, the overall national demand is about US$19.3 million.[30]

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[28] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 3-4

[29] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 7-10

[30] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 4-8

It is worth noting that, whereas the previous Nicaragua poverty map, based on 1993 data, merely indicated the poverty gap, the 1998 map revealed the extreme poverty gap.[31] Attributed to differing operational methodologies and a shift in the government's focus from poverty to extreme poverty and changes in how extreme poverty is classified, comparisons across time are problematic. The 1993 poverty map reflects the depth of the poverty gap, or the proportion of average consumption per capita that is below the poverty line, divided into three sections: less than 7% below the poverty line, 7-21% high poverty, and more than 21% extreme poverty.[32] In correlation to the rest of the country, Nicaragua's west-central area had the largest concentration of poverty. (see Figure 4).

According to data collected by the World Bank in 2016, the national poverty level was 24.9 percent, while the international poverty threshold was 3.2 percent. In 2014, 23 percent of the urban population in the upper-middle-income bracket was in poverty, while 51 percent of the rural population was impoverished. Progress in poverty reduction has stagnated since 2005, attributable to political problems and the Coronavirus outbreak, with an expectation of a rise in poverty due to severe job losses and declines in remittances.[33]

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[31] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 9-10

[32] Bradshaw, Sarah, and Brian Linneker. "Challenging poverty, vulnerability and social exclusion in Nicaragua: some considerations for poverty reduction strategies." *The Nicaraguan Academic Journal–NAJ* 2, no. 2 (2001): pg. 5-10

[33] Parra Osorio, J. C. (2020, April). Poverty & Equity Brief Latin America & the Caribbean Nicaragua . World Bank Group Poverty & Equity.

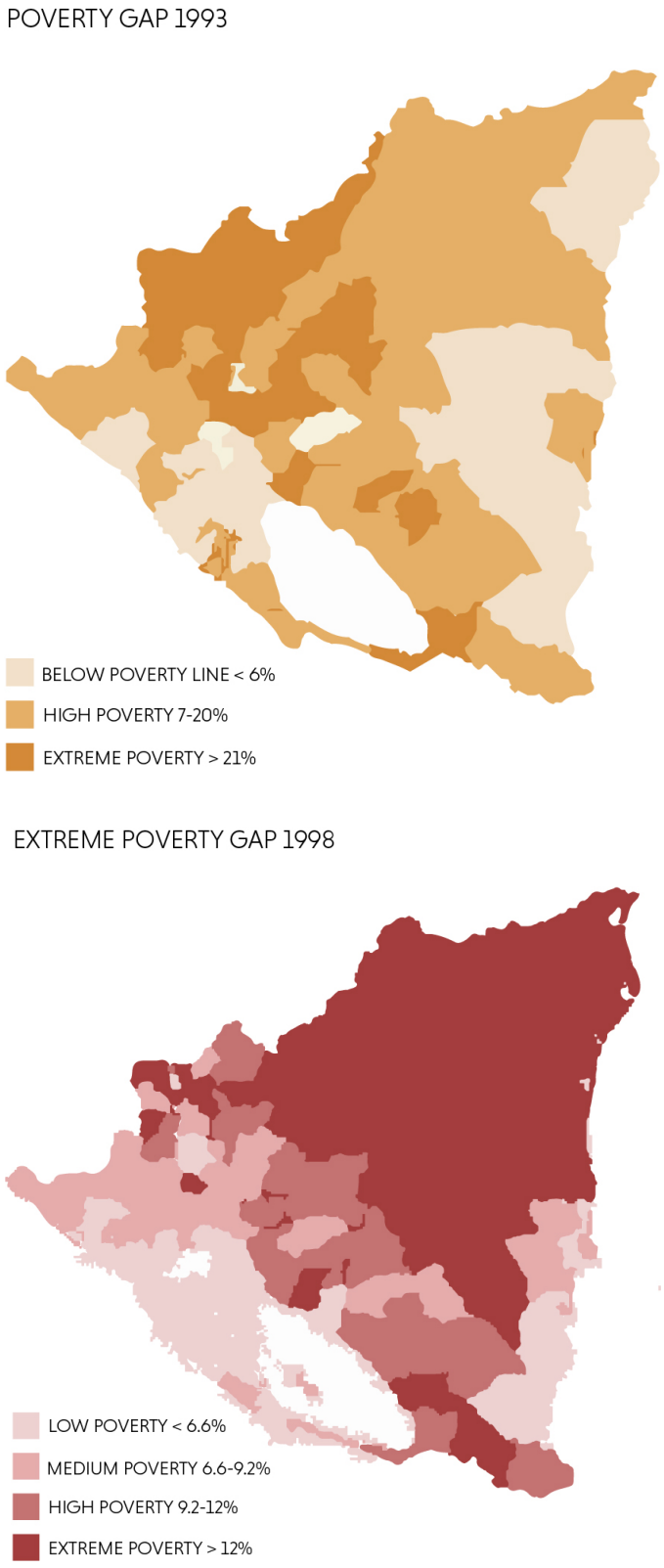

Figure 4. Poverty Gap Map of 1993 and Extreme Poverty Gap of 1998 (Source: Author, Reference: Bradshaw, Sarah, and Brian Linneker)

Chapter 3: The Indigenous Communities of Nicaragua

Indigenous Communities and their Continuance

Nicaragua's Caribbean coast was one of the earliest examples of Latin and Central American regional autonomy. The region has a long history of cultural and ethnic distinction from the rest of Nicaragua, tracing back to the colonial era. Although the Caribbean coast region is much less linguistically diverse, it contains languages in many communities, ranging from near-extinction to relative safety via varying extents of endangerment. It has also witnessed continual demographic flux and increased concentrations of miscegenation, resulting in a diversified, pluricultural people known as Costeños.[34]

Unlike the rest of what would become Nicaragua, the British colonized the Caribbean Coast, which is frequently attributed as the genesis of Costeños' current distinction from Nicaragua's Pacific coast. Like Spain's other American colonies under Spanish rule, the Pacific coast has a similar history of land expropriation by Spanish invaders and the harsh subjugation and replacement of indigenous peoples by the Mestizo population, a process known as *mestizaje*.[35]

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[34] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011.
[35] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011

Nicaragua is home to several Indigenous communities including the Miskitu, Rama, and Sumu-Mayagna Indian. The Miskitu population around the twentieth-century was about 70,000 to 150,000; however, that number quickly dropped to 40,000 when Nicaraguan Miskitu decided to migrate to Honduras to escape the revolutionary war or, in some instances, join it.[36] Nicaragua's northeastern region has a high concentration of the Miskitu community, with scatterings outside this vicinity, primarily inhabiting the country's eastern side.[37]

In the 1980s, international attention was drawn to the conflict between Nicaragua's Sandinista government and the Miskito people of the Atlantic Coast. Many Latin Americanists saw the Nicaraguan Revolution as a beacon of hope for the region. As a result, it was distressing and perplexing that a progressive, socialist administration could become so entangled in a fight with a poor, oppressed ethnic minority community—precisely the kind of group that the Nicaraguan Revolution should have aided. The Sandinista militia group forcefully evicted forty-two Miskitu communities in late 1981. The Sandinista units were stationed in several areas, where hostile local inhabitants saw them as an invading army. The armed war resulted in a devastating toll of death and suffering, as well as human rights violations. Insurgent tactics included the destruction of transportation, bridges, and health centers. A few years later the Sandinista administration announced a plan for

[36] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4-9
[37] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4-9

regional autonomy in 1984. There are opposing views on whether the Sandinista government did more good than harm to the Miskitu people, but the turmoil, bloodshed, and political upheaval forced many to flee to Honduras.[38]

Also located in the northeastern region are the Sumu Indians, with a population of 5,000 to 10,000. In the years 1982-1983, 3,000 of the Sumu Indians decided to depart to Honduras.[39] The Rama Indigenous group resides in the eastern half of Nicaragua. Their communities experienced extreme depopulation due to colonization, the arrival of foreign companies to exploit the local resources, and the migration of the locals to urban areas. The few Rama populations that survived live today on the southeastern side of Nicaragua on a small island near Bluefields. The Garifunas or Afro-Indigenous descendants also dwell in this area. Approximately 70,000 Garifunas primarily live on the Caribbean Coast of Central America, starting from Belize and then towards the south, composing a multitude of the southern region.[40]

[38] Dennis, Philip A. "The Miskito-Sandinista conflict in Nicaragua in the 1980s." (1993): 214-234.
[39] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4-9
[40] Dunbar-Ortiz, Roxanne. *The Miskitu Indians of Nicaragua*. Vol. 209. Public Interest Publication, 1988. pg. 4-9

Figure 5, Photograph of four different Indigenous communities: Rama, Sumu, Miskitu , and Creole (Source: Parsons, James J)

In the city of Bluefields, a group of Afro-American English speakers, who refer to themselves as Creoles (a person of African, European, and Amerindian ancestry), are a community that rose to existence as countless immigrations of escaped African slaves, slaves from British planters on the coast, and Jamaican immigrants settled. This Afro-Nicaraguan community has a strong cultural resemblance to other English-speaking Caribbean communities with which they continue to keep a close association. Bluefields is the most valuable economic and political center on Nicaragua's Caribbean coast. The distance between the northernmost city, Puerto Cabezas, and the southernmost city, Bluefields, is approximately 125 miles (see Figures 1 and

2). Because there are no roads linking these locations, getting to Nicaragua's capital, Managua, and the rest of the country is challenging. A census was conducted in 1987, and it was revealed that 11,212 people out of a total population of 35,612 were Creole. Bluefields' overall population increased to 36,292 according to the 1995 census, and the population reached 57,303 according to the 2019 census, and it continues to expand today.[41]

[41] Decker, Ken, and Andy Keener. "A Report on the English-Lexifier Creole of Nicaragua, also known as Miskito Coast Creole, with special reference to Bluefields and the Corn Islands." *Summer Institute of Linguistics* (1998).

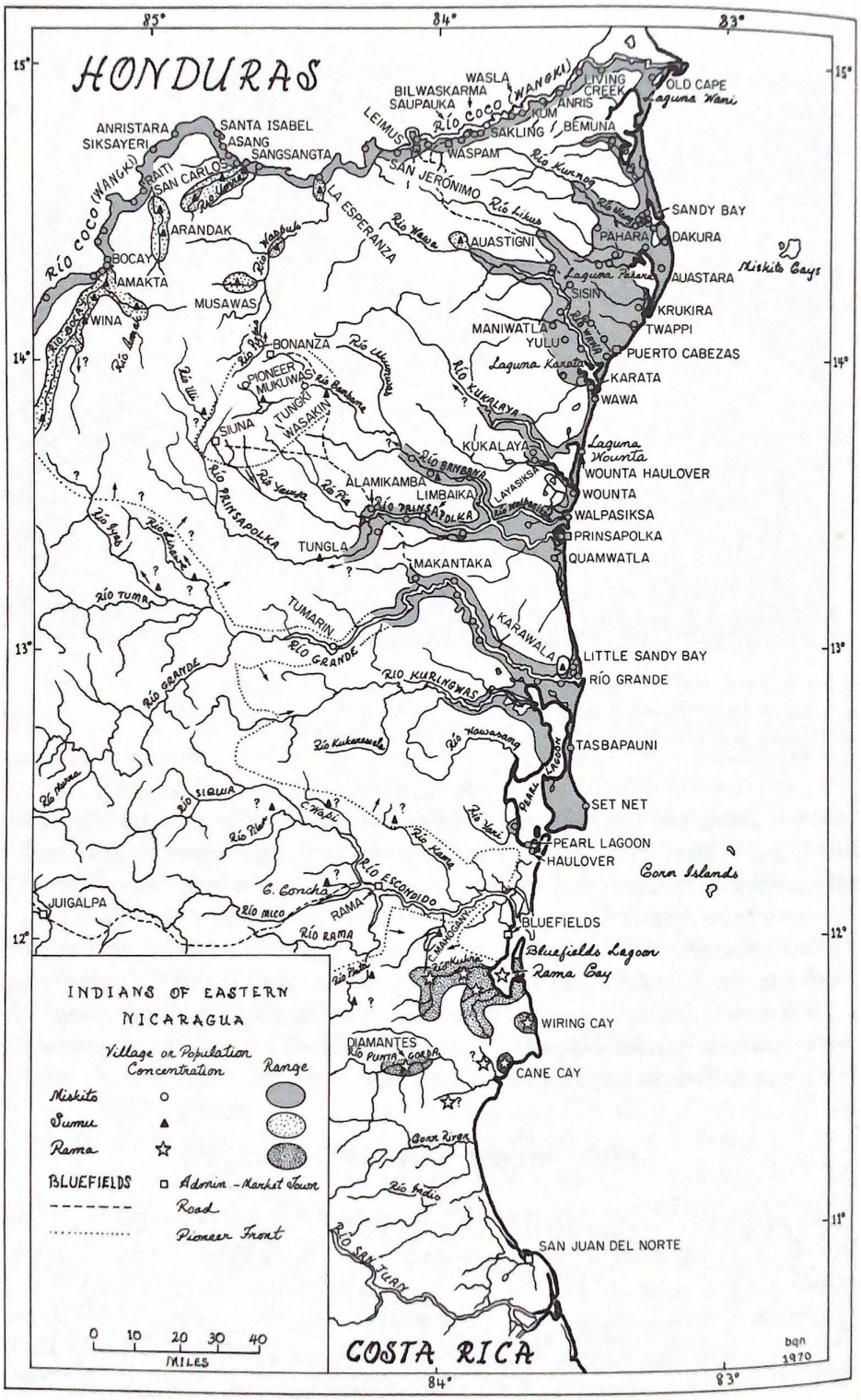

Figure 6, Map of Indigenous communities (Source: Parsons, James J)

The Miskitu Indian Peoples

The Miskitu population holds a close historical and cultural link with the Afro-descendant Black Creoles (a person of African, European, and Amerindian ancestry) whose presence in the region started to appear upon the arrival of British slave owners. The British colonization of the Caribbean Coast was strategic in which they allied with the Miskitu Indians. Both parties agreed that the Miskitu would provide valuable British goods, such as mahogany, gold, rubber, and turtles, in return for protection against any sovereign powers in the region, including Spain.[42] In 1687 an Anglo-Miskitu alliance was formed along with the rise of the Miskitu coast, where Jamaica's governor crowned the first Miskitu king. In 1847 the influx of Moravian missionaries amidst the spread of Protestant Christianity further reinforced the grasp of Anglo-cultural affinities since there was a lack of coercion associated with Anglo-Miskitu relations. Despite that, the British retreated and legally surrendered the region to Spain in the Treaty of Versailles. The Miskitu king successfully defeated Spanish efforts to fortify their control over the region. In the nineteenth century, the power shifted to the United States and a host of American companies, which built several economic islands connected to extractive businesses that used the Caribbean coast's valuable resources, such as their lands, water, forests, and agriculture. Consequently, the Miskitu lost

[42] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 1-10

their privileged stature in the region in opposition to English-speaking Creoles.[43]

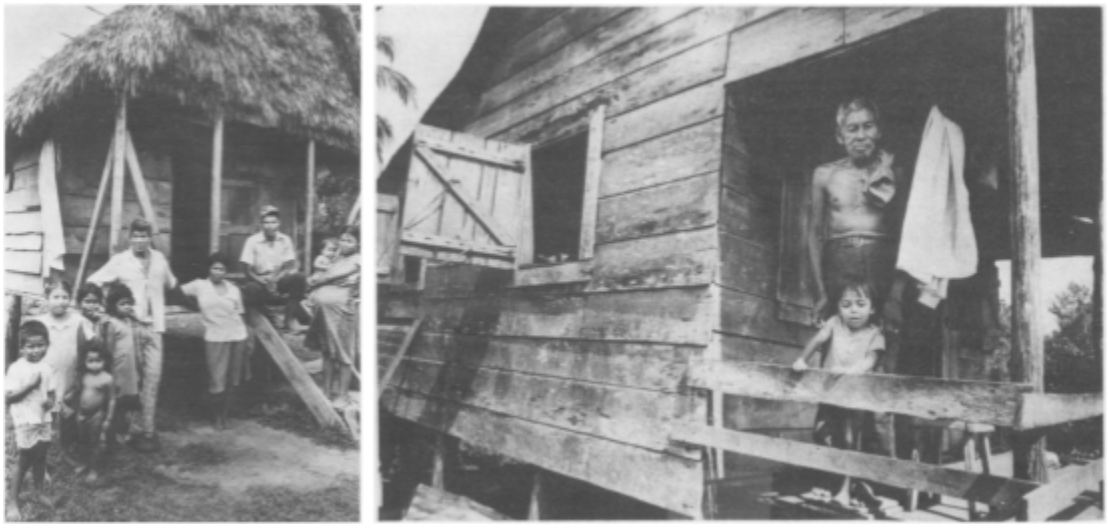

Figure 7, Miskitu people and traditional Miskitu homes. (Source: Ortiz, Roxanne Dunbar, Photographer: Lou Dematteis)

Despite the fluctuation of influence from the English, the Miskitu Kingdom structure was persistently stable for roughly 240 years. The 1860 Treaty of Managua, signed by Britain and Nicaragua, recognized the sovereignty of Nicaragua over the Atlantic region, concluding the Miskitu coast. The treaty established a district that strictly delineated the boundary of the Miskitu coast, which sat between the Rio Rama in the south, Rio Hueso in the north, and the Atlantic Coast to the east (see Figure 3 and Figure 6). In this newly instated region, the Miskitu community had the right to govern per their

[43] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 1-10

customs and regulations while also coinciding with the sovereign rights of the Republic of Nicaragua. To date, Nicaraguan assertions to the Atlantic Coast continue to be mainly argued by the region's inhabitants, implying the self-ruling tradition of the Miskitu and their historical and cultural distinctiveness. Since the sixteenth century, the imperialist powers of Spain and England confronted the pre-Columbian Indigenous societies where they attempted to attain hegemony in this region. Subsequently, these confrontations shaped the evolution of Indigenous civilizations. Still, the exact origin of the Miskitu is unknown.[44]

The Miskitu coast changed radically in 1894 over the invasion of Bluefields and the impeachment of the Miskitu coast's (Reservation) government, both executed by Nicaraguan troops.[45] The inhabitants of Bluefields had delivered a petition to Queen Victoria on March 8, 1894:

> "We will be in the hands of a government and people who have not the slightest interest, sympathy, or good feeling for the inhabitants of the [Miskitu] Reservation; and as our manners, customs, religion, laws and language are not in accord, there can never be a unity. We most respectfully beg...your Majesty...to take back under your protection the

[44] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 15-17
[45] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 32-34

> [Miskitu] nation and people, so that we may become a people of your Majesty's Empire."[46]

On January 1, 1895, Rigoberto Cabezas, governor of the newly annexed Miskitu Reserve, expressed:

> "The national conscience should also be satisfied, because here [we have] a great mission to fulfill. There must be commenced at once the slow but efficacious work of assimilating the [Indigenous] element, and rendering it one of the sources of strength of the country."[47]

A fragile aspect of the Miskitu Reservation was the boundaries that existed in the Nicaraguan Miskitu coast. In the rural northern area were Miskitu and Sumu inhabitants, while Afro-Americans resided in the south, where the only major villages were situated. Although the Miskitu had remained under Nicaraguan rule since 1860, those who dwelled within the Miskitu Reservation's boundary continued to endure political marginalization, along with other Indigenous groups. However, interference of governmental structures stayed at a minimum, allowing the communities to protect a high status of autonomy. The lack of political role the Miskitu took on resulted in a geographical diaspora and a modular political system, following the political divide between Honduras, Nicaragua, and the Miskitu coast. The

[46] Pineda, Baron L. "Nicaragua's Two Coasts." In *Shipwrecked Identities: Navigating Race on Nicaragua's Mosquito Coast*, 21–66. Rutgers University Press, 2006. https://doi.org/10.2307/j.ctt5hj296.4.
[47] Hale, Charles R. *Resistance and contradiction: Miskitu Indians and the Nicaraguan state, 1894-1987*. Stanford University Press, 1994.

fragmentation of the north, which was predominantly Miskitu, and the south, where Creoles were the majority, influenced the advancement of the Nicaraguan Miskitu coast and the formation of two autonomous regions (see figure 1) of 1987.[48]

The Resistance of Indigenous Communities

The Autonomy statute, created in 1987, offered a sense of peace to the RACCN, following the 1979-1990 Contra War.[49] Defined by the statute was an agreement to Miskitu, Creoles, and other minority groups the rights to properties, language, bilingual education, political affiliations, and the authority over the exploitation of resources. This acknowledgment of the rights of Indigenous and marginalized communities was welcomed and thriving, for the most part, in engaging them with the rest of society. Though there was malintent in the composition of this agreement, these laws aimed to involve these groups to make them decent "citizens." For instance, the Indigenous people are a self-governed and disengaged community from the rest of society; therefore, outsiders, such as the Nicaraguan government, deemed them uncivilized, so to have them integrated with Nicaragua would make them respectable residents. Hence, marginalization intensified between

[48] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 37-43
[49] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 283-286

the Pacific Coast and the Caribbean Coast due to the ill-intent intentions hidden in the reasoning for integrating them.[50]

Consequently, some communities have grown to distrust the government, and as an alternative, rely on the cocaine industry rather than government programs or developmental aid.[51] Amid the 1990s, it is theorized that the Miskitu people inside the coastal villages north of Puerto Cabezas began finding cocaine washed up on the coast. Cocaine wealth has been utilized in an unforeseen way in neighborhood communities. Sandy Bay, for instance, used cocaine wealth to develop homes, schools, and churches in a venture of self-directed progression. There are apparent internal contradictions involving the drug trade. On the one hand, cocaine has produced severe social issues, but on the other hand, it has brought wealth.[52]

Nicaragua's population predominantly identifies as Mestizos, a mixed-race group who are of European and Indigenous descent. The Caribbean Coast Autonomous Regions include different ethnic backgrounds such as groups of Amerindian descent such as the Miskitu, Mayangna, Ulwa, and Rama and the mixed-race group but mainly of African descent such as the Creoles and Garifuna. These groups still work the land sustainably using several methods of shifting cultivation. Many within the communities are fishermen and independent farmers. Most consider the land and waters that

[50] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011.
[51] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 283-286
[52] Dennis, Philip A. "Cocaine in Miskitu villages." *Ethnology* (2003): 161-172.

they utilize as the inherent property of Indigenous inhabitants.[53] There is no selling allowed of land or waters, except through the law, usufruct, regarding small parcels; however, the usage rights will revert to the community if abandoned.[54]

From the 1950s to the 1960s, the government formulated programs designed to rationalize export agriculture in western parts of the country, triggering a mass migration of homeless farmers that is still relevant today. These *campesinos* (peasants in Spanish) go to forests and savannas further to the east, previously used by Indigenous peoples, to seek new and empty lands. After about a year, these lands reach soil exhaustion due to deforestation and farming, and they then sow grass to create potreros (cattle grazing lands).[55] They then sell the grasslands to the ranchers, who had followed them into the region, moving further to the east of the forest, which slowly became saleable plains by the reiterative process of deforestation and farming. In increasingly large numbers, threatening mestizo invaders arrive in what they perceive as underused lands, forcing Indigenous farmers out of their lands that usually live far from their farms, an experience familiar to the Rama and Creoles living south of Bluefields. Commonly, these campesinos take out temporary titles of the lands they invade from government agencies to intimidate Indigenous people, prepared to condone violence upon arrival. Perhaps the

[53] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 283-286
[54] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 283-286
[55] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 298-307

current most significant threat to the territorial integrity of most of eastern Nicaragua's Indigenous communities hitherto is the approach eastwards into the Caribbean watershed by thousands of campesinos. These heinous acts are in direct violation of the autonomy statute of 1987, which asserts that resources in the Caribbean Coast Autonomous Regions cannot be expropriated without the permission of local communities. Several Indigenous communities proceed to worry about the sale and purchase of those dubious titles.[56]

Most of the land in eastern Nicaragua has been formally included in the Bosawas Reserve and the Southeastern Nicaragua Biosphere Reserve, classified into fundamental reserves (see Figure 7). The constituent reserves are intended to preserve flora and fauna across distinct areas of the entire territory and limit agricultural frontier expansion. Though the Bosawas have helped a fair amount in defending Indigenous land rights, its primary purpose and mission are to preserve wildlife discovered within their boundaries rather than the residents of this region. Unlike, The Cerro Silva Reserve impedes all settlement unless needed for the restoration management of the forest, insinuating there is a threat to wildlife.[57] Unfortunately, Indigenous families are removed from their lands in some circumstances, regardless of generational residency, rightfulness to ownership, or occupancy. The Nicaraguan Assembly passed the legislation "Law 445: Law of Communal

[56] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 283-286
[57] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 284-289

Property Regime of the Indigenous Peoples and Ethnic Communities of the Autonomous Regions of the Atlantic Coast of Nicaragua and of the Rivers Bocay, Coco, Indio, and Maiz."in January 2003.[58] Law 445 granted Indigenous peoples the right to use and manage their ancestral lands, adjacent coastal areas, and resources and also warranted that such territories be demarcated and titled. In order to implement the terms of this law, the National Demarcation and Titling Commission (CONADETI), was formed including the Regional Intersectoral Commissions and a Regional Technical Commission for land demarcation and a dedicated statute outlined the steps required during the demarcation and titling process. These steps included the official application for surveys, titles, demarcating, the condition of non-Indigenous occupants in Indigenous territories, and strategies for conflict resolution. With anticipation Law 445 would offer a rational organization of Indigenous lands and create a stable prospect to the region's history of uncertainties over rights to territories and local conflict.[59]

[58] "Law 445: Law of Communal Property Regime of the Indigenous Peoples and Ethnic Communities of the Autonomous Regions of the Atlantic Coast of Nicaragua and of the Rivers Bocay, Coco, Indio and Maiz." Land Portal, January 23, 2018. https://landportal.org/pt/library/resources/law-445-law-communal-property-regime-Indigenous-peoples-and-ethnic-communities.

[59] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011. pg. 289-303

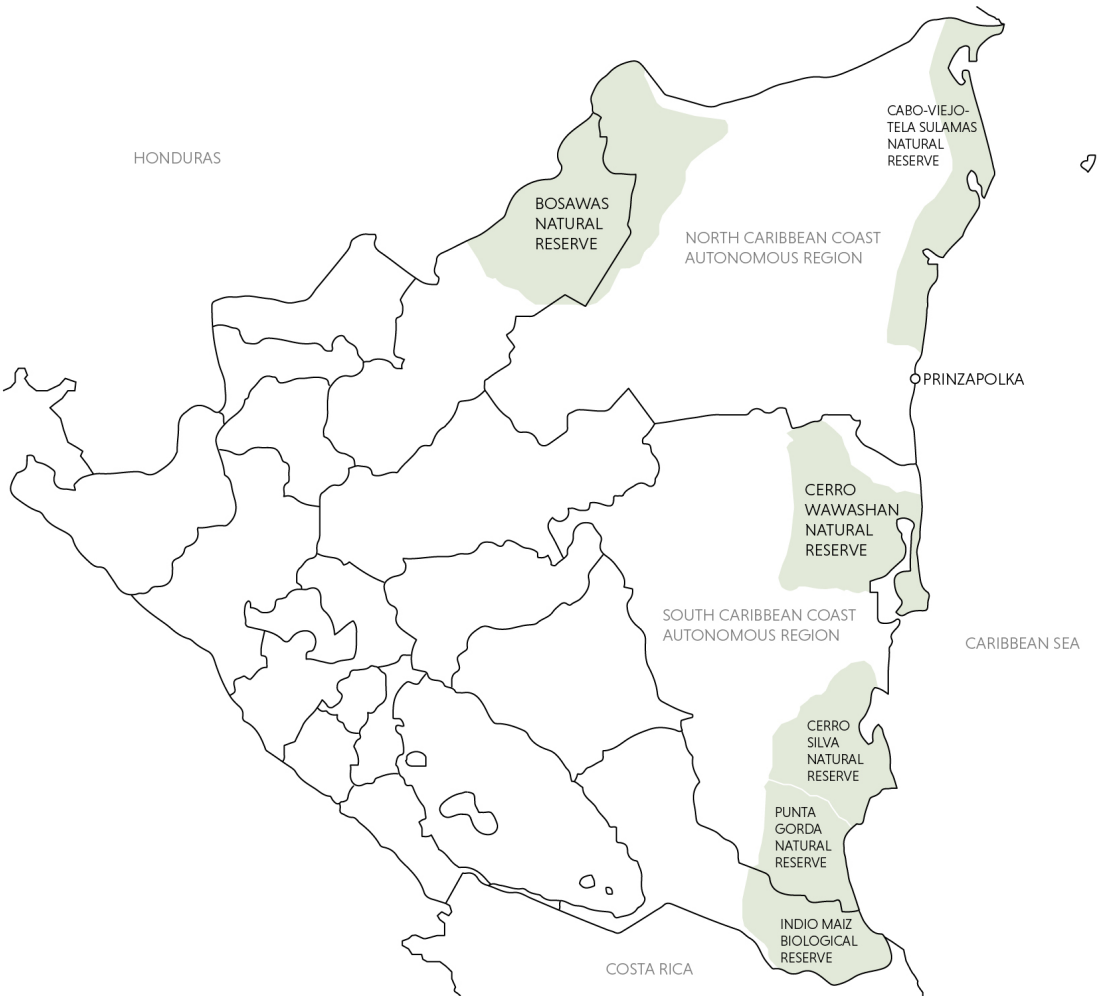

Figure 8, Current Reservations of Nicaragua Map (Source: Author, Gobierno de Reconciliación y Unidad Nacional)

Proceeding Measures and Forward Thinking

As this thesis continues to research the history of Indigenous people and what they have suffered, it is necessary to hear their prior perspectives on how to preserve their lands and their contemporary perspectives. Their fight to protect their lands persists, for as the world evolves and modernizes, the preservation of traditional and Indigenous values in communities is

disregarded and viewed as replaceable. It is an extremely delicate subject considering their lands symbolize an ancestral past that must be meticulously preserved. As a result, it is vital to protect their way of life while only enhancing what Indigenous communities deem necessary, such as more housing. The proposed housing typology will be congruent with the existing housing, a traditional house on stilts. The design will avoid over-densifying their settlements since the Indigenous communities require openness for their agricultural lands. An enhancement to the community reflects what it means to support a community without erasing their culture, customs, values, and identities. At times a complete remodeling and modernization of a community are not necessary. There must be a degree of appreciation and acknowledgment of what exists deeper than what is visible on the surface. A look into the community and its legacy is the first phase to creating a design that will cooperate with Indigenous communities and benefit them for future generations to come.

Chapter 4: Traditional Housing Typologies in Nicaragua

Traditional Miskitu Housing

The RACCN and RACCS possess a diverse set of housing typologies, but many overlapping architectural elements as well. European and Caribbean influences were one of the main drivers for the structural and materiality changes of the Miskitu dwellings. The Moravian missionaries' intrusion of 1847 affected a significant change in traditional homes while advancing the ideology of better living conditions. The Moravian style served as an architectural prototype for which the Miskitu deemed distinct details to be modern and refined.[60]

In 1699 the traditional Miskitu dwellings were long communal homes and were particularly represented in the Sandy Bay village located in the RACCN of Nicaragua as having twelve houses with four-hundred residents in total. Eventually, a shift in design occurred in which the Miskitu decided to form small rectangular dwellings, when this happened is unknown.[61] The residences' construction included dirt floors, thatched roofs curved on the edges, and four wooden posts as the support system. Typically the hardwood posts were created by *Tecoma Chrysantha* (a tree native to South America),

[60] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 143-149

[61] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 143-149

Dialium (a tall tropical plant), and Sapota Zapotilla (a tree native to Mexico, Central America, and the Caribbean). The forming of palm-thatched roofs uses various species of palm trees native to specific regions of Central America, such as the Attalea Cohune, Calyptrogyne Sarapiquensis, and Acoelorrhaphe Wrightii. Although the dwellings had no walls, the roofs are a few feet off the ground to protect them from seeping to the floor. The tall ceilings allow the hot air to rise, while the steepness of the pitched roof enables rain water to fall off effectively. The absence of walls offered natural ventilation through the main living space. The traditional structure and its simplistic form were suitable enough for the Miskitu community and their environment.[62]

[62] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 143-149

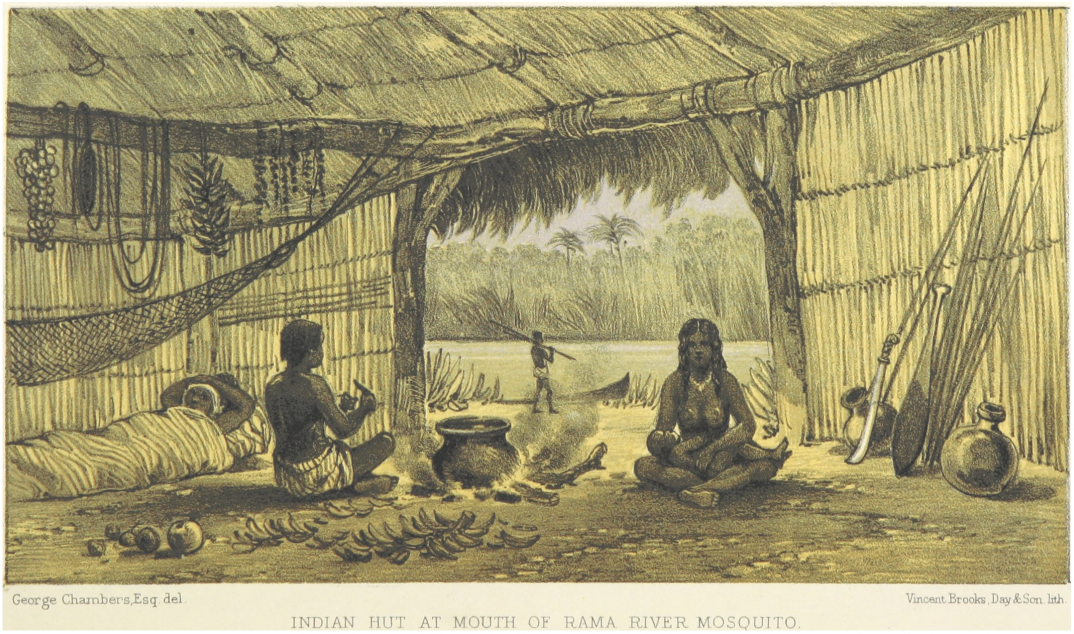

Figure 9, Traditional Miskitu hut in 1502. (Source: Pim, Bedford)

The Moravian Influx: An Alteration to Miskitu Housing

The Miskitu were exposed to different housing types from foreigners on the Coast, including English colonizers, Africans, Creoles, and Jamaicans during the eighteenth and nineteenth centuries. Additionally, foreign industrial mining and lumber company buildings exposed the Miskitu to foreign construction materials and typologies. The Moravian missionaries asserted the most alterations to the Miskitu dwellings, for they actively taught and inspired the Mikistu to build houses using diverse materials and methods. Housing was the central priority for the Moravian missionaries to develop. The Moravians' initial aspect encouraged the Miskitu to construct walls to strive for privacy. A significant change had occurred. Not just in the inhabitants but also their

dwellings. They were no longer open structures but instead had bamboo or palm tree branches wattled to the exterior of their homes. Modifications in Miskitu housing were attributed to the missionaries' religious teachings. The following is a Moravian missionary's assessment of the extent of village transformation as a result of missionary influence:

> "The civilizing effects of the Gospel are very strikingly manifest at [Nicaragua]. In 1860, a few huts were to be seen in wretched condition, now you find a double row of cottages, some of them with boarded floors, and all neatly kept, and clean. Some have gardens attached. A properly constructed road now leads through the village. Polygamy was their universal custom, now it is unknown. Instead of naked savages you meet with men and women suitably clothed and well conducted."[63]

The Moravians' presence was associated with a significant change in housing styles, to the point where missionaries later classified dwellings without walls as belonging to the non-Christian Miskitu population.[64]

Furthermore, the missionaries labeled entire communities and portions of villages as "uncivilized and un-Christian" based on dwelling types. The

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[63] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 146

[64] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 145-149

homes were rarely boarded or walled, and the entire family slept in one large apartment, some on a kriki, others in hammocks, and others on the ground or floor. The missionaries' first walls were composed of vertically stacked sawed off cabbage palm trunks, but they also experimented with wickerwork of split cabbage palm trunks. Other communities on the Miskitu Coast used this type of wickerwork before the Moravians arrived. According to a specialist, the Creoles also used wickerwork walls to create wattle and daub walls out of the trunks of a palm called “papter.” The trunks are separated longitudinally into laths interlaced at right angles to keep the rain out while providing ample fresh air. In some situations, split bamboo was also utilized as wickerwork, although later, the discovery of regional variances in wall materials had formed. The interior side walls were made of a "wattlework" of split bamboo, while the shore walls were made of vertically piled chopped cabbage palm trunks.[65] (See Figure 10 and 11)

The existence of two types of plants was most likely responsible for this regional variance. Moravians eventually sought to modify the wall material in all sites from saw cut palm trunks to vertically arranged pieces of split bamboo. Another alteration brought by the missionaries to the Miskitu Coast houses was a floor of split bamboo or sawed planks elevated above the ground on posts, also known as stilt houses. While Moravian missionaries did not invent the usage of posts on the Miskitu Coast, they did advocate for

[65] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 147-151

expanding stilt houses from Bluefields and other English settlements down the coast to Indigenous tribes for various reasons. To begin with, the majority of the coastline was constantly wet throughout the rainy season. The higher elevation of the floor enabled the house to be more sanitary and dryer. Furthermore, the high floor kept insects, small rodents, reptiles, and other creatures out of the dwelling. Missionaries advocated partitioning the one-room residence into two rooms to develop seclusion within the home. One room served as a bedroom area, while the other served as a kitchen and dining area. The construction of an outside kitchen and a full-length gallery were two other notable improvements made to Miskitu dwellings by missionaries.[66]

[66] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 157-159

Figure 10, House in Bluefields, Nicaragua. (Source: Kessler, P L.)

Figure 11, Traditional home construction. (Source: Nathalia Gonzalez)

The Contemporary Miskitu Home

The construction of contemporary residences had four main corner posts and supplementary, vertical members on the sides and ends. Corner wind braces were also installed at a forty-five degree angle to support the main pillars.[67] The roof's construction had beams and rafters made of sawed pine two-by-fours or cedro macho (a type of tree) poles stripped of bark. The ridge pole stands fifteen to twenty feet above the ground, supported by short posts that extend vertically from the tie beams. Small rods are laid horizontally across the rafters to support the thatch. Although some Miskitu homes have hipped roofs, most homes have gabled roofs.[68]

The floor of a Miskitu residence consists of sawed planks raised three to five feet above the ground and supported by four rows of three posts. The floor plan layout may include a single room that functions as a kitchen, living space, and bedroom. However, most homes are a rectangle of eighteen by twenty-two or twenty-four foot building divided into sleeping compartments and a larger main room by wood or bamboo barriers. Window openings may be built on all sides and complemented with wooden shutters.[69]

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[67] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999.
[68] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 155-157
[69] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 155-157

The main space included a table, benches, and chairs, while the bedrooms had wooden sleeping platforms known as krikris. Although the Miskitu have traditionally slept on wood, mattresses are now widely used. Bedding can be placed directly on the floor for children and, on rare occasions, for women. The combination of sheets of bark cloth and bought cotton cloth make use for covers. Silk cottonseed fibers are intermittently used to create pillows and thin mattresses. The sleeping unit may also have the main area with a few tables and stools and possibly a sewing machine. A porch spans the length of the home, and it has a long, low bench carved from a single piece of wood, a v-shaped wooden chair, or a braided fiber hammock[70]

Kitchens vary significantly in style and materials, and they are either integrated into the home, linked as an additional room or kept independently. [71] The kitchen typically includes a table with chairs or a bench, shelves for cutlery and dishes, and a kubus or clay stove as the cooking platform. This is an oblong table with rising sides made of a native white clay used to kindle a fire. Sturdy three-legged iron pots known as dikwas stand on two parallel iron bars anchored by end pieces of wood, or old dikwas partially submerged in the clay. Most kitchens feature a small slatted platform protruding outside a foot or two from a window for dishwashing and meal preparation.[72]

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[70] Helms, Mary W. Asang. "Adaptations to Culture Contact in a Miskito Community." (1971).
[71] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 157-159
[72] Helms, Mary W. Asang. "Adaptations to Culture Contact in a Miskito Community." (1971).

Before the Moravians came, English settlers on the coast used separate kitchens, but the Miskitu rarely used them until their homes were raised above the ground on posts. The kitchen was frequently relocated to a separate building after the floor of a residence was elevated. The Moravians pushed the Miskito to construct separate kitchens for sanitary reasons and to limit fire risk. The separate kitchen was smaller than the principal structure but constructed similarly, measuring around fourteen by nineteen feet. The kitchen was likewise elevated above the ground by supports and frequently linked to the larger building by wooden planks that acted as a bridge.[73]

The kitchen is a storage room where baskets and fishing nets are suspended from the rafters. The fishing poles, machetes, knives, and large cooking utensils are placed on the walls. Many Miskitu homes and separate kitchens feature full-length galleries added to the front of the structure. The differences in shape and materials utilized in Miskitu homes result from ongoing changes in Miskitu house types as architectural principles became increasingly Westernized.[74] (See Figure 12).

[73] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 158-159

[74] Tillman, Benjamin Farr. *The Miskito settlement landscape of eastern Honduras, with emphasis on the Moravian contribution*. Louisiana State University and Agricultural & Mechanical College, 1999. pg. 158-159

Figure 12, Miskitu traditional home floor plan (Source: Tillman, Benjamin Farr)

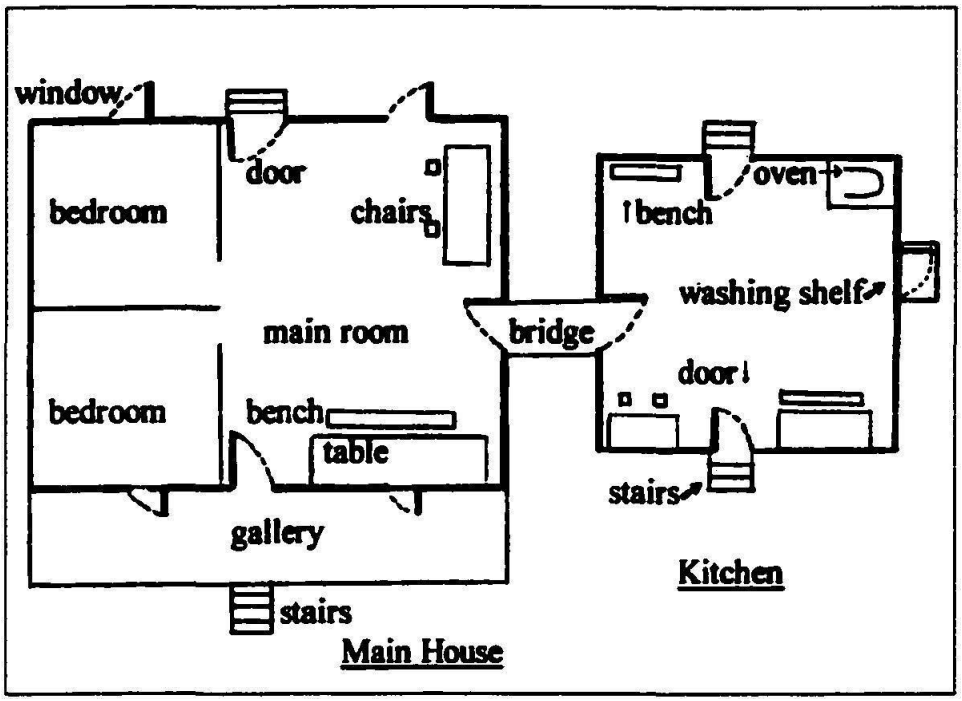

Figure 13, Kitchen inside traditional home. (Source: Helms, Mary W. Asang)

Figure 14, Miskitu sawing wood. (Source: Helms, Mary W. Asang)

Documentation of Mayangna Housing

The Mayangna ethnic community dwells in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Bosawás Biosphere Reserve in Nicaragua's RACCN. In the summer of 2019, documentation of a typical Mayangna home in Santa Mara (Bonanza municipal term) was achieved through a volunteer initiative designed by the School of Architecture at the University of Málaga, Spain.[75] Documentation and digital reconstruction of this typology are still insufficient, despite many of these traditional structures being in danger of vanishing with more

[75] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020).

contemporary buildings. For several years, the University of Málaga's Higher Technical School of Architecture has been documenting vernacular architecture and documenting it, focusing on southern Morocco and, more recently, Nicaragua. Students from the School of Architecture had the chance to spend two months in Bonanza, located on the RACCN.[76]

The established fieldwork resulted in discovering a vernacular type of the local Mayangna population, which gives a unique chance to construct a survey of the household buildings in this region, fully recorded by an organization for the first time. The main goal is to increase the possibilities for a better understanding of the existing cultural diversity and documentation hat recognizes traditional community values. While still consolidating an increasingly eroded cultural identity, as summarized in the compilation of Mayangna domestic reality and the documentation of its residential buildings. The primary objective is to expand the opportunities for a more profound knowledge of the current cultural variety and a performance interpretation that honors traditional community values. While attempting to reestablish a rapidly degraded cultural identity, as described in the documentation of Mayangna dwelling practices and the recording of their residential constructions. The community's transformational and modification processes resulted from

[76] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020). pg. 203

influences by other cultures, which serve as the framework for carrying out this mission.[77]

The volunteer project witnessed the distinctive way of life of the Mayangna people, which directly mirrors the spatial organization of the land and their residences. The settlements chosen for this inquiry were two traditional homes that retain Indigenous elements and traditional construction. The community contains 121 families spread among 101 houses, resulting in extremely high population densities, with up to thirty individuals from five different families living in the same 750 square foot house. The observed home accommodated eight people and had a division of two modules, the first measuring around thirteen feet by twelve feet and the second around eleven feet by ten feet. The floor was raised roughly three feet above the ground. This approach not only isolates the soil from the ground, allowing for improved ventilation in the rooms, but it also protects the structure from moisture, floods, and stagnation.[78]

The assessed house did not deviate much from previous descriptions of the traditional housing type observed in numerous historic Indigenous groups. The staircase, a notched palm trunk, was the element that drew the attention of one of the investigated residences. In general, the houses observed during the fieldwork often had two or three simple volumes joined by a bridge or close to

[77] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020). pg. 205-208

[78] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020). pg. 205-208

one another. There were no interior partitions, and the number of apertures was often minimal. The porch was a standard feature in all residences.[79]

Figure 15, Traditional home with attached kitchen. (Source: Photographer: Nathalia Gonzalez)

The materials and traditional processes utilized, tailored to the region's climatic and cultural requirements, but now faster and easier-to-install parts are being used. Traditional roofing materials, such as palm leaves, were

[79] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020). pg. 205-208

increasingly difficult to source. In this community, metal roofing sheets and industrial lumber boards were commonly used instead of bamboo walls. The adoption of new materials is changing the design of houses indirectly, such as with gable roofs or mono-pitched roofs. In summary, the research team concluded that the substitutions made in the housing typology make it a less comfortable home than the traditional housing typology. Compared to the usage of natural resources, the new technique incurs greater expenditures due to the procurement of building materials.[80]

[80] Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez. "Documentation of traditional housing in Mayangna communities. Bosawás Biosphere Reserve, Nicaragua." (2020). pg. 207-208

Figure 16, Interior and exterior of traditional home. (Source: Photographer: Nathalia Gonzalez)

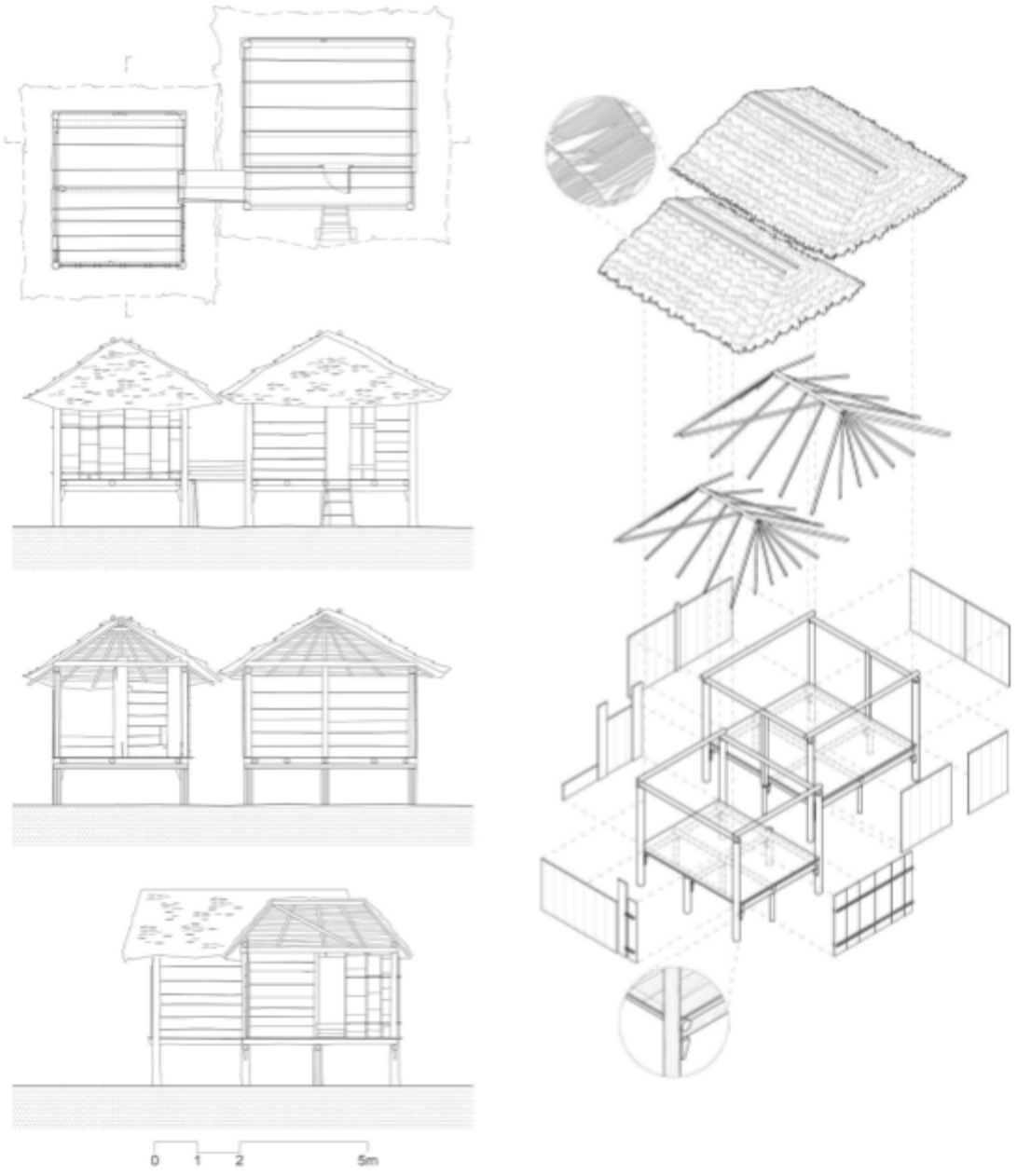

Figure 17, Plan, section, and isometric exploded drawing of traditional home. (Source: Cimadomo, Guido, Nathalia González Meixuero, José Luis Jamauca, Carlos Castaño Gil, and Marta Martín Sánchez)

Chapter 5: Approaching Indigenous Grounds

Contributions and Conservation

Indigenous peoples may contribute to biodiversity conservation in protected areas by using their local knowledge, ecologically sensitive land-use strategies, and resource management. All of which are founded on deeply held ideas, values, and conservation ethics, and are enforced by individual conscience, societal pressure, and community-based resource management institutions—as well as pledges to the preservation of their territory and resources. The following are some of the contributions that Indigenous peoples make to protected areas, according to author Stan Stevens: [81]

1. Homelands endowed with significant natural resources, encompassing the vast majority of regions that might be included in future global protected area networks.

2. Cultures have different fundamental human values.

3. Deep understanding of the topography and ecology of the area.

4. Land use and resource management methods, which are not only suitable to local ecosystems but have also shaped and proceeded to maintain these ecosystems and regional landscapes.

[81] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267

5. Indigenous conservation beliefs and practices include preserving sacred sites and species, prohibitions on natural resource harvesting, restrictions on land usage by non-community members, and the operation of local resource management organizations.

6. Professional, continual surveillance of changing land use and environmental conditions by informed and concerned observers.

7. A community that is frequently and highly motivated to safeguard territories and resources against foreign incursions.

8. Historical, cultural, and biological data are vital to protected area management, scientific research, and improving tourist experience and education through park interpretive efforts.*

   *Tourism may arise although, momentarily, this thesis will prioritize the preservation of local agricultural and fishing traditions.

9. Ways of life that may give insights into values, institutions, and practices that may be very important in supporting spiritually, culturally, and monetarily gratifying ways of life, as well as ecologically sustainable land use, in different regions and societies.[82]

Indigenous peoples stand to gain much from the establishment of protected areas. None of these benefits arise effortlessly; instead, it takes several years of uphill negotiating by Indigenous peoples and their supporters.

[82] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267

The following are some of the possible benefits of having their ancestral lands classified as protected territories, as per the author Stan Stevens: [83]

1. A way of growing regulatory acknowledgment of their legal status as distinct peoples or nations

2. A way of gaining formal recognition for their sovereignty of private communal lands, individual and community access to natural resources, and other forms of autonomy over their native region

3. Increased national and worldwide exposure, increased concern for their human rights and welfare, as well as challenges to their cultural survival and the natural integrity of their homeland

4. Increasing national and international cooperation for homeland security against invasion by non-Indigenous settlers and commercial interests

5. Additional avenues of growth beyond natural resource and labor exploitation capitalism, which is common in formerly isolated regions that become integrated into the global economy

6. National governments may provide direct funding in exchange for a pledge to indicate territory as a preserved region.

[83] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267

7. More legal, organizational, and financial support for local environmental and management projects

8. Control over sacred grounds, including the authority to implement them inaccessible to others during rites and ceremonies

9. Authority over tourism planning, including decisions regarding the type and extent of tourism, admission to tourist sites, and the amount of outside business engagement

10. Profits from protected area admission fees and tourist operation license fees

11. Priority job opportunities in the protected area

12. Tourism development offers employment and business prospects

13. Rural development initiatives that are financed by a nature reserve or have priority status in global development programs

14. Indigenous communities offer economic, political, and assistance for traditional conservation principles, institutions, and management.[84]

If Indigenous peoples are especially interested in gaining protected area status for their lands, agreements, and incentives like those outlined above must become more typical rather than exceptional.[85]

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[84] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267

[85] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267

Indigeous and Community-Based Preservation of Land

Indigenous peoples have raised several significant concerns regarding their involvement in protected lands at international and local conferences, such as, The Inter-American Court of Human Rights (IACHR), The Center for Justice and Human Rights of the Atlantic Coast of Nicaragua (CEJUDHCAN), and The Center for Justice and International Law (CEJIL).[86] Some of their concerns include the following: sovereignty, autonomy, land tenancy, rights to resources, management, breach of conservation treaties, conservative views, conservation within the community, development, and control of tourism.[87]

In terms of sovereignty, Stan Stevens believes that many Indigenous peoples will continue to fight for complete independence and legitimacy as a country with complete control over their ancestral lands. However, some Indigenous people acknowledge how difficult it may be to obtain autonomy as a country and thus refrain from pursuing it. Indigenous peoples may realize that establishing protected zones is a method of obtaining at least partial recognition of settlement and land use rights. Perhaps this is compelling when government policies or court decisions on land disputes have hindered full recognition of Indigenous peoples' sovereignty over their ancestral territories.[88]

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[86] "Miskito Indigenous Communities." Cejil, March 12, 2021. https://cejil.org/en/case/miskito-indigenous-communities/.
[87] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 265-267
[88] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 279-280

Prioritization for cultural freedom and autonomy are essential for the long-term survival of any inhabited protected territory. Whether an Indigenous group has ultimate sovereignty or a legal title to its protected land, autonomy should be considered a fundamental human right. Traditional Indigenous groups should have a role in forming protected regions, including the right to reject to have their territory classified as a protected area. It is common to have these protected zones formed without the consent and consultation of its inhabitants.[89] The following statements will portray some of the sentiments on attaining autonomy on Nicaragua's Caribbean Coast.

Author Charles R. Hale documented several Miskitu narratives, including that of Simon Gonzales, who expressed:

> "In old times the Miskitu had a king, and much more...The Miskitu are a nation with rights, a people that deserves respect. The government should grant us our lands, and inside that territory, Indians should rule...There are all kinds of riches on the Coast, you know. We have gold, lobster, oil, you name it. Most of [Nicaragua's] riches are here, and they belong to us."[90]

Another author, Roxanne Dunbar Ortiz, focuses on Nicaragua's regional autonomy and presents documentation including the following quote:

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[89] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 279-281

[90] Hale, Charles R. *Resistance and contradiction: Miskitu Indians and the Nicaraguan state, 1894-1987*. Stanford University Press, 1994.

"We [Miskitus] associate autonomy with three concrete demands: the return to the Rio Coco [river close to Honduras' border], the unity of the family, and a lucid government policy which allows room to respond to the historical, social, and economic demands of the Indian people within a framework of respect..."[91]

According to Gustavo Adolfo Castro Jo, a "Bluefields Indian" and faculty at the Caribbean University in Bluefields:[92]

"Regional Autonomy represents for the country in general, and the Caribbean Coast in particular, an opportunity to establish dignity and respect between Nicaragua's diverse populations, reducing economic and social inequalities between the two regions and strengthening national unity. It is an opportunity to construct an inclusive, multiethnic and intercultural nation...Today [2011] communal, territorial and regional governments exist which together have come to constitute regional autonomy. There have been advances in areas of vital importance for the inhabitants of the Caribbean Coast, such as the demarcation and titling of the lands of the indigenous and Afro-descendant populations, the recognition

[91] Ortiz, Roxanne Dunbar. "Indigenous Rights and Regional Autonomy in Revolutionary Nicaragua." *Latin American Perspectives* 14, no. 1 (1987): 43–66. http://www.jstor.org/stable/2633673.
[92] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011.

> and respect of the identity and cultures of each group and ethnic community...There are many positive aspects to the process of establishing Nicaragua's regional autonomy, yet its deficiencies and limitations are clearly visible."[93]

Traditional use restrictions of resources may be implemented across a protected region or in restricted land use zones. Indigenous people may amend previous paternalistic protected area regulations in order to safeguard resources from outsiders and to serve as a buffer against biodiversity loss and cultural deterioration caused by changing lifestyles and the implementation of new technology. Traditional use laws have the power to protect the natural landscape, but they should only be applied if Indigenous peoples were consulted or had consented in advance. In some cases, traditional usage laws may become disagreeable or unsuitable wildly when beliefs and interests diverge between generations. The existence of a protected area should not preclude Indigenous peoples from developing innovative techniques of resource use. However, the objectives of protected areas, such as sustainability, biodiversity conservation, and the preservation of significant cultural landscapes and ecosystem management, must remain crucial for resource management.[94]

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[93] Baracco, Luciano, ed. *National integration and contested autonomy: The Caribbean Coast of Nicaragua*. Algora Publishing, 2011.
[94] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 282-283

Indigenous people's input, involvement, and decision-making are crucial when creating and executing protected area policies and management laws controlling property resource use and local resource management. The facilitation of local control over property resource use should be through protected areas, including the rehabilitation of weakened and abandoned local institutions.[95]

When there is a breach in conservation and development agreements, there may be a jeopardization in Indigenous people's agreements and participation in protected areas with government agencies and international organizations. A lack of adequate financial backing could compromise the attempts of Indigenous peoples to protect their areas against invasion by settlers and outside corporate interests. These factors would be detrimental to both Indigenous peoples and the global expansion of protected areas. Future collaboration from Indigenous people is at risk because of the accustomed to unfulfilled promises, mainly revolving around protected areas.[96]

Conservative thinking is influential and impactful to governments, national parks, and forests agencies, and conservation and development organizations. Partly, this might represent the viewpoints of elderly citizens whose education and training precede the recent shift in perception toward Indigenous land conservation. They are frequently deeply held ideologies that

[95] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 283-285
[96] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 283-285

considerably affect policy formation, enforcement, and relations with Indigenous peoples. Many biologists, ecologists, and other physical scientists who advocate for protected areas and planning subscribe to traditional conservation ideas. Conservative concepts can hinder communication, limit participation, degrade current community conservation practices, and impede future projects, even when laws acknowledge Indigenous peoples' settlement and land usage.[97]

Essentially, community-based conservation supports local traditions and projects by providing funding and new knowledge, ideas, technology, and methods. Particular critical challenges exist in conservation difficulties at the "community" level. One crucial issue Indigenous peoples may have is whether an outsider's definition of the community includes not just Indigenous inhabitants but also recent settlers. A second issue is that the subject of community is often oversimplified, for even within a single village can be so socially, economically, and politically fragmented. Community-based conservation has its limitations, but it is necessary and recognized when governments, parastatal agencies, and international conservation groups support rather than disregard community initiatives to achieve personal conservation and development goals.[98]

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[97] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 285-287

[98] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 285-287

The creation of protected areas commonly precludes some avenues of potential local development. The use of commercial resources in some circumstances is entirely consistent with the objectives of inhabited protected areas. The protected area title may generate new development strategies that compensate for limits on some areas of local resource usage. Protected area authorities should be in charge of coordinating regional development planning, acting as a conduit for government and foreign financial, technical, and logistical support, and making substantial contributions to community development initiatives.[99]

Protected areas frequently become tourist attractions, which can present both benefits and challenges. Many Indigenous peoples and their homelands have experienced massive cultural, social, economic, and environmental consequences due to the present popularity of sightseeing and ecotourism. Indigenous peoples should decide on tourist access to their communities, locations where they utilize natural resources, sacred sites, and other culturally significant sites. They should be able to declare sites and regions off-limits to tourists or restrict access during times of grave concern, such as festivals, hunts, rites, or when they require seclusion. Concerns regarding Indigenous peoples should be taken into account when deciding on suitable levels of tourism and tourist activities, infrastructure development, and cultural and ecological interpretation. Indigenous peoples should be allowed to prohibit foreigners from conducting tours in their homelands, force

[99] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 288-289

them to utilize local businesses and guides, or demand that external businesses operate exclusively under joint venture agreements within the protected region.[100]

Ancestral Lineage and Connections to Nature

Approaching Indigenous Grounds entails the geographical domains of Indigenous peoples; however, this also includes the cultural and ancestral imprinting that lives in their natural landscape. The phrase "Native science," according to author Gregory Cajete, is a metaphor for Native knowledge and creative contact with the natural world in both theoretical and practical dimensions. “Native Science,” his book, is about embracing and honoring Native contributions to a developing philosophy of science and ecological consciousness. Gregory Cajete does not focus on Native religion and instead discusses its extension to ecological dimensions. He defines *Native spirituality* as not a religion in the Western sense of the word, but rather a collection of fundamental beliefs in the sacredness of personal and communal ties to the natural world that are dynamically acted upon and manifested at both the private and public realms. It is necessary not to underestimate the value of a lived and innovative connection to nature.[101]

[100] Sneed, Paul, Bernard Nietschmann, and Peter Herlihy. *Conservation through cultural survival: Indigenous peoples and protected areas*. Island Press, 1997. pg. 289-292
[101] Cajete, Gregory. "Philosophy of native science." *American Indian thought* (2004): 45-57.

Native science connects humans to the natural environment, where people depend on existence and purpose. A few indigenous cultures practice Native science, and its users span from adolescents to seniors to specialists, engaging with the elements and natural forces of their environment. This interpersonal and emotional interaction magnifies awareness of the subtle features of a place. Members will feel one with nature and respect the sacredness of the land. There is a stronger bond and devotion to the ecosystem that is cared for and cultivated with gratitude.[102]

Nature is part of everyday life and worthy of praise from the perspective of a culturally conditioned individual to the natural environment. For this rationale, the conservation of lands and biodiversity in a region is paramount; it is something the Indigenous population is closely associated with and has established loyalty to. With increased sensitivity, the individual observes and senses the natural landscape. The body possesses heightened sensibility to the subtle influences of nature. Through their tremendous scope and consciousness, their minds perceive the nuanced qualities of the natural environment.[103]

While anthropologists' cultural conditioning and misrepresentations continue to influence conceptions of Indigenous peoples' existence, as Gregory Cajete points out, this sensuous connection with nature is neither mystical nor unusual. It is, instead, the product of historical and inherently

[102] Cajete, Gregory. "Philosophy of native science." *American Indian thought* (2004): 45-57.
[103] Cajete, Gregory. "Philosophy of Native science." *American Indian thought* (2004): 45-57.

ingrained responsiveness to nature. Indigenous people study nature and immerse themselves in it, activating all of their senses. The indigenous experience is in collective cultural forms such as art, stories, ritual, and innovation. It also includes the more delicate and intimate affirmations of individual actions of respect, compassion, language, and emotions that are constantly given to the land and its many species. The sustaining of relationships via continuous involvement in nature's organic creative process is a distinguishing feature of Native science.[104]

Learning to touch, feel, hear, breathe, and taste the environment in the same way prior generations did may awaken memories of how phenomenal nature is in humankind. This does not imply a return to the premodern past but rather transferring ancestral perceptions and ways of being into the twenty-first century, where the world's environmental worries will necessitate a whole different manner of living in nature.

The philosophy of Native cultures is centered on direct contact with the earth as a source of wisdom and worth for human existence and civilization. Aggregates, forests, fauna, flora are possible manifestations of the sacred and representations of life. Plants are excellent analogies for the life aspect of Native science, for they are anchored in the ground and fundamentally relevant to human life. Plant knowledge is built on firsthand experience. Through experience, diligent observation, and engagement with

[104] Cajete, Gregory. "Philosophy of native science." *American Indian thought* (2004): 45-57.

plants, Native People gained a comprehensive grasp of plant uses and relationships with humans, animals, and the ecosystem.

Land, likewise, becomes an expansion of the Native mind since it is the repository of memories. As a result, defining the types of expressions of devotion to be offered to each sacred land becomes one of the key tasks of totemic clans. Sacred sites include the connection of ancestral lineage to specific flora, fauna, or natural occurrences. It is the landscape that holds the memories and remains of the ancestors, as well as the soil, air, fire, water, and spirit from which a Native culture has emerged and continues to return. Ultimately, the land is what characterizes a Native community.

Chapter 6: Prinzapolka Municipality: Site History and Documentation

Historical Background and Context

Prinzapolka municipality was established in the nineteenth century, due to the emergence of banana and mining companies that used the Prinzapolka River to transport their goods. The Prinsus Indians of Sumo-Mayagna descent were the first inhabitants of Prinzapolka. They were later displaced by the Miskitu population from the village of Wankluwa, fifty-three kilometers south of the Prinzapolka River. The "reincorporation treaty" of the Miskitu Coast founded the municipality of Prinzapolka near the end of the nineteenth century. Bilwi (Puerto Cabezas), Bonanza, and Rosita are the present municipalities. Bilwi and Bonanza split off years later, while Rosita remained the headquarters and became an autonomous municipality.[105]

From the early nineteenth century through the mid nineteenth century, the Prinzapolka River functioned as a channel to transport vast resources extracted and produced by North American companies, including gold, silver, copper, zinc, timber, and bananas.[106] Due to the companies in the region, the Indigenous inhabitants relocated to the higher parts of the river, forming settlements that still exist today. This factor should not be isolated from the

[105] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.69-70

acculturation process because it was a direct cause of emigration both from the Indigenous and non-Indigenous populations.[107]

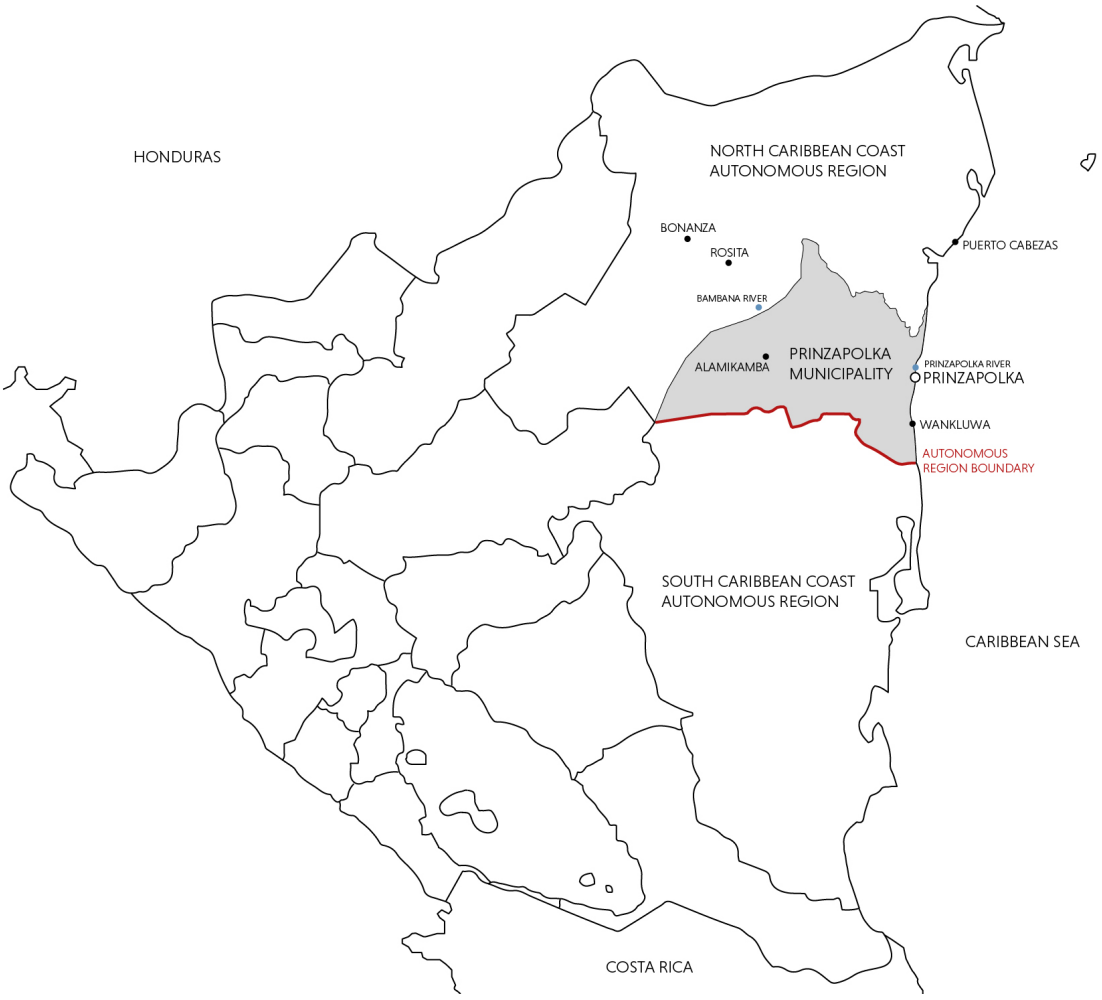

Figure 18, Prinzapolka Municipality Map (Source: Author)

[106] Guevara, Ramón. "Estudio territorial del municipio de Prinzapolka según la interrelación en los enfoques de medios de vida y desarrollo territorial." *Wani* 54 (2008): 34-38.
[107] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.69-71

Location and Population

The geographical coordinates of the Prinzapolka municipality are 13 degrees 24' north latitude and 83 degrees 33' west longitude. Based on the most recent 2007 statistics, the Prinzapolka municipality has a total land area of 7,020.48km². A separate survey conducted in 2007 calculated that the population of Prinzapolka municipality was 7,500 individuals. Other sources estimate the population to be around 7,700 individuals, while another estimates the population to be over 10,800 individuals.[108]

Regarding poverty in the municipality of Prinzapolka, research based on the utilization of unfulfilled fundamental needs of a person and their homes, such as inadequate housing, overcrowding, financial dependency, and insufficient education, thoroughly assessed the municipality's degree of poverty. According to data collected in 1995, 77.7 percent of Prinzapolka's citizens live in extreme poverty, 18.1 percent live in poverty, and just 4.2 percent live above the poverty line. Moreover, only seventeen percent of the population has access to electricity, corresponding to the two power plants in Alamikamba. There are twelve volt batteries recharged with plates powered by solar energy installed by doctors without borders.[109]

[108] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.69-70

[109] *Ficha municipal nombre del Municipio prinzapolka URACCAN*. https://observatorio.uraccan.edu.ni/. (n.d.). Retrieved December 13, 2021, from https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 13

Topography and Soils

Per the research conducted by the Nicaraguan Institute of Territorial Studies (INETER) on Nicaraguan geology, the Caribbean coast is the geological province of the plains of the Atlantic coast or the Atlantic coast sedimentation basin. To the right side of Prinzapolka's municipality is the Atlantic ocean. The topography on the mainland is low, flat, and undulating, broken by swamps and lagoons and covered with gravel and sand deposits. Soils formed from tertiary sedimentary rocks exist in the Nicaraguan Caribbean region, as do soils of fluvial and alluvial origin in the lower regions along the coasts, the highest mountainous areas, and soils produced from ancient volcanic rocks near the central plateau. There are soils with severe constraints for agricultural use, particularly forests. However, some areas of Prinzapolka municipality are suitable for subsistence agriculture use: these soils are alfisols (moderately leached soils with relatively high fertility), clay loams, acidic soils, from flat to undulating, and require extraordinary proper care to ensure their sustained use.[110]

[110] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.72

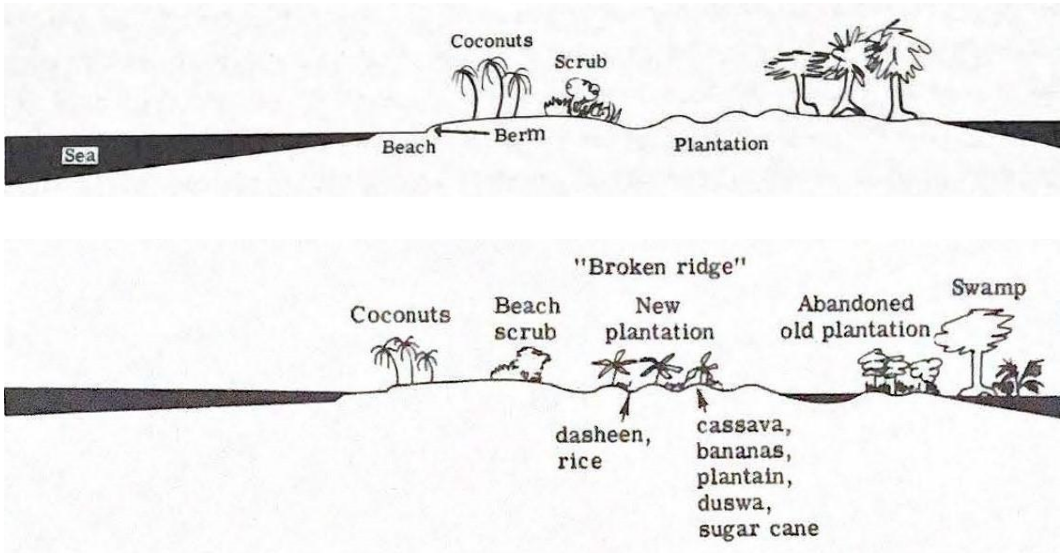

Figure 19, Sections of land and vegetation. (Source: Parsons, James J.)

Figure 20, Swamps and vegetation in Prinzapolka. (Source: Thomas De Roza).

Figure 21, Topography in Prinzapolka. (Source: Kjeldsen, Jorgen Peter)

Climate

With an average temperature of seventy-seven degrees Fahrenheit, the municipality climate is considered a humid tropical forest. The warmest months are February, March, and April, but the hottest month is May when temperatures exceed ninety-seven degrees Fahrenheit. In June, July, and August, the temperature gradually declines to seventy-nine degrees Fahrenheit; in November and December, the temperature descends to sixty-six degrees Fahrenheit, with December being the coldest month of the year. In May, pluvial precipitation begins. It rains intensely practically daily throughout May, June, July, and August. In September and October, the rains diminish slightly, raining every four or five days; then, in November and December, the rains occur every ten or fifteen days. The rain stops in February, March, and April (summer season). On average, the annual rainfall is about 118 inches, roughly 9.8 feet.[111] Charles Napier Bell (1835–1906), civil engineer and son of James Stanislaus Bell, trader and adventurer spent many years on the Miskitu coast, shares his insight on the heavy season:

> In June heavy squalls are frequent...Their appearance is dreadfully ominous. Always coming from the east, they rise over the horizon black as night...As they approach, the sky is overcast, the strong trade wind dies away, the wind comes off

[111] *Ficha municipal nombre del Municipio prinzapolka URACCAN*. https://observatorio.uraccan.edu.ni/. (n.d.). Retrieved December 13, 2021, from https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 35-36

> the land blowing towards the approaching squall, which is seen coming over the lagoon, lashing the waters furiously, and shrouded with a thick curtain of falling rain. First come scattered drops and flying puffs; and then the squall breaks wildly over the land, accompanied with torrents as if the clouds had burst. Leaves and branches torn from the trees fill the air...These squalls pass by one after another, sometimes five or six in the twenty-four hours.
>
> But the great feature of the rainy season is the stupendous rain and thunderstorms which from time to time pass over us...The rain comes down with a roaring sound on the leaves of the forest, like the sound of a great waterfall, or if you are at sea it makes a hissing noise on the surface of the water which is deafening. The lightning and thunder are terrific. I have been since those days over a great part of the world, and never heard thunder to compare with that on the [Miskitu] Coast.[112]

The relative humidity in the municipality reaches a maximum average of eighty-eight percent in October and a minimum of seventy-nine percent in April. The prevailing winds are of two types: northwest trade winds, which blow powerfully between January and April, causing the summer (dry season or time), and monsoon winds, which are less powerful but transport much

[112] Bell, Charles Napier. *Tangweera: life and adventures among gentle savages*. E. Arnold, 1899.

moisture; they reoccupy the ocean, where they fall as rain for the majority of the year.[113]

Severe threats found in the Prinzapolka municipality are floods, tropical storms, hurricanes, forest fires, and pollution of rivers and lagoons. Another research conducted by the Nicaraguan Institute of Territorial Studies found that the Caribbean Sea slope is the most vulnerable to flooding since massive rivers intersect and dump their waters into the ocean, besides the flow of moisture present in the region. In the case of the Prinzapolka municipality, these flood-prone zones include populated areas along rivers and lagoons, primarily in the downstream area, and it occurs during the winter season from May to November.[114] While traveling up the Prinzapolka river, Charles Napier Bell reported on the massive floods that had turned the land into a vast sea of water:

> "The flood rose during the night, and when I woke I hardly recognized the place. I had known the village as [sixty] feet above the river; now it was not more than [ten] feet. On the opposite side the banks were low, and the river was the colour of clay, and was bearing along the most astonishing quantities of stuff. Among immense rafts of trees, grass, and bamboos we occasionally saw canoes, thatched roofs, and pikes of

[113] "Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg.30-35

[114] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.79

banana-trees. Many snakes were seen swimming about the river, and dead deer and peccary floated past."[115]

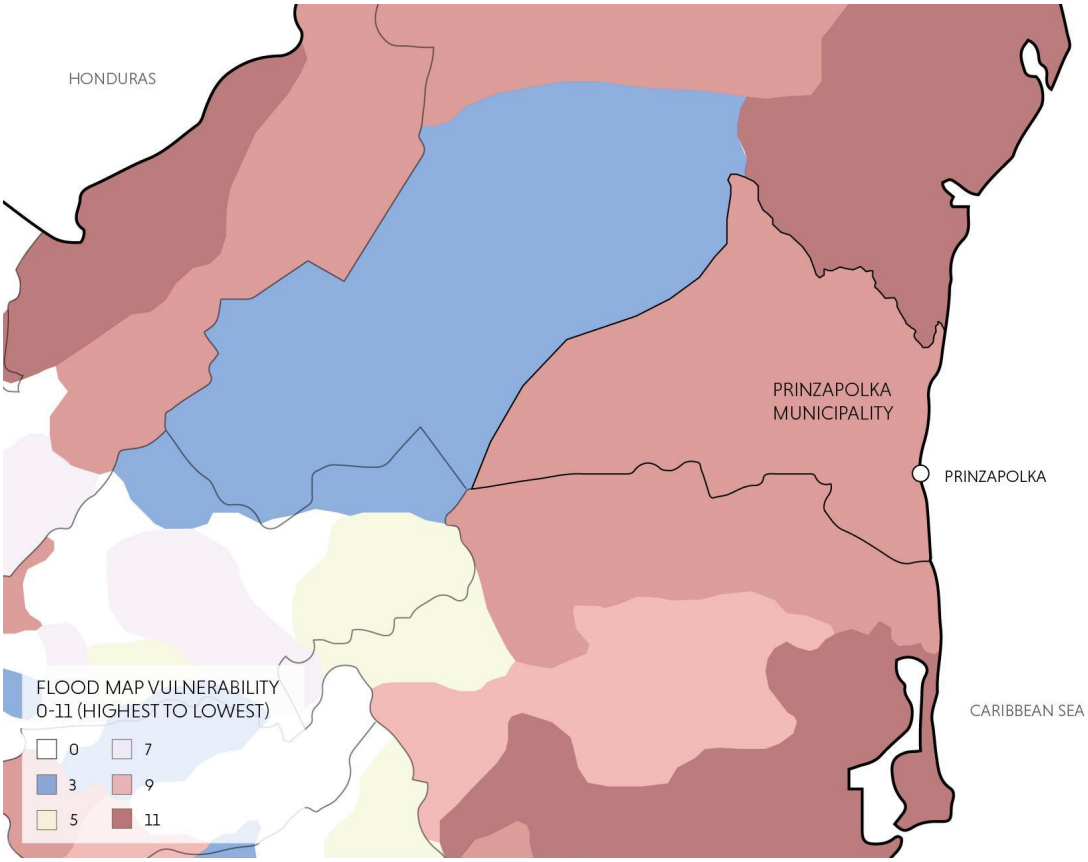

Figure 22, 2001 Floor and vulnerability map. (Source: Author, INETER)

Risks of wildfire are human-made issues that have caused significant economic and environmental losses in the short term. In the long run, that threatens the country's future, owing to the adverse effects on natural resources, particularly forests and biodiversity. as well as protected places. The regions of Prinzapolka impacted by fires are in the pioneering agricultural

[115] Bell, Charles Napier. *Tangweera: life and adventures among gentle savages*. E. Arnold, 1899.

border and the land's forests, located in the three livelihood zones.[116] (see Figure 19).

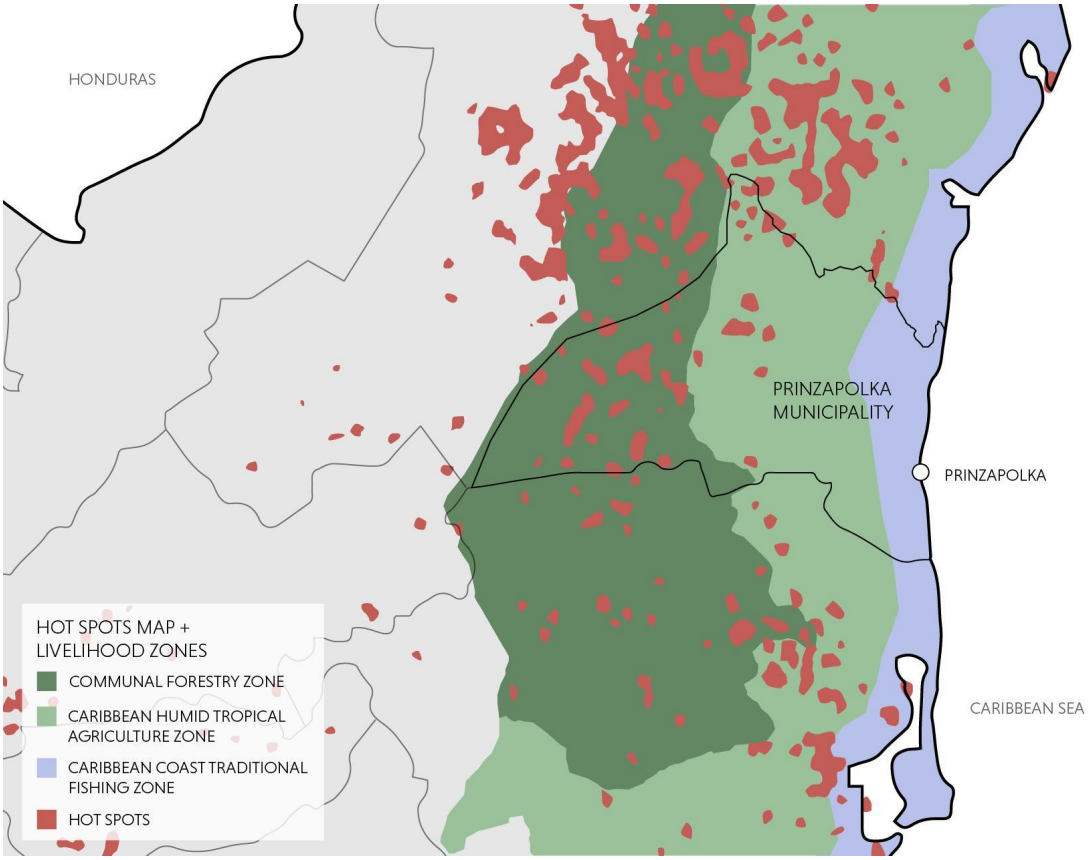

Figure 19, Hotspots and livelihood zones map. (Source: Author, INETER).

According to the previous study, the month with the highest probability of hurricanes is September (thirty percent), followed by October (twenty-five percent) and June (twelve percent). The coastal area of the municipality of Prinzapolka, specifically, would be especially vulnerable to

[116] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.80

hurricanes.[117] Storm Iota, which hit Central America in 2020 from November thirteen to eighteen, was a catastrophic category 4 Atlantic hurricane that wreaked havoc on places that had already been devastated by Hurricane Eta just two weeks prior. In response, the Continuous Emission Monitoring System (CEMS) Rapid Mapping service was launched to analyze Hurricane Iota's impact, one of those countries being Nicaragua. The municipality of Prinzapolka was analyzed, and the map (see Figure 20) illustrates the flood demarcation, with a total inundated area of around 69,653 acres.[118]

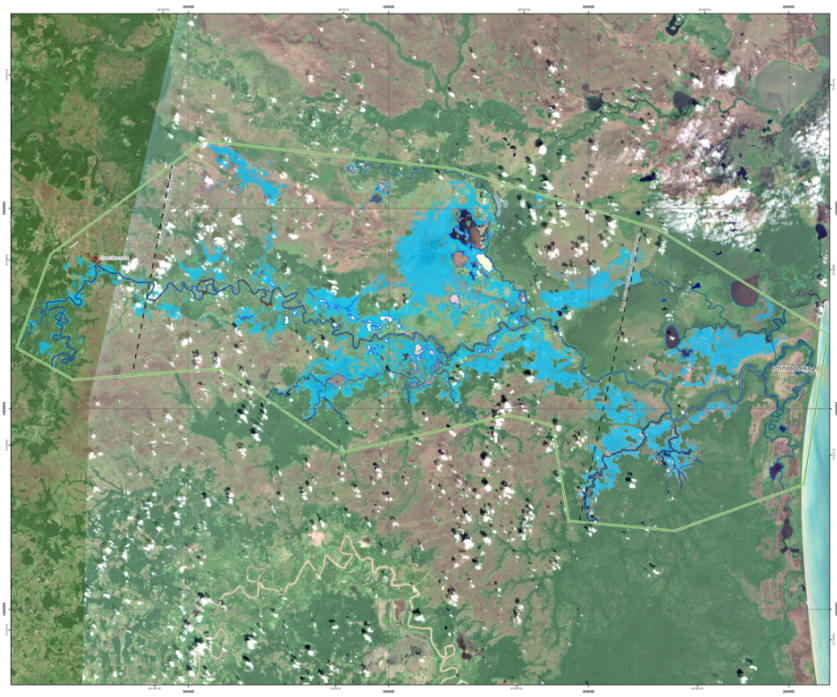

Figure 24, Hurricane Iota flood impact on Prinzapolka municipality. (Source: Shultz, Director James M.)

[117] Guevara, Ramón. "Potencialidad, vulnerabilidad y riesgos en el municipio de Prinzapolka." *Wani* 54 (2008): 69-85. pg.81

[118] Shultz, Director James M., Senior Fellow Ryan C. Berg, James P. Kossin, Scientist Frederick Burkle Jr, Alessandra Maggioni, Victoria A. Pinilla Escobar, Melissa Nicole Castillo, Zelde Espinel, and Dean Sandro Galea. "Convergence of climate-driven hurricanes and COVID-19: The impact of 2020 Hurricanes Eta and Iota on Nicaragua." *The Journal of Climate Change and Health* (2021): 100019.

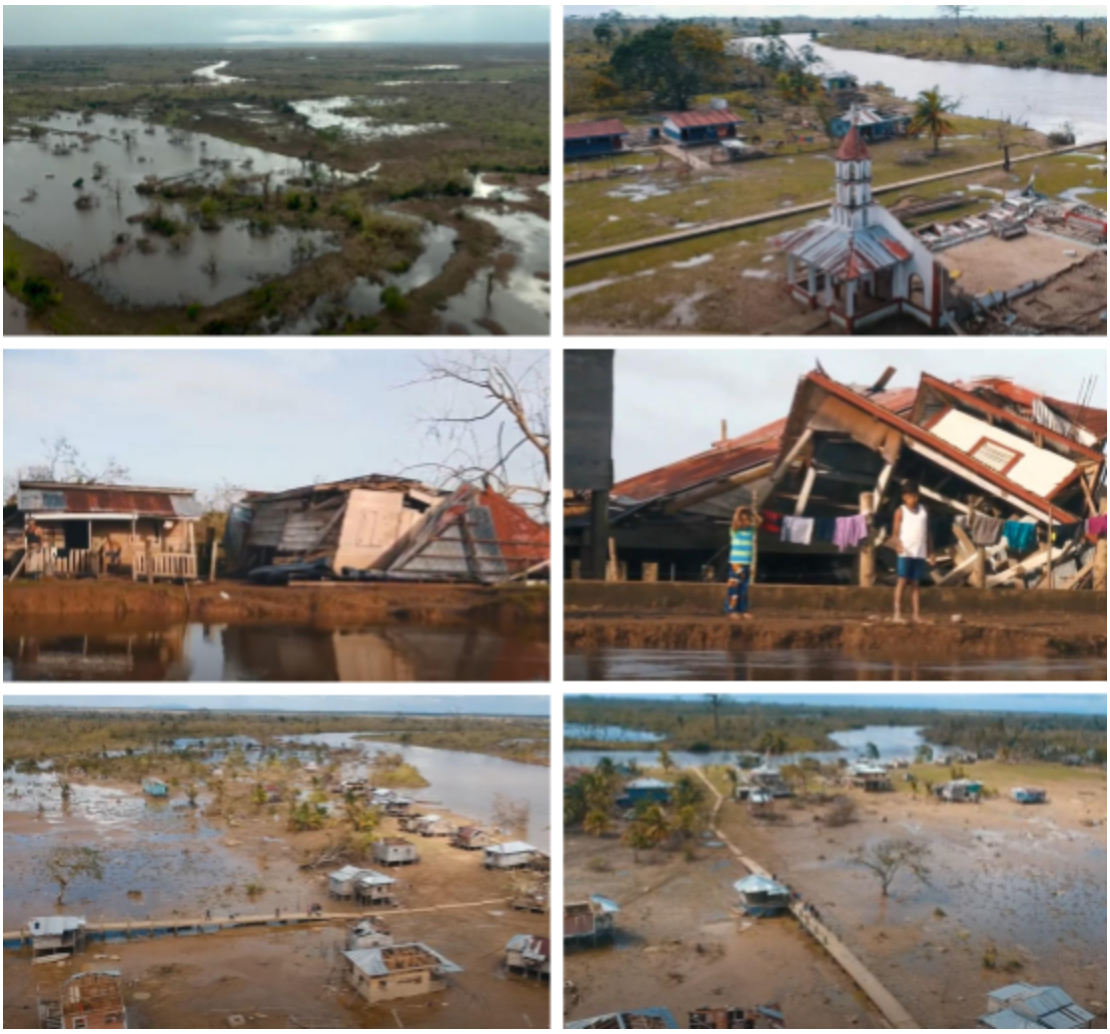

Figure 25, Prinzapolka after Hurricane Iota. (Source: UNICEF).

Biodiversity

The pine savannah, wet tropical broad-leaved forest, bamboo groves, swamps, lagoons, rivers, and other natural habitats or ecosystems live in the Prinzapolka municipality, which is part of the natural-geographic region of Miskitu Coast.[119] From the first natural-geographical descriptions, this region has been renowned for its vast natural diversity; both the fauna of animals,

[119] Kjeldsen, Jorgen Peter. "Aves del municipio Río Prinzapolka, un inventarío de base." *Wani* 41 (2005): 31-64.

insects, and birds, as well as flora, are distinguished by a large number of species.[120]

The municipality of Prinzapolka is known to exhibit a rich diversity of floristic ecosystems and animal species. However, it is still one of the most impacted in terms of ecological balance in the North Atlantic. Due to the municipality's size and the diversity of geographical areas it encompasses, it possesses a broad and diversified range of natural resources that, while unreasonably exploited since the turn of the century, represent a great wealth potential for the municipality.[121]

There are coral reefs, massive kelp beds, and seagrass beds on the continental shelf, a portion of a continent submerged under a relatively shallow area. Various sea and freshwater species exist in the lower stretch of the Prinzapolka river (robalo fish, sierra fish, jaguar guapote fish, tuba fish, beardfishes, and tarpon fish, shrimp, turtles, crocodiles, and lizards), along with birds such as geese and ducks.[122]

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[120] Kjeldsen, Jorgen Peter. "Aves del municipio Río Prinzapolka, un inventarío de base." *Wani* 41 (2005): 31-64.
[121]"Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 5-9
[122]"Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 7-9

Floristic ecosystems have a history of being heavily manipulated, and a substantial portion of them are in the process of regeneration. Currently, the greatest forest impact is in redwood: pine, almond, ceiba, mahogany, cedar, ironwood, Gavilan, guava, cashew, rubber, to name a few. There are broadleaf forests and coniferous forests in both the lowest and highest reaches of the Prinzapolka river, with the most common varieties being almond, bamboo, mahogany, wild cherry, coral tree, ficus insipida, cedar, cashew, Gavilan, guava, rubber, Calophyllum antillanum, boojum tree, byrsonima crassifolia, pine, papaya, among others.[123]

The mangrove is one of the most prevalent plant species. Maintaining the sector's current ecosystems is critical; it protects the coasts from landslides caused by tides, and its roots are home to a diverse range of crustaceans, mollusks, and turtles. On the continental shelf, there are coral reefs, extensive algae banks (ninety-nine species), and seagrass beds that function as habitats for young marine animals of many species and provide food for lobsters, hawksbill sea turtles, and green sea turtles.[124]

The particular areas of the municipality determine the allocation of animal species. The multitude of species that inhabit the forest are deer, tapir, wild boar, pumas, wildcats, skunks, raccoons, armadillos, monkeys, foxes,

[123]"Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg.9

[124] *Ficha municipal nombre del Municipio prinzapolka URACCAN*. https://observatorio.uraccan.edu.ni/. (n.d.). Retrieved December 13, 2021, from https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 9-10

sloths, snakes, lizards, turtles, peacocks, turkeys, parrots, pigeons, hummingbirds, owls, and many other animals. The most prevalent wildlife on the coast is shrimp, sharks, lobsters, sawfish, King mackerel, croaker, snapper, and sea turtles. As a byproduct of distinct natural ecosystems, a considerable percentage of fauna species and a substantial population of them can exist.[125]

Social and Economic Issues Regarding Land and Resources Exploitation

Members of the Prinzapolka River basin communities have expressed dissatisfaction with the lack of information on the extraction of permits from their villages. Although the signatures of the trustees are required to secure the licenses, National Forestry Institute (INAFOR) is the one that gives permission for forest extraction, even within the communal lands of Indigenous peoples.[126] Trustees are occasionally summoned to INAFOR headquarters at short notice to sign and confirm permits issued months or years ago. Only a few of the Prinzapolka River communities have received titles to their lands, as well as a few small parcels. Despite their persistent pleas, the overwhelming number of communities who occupy these extensive lands do not have titles.[127]

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[125]"Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf.

[126] Brook, Mary. "Revista de Temas Nicaragüenses No. 79© Wani Esquemas Institucionales para el manejo del Bosque en Prinzapolka: Relaciones entre Actores ubicados en Distintos Niveles." *Jaime D. Villa*: pg.188-189

[127] Brook, Mary. "Revista de Temas Nicaragüenses No. 79© Wani Esquemas Institucionales para el manejo del Bosque en Prinzapolka: Relaciones entre Actores ubicados en Distintos Niveles." *Jaime D. Villa*: pg. 188-189

The most profitable activities in Prinzapolka and its surrounding communities are logging and ranching, but to participate requires access to funds for investment, which local financial elites or vast corporations can only obtain. The resources are concentrated in a few people's hands and benefit from exploiting the community's assets.[128]

The selling of wood in the western portion of the Prinzapolka River provides a substantial source of revenue for its residents, although the local profit has been declining. In the nineteenth-hundreds, when multinational companies developed important activities in Prinzapolka, many of the residents of these communities worked as loggers for these enterprises. Instead, agreements between companies and residents, both legitimate and illicit logging, have been arranged with local leaders. Differences have emerged between individuals who benefit from these natural resources and the bulk of community members who do not. Some mestizo people take wood from newly privatized parcels or illegally on untitled Indigenous territories.[129]

Site Analysis

The targeted location for this thesis will be within the municipality of Prinzapolka, in the small village Prinzapolka, named after the municipality

[128] Brook, Mary. "Revista de Temas Nicaragüenses No. 79© Wani Esquemas Institucionales para el manejo del Bosque en Prinzapolka: Relaciones entre Actores ubicados en Distintos Niveles." *Jaime D. Villa*: pg. 188-189

[129] Brook, Mary. "Revista de Temas Nicaragüenses No. 79© Wani Esquemas Institucionales para el manejo del Bosque en Prinzapolka: Relaciones entre Actores ubicados en Distintos Niveles." *Jaime D. Villa*: pg. 189-194

which is predicted to have a population of one hundred people (see Figure 2).[130] Its geographical coordinates are 13.4°N, -83.56°E.[131] The site sits south of the Prinzapolka river and the Caribbean Sea to the east. The proposed site has a total area of about 2,000,000 square feet, which equates to 185,806 meters or 45.9 acres.[132] While this site is vast, the design will strategically use the space to its immediate benefit while not dominating the already established community in Prinzapolka.A series of seventy-seven structures currently sit sporadically on roughly fifty percent of the site, with a total area of almost 1,000,000 square feet, which is approximately 92,903 meters or twenty-three acres.[133] Among the notable structures on Prinzapolka are a Moravian and Catholic Church, a school, a baseball stadium, a multifunctional field, and a bull barrier.[134] Much of the residential dwellings still adhere to the traditional housing typologies outlined in the preceding chapter. In terms of the planned design, no structures will be demolished or relocated; instead, the design would maneuver around the buildings, providing a degree of chemistry between the existing and the new.

The Prinzapolka site is adjacent to a closed broadleaf forest, which has a dense canopy at the top level (seventy to one-hundred percent cover) that

[130]Although there is no information on the population of Prinzapolka, based on the adjacent village of Ariswatla, which has a total of 100 people, it may be inferred by using this as a reference and photos that Prinzapolka likewise has approximately 100 people.
[131] Google maps (Google), accessed December 13, 2021, https://www.google.com/maps/place/Prinzapolka,+ Nicaragua
[132] Rough estimate based on author's calculations
[133] Rough estimate based on author's calculations
[134] "Arquitectura De Prinzapolka." Mapa Nacional de Turismo, July 26, 2021. https://www.mapanicaragua.com/arquitectura-de-prinzapolka/.

allows minimal sunlight to penetrate to lower elevations. The upper elevation has a height range of sixteen to one hundred thirty feet with a dispersion of emergent trees. Meanwhile, reports show that the site's topography has a zero to eight percent flat to moderately sloping or slightly wavy relief. (see Figure 27). Although this is a benefit in retrospect, having a flat plain in a location surrounded by extensive bodies of water will be a challenge in and of itself for this given site.[135]

Figure 26, Prinzapolka satellite image. (Source: Author, Google Maps).

[135] "Atlas Nacional Suelos De La Republica De Nicaragua 2021." INETER-DGOT. Gobierno de Reconciliacion y Unidad Nacional. Accessed December 13, 2021. https://www.ineter.gob.ni/flipatlassuelo/AtlasNacionalDeSuelo.html. pg.12-13

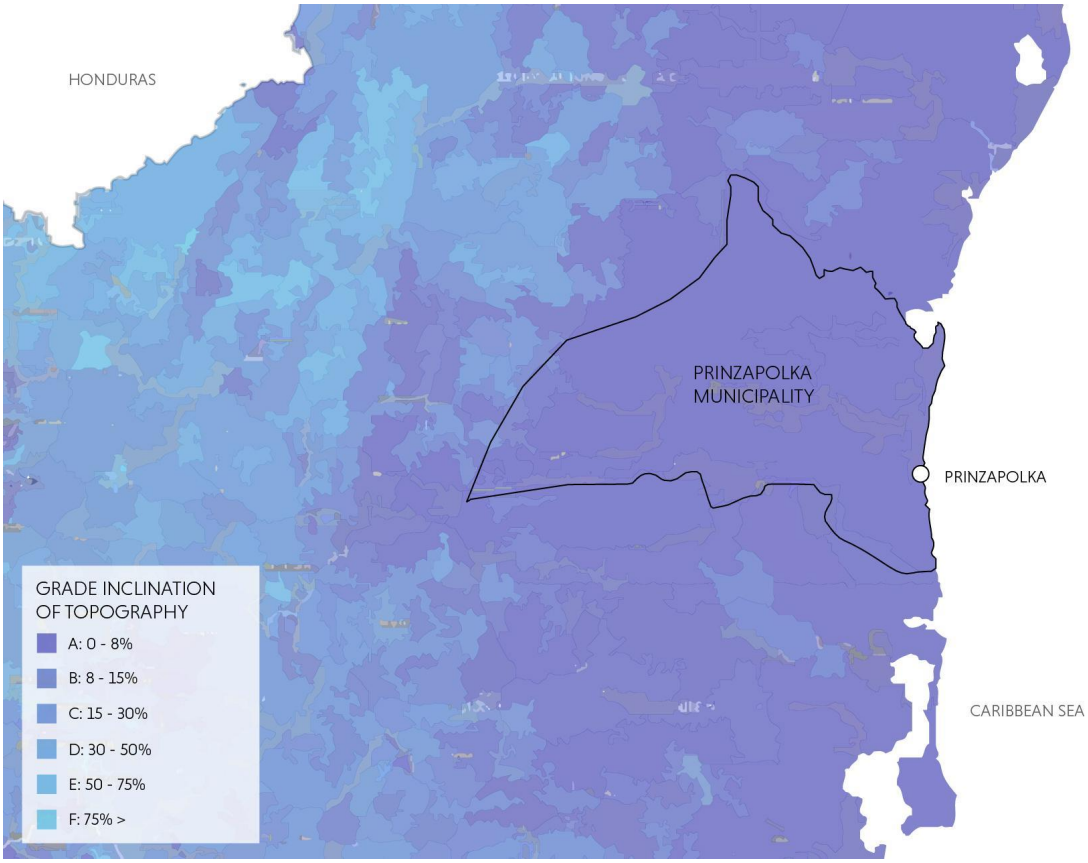

Figure 27, Grade inclination of topography map. (Source: Author, INETER-GOT)

Consequently, the zone along the site's boundary is the most vulnerable to sea-level rise. Figure 28 depicts the potential impact of tsunamis based on the historical record of the "Masachape tsunami" in 1992, when the elevation ranged from twenty to thirty-two feet above sea level.[136] Other portions of the site are vulnerable to being damaged by cyclonic swells, caused primarily by strong winds pushing the sea surface; the submarine topography and coastal morphology determine the waves' impact and height.

[136] "Mapas De Susceptibilidad Por Elevación Del Mar Municipio Prinzapolka." Platforma Nacional de Informacion y Conocimientos Sobre Cambio Climatico . Gobierno de Reconciliacion y Unidad Nacional. Accessed December 15, 2021. https://cambioclimatico.ineter.gob.ni/.

The spectrum ranges from storms to category five hurricanes, and the severity of the catastrophe determines their size. The heights can fluctuate anywhere from six to twenty feet.[137]

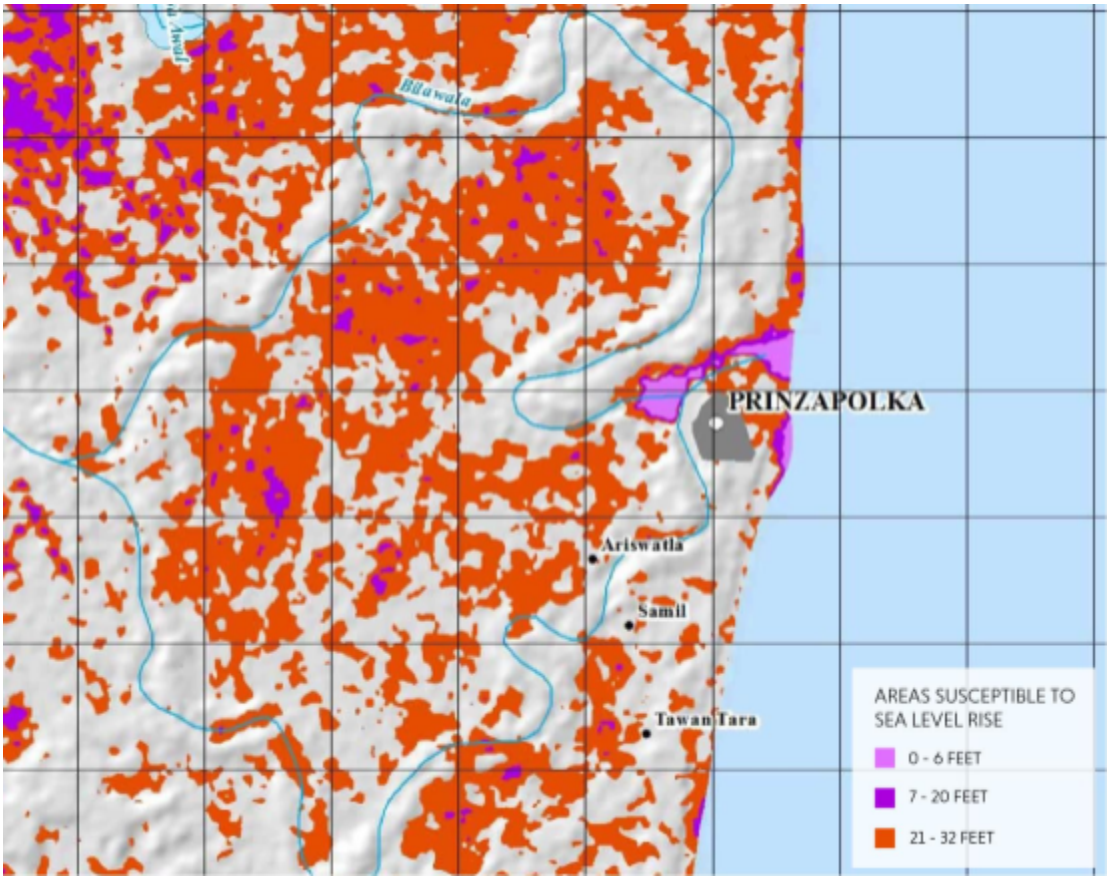

Figure 28, Areas susceptible to sea level rise map. (Source: Gobierno de Reconciliación y Unidad Nacional).

Water erosion on soil can have an array of negative ramifications. In agricultural areas, erosion can trigger a decrease in cultivable depth and soil

[137] "Mapas De Susceptibilidad Por Elevación Del Mar Municipio Prinzapolka." Platforma Nacional de Informacion y Conocimientos Sobre Cambio Climatico . Gobierno de Reconciliacion y Unidad Nacional. Accessed December 15, 2021. https://cambioclimatico.ineter.gob.ni/.

fertility, increasing dependency on fertilizers and even leading to the abandonment of agricultural lands. In other circumstances, if the erosion is severe enough, it can disrupt river flow, the retention capacity of flooded regions, and even the blocking and eutrophication of reservoirs and bodies of water. Despite its vulnerability to floods, Prinzapolka classifies as having minimal water erosion, no apparent erosion, and or a zone of sedimentation of eroded material upstream.[138]

The effective depth is the space through which the plant's roots may penetrate without meeting major impediments; there is a retaining of available water or moisture and a supply of nutrients. When soil is shallow, there is less space for the roots to discover the availability of nutrients, the greater the risk of floods in low areas, or the higher the risk of deterioration and loss of soil due to erosion in hillside areas. Fortunately, Prinzapolka has a soil depth of up to thirty-five inches, which allows for optimal root development.[139]

The surface soil texture or arable layer, ranging from zero to twelve inches, is a physical property of high economic value for agriculture. It has a decisive influence on the behavior of the soil, for example, the capacity to retain water and nutrients, its permeability, and its risk of soil loss due to water or wind erosion, its ability to decompose organic matter, and crucial

[138] "Atlas Nacional Suelos De La Republica De Nicaragua 2021." INETER-DGOT. Gobierno de Reconciliacion y Unidad Nacional. Accessed December 13, 2021. https://www.ineter.gob.ni/flipatlassuelo/AtlasNacionalDeSuelo.html. pg.12-13

[139] "Atlas Nacional Suelos De La Republica De Nicaragua 2021." INETER-DGOT. Gobierno de Reconciliacion y Unidad Nacional. Accessed December 13, 2021. https://www.ineter.gob.ni/flipatlassuelo/AtlasNacionalDeSuelo.html. pg.14-15

parameters such as managing irrigation. This stratum or surface layer is the most fertile and has the highest natural fertility because it has a greater quantity of organic matter, which darkens the color of the soil; the growth of plant root systems demonstrates this. Overall the proposed site has fine, sandy clay, silty clay, and clay with less than sixty percent of the clay fraction., with very high moisture retention.[140]

The Prinzapolka river, which skirts the entire left shoulder of the site, is a prominent land feature. Therefore, gathering information on its role in the community and its utilization is fundamental. The Bambana river, which intersects the Prinzapolka river at one point and is approximately eighteen miles from the site, was discovered to be contaminated (see Figure 18). Since the 1930s, the Bonanza mining business has discharged waste from its processing facility, comprising cyanide, the principal contaminant, quartz, andesite, lead, zinc, pyrite, and other particles mixed with other particles of fine sand, silt, and clay. Cyanide and the other elements bond to various heavy metals to generate highly poisonous compounds that kill fish and aquatic plants that consume them. The usage of these waters for potable use is exceedingly hazardous, with reports of children dying after drinking the waters of the Bambana River. Although there have not been additional investigations on this, it is safe to infer that these pollutants have continued to flow through the Bambana and Prinzapolka rivers, damaging vegetation, fish,

[140] "Atlas Nacional Suelos De La Republica De Nicaragua 2021." INETER-DGOT. Gobierno de Reconciliacion y Unidad Nacional. Accessed December 13, 2021. https://www.ineter.gob.ni/flipatlassuelo/AtlasNacionalDeSuelo.html. pg.14-15

animals, and even humans who reside on their banks.[141]

The Prinzapolka river is 187 miles long, with 99 miles navigable, and it serves as the primary mode of communication for the communities.[142] Traveling from Nicaragua's capital to the Prinzapolka River is a perilous journey; from start to finish, one must first travel by land or air to a separate municipality in the North Atlantic region, then cross the river at some point. The quickest method to communicate with Puerto Cabezas, where there is an airport, is by motorboats or sailboats. Nevertheless, this mode of transportation is a high risk since the boats are small and storms are frequent in this area.[143]

[141] "Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 10-11

[142] "Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf.

[143] "Ficha Municipal Nombre Del Municipio Prinzapolka URACCAN." https://observatorio.uraccan.edu.ni/. Accessed December 13, 2021. https://observatorio.uraccan.edu.ni/sites/default/files/documentos/Ficha%20Municipal%20Prinzapolka.pdf. pg. 12-13

Chapter 7: Design Process and Proposal

Maintaining Alignment

Upon embarking on the proposed revised housing typology for the Miskitu community, there were a few principles to bear in mind to keep the thesis on track with its intended promise. These principles included but were not limited to respecting the indigenous community and their traditional way of life, maintaining the design simple yet resilient, preserving their Indigenous territory, enriching their built environment while avoiding Western culture, and much more. As mentioned before, the Miskitu community, like other Indigenous communities, has experienced colonialism and a historical record of social injustices that have plagued their communities. As previously indicated, the Miskitu community, like other Indigenous groups, has a significant history of colonization and socioeconomic inequality, which have had an adverse impact on the inhabitants and their land. As a byproduct of being excluded and driven into poverty structurally, their homes are not durable enough to last generations or resist the natural disasters in their areas.

This thesis will offer a revised housing typology that will leverage these challenges to produce practical ways to better manage these harsh weather conditions to retain their ancestral lineage. The design will implement essential agricultural subsistence systems at an urban scale while also providing an ecological environment for the Miskitu community, such as a

garden of plants, vegetables, and fruits, which will be pivotal to the community's well-being. Meanwhile, the design intends to embrace their ancestral tradition by imparting simple tactics and longstanding practices to help reduce the high poverty rate in Prinzapolka to perpetuate the ancestral lineage of Nicaragua's Miskitu peoples.

The Design Proposal

Prinzapolka is a site that faces various obstacles, including regular rainfall and typical floods, as well as its classification, being a humid tropical forest ecosystem. Focusing further into Prinzapolka, as discussed in the previous chapter, the location is relatively isolated from neighboring villages, with canoes serving as the primary mode of transportation. The dense forest and two major bodies of water, the Prinzapolka River and the Caribbean Sea, are among the elements of the current site layout (see Figure 29). The current location features a single road that serves as the principal axis, with three subsidiary roads branching out (see Figure 30). Fifty-eight of the sixty-one existing structures are residences; twenty-eight of the fifty-eight are particularly vulnerable to floods due to their close proximity to the Prinzapolka River. As a response, under the planned site design, these 28 structures will be relocated to safer ground (see Figure 31).

Figure 29, Prinzapolka 3D Aerial View. (Source: Author, Google Maps)

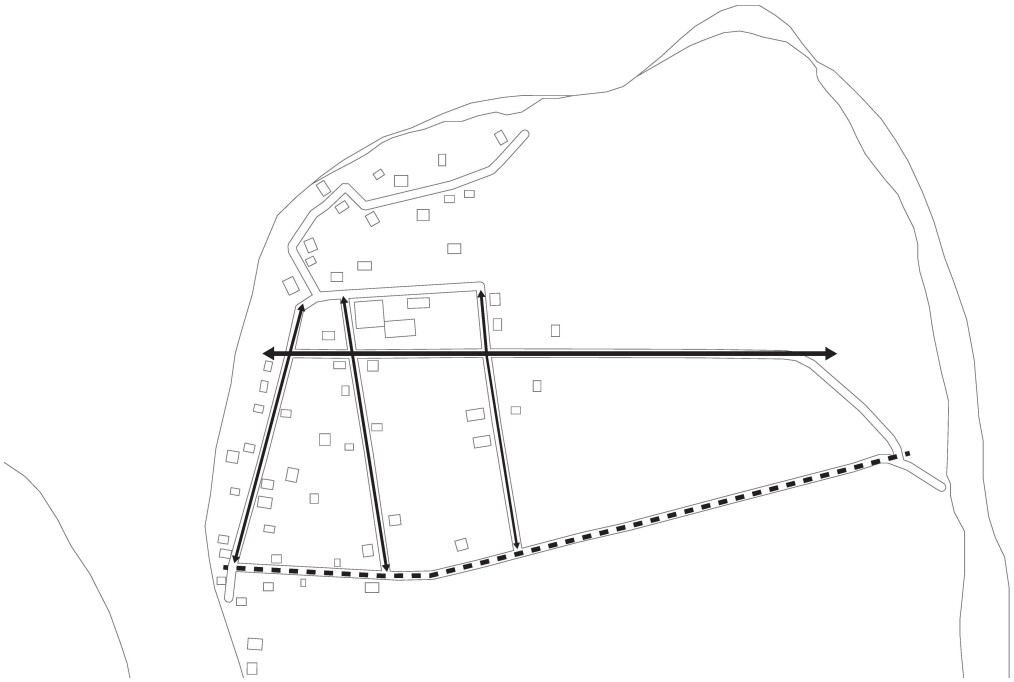

Figure 30, Existing Site Plan: Axis. (Source: Author)

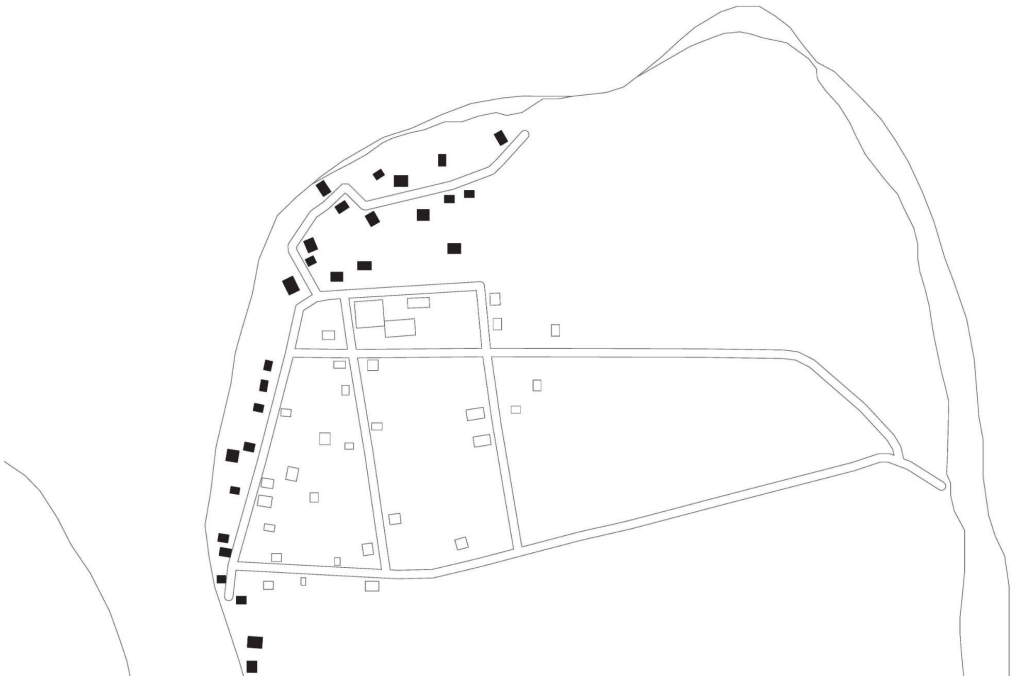

Figure 31, Existing Site Plan: Flood-Prone Homes. (Source: Author)

Accordingly, the design merely accentuated the principal axis and extended the spine to the west of the site, where it links to a dock (see Figure 32). Smaller veins of pathways begin to emerge from this spine, allowing better access to the entrance of the newly constructed homes. In the event of a major natural disaster, this linear arrangement reduces latency and increases efficiency in distributing resources around the population. It fosters a sense of connectedness and fortifies the community's perseverance ability.

The division of the site's zoning is into three, where the central spine will contain the majority of the new homes, followed by agricultural lands that hug this zone, and lastly, communal spaces that serve as anchor points on the site (see Figure 33). As part of the new vegetation, additional trees and the

introduction of mangroves will be planted along the coastline to create a buffer zone that will assist in protecting the homes on the site.

The overall site plan program involves mangroves, a new forest, an animal farm, pasture, a dedicated community space for festivals or gatherings, and a soccer field, all within walking distance of the present school. There will also be agricultural lands and a bamboo forest, with bamboo serving as the principal building material for the revised housing typology (see Figure 34).

Figure 32, Proposed Site Plan: Axis. (Source: Author)

Figure 33, Proposed Site Plan: Zoning. (Source: Author)

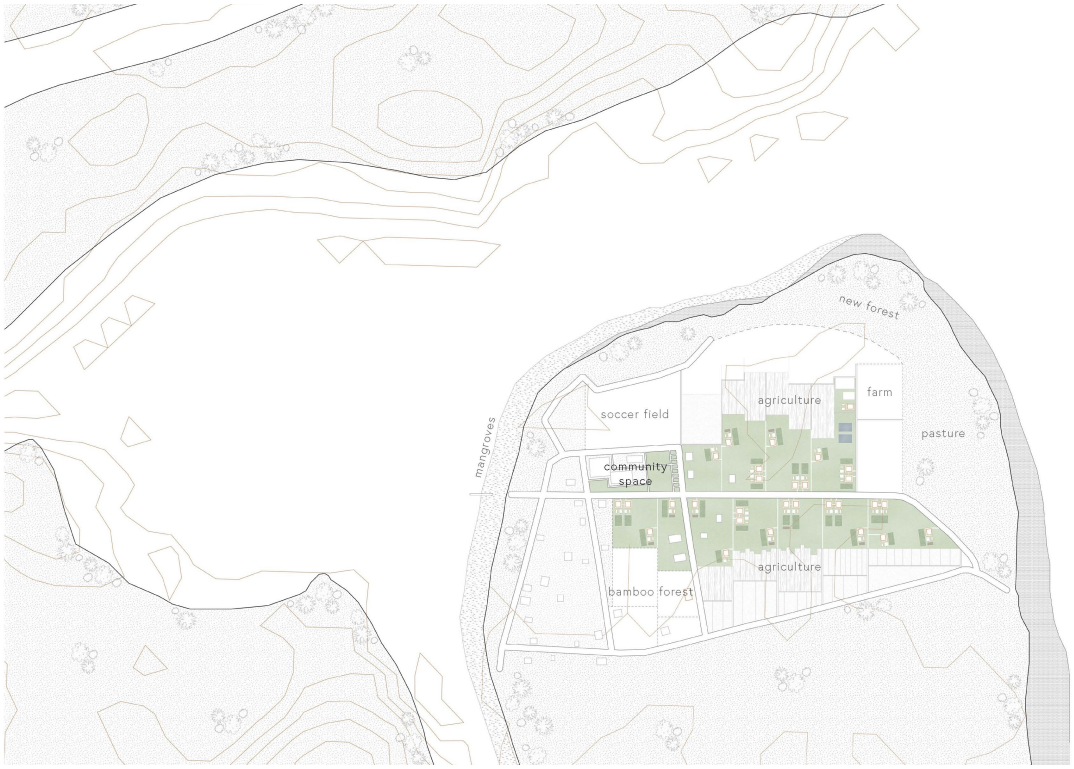

Figure 34, Proposed Site Plan (Source: Author)

The site layout is divided into blocks when observed closely. The first block is a typical housing block that illustrates the integration of amenities in each primary residence. For instance, each home will feature a reed bed system, a private garden, a self-contained laundry-shower-toilet structure, and, on occasion, a chicken coop and pigpen (see Figure 35). The farm block will contain a cattle and horse paddock, an open lot, a horse stable, a new home for the farm owner, and rainwater harvesting storage ponds that will serve as the Miskitu community's primary supply of potable water (see Figure 36). Finally, the bamboo block will have a bamboo shed for bamboo treatment and a bamboo forest where the extra bamboo will help construct the new homes (see Figure 37).

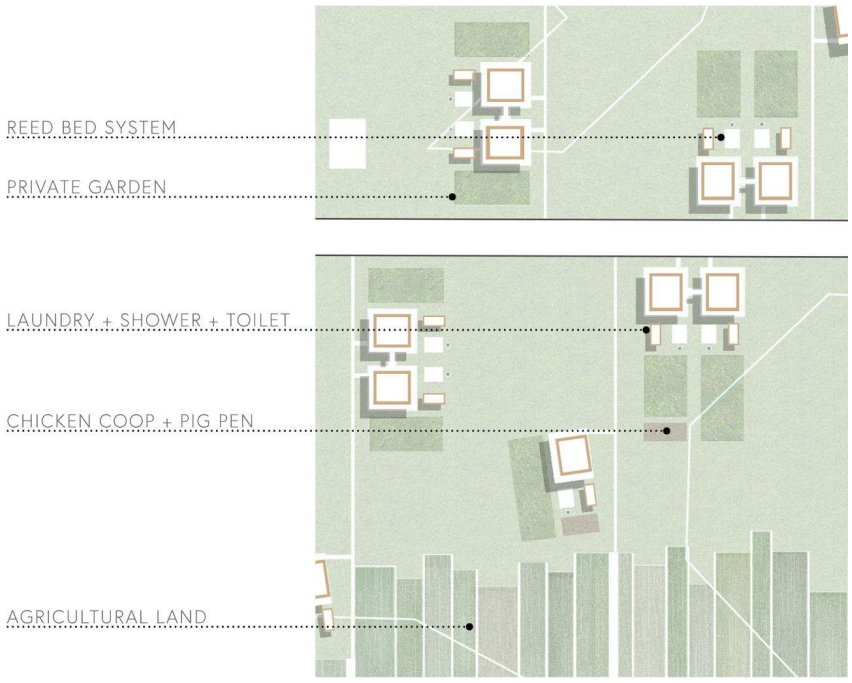

Figure 35, Typical Housing Block (Source: Author)

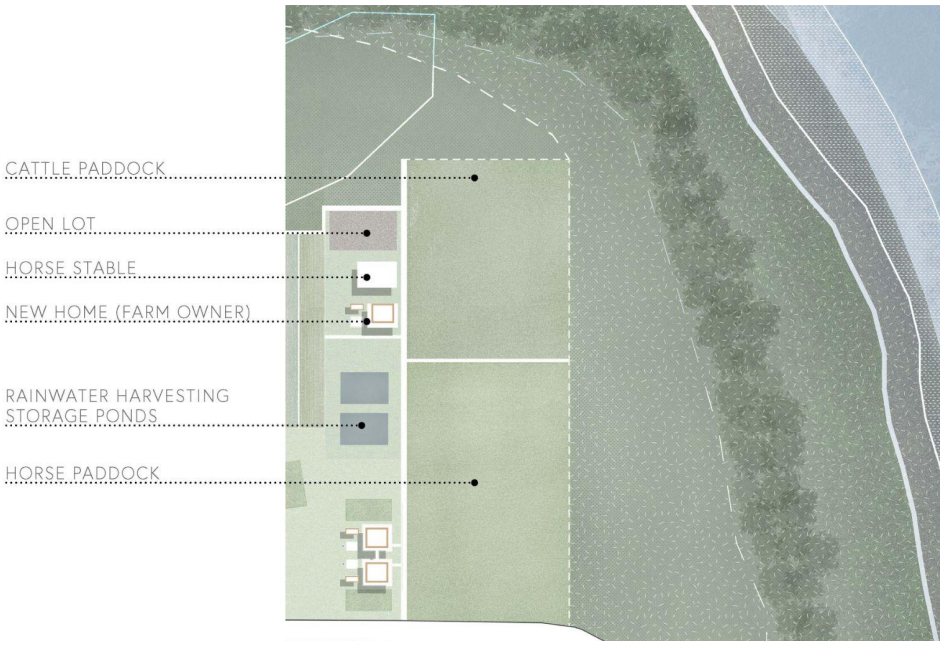

Figure 36, Farm Block (Source: Author)

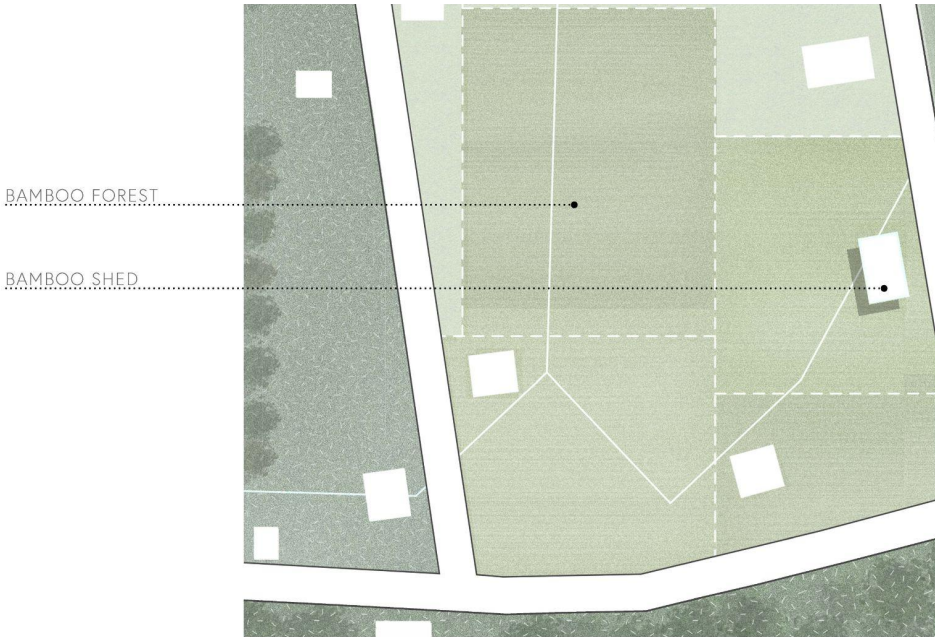

Figure 37, Bamboo Forest Block (Source: Author)

The illustrative aerial view demonstrates how elements in a typical housing block are generally arranged (see Figure 38). The reed bed system is designed to be a greywater system, with the water utilized to water the plants (see Figure 39). The second component is a self-contained structure that was designed to perform three functions in one. The compost toilet, a waterless toilet that produces natural fertilizer, is the self-contained structure's initial function. The second function is a rudimentary shower, and the third is a laundry area where clothes are washed by hand (see Figure 40). This is all convenient and easily accessible to the residents. The final component is the rain barrels, which are positioned adjacent to the home and collect rainfall via a bamboo gutter, where the home's residents may subsequently use the water (see Figure 41).

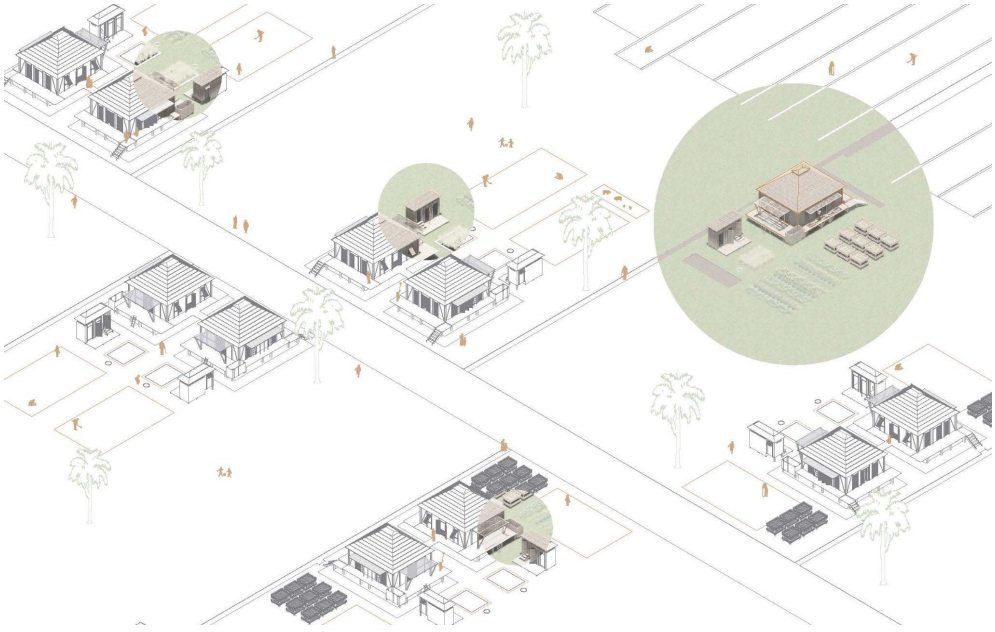

Figure 38, 3D Aerial View (Source: Author)

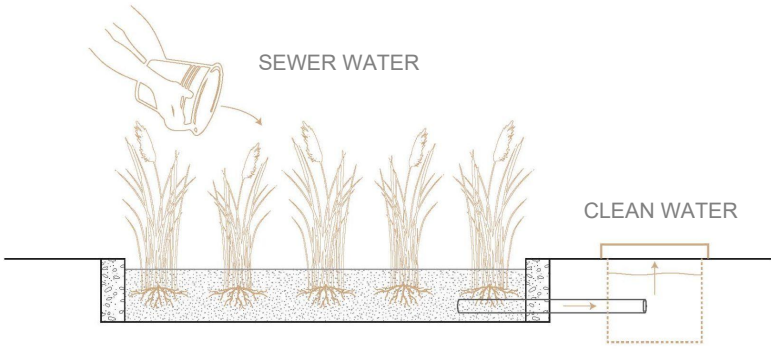

Figure 39, Reed Bed System (Source: Author)

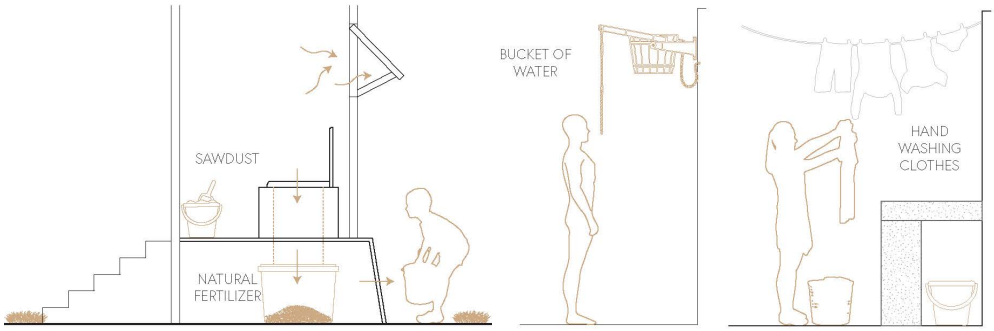

Figure 40, Self-Contained Structure (Source: Author)

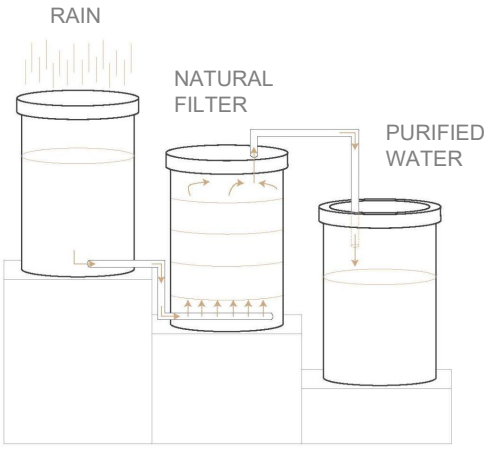

Figure 41, Rain barrels (Source: Author)

While analyzing and researching tropical housing guidelines, the discovery of strategic openings and attention to structural integrity arose. The awareness of these design elements is essential to allow wind to move freely throughout the space. As a result, these guidelines were applied to the proposed housing type to successfully strengthen the homes in the event of a natural disaster. Doing so would prepare and set up the houses to withstand the worst hypothetical weather conditions, resulting in the most durable and sturdy home conceivable. Without these parameters, the wind's force and pressure can cause walls and roofs to collapse and concave, leading to a devastated house (see figure 42).

Figure 42, Tropical Housing Guidelines (Source: Author)

One of the current housing typologies in the Miskitu community is a single home measuring twenty-four feet by eighteen feet. Its primary building material is wood, and its roof is often a pitched metal roof (see Figure 43). The house on stilts is raised anywhere from three to five feet above the ground. The second house type, which is widespread in the Miskitu

community, is comparable to the first, except that the kitchen is an independent structure with proportions of nineteen feet by fourteen feet, which is then joined by a small bridge (see Figure 44). The third house type differs from the other two typologies regarding the predominant building material applied and the kind of roof. Instead, palm leaves and a thatch hip roof are employed in the architecture of this house. Notably, the third house type is the smallest style, where its main house measures twelve and a half feet by thirteen feet (see Figure 45).

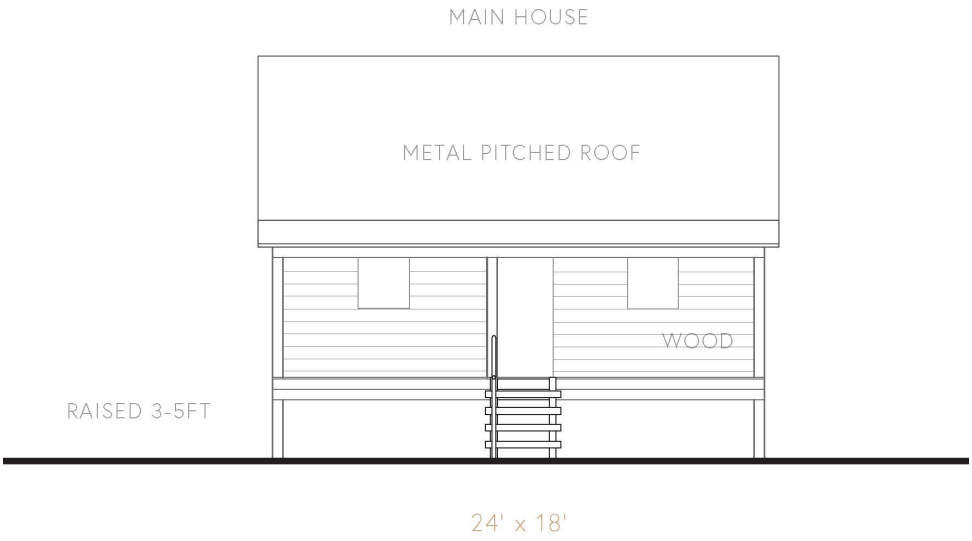

Figure 43, Existing Housing Typology 1 (Source: Author)

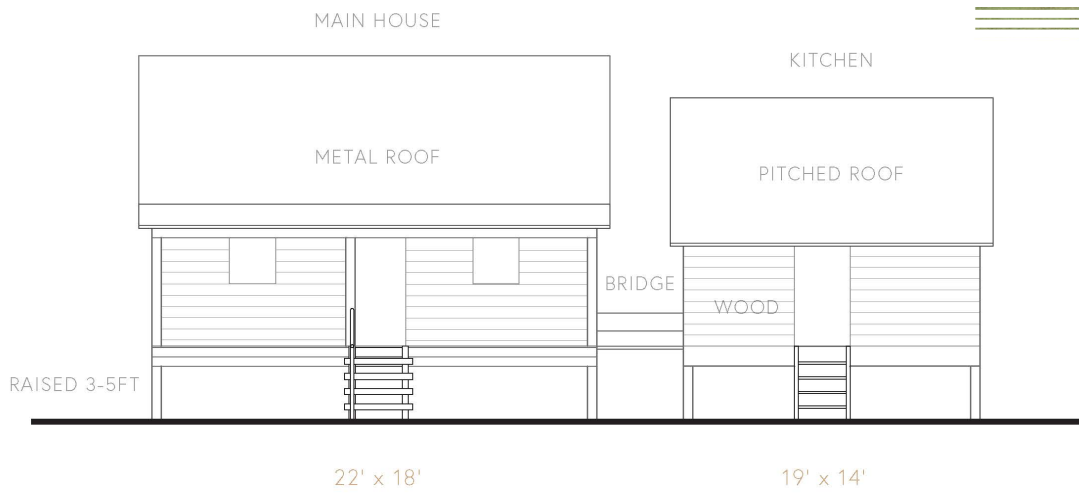

Figure 44, Existing Housing Typology 2 (Source: Author)

Figure 45, Existing Housing Typology 3 (Source: Author)

The typical existing floor plan is relatively open, except for a few walls that divide more private rooms, but the usage of doors remains nonexistent (see Figure 13). A deeper examination of the floor plan reveals a lack of wind circulation across the space, threatening the structural integrity

and stability of the home (see Figure 46). The tropical housing guidelines uncovered through research were once again adopted to assess the existing floor plan design to determine what could be modified or improved. The floor plan contains flaws that jeopardize the home's resilience, such as a lack of suitable apertures on the main house and the kitchen structure. The small bridge in the middle connects the two structures, which lack support and sturdiness. Finally, after rigorous review and research, the recommended shape for the redesigned housing typology will be a single house integrating the gained knowledge from the existing plan and the tropical housing guidelines to design the most resilient home feasible (see Figure 47).

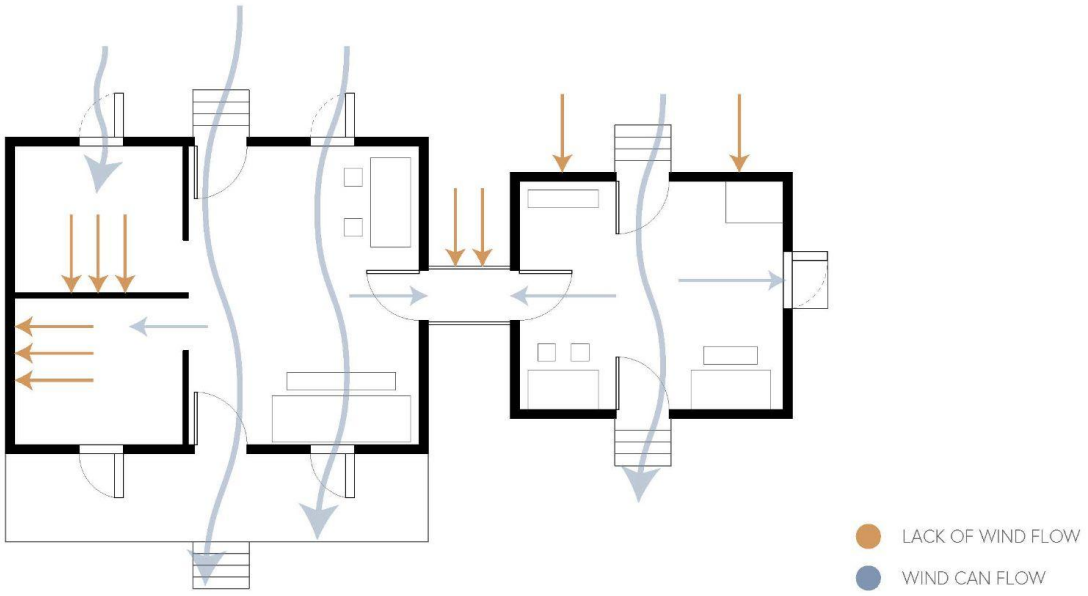

Figure 46, Existing Floor Plan: Lack of Wind Flow (Source: Author)

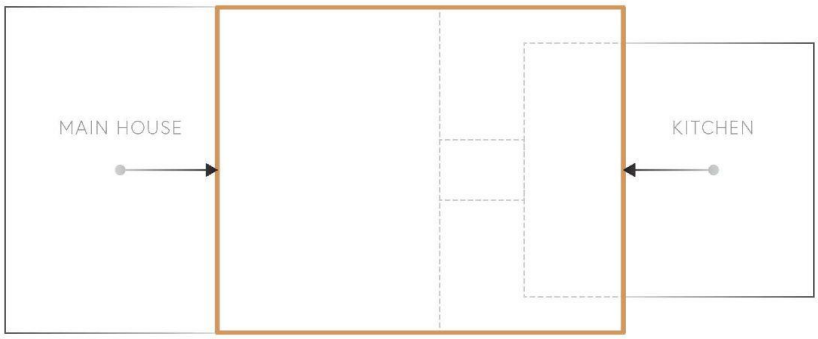

Figure 47, Proposed Floor Plan: Shape (Source: Author)

Upon settling on the intended form, the building material had to be determined. When all of the building materials were compared, and the current environment of Prinzapolka was addressed, bamboo emerged as the best construction material. Why was bamboo the optimal option for these new homes? *Bamboo* is a sustainable and robust material that is not only readily accessible locally to the Miskitu community but is also less expensive. Nicaragua has a severe deforestation crisis and addressing it raises awareness of this extremity while also benefiting the environment. While considering the suggested floor design, the strategically placed apertures along the facades where the wind direction originates provide for any high winds to appropriately depart the residence, resulting in a safe structure (see Figure 48). These openings provide an abundance of daylight to seep into the space (see Figure 49).

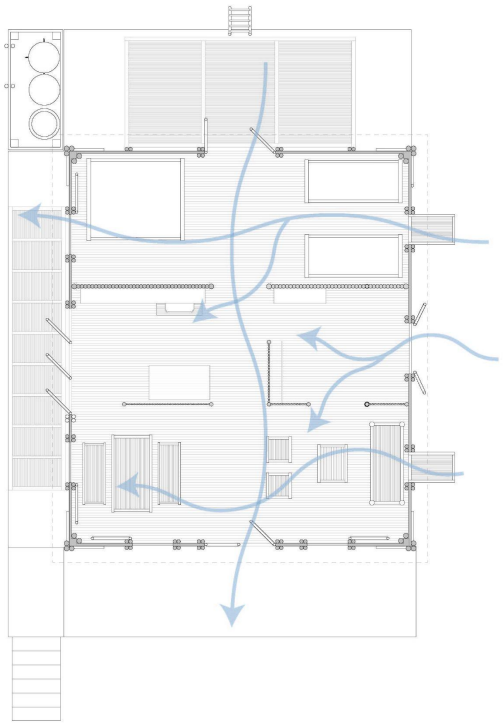

Figure 48, Proposed Floor Plan: Wind (Source: Author)

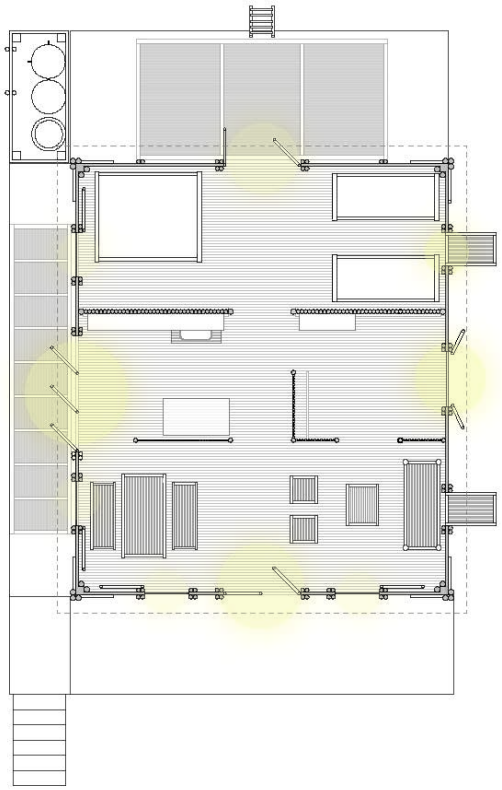

Figure 49, Proposed Floor Plan: Daylight (Source: Author)

The principal axis runs from the entrance of the house to the rear, where midway turns to the left to accommodate a wrap-around deck. The secondary axes serve as access points to designated spots inside the house (see Figure 50). These axes introduce how the home is divided into several zones, beginning with more public spaces at the entrance and ending with the most private spaces towards the rear of the house. The overall designed floor plan captures the positioning of the raised garden beds to the left and a garden that is all adjoining to the kitchen, operating as a food-to-table setting that is practical and stimulates camaraderie. The self-contained structure is situated at the base of the home, conveniently near the sleeping area. The reed bed system and the chicken coop and pig pen are also shown in the planned floor layout (see Figure 51).

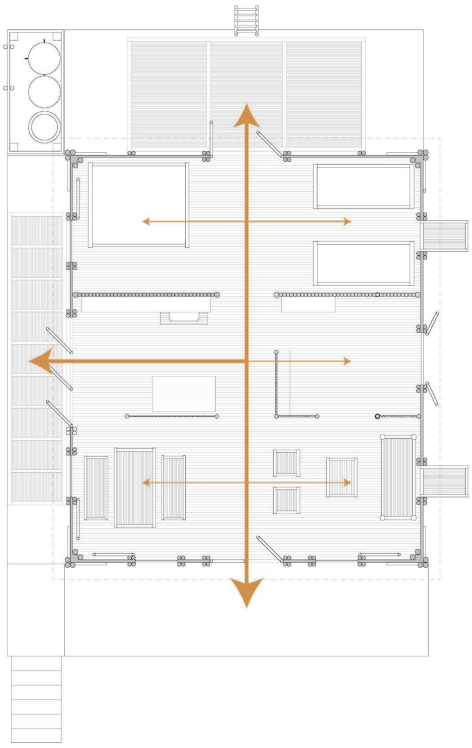

Figure 50, Proposed Floor Plan: Axis (Source: Author)

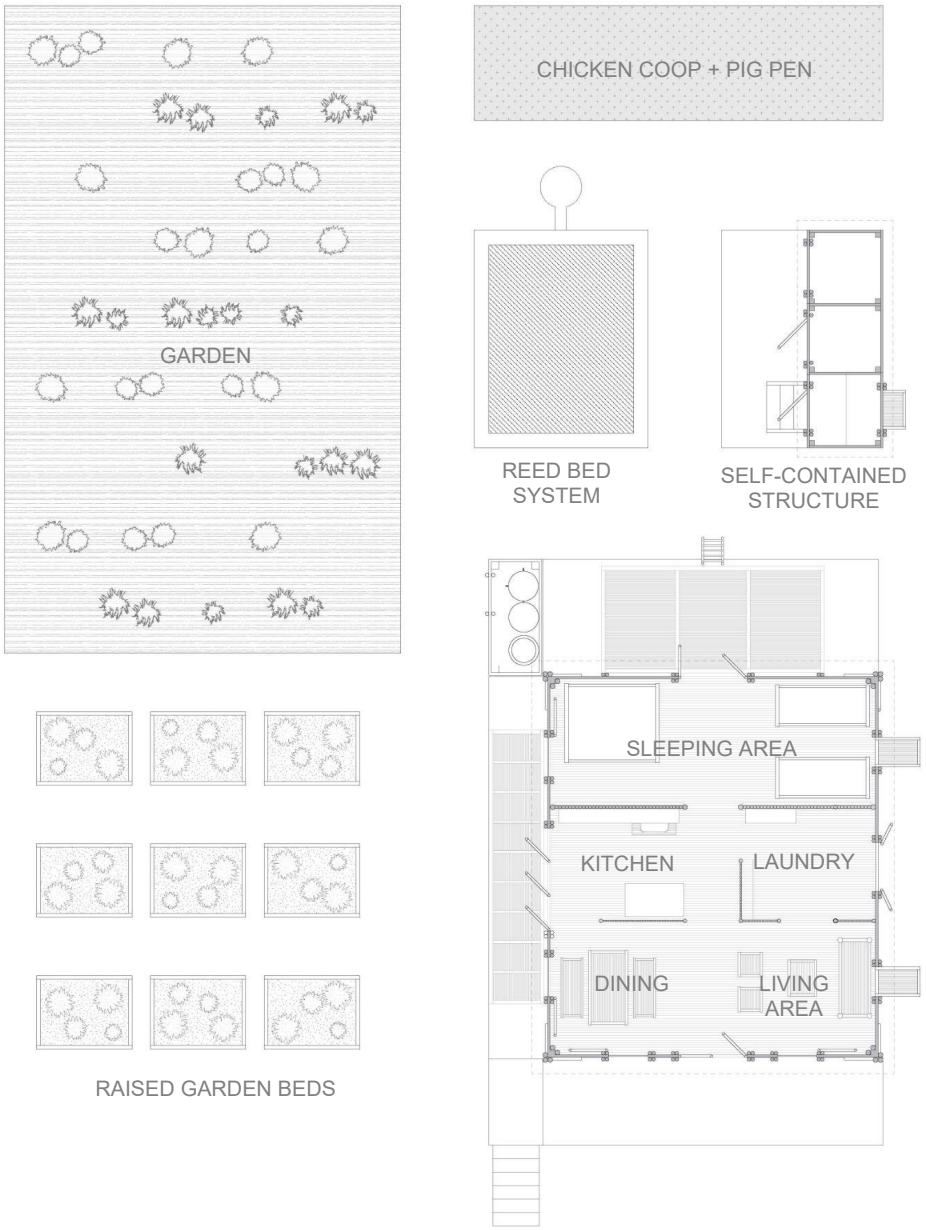

Figure 51, Proposed Floor Plan (Source: Author)

The façade of the home was also meticulously planned, with one of the intended goals being to create a resilient home that could resist the most catastrophic flooding scenario (see Figure 52). In response to this, the houses

are built on a two-foot mound with a three-foot-high elevated deck. Furthermore, the home continues to use passive strategies and low-tech mechanisms, such as the insertion of the cupola to the roof to increase natural ventilation to flow in and out of the interior space. Shade devices such as canopies or cantilevers were built near the kitchen and the sleeping area. Raised gardens are also put near the home to safeguard crops in the event that a flood or tropical storm wipes them away, destroying their harvests; at the very least, the residents will have a source of emergency crops if this transpires (see Figure 53).

Figure 52, Exterior Rear Render (Source: Author)

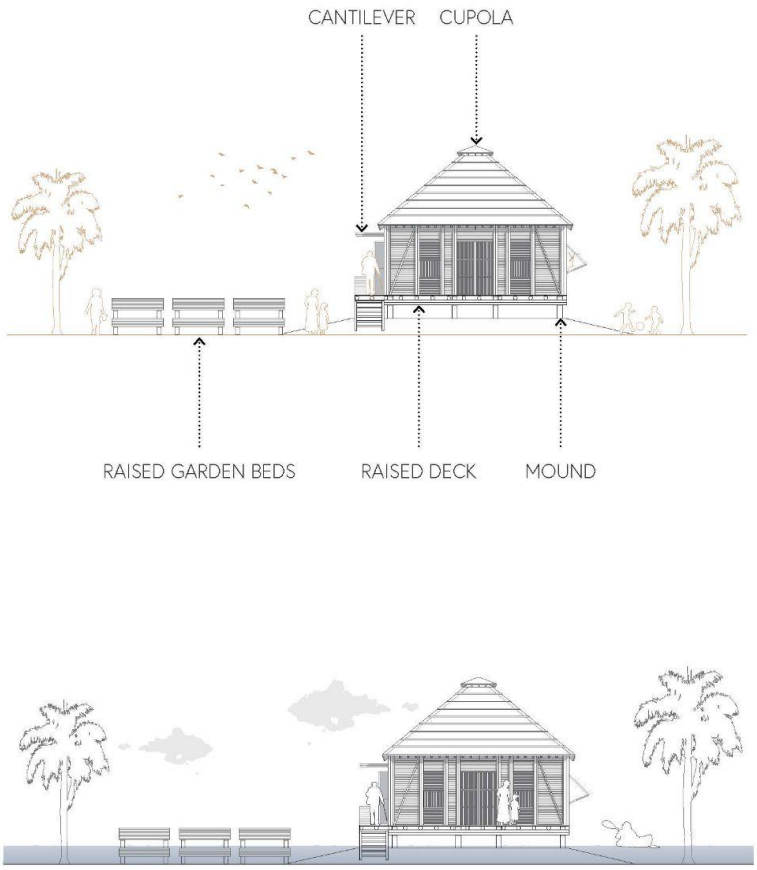

Figure 53, South Elevation: Normal and Flooded (Source: Author)

Although the structure is built to endure any extreme scenario above ground, the foundation must also be appropriately developed (see Figure 54). The idea is that timber and concrete will be embedded and used deliberately in more relevant aspects of the home's overall design. The foundation is anchored by timber posts and concrete footings, while most of the main structure is still bamboo (see Figure 55). Timber is also utilized sparingly on the roof, as seen on the hip rafters. Not only is the majority of the building made of bamboo, but the furnishings within the house is also made entirely of

bamboo (see Figure 55). Different diameters of bamboo culms are utilized to differentiate and manufacture a wide range of products for the home's exterior and interior.

Figure 54, Exterior Flood Render (Source: Author)

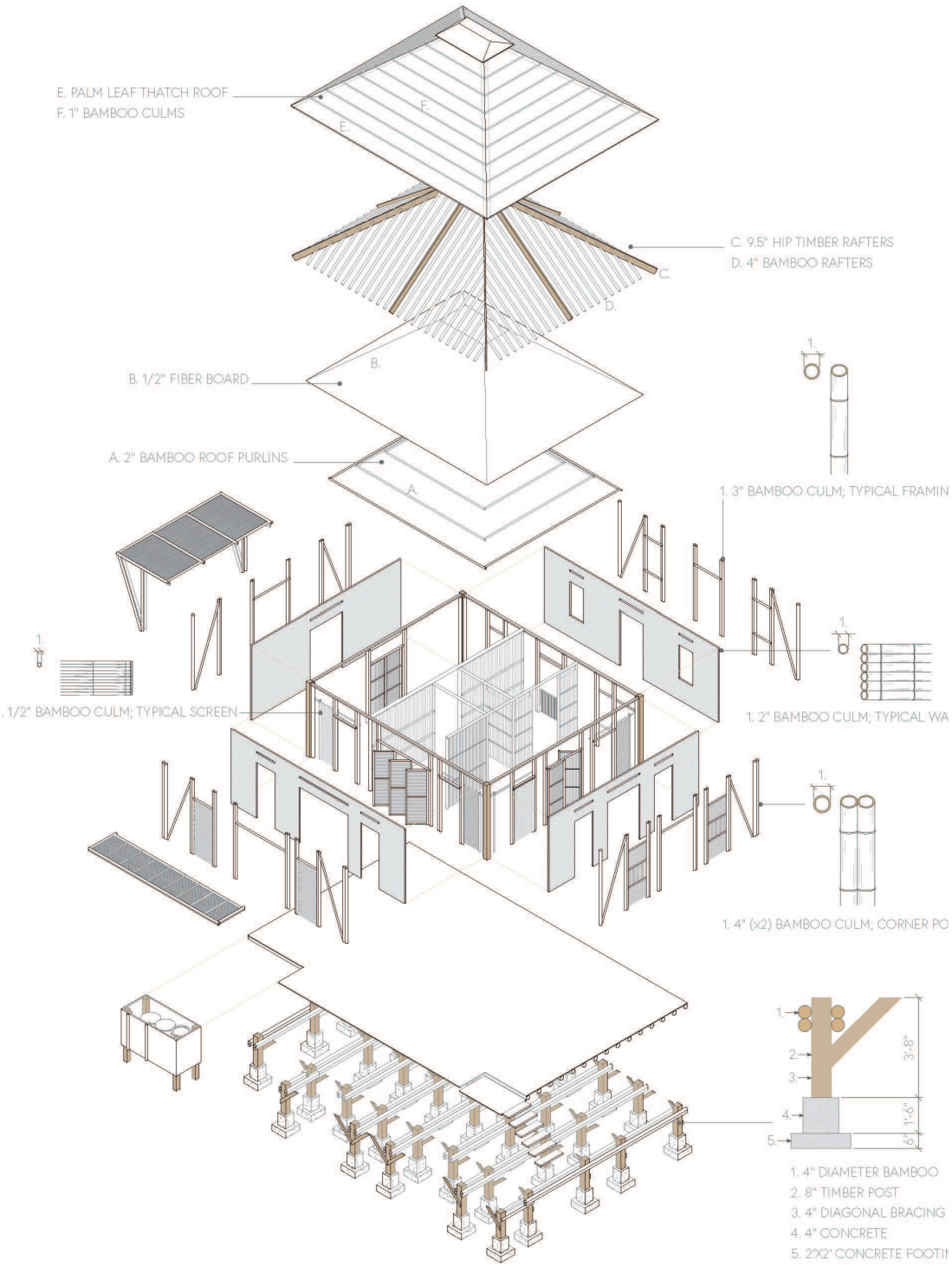

Figure 55, Kit of Parts (Source: Author)

Figure 56, Interior Kitchen Render (Source: Author)

Overall, the Miskitu people were kept in mind from the beginning to the completion of the design process. The decision to concentrate on the Miskitu group stems from widespread underrepresentation. Since they lack basic necessities, they find it difficult for outsiders to recognize their need for assistance. Miskitu people live in severe settings, and their way of life has remained mostly unchanged for decades. Their cries for relief and the need for support are not apparent within scope. However, they are undeniably present, which is why researching and identifying the Miskitu community's presence will drive change.

Conclusion

In Retrospect

Studying the Miskitu people's history and early presence in Nicaragua is critical. While under force from the Nicaraguan government to integrate with the rest of society, the Miskitu have achieved significant gains in maintaining their self-government activities. Their struggle to exist as a community and maintain their ancestral territories in the face of frequent natural disasters and severe weather parallels the continuing fight to defend their Indigenous land rights. The suggested design acknowledges that these places are precious to the current residents of these lands and prior generations. A fresh approach and thinking style was sought to protect the Miskitu culture, people, and natural landscape. When the Miskitu community was considered, the design was able to attain its ultimate value, for it was based on their necessities and possible beneficial elements.

Before beginning the methodological approach, the considerations of the following questions helped steer the directionality of the framework for this thesis. Among the questions was what implementations of specific initiatives would help alleviate the high poverty rate in RACCN? Elements such as ample housing will help ameliorate the high poverty rate caused by a shortage of homes in most small villages, which is evident in the municipality of Prinzapolka and the RACCN as a whole. Incorporating and adopting the

existing home typologies as the underpinning of the redesign house type must comply with the high flood levels in Prinzapolka. Even though the existing homes are three to four feet above the ground, they still undergo inundation. Two viable alternatives were to elevate these homes higher or construct a barrier that prevents high seawater levels from entering the site. Other options included constructing flood mitigation technologies, whether structural or nonstructural. These flood-prevention devices may potentially be long-term solutions that assist in reducing soil erosion. In the end, the revised housing typology was designed to tolerate the tremendous floods but to also withstand powerful winds from heavy storms in conjunction with tidal currents. These durable homes will withstand these climates while employing traditional yet simple construction methods.

According to this thesis, if the design proposal is successful, the Miskitu people's ancestral lineage will be extended. It is undoubtedly necessary to preserve the land, yet, it is critical to fathom why the land must be preserved in the first place. Although Prinzapolka and several other comparable sites near Nicaragua's coastline are incredibly challenging, communities like the Miskitu should not be displaced and relocated. The first approach to protecting their heritage and links to their land is to seek resolutions to these challenges. Considering the site and natural environment are strenuous to engage with, the alternatives cannot be the easy way out. The core narrative is that the Miskitu community is vastly underrepresented. Few individuals are cognizant of or engaged in what is occurring in developing

nations like Nicaragua. Numerous indigenous peoples live under challenging terrains across Nicaragua, and their way of life has remained mostly untouched for centuries. Although the demands for relief and the need for aid are not glaringly obvious, they are undeniably prevalent, which is why investigation and revealing the presence of these groups will drive progress. Like the Miskitu community, Indigenous peoples worldwide experience resource scarcity, which their governments may choose to dismiss or disdain.

As a last thought, it all started with the Miskitu people, and it concluded with them. From the research phase of this thesis and uncovering the origins of the Miskitu peoples to the design component of this thesis, the Miskitu people and their territory remained a priority propelling this thesis to its full potential.

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