

# Chapter 5

# POLICY MEMOS

## CLIMATE SCHOOL POLICY MEMOS

### EAST PORTLAND, JAMAICA

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# I. Building a Resilient Tourism in East Portland

Shadé Jaiyeola & Tamara Rasamny

## Introduction:

Tourism is an important pillar of Jamaica's economy, representing a significant source of revenue and employment. In 2019, before the COVID-19 pandemic hit, the tourism industry accounted for 34% of GDP, generated \$3.64 billion, and contributed to 350,000 direct and indirect jobs. The vibrant island nation of Jamaica is well known around the world for its rich cultural heritage, diverse natural landscapes, and warm hospitality that attracted four million tourists in 2023. However, this rosy picture is incomplete without painting the reality of income inequality and environmental degradation that also dramatically influences the current state of the country.

## Historical Context: Slavery, Colonization, and the Current Economy

Jamaica's history is profoundly linked with the legacies of slavery and colonization that have shaped its current economic and social landscape. The island was colonized by the Spanish in 1494 and then seized by the British in 1655. Under British rule, Jamaica became an important point for the transatlantic slave trade, turning it into the largest enslaved population in the Caribbean by the 18th century. Despite the abolition of slavery in 1834, formerly enslaved people continued to face economic marginalization and systemic racism. The establishment of Maroon communities—settlements of escaped enslaved individuals who resisted colonial rule—demonstrated resilience against oppression. However, post-emancipation policies restricted land ownership and contributed to widespread poverty among Black Jamaicans. Jamaica's post-independence era after 1962 saw the persistence of economic struggles, and a heavy reliance on agriculture and tourism. Today, despite some improvements, poverty remains, with 12.3% of Jamaica's population living below the poverty line in 2023 and 33% of Jamaicans experiencing severe food insecurity. However, the island also shows some inspiring developments, with a record-low unemployment rate of 4.2% in 2023.

## Portland: A Hidden Gem and the Birth of Tourism

In Portland, the focus of our study, tourism plays a singular role in the economy. Portland became the birthplace of Jamaica's tourism industry in 1899, following the start of a large banana export operation by boat, when ships were chartered in Portland's port to create the first recorded line of passenger transport between the United States and the Caribbean. Today, with its lush forests and pristine

beaches, Portland is often described as the country's hidden gem as it has escaped the pitfalls of mass tourism, unlike regions like Montego Bay or Negril. Additionally, the region has a rich cultural history, including the legacy of the Maroon communities who have established autonomous communities in places like Mooretown. With its unique biodiversity and rich cultural heritage, Portland has immense potential for eco and ethno-tourism.

Eco and ethno-tourism—a type of tourism that sustains the well-being of local communities and promotes environmental and cultural awareness—can bring significant benefits to Portland, including employment opportunities and revenue generation. However, it also brings environmental and socio-economic challenges. The growth of tourism has led to deforestation, habitat destruction, and water pollution, as exemplified in the case of Montego Bay, where the rapid growth of mass tourism was followed by an increase and pollution. Unchecked tourism may also undermine local traditions and displace local populations.

Thus, it is essential to approach tourism development in Portland with an environmentally conscious and culturally informed mindset while ensuring that all decisions are community-led. Through our research we will ponder the following question: What if the tourism industry in Portland could bridge the local and the foreign through a non-extractive focus that promotes a regenerative economy? By engaging local communities as active stewards and beneficiaries of tourism, Portland can bring a sustainable tourism model that prioritizes community well-being, climate resilience, biodiversity protection, and the protection of Jamaica's rich cultural heritage.

## I. Background and Context

Certain risks to the theme of sustainable tourism in Portland mimic other aspects of tourism around Jamaica. First and foremost, there is an overreliance on the tourism sector within Jamaica's economy, which often lacks equal distribution of wealth that fails to trickle down to small business owners, given the role of large-scale all-inclusive resorts. Mitigating these risks includes finding ways to lift eco and ethno-tourism outlets that celebrate and highlight aspects of Jamaican culture, people, and nature.

Jamaica's land policies and the increasing privatization of coastlines is also an important concern. In 15 km of

shorelines, only 1.8% is actually publicly accessible. This lack of access not only impacts on the ability of locals to enjoy their natural sites, but also severely affects various forms of employment, such as working in the fishing industry, where fishers are forced to travel long distances to access the sea. Large-scale tourism operations common in Montego Bay and Ocho Rios risk undermining Portland's valuable nature landscapes. Currently, a Sandals-owned building is being built next to the entrance of the Blue Lagoon, one of Jamaica's national monument sites.

Jamaica's land policies and the increasing privatization of coastlines is also an important concern. In 15 km of shorelines, only 1.8% is actually publicly accessible. This not only has an impact on the ability for locals to enjoy their natural sites, but also severely affects various forms of employment, such as working in the fishing industry, where fishermen are forced to travel long distances to be able to access the sea. Large-scale tourism operations that are common in Montego Bay and Ocho Rios risk undermining Portland's valuable nature landscapes. Currently, a Sandals-owned building is being built right next to the entrance of the Blue Lagoon, one of Jamaica's national monument sites.

Additional risks to consider are those where environmental protection and tourism expansion contradict and compete, which manifests in various ways. The impact of mass tourism further leads to environmental degradation and increasing environmental justice inequities between tourists and the local population. Water, land pollution, energy access, and waste production are all examples of how tourists and locals have different access to necessary resources and often have different waste footprints, contributing to environmental consequences such as land pollution. In Portland, this contradiction is actively illustrated through the tensions between sand mining and river rafting, where sand mining is impacting the ability, consistency, and quality of river rafting, potentially disrupting the river flow and risking the employment opportunities of the more than 100 river rafting coaches who depend on the river to sustain themselves. The sand mining operations are supposed to be moderated by the policies around the coordination of mining and river rafting operations, although, quite often, these legal guidelines are often breached. Monitoring and reporting efforts to ensure that guidelines are followed are usually ineffective.

All of these considerations, mixed with the increasing risk of climate change, are a potential threat and danger to Jamaica's tourism sector. A recent study reveals that sea level rise due to thermal expansion, particularly from 2004 to 2019, led to sea levels rising 67% faster than the Intergovernmental Panel on Climate Change's estimates. Therefore, a key question to consider is how to ensure the benefits of tourism are equitable and do not lead to unintended consequences? Going further, how can tourism be reframed through its approach of the eco and ethno- to go beyond traditional forms of tourism that celebrate these cultural components as opposed to extracting from them?

## II. Existing Plan and Policy Landscape

Several programs and policies that address the theme of sustainable tourism and can help inform a regenerative vision for the industry in Portland already exist on the local, regional, and international level.

**Portland Bight Protected Area Management Plan** aims to conserve the ecological and cultural values of the Portland Bight Protected Area by increasing the capacity of the Caribbean Coastal Area Management Foundation and its partners to implement effective management of the Portland Bight Protected Area. The plan also focuses on reducing human disturbance and unsustainable land use—including tourism operations.

**Vision 2030 Jamaica** is a strategic development roadmap to improve economic prospects, livelihoods, and sustainable development. Objectives relevant to ecotourism include sustainable market growth, enhanced visitor experiences, community-based development, inclusivity in tourism, and environmental sustainability.

**Jamaica's National Environment and Planning Agency (NEPA)** is the national government body responsible for establishing policies and programs for environmental protection and conservation, environmental management, spatial planning, compliance and enforcement of environmental regulations, and public education and outreach. Some relevant policies and practices include environmental impact assessments that ensure tourism developments follow sustainable practices, protected area management and marine and coastal zone management. NEPA implements regulations for sustainable marine and beach tourism, manages national parks and protected areas, and regulates tourism operations and expansion around those areas.

**Caribbean Tourism Organization (CTO)** is the region's tourism development agency whose purpose is to provide the services and information necessary for sustainable tourism development to foster economic and social prosperity in the Caribbean. The organization has the potential to support Jamaica in implementing regional standards for sustainable tourism and promote community-based tourism initiatives through sharing best practices and participation in its network of private stakeholders.

**Sustainable Development Goals (SDGs)** are part of the 2030 Agenda for Sustainable Development adopted by all United Nations members in 2015. They represent a global framework calling to end poverty, protect the planet, and ensure peace and prosperity by 2030. Tourism-specific goals that could be applied to the Jamaican context include Decent Work and Economic Growth (SDG 8), Responsible Consumption and Production (SDG 12), and Life Below Water (SDG 14).

**Example 1: Ecotourism in Hawaii**

A successful case of creating a more equitable and sustainable tourism industry can be taken from Hawaii. The Sustainable Tourism Association of Hawaii (STAH) is a third-party certification program that promotes sustainable tourism and acts as a database for tourists to access different verified businesses. This program also allows tourists who wish to explore this side of Hawaii to have a reputable and easy-to-access website where they can discover a variety of local tourism businesses. STAH partners with Travelife, which provides businesses with the platform to advertise themselves to an audience interested in more responsible tourism, helping STAH with global recognition.

**Example 2: Funding opportunities in the Caribbean: Compete Caribbean**

Launched in 2012, the Compete Caribbean Partnership Facility (CCPF) is a private sector development program that delivers innovative and practical solutions to boost economic growth and foster innovation in the Caribbean. Funded by the Inter-American Development Bank, the Caribbean Development Bank, and the Government of Canada, CCPF aims to improve the competitiveness of small and medium-sized enterprises in the region. The program’s primary functions include providing technical assistance to small businesses, offering funding and advisory services in innovation and value chain development, facilitating collaboration between governments and the private sector, and building capacity within business associations and chambers of commerce.

**Gap Analysis/ Expressions of the transformation needed**

Key gaps in various policies are competing interests relating to the real need for economic development within Portland and ensuring that many of Portland’s unique sites are valued and their integrity preserved. As described in Section II, the competing interests of the tourism river rafting industry and the increased sand mining along the Rio Grande have not necessarily been resolved due to the lack of monitoring and implementation of legal guidelines. Despite having entities tasked with overseeing the sand mining process, discussions with river rafting coaches and first-hand witnessing of rules being broken could suggest that the guidelines are often just suggestions lacking implementation.

Important considerations to take when identifying certain gaps and the transformations needed relate to financing, capacity and awareness building, and data collection. Notably, these include

- Streamline access to grants, low-cost financing, and community outreach.
- Secure funding from multiple sources to ensure higher resiliency and lack of dependency on a singular source of funding.
- Emphasize policies that prioritize local initiatives and include strict eligibility requirements that require larger

- operators to provide some form of additional and proportional payment to the community.
- Incorporate regular monitoring and data collection to ensure proper check-ins with eco and ethno-businesses and inform future policies.
- Engage stakeholders early in the process and consistently throughout the process. Include a strong emphasis on co-production of knowledge and co-design of policies and interventions addressing eco and ethno-tourism.
- Expand eco and ethno-tourism businesses to engage in other economic activities such as agriculture, sustainable fishing, and crafts/art creation.

**Seeds of Change: Toward Climate Justice, Action, and Accountability**

**A. Climate justice imperatives**

- Through our research and dialogue with local stakeholders in Jamaica, we have identified some key elements—our climate imperatives—that any eco and ethno-tourism initiatives must respect to stay true to the values of climate justice and equity in the Jamaican context:
- Ensure that tourism doesn’t negatively impact Portland’s natural heritage and actively builds climate resilience.
- Preserve Jamaica’s historic and cultural heritage and the authentic ways people wish to express them.
- Acknowledge the historical legacy of colonialism and avoid having tourism fall into similar pitfalls of extraction and exploitation.
- Prioritize and engage communities in planning and implementing tourist infrastructure and projects.
- Support alternative ways to generate revenue and prosperity of tourism.

**B. Seeds of Change**

- At the local level, actions could include:
- Leveraging the expertise and experience of local communities, especially Maroon communities, to create a tourist experience that educates tourists about Jamaica’s culture and empowers communities to be at the forefront of tourism’s benefits rather than an afterthought.
- Introducing a local tourism label or database to highlight sustainable tourist experiences and institutions that are owned and operated by local communities.
- Creating a network of local tourism professionals.

At the regional/national level, actions could include:

- Leveraging the resources and knowledge of the Caribbean Tourism Organization to share best practices.
- Promoting local ownership for tourism activities and hotels through tax incentives and grants.
- Conducting training programs for residents to enhance skills in hospitality and conservation.

- Implementing regulations on tourist activities that have a direct environmental impact coupled with regular monitoring.

At the global level, actions could include:

- Collaborating with other small island countries to advocate for equitable climate finance initiatives and adaptation measures.
- Increasing loss and damage funding from international organizations to help enhance capacity building and resilience against climate risk.
- Increasing cooperation between tourism and biodiversity hotspots around the world to share best practices.

Columbia University started a research and collaboration partnership with UWI and the Alligator Head Foundation that has proven immensely rich and rewarding for students and, hopefully, for the host organizations. It is essential to keep this partnership alive, for instance, through the following actions:

- Sharing detailed information about case studies to facilitate the sharing of best practices.
- Helping connect different community members we met in our trip, if relevant.
- Continuing the partnership with the Alligator Head Foundation through potential internships/ fellowships or capstones.
- Columbia students had the immense opportunity to learn from experts about Caribbean climate resilience and various topics, including ecotourism. It is crucial that we leverage that knowledge at every step of our future careers and advocate for equitable and just policy.

**From Seed to Scale: Imagining Implementation**

A Regenerative Tourism Label could help enhance and highlight community-based sustainable tourism practices in Portland, Jamaica, by recognizing and uplifting locally based tourism operations that provide environmental, cultural, and community benefits. A similar label, the national Green Business Certification Programme of Jamaica, was proposed in 2016 to promote ecotourism under the voluntary guidance of the National Environment and Planning Agency. The goal was to identify and certify businesses committed to environmental protection, cultural integrity, community involvement, and sustainable revenue generation.

**Eligibility Criteria:**

The regenerative tourism label would program local tourist operators and Maroon communities that expressed a desire to operate sustainably. A maximum capacity limit would apply to eligible hotels to maintain the environmental and social balance.

**Benefits to Recipients:**

The Regenerative Tourism Label would bring various

advantages to participating businesses, including increased promotion and recognition among eco-conscious travelers. An online climate data platform provides information to help operators adapt to changing climate conditions. Access to training and workshops ensures that tourism operations are regenerative and sustainable. Through these types of technical assistance, tourism operations would have the opportunity to pursue both climate adaptation and mitigation activities. Participation in the label would also provide access to skills development opportunities both inside and outside the tourism industry to help improve economic resilience and prosperity beyond tourism.

Participants would also gain financial incentives through grants and low-interest loans that help them invest in sustainable practices. Network opportunities would arise from inclusion in a broader community of sustainable tourism practitioners, facilitating knowledge sharing and collaboration. Government and international tourism platforms would also provide marketing support.

**Potential Funding Sources:**

Potential funding includes international environmental funds, such as the Global Environment Facility, the Green Climate Fund, and the Caribbean Development Bank; government grants, including government ministries of tourism, health, and environment; and impact investing and blended finance initiatives that can invest in climate-positive projects with low-return requirements.

**Supporting Policies:**

On the local level, tax incentives for operators investing in renewable energy, water conservation, and waste reduction will be available to program participants. Training programs focused on sustainable tourism management and climate resilience will also be offered to residents. On the international level, the program would benefit from an alignment with guidelines and standards from the Global Sustainable Tourism Council, the United Nations World Tourism Organization, and the Convention on Biological Diversity to follow best practices on sustainable tourism and biodiversity preservation. Key risks include the failure to meet environmental and cultural preservation goals, loss of authenticity due to commercialization, and insufficient local community involvement. Mitigation strategies involve setting strict eligibility criteria, providing ongoing education and training, and offering financial incentives that encourage sustainable practices.

This label must follow a set of standards and a clear framework to be effective. The structure presented should include the sustainability areas it seeks to address (environmental, social, economic, and cultural), transparency requirements such as the need for rules and regulations to be published and widely distributed, and the credibility requirements enforced by the existence of an on-site, third-party verification system.

Overall, this Regenerative Tourism Label presents a strategic opportunity for Portland, Jamaica, to redefine its tourism industry through a holistic approach that combines

cultural preservation, environmental sustainability, and economic growth.

# II. Climate Reality of Agro Farming in East Portland, Jamaica

Christina Sanders

## Purpose

A climate justice project in Jamaica focusing on ridge-to-reef and watershed management and assessing climate risk experienced by stakeholders impacted by climate change. The project centers around the living and built environment, anti-racism, climate justice, and design. It aims to gain firsthand experience with vulnerable populations to ensure a balanced approach to problem-solving and support for climate adaptation and climate-related disasters.

## Goals

This project aims to understand the primary factors contributing to climate risk for the residents of East Portland, Jamaica. It seeks to identify the specific groups that have become more vulnerable due to the impacts of climate change and to what extent. Additionally, the project will examine the current state of and obstacles to water access for this agro-farming community, exploring the political challenges, systems, and remnants of colonialism that hinder residents' ability to adapt to climate change. It also aims to identify the specific climate-induced challenges faced by local stakeholders and review the potential and projected climate challenges East Portland residents could encounter in relation to drought and climate change. The culmination of this research project will highlight successful practices used by community members, offer individual and communal opportunities for action, suggest water catchment and harvesting options, and share climate adaptation practices for farmers in this region of the island.

## Topography and Climate of Jamaica

Jamaica boasts a diverse landscape featuring rugged mountains—some volcanic, narrow valleys, and a coastal plain. It is 90 miles (145 km) south of Cuba and 100 miles (161 km) west of Haiti. Jamaica's climate is tropical, hot, and humid on its coast, while it is temperate inland. The island's natural resources are abundant, with a wide variety of food and medicinal plants, water, and natural materials

perfect for regenerative building. The inhabitants of Jamaica experience a significant amount of rainfall, which means there is a limited need to create artificial lighting, heating, or cooling.

## Historical Context

Jamaica derives its name from the Taíno word "Xaymaca," which means land of wood and water. As the earliest known inhabitants, the Taíno people were involved in the production and trade of tobacco. Fish was the primary source of their diet, along with cassava, corn, cocoa, and yams. During the colonial era, Jamaica was a significant part of the Middle Passage that kidnapped Africans, took them mainly to Caribbean nations, and forced them to work on plantations growing crops that were taken to England. The Middle Passage trade was profitable for colonists. Amid colonialism, Queen Nanny, leader of the Windward Maroons of Jamaica, emerged as a protective force to organize against the British and protect the enslaved Africans and remaining Taíno people. Situated in the Blue Mountains, Nanny trained and defeated attempted colonialism, and the British offered a 500-acre treaty for the Maroons to live free as long as they stopped attacking their troops. As a result of this early and successful revolt, Nanny Town, also known as Moore Town, still exists today. Subsequent uprisings from people on the island to defend themselves have not been met with such a fate. Under the Crown Colony system, those who sought to demand rights were often sanctioned with executions and destroyed dwellings. Remnants of the Crown Colony system still exist in Jamaica today.

## About East Portland

East Portland Parish covers an area of 813.9 km<sup>2</sup> (314.3 sq. miles) and is one of Jamaica's more rural regions. It is situated on the northeast coast and is bordered by St. Thomas to the south and St. Mary to the west. The parish consists of two main towns, Port Antonio (the capital) and Buff Bay, and has two harbors. Port Antonio is a popular tourist destination and a hotspot for the country. Portland

is a major contributor to Jamaica's agricultural output, particularly in producing bananas, coconut, and breadfruit for domestic and foreign markets. Most of the coastal area of the parish is suitable for cultivation. In terms of fishing, there is deep-sea fishing off the coast of Port Antonio, and there are ongoing efforts to protect fish populations through the creation of fish sanctuaries.

## Community Interview I

### Sherwood Forest

Three families own the land of Sherwood Forest; the Deans own the property. For generations, the land has been used by farmers and families at no monetary cost. Today, many owners are implementing a limited lease system to prevent farmers or community residents from claiming adverse possession. The land on which Mr. Curry's property and the community center are located is on a peppercorn lease, which means they pay a nominal amount of one dollar to lease the land legally but can never own it. The original owners of the land, the Deans and Elder Deans, have passed away, and their children and grandchildren now own the land. However, most of them live abroad. This land used to be a plantation with enslaved people.

Sherwood Forest is in Eastland, Portland, with roughly 2,000 residents. The Sherwood Forest community produces almost every vegetable you can think of. They supply the market and other residents in the community. However, farmers in the area represent an aging population, and younger residents are not as interested in farming. Additionally, assistance is not readily available to support farmers in the same way as in other places. Most Sherwood Forest farmers produce multiple crops, and farming is the main food supply for residents, serving the core purpose of providing food for self-subsistence. Typically, farmers own a maximum of two acres of land, with many owning just half an acre. However, they must purchase everything on their own, including seeds and growing supplies. Private sectors that produce fertilizers and insecticides promote their products to farmers.

With regard to domestic water use, there are many leaks in the watershed line. Mr. Curry shared that the water, that could be harvested, is not working correctly through the lines due to major leaks that need repair. The absence of routine maintenance from governance bodies and instances of scarcity feuds have led to additional hurdles for farmers needing access to water.

## Community Interview II

### Windsor Maroon Farmer

Maroon communities use climate-based, zero-waste, and majority organic farming techniques, including animal carcasses from cooking and farming systems such as nature-based aqueducts. Sustainable agriculture has been a long-standing practice among the Maroons, who have

adapted their farming techniques to the local environment. Crop rotation, intercropping, and agroforestry methods are used to maintain soil fertility and biodiversity. Their growing practices are mindful and adapted to the natural environment. The Maroons have a deep knowledge of survival and sustainability, which they have passed down through generations. The Maroons have inherited independent ancestral land, which offers them protection and rights. Unlike the residents of Sherwood Forest, their community-centered governance provides a sense of land security.

The success of Maroon farmers is not only due to their agricultural practices but also their strong sense of community and inner-community accountability. This unique aspect of their culture allows for resolving disputes in a manner that doesn't disrupt production, ensuring a continuous focus on food production and operations. Like their Sherwood Forest counterparts, younger members of the Maroon community are becoming less interested in agricultural farming and are more occupied with roles in the industrial and development areas. They seek opportunities that offer weekly pay to access more frequent financial resources for childcare or personal expenses. Traditional knowledge combined with land ownership, independent governance, and a community-cultivated connection with the land and environment has proven that resilience is possible when vulnerable communities have access to necessary resources for adaptation.

## Water Access for Farmers

Farmers in rural areas rely on personal harvesting, community tanks, or local officials who truck water to them. However, they are concerned about the sustainability of their livelihoods during droughts and decreased rainfall. Community members would prefer to have permanent water supply lines maintained, instead of depending on sporadic water drops from the government. Farmers advocated for the maintenance of existing community harvesting tanks. Currently, two out of five catchment tanks in Sherwood Forest are not operational, which is a missed opportunity to provide additional water resources to community farmers during drought.

## Direct Impact of Climate Change

Climate change is exerting a direct and palpable influence on the water supply system originating in Cambridge, nestled in the mountains. This alteration manifests in various ways, notably in the quality and quantity of water available. The dwindling rainfall and prolonged drought have led to a marked reduction in the volume of water accessible. This phenomenon reverberates beyond domestic use, impacting non-domestic functions like harvesting and truck delivery services. In East Portland, the sustained drought has eroded the overall water-holding capacity of the catchment area, exacerbating the strain on available resources. Agricultural endeavors, vital for sustenance and economic stability, have been severely

hampered by the parched conditions, resulting in decreased crop yields. The ripple effects of such agricultural setbacks are keenly felt in the economic realm as farmers grapple with the financial ramifications of diminished harvests, thereby underscoring the far-reaching consequences of climate change on both environmental and socioeconomic fronts.

#### Land, Political and Social Challenges

In navigating the complex landscape of climate change, social and political challenges and issues surrounding land use, ownership, and water access stand out as critical focal points. Rooted in historical legacies, “colonial loopholes” persist within legal and economic frameworks, perpetuating disparities in land ownership and control in Sherwood Forest. Local policies often obstruct individuals and communities from asserting rightful stewardship over their lands and resources, exacerbating vulnerabilities in both economic and environmental realms. For many farmers, the coercion into peppercorn lease agreements represents a stark reality, wherein sustainable livelihoods are compromised in favor of exploitative arrangements. Moreover, the scarcity of water resources compounds these challenges, with inadequate infrastructure and distribution exacerbating the problem for residents. Community tanks often lack essential access to water, while residential areas grapple with insufficient pipes and limited potable water sources in these rural regions of the island. Addressing these multifaceted issues farmers face demands holistic solutions, including implementing water harvesting and catchment systems to ensure equitable access and sustainable management of vital resources.

#### Seeds of Change

#### Global Action

Global action on debt cancellation from the International Monetary Fund (IMF) is imperative to alleviate the burden on Jamaica as a reparative measure to free up national capital for creating a resilient water access infrastructure and allow resources for regular maintenance. The IMF holds significant influence in shaping international financial policies, and advocating for debt cancellation and an intervention of this sort would be invaluable for ensuring adaptation and sustainable development. Moreover, advocating for preferential trade agreements can further empower developing countries by providing Jamaica with fairer access to global markets. By promoting equitable trade practices, the nation can foster economic growth, increase GDP, and reduce inequalities, ultimately contributing to a more balanced and prosperous global economy.

#### National Action

Jamaica has a myriad of potential national actions aimed at uplifting its rural communities and agricultural sector. One such initiative could involve implementing RADA Water

Harvesting Programs in areas like the Sherwood Forest community, ensuring sustainable water management for farming activities. Collaborating with organizations like East Portland Partners to provide fertilizer and seeds to rural residents can significantly enhance agricultural productivity and food security. Moreover, considering the historical context, offering land grants or grandfathering in reparative land for communities like the Sherwood Farming community can empower them to reclaim their agricultural heritage and build sustainable livelihoods. Establishing an Emergency Preparedness Plan specifically tailored for rural farmers would mitigate risks associated with natural disasters and climate change impacts. Additionally, incorporating adaptation education materials featuring cartoons and video explanations could enhance accessibility and understanding among farming communities, facilitating smoother adoption of new practices and technologies to thrive in a changing environment. These actions collectively signify a holistic approach toward fostering resilience, empowerment, and prosperity in Jamaica’s rural landscapes.

#### Regional Action

Community partners in Jamaica have a pivotal role in advancing sustainable agriculture and environmental conservation efforts. By establishing tree and plant nurseries tailored to the needs of local farmers, these partners can provide crucial resources and expertise to enhance crop diversity and resilience. Hosting quarterly updates with government officials and community members offers a platform for collaboration, enabling the exchange of insights and the alignment of priorities. Additionally, community partners can leverage their networks to invite experts for gatherings focused on resilient farming practices, empowering local farmers with knowledge and tools to adapt to changing conditions. Moreover, engaging in reforestation projects in open, unused rural lands presents an opportunity for community-driven initiatives to enhance biodiversity and mitigate environmental degradation. Through concerted regional actions, community partners can catalyze sustainable development and foster resilience in Jamaica’s agricultural landscapes.

#### Local and Farmer Action

Local farmers in East Portland, Jamaica, can enact meaningful change through proactive engagement and community empowerment initiatives. Firstly, becoming well-versed in local land, production policies, and laws equips farmers with the knowledge necessary to navigate regulatory frameworks effectively, ensuring compliance while advocating for their interests. Establishing standing meetings with Members of Parliament fosters direct communication channels, enabling farmers to voice concerns, propose solutions, and secure government support for agricultural development initiatives.

Furthermore, by building local power through collective

action, farmers can amplify their voices and garner better responses from authorities, driving policy changes that benefit rural communities. Moreover, the establishment of a civically educated rural farmer association serves as a safeguard against displacement and ensures

representation in decision-making processes. Through these localized actions, farmers in East Portland can fortify their resilience, protect their livelihoods, and contribute to sustainable rural development.

## III. Unlocking Community and Ecosystem-led water access and management in East Portland, Jamaica

### Zoe Ann Dansdill

The challenges facing East Portland, Jamaica’s coast are varied and connected. From insidious privatization, rising ocean temperatures, and increasingly intense storms to dwindling economic opportunities and capacity, policy failings and climate change are intertwined and compounding, placing immense stress on human and non-human communities alike. This project’s focus on the coastline and ways of rewriting how ecosystems are managed and related is an attempt to imagine a future where East Portland community members are the leaders of how their coast and the ocean beyond are managed.

East Portland is rich in natural and cultural beauty, and community members have deep knowledge of the ecosystems and how they are changing. Community actors and leaders are aware and active in addressing how climate change and political intransigence impact the natural abundance of their home. This knowledge and desire for change is an invaluable asset for imagining and creating a new future. A clear example of this knowledge and energy for change can be seen in the fisher communities in East Portland, particularly Prospect Beach. This sentiment was clear when visiting this beach on a Wednesday morning in March as fishers gathered around and cleaned their catch.

To ensure the longevity and health of East Portland’s coast, ecosystems, and human community in the face of the climate crisis, it is critical to invest in, empower, and strengthen existing knowledge of this area. Creating a citizen-science based education and work program to train local fishers to participate in reef monitoring, aquaculture, and organized community-led action represents an opportunity to harness the existing knowledge and

energy and channel it for both community and ecosystem protection.

#### Risks, Needs, and Challenges

In speaking with fishers working at Prospect Beach, two themes were abundantly clear: There are too many fishers and too few fish. One fisher shared that catches have become smaller and smaller over the last 20 years, and fishers are forced to go further offshore to bring in what they need for a day’s work and sale. This decline in fish is a direct effect of climate change and extreme events such as the 2023 marine heat wave, which resulted in mass coral bleaching, destroying the ecosystem where fish live and feed.<sup>2</sup>

Fishers also reported seeing clear increases in pollution levels in coastal waters, from trash and litter to evidence of oil and soap in the water. Fishers are shore bound on days when this pollution is particularly bad, such as after heavy rain and subsequent runoff. While fishers are forced to travel further offshore, gas prices are also high—at times, the gas needed to travel far enough offshore to get a full catch costs as much or more than the catch will gross. Some fishers don’t have their own working boats, thus reliant on borrowing from friends when they can.

This dwindling supply of fish exacerbates an already delicate cycle of economic activity for this community, which operates on a calendar of seasonal income variations from fishing and tourism. Some fishers have on by picking up other work in the off-season. Likewise, many shared that their children and grandchildren—the younger generations—are not interested in fishing because they see

it as a dying trade due to climate and other pressures. This choice and reality are not easy, as many fishers grew up on the water, following generations that have lived and worked as fishers. They do not want to leave this work and lifestyle behind—they want to be on the water. This sentiment was made abundantly clear by the energy expressed at Prospect Beach for the diversification of livelihoods, from ideas about growing and selling Irish sea moss to being trained to scuba dive to support fish sanctuary protection.

At Prospect Beach, encroachment of other businesses and activity also puts pressure on the fishing community, which sells directly from the shore on the street, about 20 yards away. Bars and restaurants are popping up around the fishing section of the beach, making upgrades to the beach and boat removal for maintenance nearly impossible. This activity is connected to a larger issue facing this community—a lack of organizational and institutional coordination. While there is a loose structure of a fisher’s co-op, it was clear from conversations with fishers at Prospect Beach that there is very limited, if any, consistent organizing being done through this channel. Likewise, there is little evidence of direct and organized engagement and coordination with other fishing communities around the country, which would provide legitimacy and power to the community’s ability to gain funding and policy support.

These challenges are exacerbated by a lack of political “safety nets” for the community. Fishers are highly reliant on community organizations like the Alligator Head Foundation for support through boat donations and the creation of space for community meetings. While there are some government-led programs that, in theory, should support the fishers of Prospect Beach and others, such as the Ministry of Economic Growth and Job Creation’s Promoting Community-Based Resilience in the Fisheries Sector project,<sup>3</sup> and action supported by international actors like the World Bank and Climate Investment Funds,<sup>4</sup> there is little evidence of these programs reaching or helping the fishers at Prospect Beach. Thus, further ground-up organizing and development is needed to support these communities facing the impacts of the climate crisis.

### Opportunities and Precedents for Change

The creation of a citizen science training and work program for Prospect Beach’s fishers (and others) offers an opportunity for fishers to fill the growing seasonal gaps in income from fishing and tourism, as well as more directly include them in work to combat some of the largest threats to their livelihoods and ways of life. This program, which could be led by the Alligator Head Foundation with other partners (such as the University of West Indies), would provide specialized training and capacity building for fishers.

### Program design

A key aspect of this program would be that it is community led. Therefore, outreach and interviews with fishers at Prospect Beach to gauge interest and collect ideas from would be the first step. Likewise, holding community meetings and workshops to identify individuals with capacity and related expertise to support development would allow this program to remain community designed and run.

Courses could include basic coral biology and taxonomy; coral and other species identification; data collection, measurement, and analysis; aquaculture; marine conservation; scuba diving; and leadership and organizational development training. The latter could be focused on improving fisher’s co-op management and organization to strengthen fishers voice at the local and national levels, providing more collective legitimacy for political lobbying. For example, by replicating the organizational system of the Jamaican Fish Sanctuary Network, fishers could begin to build a national coalition and network to support and build resilience into the future. Partnering with the Jamaica Fishermen Co-operative Union Limited<sup>5</sup> in Kingston, which has close ties to other community co-operatives across the country and works to supply fishing supplies to its members, could also be a powerful collaboration. If successful, this could eventually lead to a regional coalition across the Caribbean, allowing for global action and pressure for increased action and funding for fishers and the threats they face from climate change.

Program and course design could be informed by past projects similar to this, such as a 2000–2009 Earthwatch project that trained volunteers in coral monitoring and data collection to inform coral reef protection policy production.<sup>6</sup> Denise Henry from the Alligator Head Foundation, with her deep knowledge of the specific challenges facing East Portland’s coral reefs, Una Mae Gordan, with her years of experience in community development and policy, and other such actors would bring valuable insights and knowledge to course design to ensure it is tailored and effective for this specific community.

### Funding & Enabling Policies

As with any project of this kind, funding will always be a challenge. That said, there are many avenues for grants and funding allocation available. For example, international organizations and fund’s such as the Climate Investment Fund, which has funded action related to fisheries in Jamaica before, and the International Coral Reef Initiative (ICRI)<sup>7</sup> offer grants of varying sizes for projects like this. Additionally, through the creation of enabling policies for such action, by linking this project with fish sanctuaries across Jamaica, there would be a larger chance of national attention and investment by the Jamaican government. At this level, the government could be lobbied to provide

stipends in the future to fishers engaging in this training as part of its national workforce development and climate action goals.

More locally, policies to ensure external companies operating in East Portland support the community could provide revenue as well, such as policies to require investment and grants required for any new tourism operators in East Portland. This could be specifically targeted at “eco” tourism operators and those who have reef and marine biodiversity tours as key offerings, since funding this program and work would be in their interest as a way to protect those assets. This kind of transformation of how private actors and companies relate and support the local community could have wide reaching effects on the entire East Portland community and protect against the kind of privatization and economic stratification seen in other areas of Jamaica where tourism has pushed local communities aside (i.e., Montego Bay).

## IV. Community Land Trusts in Cartagena: Strategy and Implementation

### Wayne Dawkins & Alessandra Gianino

#### Part One: Community Land Trust Strategy for the Communities

##### Introduction

Indigenous communities, Afro-Colombians, and Latin American migrants are the bedrock of Colombia’s society, enduring despite the influence of the Spanish during the colonial era. While colonization laid the groundwork for many of Colombia’s governance structures, it conflicted with the nearly one hundred indigenous groups that inhabit the nation, each establishing its own systems of governance and conflict resolution over the years. To comprehend Colombia’s present state, it’s crucial to recognize the profound impact of the Spanish Empire on Colombia, particularly since the empire’s arrival, which advanced land tenure, water governance, and environments conducive to its interests.

The Spanish enacted laws that acknowledged indigenous land rights selectively, often resorting to violence to assert their land claims when the laws benefited them. This legacy of violence has long plagued Colombia, escalating leading up to the civil wars of the 1960s and beyond, driven by

### Looking Forward

The pressures from climate change on fish, fishers, and beyond are only growing. To remain resilient in the face of these challenges, communities must be invested in, and their skill and ingenuity empowered. In East Portland, it is critical that fishing communities like Prospect Beach are armed with the knowledge and skills to build capacity and leverage, as well as provided opportunities for ocean-based income diversification. The development of a citizen-science and organization training program in East Portland would be one step in bridging the gap between traditional livelihood practices and contemporary conservation efforts and the separation between local and national and international actors. This program represents a way to address both economic vulnerabilities and environmental threats while maintaining ownership and connection to the ocean for the fisherfolk of East Portland.

conflicts over housing, gang activity, agricultural land use, and access to water.

Today, Colombia operates as a republic with a decentralized governmental structure. The Colombia Constitution of 1991 states:<sup>8</sup>

Colombia is a social state of law, organized as a unitary, decentralized Republic, with autonomous territorial entities, democratic, participatory and pluralist, based on the respect for human dignity, on the work and the solidarity of its population, and on the primacy of the general interest.

With over a thousand municipalities organized into districts, each possesses a unique governance framework and objectives concerning water management, environmental conservation, housing, and urban administration.

Among these municipalities, Cartagena is a beacon of progressiveness. It has negotiated agreements benefiting Afro-Colombians, securing land tenure and restoring their rightful claims to land lost during displacement and

Cartagena’s development. The areas we have pinned on the map and are studying are lands which could be recognized as part of Afro-heritage. La Boquilla, Comuna 6, and Juan Angola are different communities with distinct social fabrics and constituency goals. How they interact with nature has varied, and their tenure is not the same.

Comuna 6 stands as a community battling development and secure land tenure. Our learnings between different communities, however, highlight areas of connectedness and opportunities for good governance within Comuna 6 that may advance their rights to a just participation in Colombian society. Climate resilience, mangrove maintenance, and adaptive water management would make excellent foundations for land tenure and good governance.

### CLT land tenure tool

A community land trust (CLT) is a non-profit corporation that treats land as a public good. The corporation holds a parcel of land on behalf of a community and serves as a steward of the land. The non-profit can implement, steward, and oversee multiple initiatives, such as the maintenance of mangroves, education, and governance structures. The proposed CLT tool prioritizes land tenure for the community as stewards of the mangroves and encourages many of the activities they are already doing to continue.

Active policies for the land trust to integrate are:

**Maintenance of Mangroves:** Partnerships between community members, local organizations, and researchers can help navigate solutions that prioritize the conservation and restoration of mangrove ecosystems vulnerable to urban development. The Alliance Action Plan can also serve as a knowledge-sharing method between sites and mangroves.

**The Alliance Action Plan:** Organization of a monthly or biannual gathering focused on mangrove upkeep. Discuss annual water flow predictions, solid waste accumulation, and implementing maintenance projects. The community will develop a political voice as it engages in discussions about the interconnected waterways, monitoring waste, river flow patterns, and social connections.

**Spatial Programming:** The CLT may implement its own land-use allocations within a parcel. In Comuna 6, for example, this could look like “zones” for planned spaces for shared equity housing, conservation zones for mangroves and other natural ecosystems, and delineated areas for public parks.

**Water Governance Structures:** A monthly cleanup organized by the Alliance Action Plan with community leaders to track the amount of waste that is collected. Data can be leveraged for future opportunities that highlight the work of the community.

**Disaster Management Structures:** Implement early warning systems, evacuation routes, and community education around disasters and weather planning. Plans can focus on fluctuating weather, floods, and soil erosion, with guidance from the local universities, and may contend and support resilience from economic and social disasters.

**Community Benefit Agreement:** This would prioritize the restoration of mangroves, fortifying land, and building resilience through governance and unique structures. A Community Benefit Agreement could be a selling point for active restoration groups worldwide willing to support the activities of the local community. Recent research on Comuna 6 has advocated for the Community Benefit Agreement to be made to formalize the community’s distinct structure and relationship with the surrounding mangroves.

### CLT’s from rural to urban settings for the Caribbean

Research on CLTs in rural settings has highlighted the benefits of shielding communities from major corporate interests. In Colombia, widespread displacement from farms and homes in rural areas was rampant for years. However, collective tenureship has saved some communities. For example, collective land tenure in La Boquilla shows the advantages of communities banding together to advocate for long-term, sustainable tenure for their families. Within the urban contexts, it’s crucial to recognize that La Boquilla’s community consists of fishers who intertwine their livelihoods with their environment and act as stewards of it. This arrangement is something the world will see more of as the environment and climate may play a larger role in how and where people live.

In contemplating the future amidst climate change and envisioning just benefits of the commons, proposing collective tenure and sustainable land stewardship emerges as the optimal approach to safeguard vulnerable communities, which may otherwise face precarious circumstances. The implementation of CLTs sheds light on a possible journey toward community ownership and how it aligns with regional and global concepts of climate justice.

### Part 2: Implementation

The implementation of CLT or any possible legal instrument for tenure could prove difficult for the Communities given the barriers they might have in declaring themselves as Afro-indigenous (precedent with La Boquilla) or as victim’s under Colombia’s Victims Law. While these avenues should remain options where possible, it is worth discussing other potential pathways for implementation. The second half of this memo will (1) discuss local laws and policies that could help the Cartagena Communities establish a CLT and (2) itemize regional and international organizations that could assist the communities in land tenure.

### Utilizing Local Laws and Policies

Two policy tools may be worth exploring as options to secure tenure for the Cartagena communities.

#### 1. Participatory and Inclusive Land Readjustment

In Colombia, Law 388, commonly known as the Territorial Development Law, attempts to facilitate a more equitable distribution of land in urban zones and provides three urban planning tools: partial plans, urban action units, and land readjustment. While each should be understood as part of a whole that facilitates urban development in Colombia, the latter is expanded upon.

According to a report from UN-Habitat,<sup>9</sup> land readjustment:

... allows a new lot configuration and the better conformation of a new urban area and therefore guarantees an equitable distribution of benefits and burdens derived from its development ... [it is] one of the main tools to render it possible to execute the “social and ecological function of property.”

The basic concept of land readjustment is that all landowners in a given area pool their land resources, and the area is then re-surveyed to include appropriate public infrastructure. The remaining land is then re-surveyed and returned to the original owners. The reconfigured plots of land are then available for either individual or collective development with the result that after the project land values have increased because of improved access and enhanced city services.

The neighborhood of La Candelaria in Medellín, Colombia, underwent land readjustment in 2014 and 2015. The city partnered with UN-Habitat to focus its efforts on the areas of informal settlements. In doing so, UN-Habitat designed a new framework, Participatory and Inclusive Land Readjustment (PILaR), to foster inclusive engagement with stakeholders “to encourage community ownership of urban redevelopment.” PILaR works to include owners, civil society, academics, property developers, financial institutions, and other interested parties to negotiate the land readjustment process. Indeed, informal occupiers are inherently involved in PILaR, and the process can enable more unified local and city-wide communities.

The readjustment in Medellín held many similarities with the Cartagena communities. In Medellín, the neighborhood that was readjusted lay along a river and was a site of vulnerable housing and public spaces. The irregular and dense shape of the land barred public transportation access and limited vehicle entrance. Moreover, most of the land was municipally owned, which complicated the proceedings. It may be helpful to contact UN-Habitat for advocacy help or contact urban planners in Medellín to discuss opportunities in Cartagena.

A decision to include community engagement does not

always culminate in inclusive engagement. Communities—especially those with informal and disadvantaged status—may require further resources, assistance, education, or empowerment tools to build capacity in the PILaR process. Given that opposing parties may have interests external to community well-being, local communities must be armed with additional resources to ensure equitable voice and participation.

Advocacy played a substantial role in the case of land readjustment in La Candelaria, and the Cartagena communities may wish to pursue regional and international contacts to further their land tenure goals.

#### A. Habitat Banks

The Cartagena communities may wish to advocate for some of the land around Ciénaga de la Virgen to be put into a habitat bank (HB). The land is scheduled to be placed in a land bank, but the HB model would allow the surrounding communities to become involved in the land management. An HB is a conservation strategy involving corporations that pay for economic services performed in the HB. The HB allows the company to engage in mitigation, biodiversity offsets, carbon offsets, etc. Local people can become involved as service providers within a Payments for Economic Services (PES) model. In Cartagena, PES could be made to individuals or the communities’ Seeds of the Mangrove Fund (discussed by our colleagues in Section VI). Notably, an HB can incorporate a multitude of ecosystem services such as mangrove stewardship, biodiversity monitoring, or water quality enhancement. This policy would ensure that the Cartagena communities could continue stewarding the land in many ways and remain connected to the mangrove ecosystems. Several HBs have been implemented in Colombia in the past several years, including in the Orinoquía region and San Martín de los Llanos in the Meta department. Terrasos is a leading Colombian company that implements HBs. Although it works primarily in rural regions, this may be an opportunity for Terrasos to expand its biodiversity mission into urban natural areas.

If the land around the ciénaga does not prove large enough to support a sufficient number of ecosystem services for the communities, we recommend introducing inequality offsets as a new policy tool for implementation within the HB model. An inequality offset would function similarly to offset tools used to mitigate contributions to climate change. For example, carbon offsets comprise a climate action measure where a corporation provides compensation in exchange for an allowance to emit a certain amount of carbon dioxide. Because carbon directly contributes to climate change, the purpose of the offset is to mitigate carbon emissions to alleviate climate change.

A growing amount of research identifies poverty and inequality as another key contributor to climate change. Researchers expect that decreasing wealth gaps across society will also decrease emissions. Even if poverty and

inequality indirectly contribute to climate change, targeting them will serve a climate purpose. In an inequality offset scheme, therefore, companies would contribute directly to a community to replicate a climate action measure (i.e., reducing inequality) to mitigate climate change. In the case of the Cartagena communities, inequality offset compensations could be made directly to the Seeds of the Mangrove Fund.

HBs, PES, and inequality offsets will not secure land tenure for the communities. However, these measures offer land-based investment strategies aimed at generating funds for the communities to acquire land near the surrounding banks and eventually implement a CLT.

**B. International Covenant on Civil and Political Rights**

Certain articles of the United Nations International Covenant on Civil and Political Rights (ICCPR) could serve as anti-displacement measures. In Georgopoulos et al. v. Greece (2005) and Liliana Assenova Naidenova et al. v. Bulgaria (2011), the plaintiffs used various combinations of ICCPR Articles 2, 17, 23, 26, and 27 to argue that states could not evict and displace communities. However, as the Human Rights Committee decided, eviction could not occur if the state did not provide immediate alternative housing. Still, these cases demonstrate international precedent for halting community displacement at the hands of a governmental entity.

Invoking articles in the ICCPR should be the last option.

Interested parties must first exhaust all local and national options before pursuing an international cause. However, if, for example, the City of Cartagena proceeds with an urban renewal plan that evicts local communities and does not provide alternative and immediate housing, ICCPR could be used as leverage to advocate for such accommodations. Although invoking the ICCPR cannot be used to argue for implementing CLT, it could be harnessed to facilitate resistance.

**2. Community Network Support**

A. CARTAGENA AND COLOMBIA  
Terrasos

B. REGIONAL  
Catalytic Communities, Brazil  
Inter-American Development Bank

C. INTERNATIONAL  
International Center for Community Land Trusts  
World CLT Day on May 17-18 (<https://worldcltday.org>)  
Columbia Center on Sustainable Investment  
Namati  
Favela CLT and Puerto Rico  
World Habitat and UN-Habitat \*specifically for PILaR\*  
UN-Habitat has initiatives specifically related to climate housing  
World Land Trust  
World Resources Institute

felt by the Indigenous peoples of Colombia and the Palenque community as the first free African town in the Americas.

Alongside these historical pressures are contemporary ones, consisting of double displacement caused by the privatization, the tourism industry, and the government, resulting in the loss of culture and heritage and increased natural disaster risks. Disaster risks like increased heat, flooding, drought, land erosion, and water contamination, among many others, are shared across all communities across Colombia. Still, their impacts disproportionately affect some more than others, depending on socioeconomic class. Those who were historically pushed out into the wetlands of Comuna 6 (Ciénaga de la Virgen) experience the brunt of the climate crises. These wetlands, once filled with a rich biodiversity of animals and plants that represent a healthy environment, are now contaminated by human-generated pollution, increasing the climate risks and vulnerabilities of those who have no choice but to live there.

**Existing Plan and Policy Landscape**

In July 2022, the Congress of Colombia enacted Law 2243 to conserve mangroves. Colombia has a mangrove area of 290,704 hectares, with approximately 75% on the Pacific coast, 25% in the Caribbean, and 0.07% on the island coastland. Law 2243 has several aims, including guaranteeing the protection of the mangrove ecosystems, planning the management and sustainable use of these ecosystems, and fostering conservation and restoration. Despite this law, there are still difficulties with its implementation as mangroves continue to be cut down for the sake of urbanization and development. Jorge Maldonado, a professor in the Department of Economics at the Universidad de los Andes, stresses that there are two main challenges with implementation: the difficulty of gathering stakeholders to discuss mangrove conservation and the need for a process to navigate the diversity of stakeholder perspectives. Additionally, there is a strong distrust between community members in Colombia and the government due to the constant shift in government leadership; for instance, Cartagena has had 12 mayors in the last 10 years.

**Seeds of change**

For the reasons described, it is imperative and urgent to plant regenerative seeds of change that can hopefully alleviate root pressures in ways that are equitable and just for all. By utilizing the imaginative “Tree of Dreams” framework inspired directly by the frontline communities, we can visualize how seemingly separate visions, narratives, and desires can draw parallels and intersect across a canopy of social views and shared values. Our team created a set of principles to help seed community-based mangrove restoration in such a way that centers climate justice by:

- Promoting responsibility and justice by inspiring the transparent, equitable distribution of resources by partnering with governments, schools, and humanitarian organizations.
- Fostering trust within communities to inspire knowledge sharing between all partners.
- Developing climate risk adaptability and resilience strategies for stakeholders and communities that are otherwise unknown or hidden due to bureaucratic reasons.
- Leveraging community-based opportunities such as creating collaborative participatory citizen science programs that are guided by local knowledge and creates ecological stewardship job creation and opportunity for all.

These seeds can be applied on the following scales.

**Seeds of Change: Towards Climate Justice, Action, and Accountability**

On local and regional levels, seeding change would require identifying indicators to navigate the monitoring process within alliance members already working on mangrove restoration in Comuna 6, La Boquilla, and Juan Angola Canal. Strengthening existing connections and collaborating with other organizations currently monitoring mangroves, species biodiversity, development, and tourism to support citizen science programs across mangrove restoration sites could help close knowledge gaps, which can be accomplished by holding regular meetings at community centers. Finally, advocating for government investment in community and mangrove restoration would need implementation to create an alliance action plan that is supported by the data collected from the citizen science programs.

**Global:**

At a global level, implementing the suggested policies and programs will require collaboration between different levels of government, from a local to a global scale. In this case, the policies proposed through the Cartagena Alliance Action Plan call for protecting coastlines among the increased privatization, especially vulnerable coastal communities and mangroves. This policy can be supported through global policy frameworks, such as the Rights of Nature, where rather than treating nature as property under the law, the Rights of Nature acknowledges that nature in all life forms have the right to exist, persist, maintain, and regenerate its vital cycles. In addition to the Rights of Nature, partnerships can be forged between Global Mangrove Watch and local mangrove restoration organizations to create a consistent database to support mangrove monitoring through citizen science programs in Cartagena. These citizen science programs and alliances require financial funding beyond local funding resources, and global funds are available to support Cartagena’s adaptation and resilience efforts. These funding streams could come from the international Adaptation Fund, which

# V. Inspiring Regenerative Community Based Mangrove Restoration

Yumi Rodriguez and Marion Powell

**Introduction**

With their ability to prevent flooding and sequester carbon and toxins, mangrove trees are of metaphorical and communal significance to coastal communities. They symbolize resilience, the ability to anticipate and respond, adaptive capacity, and the potential to adjust to challenging circumstances. They are also a metaphor for networking and organizing knowledge in the face of climate change. Such is the case for existing partnerships across Cartagena, Colombia, and the Columbia Climate School, toward creating a regenerative community-based mangrove restoration policy.

“The Tree of Dreams” visual storytelling concept is inspired by a collaborative group activity created by Grupo Fundación Social and other humanitarian organizations and communities across Cartagena, Colombia. The tree, as a visualization tool, helps illustrate branching themes of regeneration and resilience across the communities of Cartagena, and biodiversity at large. From a “roots-to-canopy” perspective, the visual model addresses the “root pressures” affecting Comuna 6, La Boquilla, and Juan Angola Canal communities. These root pressures are primarily traced to the historical and inequitable displacement of peoples throughout colonization, mainly

was previously awarded to Colombia, in addition to Loss and Damage Funds.

### 3. Columbia University

Columbia University holds a place of privilege that can support adaptation and resilience plans across the globe. Some of these strategies include serving as an intermediary between stakeholders and national and global resources, such as navigating the application process for the international Adaptation Fund or Loss and Damage Fund. It is important to clarify and simplify the process for local stakeholders to become Columbia vendors and thus be able to receive funding and monetary compensation. Such actions may involve reducing or eliminating overhead and administrative charges for projects and academic offerings that engage directly with community stakeholders. Columbia can also offer mangrove monitoring resources to promote citizen science programs, such as donating supplies.

#### From Seed to Scale: Imagining Implementation

##### Cartagena Alliance Action Plan:

A framework that proposes focusing on collaboration to share knowledge, promote transparency, and center the livelihoods of human and mangrove communities can address these issues. At the local level, an Alliance Action Plan can be created based on a similar policy framework in Belize. The Cartagena Alliance Action Plan (CAAP) is comprised of leaders from a various departments focusing on mangrove restoration in Cartagena. It includes mangrove restoration employees from Comuna 6, La Boquilla, and Juan Angola Canal. Additional stakeholders focusing on monitoring development, tourism, and other biodiversity and ecological factors, such as university professors, researchers, and community planners, can join the alliance. CAAP will be responsible for strengthening the legislative and policy framework for protecting mangrove values, reducing illegal clearance of mangroves, and engaging and informing the public to promote transparency. CAAP members can hold regular monthly meetings at community centers within Cartagena to discuss and share mangrove restoration project strategies and address issues related to upcoming developments. CAAP can also be a chapter within a global context, supported by the Global Mangrove Alliance. The Global Mangrove Alliance has set some of the most ambitious mangrove restoration goals to be achieved by 2030. These goals include doubling the area-based protection of mangroves from 40% to 80%. Additionally, a regional policy supports the growth of mangrove conservation efforts in the Caribbean: the Regional Strategy and Action Plan for the Valuation, Protection and/ or Restoration of Key Marine Habitats in the Wider Caribbean 2021–2030. Through this framework, CAAP would have further support at the regional and global levels.

##### Citizen Science Program:

The citizen science program is a community-led initiative to support mangrove monitoring and potentially provide job opportunities for locals. Creating this program requires collaboration between organizations already practicing mangrove ecosystems and biodiversity monitoring. These collaborators include the National Audubon Society (Panama), Global Mangrove Watch, and World Wildlife Fund, which can inspire measurement indicators and implementation. For example, the National Audubon Society creates transect plots and collects soil and leaf litter samples that are dried for surface and carbon storage content analysis.

Laboratory settings could be made possible through shared partnerships with academic institutions. According to the National Audubon Society:<sup>10</sup>

This initiative includes analyses of shorebird population levels and efforts to prevent the loss of mangrove cover in the Bay of Panama. It also supports the development of a conservation plan for the Bay of Parita that engages key stakeholders, identifies threats, and plots a path for future conservation efforts. Finally, it addresses coastal solid waste—in particular plastics that are killing off mangrove forests, reducing roosting habitat, and presenting a direct threat to shorebirds through ingestion.

Creating alliances with other organizations, such as Global Mangrove Watch, which utilizes remote sensing, and the World Wildlife Fund, can also provide more robust global indicators of health. In addition, local and international universities can support this program by donating or loaning monitoring tools such as binoculars, transect lines, turbidity testing kits, refractometers, and soil sample tubes. In time, local entrepreneurship funds can support the program by purchasing new tools to expand the program and increase data collection to support policies prioritizing mangrove restoration amongst urban development. These funds would also provide economic support to pay community members for their time monitoring mangroves. If successful, the citizen science program can offer the benefits of community partnership and trust building, knowledge sharing, bottom-up empowerment, and job creation and ecotourism opportunities.

##### Conclusion

These intersecting dreams can be realized through continued collaborations between academic institutions, community organizations, locals, and governments. The communities visited in Cartagena all face the lasting impacts of displacement and governmental corruption that leave them vulnerable to the effects of climate change. As Climate School students, we wanted to offer principles that center on the local community and support their vision toward a regenerative and resilient environment and community. We also drew from existing political frameworks so Cartagena’s mangrove ecosystem and

surrounding communities would be protected by law. In addition, to empower local communities and provide a method for economic resilience that supports the restoration of mangroves, we proposed a citizen science monitoring program. These frameworks address the need for consistent collaboration and a strategy for

navigating diverse perspectives from a local, regional, and global perspective. Ultimately, these frameworks are recommendations for addressing the policy gaps in Colombia and reducing the burden of local communities to progress toward a resilient Cartagena.

## VI. The Seeds of the Mangrove Fund

### Fabio Agoes and Stephanie Su

#### Introduction

The Ciénaga de la Virgen area is a poignant example of the intersection between environmental degradation and socioeconomic instability. This region faces significant environmental risks due to climate change, exacerbating vulnerabilities such as rising sea levels and more frequent extreme weather events, leading to severe flooding. Environmental degradation is intensified by human activities such as the rampant cutting down of mangroves—vital for coastal protection and biodiversity—and increasing pollution from plastic waste and agricultural runoff, which degrade water quality and harm marine life. Social risks in the region are manifest in the overcrowded informal settlements that house many internally displaced people and refugees, who suffer from inadequate infrastructure and increased vulnerability to environmental hazards. Economically, the local dependence on tourism and subsistence fishing is threatened as these are directly impacted by environmental decline, which not only detracts from the area’s natural beauty but also diminishes marine biodiversity essential for the local fisheries. Culturally, the community risks losing its heritage as environmental degradation threatens traditional practices like fishing and local crafts, which are integral to cultural identity.

#### Risks

The construction of these risks can largely be attributed to both active and passive human actions. Urban development has often prioritized expansion over ecological conservation, leading to significant environmental destruction. Additionally, inefficient governance and weak environmental regulations have allowed pollution to persist and expand, further degrading the natural habitat. Economic and social systems exacerbate these risks, as the lack of robust support for displaced populations and the informal nature of the local economy limit the community’s ability to achieve economic resilience and effectively manage environmental challenges.

#### Understanding the Community

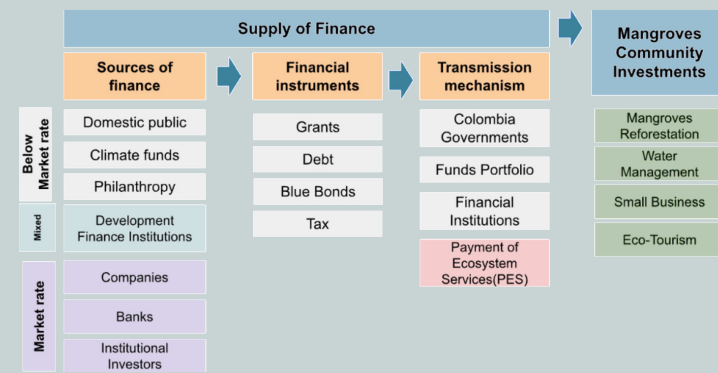
In a workshop with Comuna 6, the community identified four primary needs essential for fostering change and sustainable development in the Bay of Cartagena:

1. The community highlighted the need for innovative finance systems that include mechanisms to fund environmental conservation, such as Payments for Ecosystem Services (PES) and nature-based solutions (NbS). They also suggested supporting local infrastructure improvements through tourism taxes and fostering small businesses like crafts and farming to boost regional economic growth.
2. Accountability and credibility were emphasized, with calls for transparent monitoring of financial transactions to ensure that revenues are traceable and benefits are demonstrated to all stakeholders, thus building trust between the community and institutions.
3. The community expressed a need for financial education and skills training to enhance their capacity to manage and benefit from these initiatives effectively.
4. There is a strong desire for legitimate leadership and advocacy to articulate community concerns, link different community groups, including migrants, and empower them to actively contribute to the community’s development. The overarching aim is to scale these initiatives within the concept of Minga, encouraging a broader, more integrated approach to addressing the community’s challenges and opportunities.

#### Seeds of Change

The finance flow for mangrove conservation projects in Cartagena is depicted through a structured model starting with diverse sources of funding categorized by market orientation. “Below-market” sources refer to financial offerings that have returns that are lower than what is

Image 1: Finance Flows



currently available in the open market, like public funds, climate funds, and philanthropy. “Market-rate” sources refer to the standard or typical return on an investment comparable to the average or prevailing rates observed in the broader market, such as companies and banks, providing the financial backbone. These funds are channeled through financial instruments such as grants, debt, blue bonds, and taxes, then managed via transmission mechanisms involving government, financial portfolios, and payments for PES. Ultimately, the funds support community-based investments like mangrove reforestation, water management, small business support, and ecotourism development. This system aims to enhance mangrove ecosystems, bolster the local economy, and ensure sustainable community livelihoods.

Sources of Finance and Likely Providers  
Table 1: Investor Matrix

Types of Investors	Roles	Likely Provider
Senior Investors (Market Rate)	Targeting to commercial returns	Local Investment Bank; Private Companies from Global North;
Concessional Investors (Mixed)	Providing lower-risk capital	Inter-American Development Bank; Colombia/Cartagena Government; Caricom Nations;
Technical Assistance Providers (Below-Market rate)	Offering grants for capacity building in technical skills, financial management, contracting and impact evaluation	Global Innovation Lab for Climate Finance(GICF); IDB; World Bank; UNDP

Senior investors target commercial returns, focusing on maximizing profitability. Concessional investors supply lower-risk capital, often under more favorable terms than market rates, to facilitate project feasibility and encourage additional investment. Technical assistance providers offer grants for capacity building, enhancing technical skills, financial management, contracting practices, and impact evaluation methods. Together, these groups play integral roles in supporting sustainable projects by aligning financial and developmental goals.

Seed of Change: The Seeds of the Mangrove Fund  
Fig 2: Seeds of the Mangrove Fund Stakeholder Map

The Seeds of the Mangrove Fund integrates a general fund framework with a cooperative approach governed democratically by the community. Contributions from community members are voluntary, leading to a fluctuating income. In contrast, investments from the private sector and international sponsors provide a consistent revenue stream, demonstrating their backing for the community and enhancing their standing as companies with favorable ESG impacts.

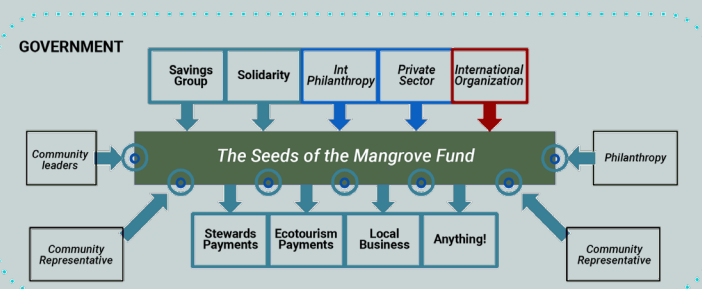
This model represents a PES system, functioning cyclically as the community protects the mangrove ecosystem, boosting tourism and local businesses. This enhancement benefits companies that invest in their ESG reports and contribute to Colombia’s nationally determined contributions, attracting more tourists and supporting corporate social responsibility initiatives. This influx of visitors and investment generates financial returns for the community, allowing the cycle to continue.

Deeper Dive: Unlock Private Finance into Cartagena

- Increase NbS visibility within the financial sector through education and advocacy.
- Support pilot projects (starting with Comuna 6) that serve as low-risk introductions to mangroves, helping to refine methodologies and gather data on their effectiveness.
- Longer repayment and grace periods are essential for projects with long time horizons and delayed cash flows.
- Diverse risk-return profiles, with junior tranches de-risking more senior investments to attract private capital.
- Catalyzation of new investments in natural capital by demonstrating potential returns to private investors.
- Establishing clear methodologies and goals to provide investors with confidence and clarity on the impacts and returns of NbS investments.

Deeper Dive: Accountability of the financial benefits

Cartagena can collaborate with the Global Innovation Lab for Climate Finance, search for technical assistance to design a mangrove smart ledger and favor the development of small-scale community mangrove projects.



- Establish a peer-to-peer platform connecting local communities’ mangrove projects with corporate and individual funders eager to achieve carbon neutrality.
- Use satellite remote sensing to measure the financial and environment outcomes and the carbon captured, which reduces the costs associated with third party validation.
- Increases financial transparency and local community earnings through blockchain-backed smart contracts.

Seeds of Change: Community-Determined Contributions to engage with local, regional, and international stakeholders

This framework emphasizes the need for commitments from communities and the acknowledgment of local or regional governments to enhance the fund’s credibility. Contributions should include principles and guidelines to foster community involvement and ensure alignment with national or international objectives. There are three foundational pillars: finance, advocacy, and governance.

Finance

Align community projects with sustainable targets at international, national, and private sector levels. Identify

community assets that can serve as unique selling points. Prioritize community needs and the urgency of funding and select appropriate funding mechanisms. Explore potential funding sources, engage stakeholders, and learn from other communities, such as those in Cartagena.

Advocacy

Enhance community engagement and elevate education and awareness about climate, business, finance, and budgeting. Develop strategies to influence local government decisions and champion innovation. Highlight the crucial role of mangrove ecosystems in environmental sustainability.

Governance

Ensure transparency in project selection, funding, and implementation through clear communication channels among stakeholders. Establish systems to monitor and evaluate project impacts, achieve goals, and facilitate continuous improvement. Encourage the formation of partnerships and innovative approaches to local governance.

# ENDNOTES

1. United Nations, Department of Economic and Social Affairs, Population Division. (2017). World population prospects: The 2017 revision. Retrieved from [https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un\\_2017\\_world\\_population\\_prospects-2017\\_revision\\_databooklet.pdf](https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un_2017_world_population_prospects-2017_revision_databooklet.pdf)
2. Oxenford, H. A., & Monnereau, I. (2017). Impacts of climate change on fish and shellfish in the coastal and marine environments of Caribbean Small Island Developing States (SIDS). Caribbean marine climate change report card: science review, 2017, 83-114. [https://assets.publishing.service.gov.uk/media/5a7509eed915d60d3b90a0c/10.\\_Fisheries\\_combined.pdf](https://assets.publishing.service.gov.uk/media/5a7509eed915d60d3b90a0c/10._Fisheries_combined.pdf)
3. Ministry of Economic Growth & Job Creation. (n.d). Promoting Community-Based Resilience in the Fisheries Sector. Retrieved from: <https://megjc.gov.jm/promoting-community-based-resilience-in-the-fisheries-sector/>
4. Climate Investment Funds. (2022, January 5). Project Spotlight: Promoting Community-Based Climate Resilience in the Fisheries Sector in Jamaica. Retrieved from: <https://www.cif.org/news/project-spotlight-promoting-community-based-climate-resilience-fisheries-sector-jamaica>
5. Jamaica Fishermen Co-operative Union. (n.d). <https://jafishermen.com/>
6. Crabbe, M. J. C. (2012). From citizen science to policy development on the coral reefs of Jamaica. International Journal of Zoology, 2012(1). <https://doi.org/10.1155/2012/102350>
7. UNEP-ICRI. (n.d.). Small Grants Programme. Retrieved from <https://icriforum.org/unep-icri-small-scale-grants-programme/>
8. Food and Agriculture Organization of the United Nations. (n.d.). Colombia: Constitution. Retrieved from <https://faolex.fao.org/docs/pdf/col127440E.pdf>
9. United Nations Human Settlements Programme (UN-Habitat). (n.d.). Urban legislation: Colombia. Retrieved from <https://unhabitat.org/sites/default/files/download-manager-files/Urban%20legislation-Colombia11.pdf>
10. National Audubon Society. (n.d.). Our work in the Americas: Panama. Retrieved from <https://www.audubon.org/our-work/americas/panama>

# Chapter 6

# REFLECTIONS

Earth Studio is not only an opportunity to put learning in action, but it reveals a lot about what it means to work at the intersection of climate change and practice. At the end of each semester, students reflect on their experiences - from the paradox and contradictions that may be left unresolved, to the ideas and discoveries that have become clear.

## PRINCIPLES OF CLIMATE AND JUSTICE

### STUDENT REFLECTIONS

#### REALIZING THE POTENTIAL POLICY

Alessandra Gianino

#### AN IMMERSIVE EXPERIENCE

Christina Sanders

#### FROM LEARNING TO PRACTICE

Fabio Agoes

#### THE VALUE OF HEARING ON THE GROUND EXPERIENCES AND NEED

Marion Powell

#### INTERPLAYS BETWEEN PRIVILEGE AND JUSTICE

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#### CREATING A NEW MODEL THROUGH COLLABORATION

Stephanie Su

#### BRIDGING GAPS BETWEEN CLIMATE JUSTICE AND DEVELOPMENT

Tamara Ramasamny

#### TRANSFORMATIVE EXPERIENCES CHANGE YOU

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#### LOCAL KNOWLEDGE, DREAMS, AND CALLS TO ACTION

Yumi Rodriguez

#### PUTTING EVERYTHING I HAD INTO IT

Zoe Dansill

## COLUMBIA UNIVERSITY'S ACCOUNTABILITY TO ACTION



# REALIZING THE POTENTIAL FOR POLICY

Stepping into an ongoing, deep, and passionate project has been incredibly rewarding yet nonetheless challenging. Although our Toward Climate Resilience and Justice: Caribbean Basin class has come to a close, the on-the-ground advocacy will continue to push to realize its goal. I have constantly grappled with how we as students can help make an impact (even if a tiny one) in such a short amount of time. This was a difficult mindset to confront throughout the semester. We are ultimately here to learn, yet there exists a slight pressure to produce meaningful research, the final product of which has shifted and morphed throughout the class. Learning to appreciate this duality and capitalize on the flow of the changing tide has been a valuable journey.

During our trip to Colombia, one memory pointedly illustrated the non-linear nature of this work. While visiting Juan Angola Canal in Cartagena, our guide, Luis, described the stewardship efforts he invested into learning about and maintaining the surrounding mangrove ecosystem of the canal. His passion shined. He then recounted how city officials had recently cut down the mangroves without informing the community, an experience that had greatly saddened him and other mangrove advocates. It was a step back, but it was not an ending. For me, this experience highlighted the potential of nature-based solutions in urban planning. They go beyond addressing the climate crisis, as they can unite communities around a beautiful and peaceful entity while also serving as a symbol of resistance and community identity.

This course has also challenged my understanding of policy's potential. Having come from a legal background, I am used to exploring advocacy solutions within the constraints of a set system. Yet this course has asked us to confront those constraints, to produce solutions through creativity, and to question what we think is possible in our current reality. In doing so, it has demonstrated firsthand what informed advocacy can be. Our other Climate and Society courses discuss advocacy, stakeholder engagement, policy, etc., without truly exploring how each unfolds in practice. Discussions do not always prepare us for practical experience—yet Towards Resilience has offered just that. It has shown us how to ensure that advocacy is neither one-sided nor prescriptive, as our teachings have constantly stressed the importance of co-producing knowledge, researching options that respect the organizations with whom we collaborate, and offering support rather than directions. It is this aspect of the course that has made it special.

## Alessandra Gianino

Images: Local bridge and ferry connecting neighborhoods; Informal Housing within Comuna 6  
Photos Credit: Mingrui Luo



# AN IMMERSIVE EXPERIENCE

Participating in the Toward Climate Resilience and Justice: Caribbean Basin course with the Climate School was an immersive experience. One of the most impactful aspects of the course was the brief time spent working directly with design students and community partners. It was challenging to pivot to agro-farming when I had no prior knowledge of the subject. While my initial interest in registering for the course was focused on watershed management, circumstances led me to delve deeper into topics such as food security, drought, and individual water harvesting versus watershed and ridge-to-reef approaches.

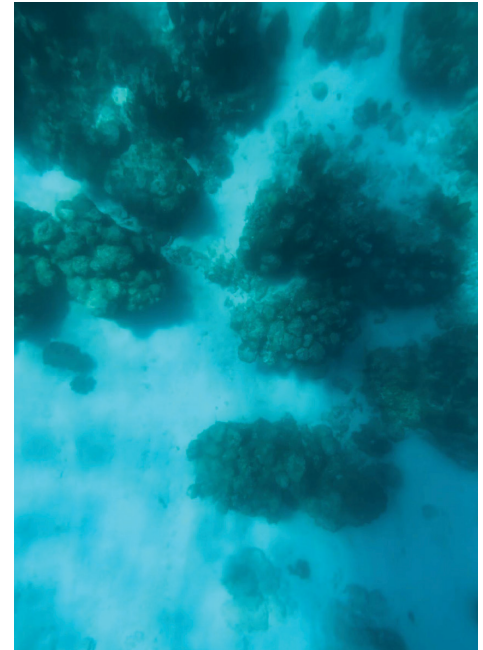
Working alongside farmers and gaining insight into the challenges they face has significantly enhanced my understanding of water access management for climate-vulnerable populations. Learning about Queen Nanny of the Maroons and the stories of the early Taíno people left a profound impression on my interest in the climate of the Caribbean, Gulf Coast, and South America. Enslaved by the British as a girl, Nanny emerged as a fierce leader who formed an Army of Maroons to challenge British rule, ultimately securing freedom for early Jamaican Maroons. Encountering her statue tribute at the airport and seeing her image on the Jamaican \$500 bill was both special and humbling. Meeting her descendants, who still reside in the lands she fought for, was a surreal experience.

Although my focus was not initially on watershed issues, I had the opportunity to examine water access challenges in East Portland, Jamaica, and to hear firsthand from local farmers about their experiences with climate change. Many farmers shared vivid memories of abundant rainfall during their childhoods, juxtaposed with the despair felt by their rural community as they now face increased drought conditions. Assessing climate risk and vulnerability is key to understanding the impact of days without rain and inadequate water access on crop yields, which threaten food security for farmers and Jamaican community members who rely on their produce. Furthermore, climate change has significantly affected farmers' income by diminishing the quality and quantity of agricultural goods.

This course is recommended as an excellent introductory course for those interested in understanding the impact of climate change on vulnerable communities.

## Christina Sanders

Images: Coral bleaching on the North East coast of Jamaica; School in Moore Town, Jamaica powered by solar panels  
Photos Credit: Christina Sanders



# FROM LEARNING TO PRACTICE

Fabio Agos

Image: Fabio and Stephanie presenting together at the University of Bolivar.  
Photo Credit: Mingrui Luo

In the quest to understand the multifaceted challenges of climate change in the Caribbean, the elective course Toward Climate Resilience and Justice: Caribbean Basin at Columbia Climate School stands out. This unique academic offering culminates in a five-day immersive trip to Cartagena, Colombia, providing students with a firsthand exploration of climate resilience and justice issues in a historically and culturally rich setting. As a participant, I embarked on this journey not only to gain academic insights but also to witness how communities on the front lines are navigating the pressing challenges posed by environmental changes. In this article, I share my experiences from Cartagena, reflecting on the profound learning facilitated by our professor, the vibrant community interactions, and the intriguing parallels I drew with places as distant as my home country, Indonesia.

Colombia, recognized as one of the most biodiverse countries in the world, deeply intertwines social peace with the preservation of its natural resources. Cartagena, situated on the northwestern coast, stands out not just for its stunning architecture and natural landscapes, but also for its rich historical tapestry. Despite its designation as a UNESCO World Heritage site in 1984, the city continues to grapple with significant socio-environmental disparities. Moreover, a political crisis at the municipal level has resulted in a highly unstable governance structure, with ten mayors rotating through office over the last seven years, contributing to disordered urban management.

Based on my readings, Cartagena serves as an intriguing case study for students of climate and society, illustrating critical ESG challenges. The city faces issues such as biodiversity loss, which poses environmental concerns; gentrification and cultural loss, which raises social issues; and pervasive corruption and a lack of trust in public institutions, indicating deep governance problems. Together, these issues position Cartagena as a critical example of an ESG dilemma.

However, during my trip, I was struck by the tight-knit nature of the community and surprised by the number of stakeholders committed to improving Cartagena for everyone. Despite the ongoing biodiversity loss, Cartagena remains a stunning place. Initially, we had five site options to visit: La Boquilla, Juan Angola Canal, Comuna 6, Isla Tierra Bomba, and Pasacaballos. I visited La Boquilla, Isla Tierra Bomba, and Comuna 6. Each site presented unique challenges, yet a common theme of climate change and societal issues was evident across all locations.

During the trip, we conducted workshops with the community to identify problems, understand their root causes, and determine the most suitable solutions or interventions. As part of the climate finance team, we developed a community fund model that leverages the tight-knit nature of the community to gather and maximize funds for development. This approach aimed to harness local solidarity and resources to foster sustainable growth and resilience.

We were able to accomplish this thanks to our incredible professor, Johanna, whose experience as a consultant was evident throughout the trip. She meticulously managed every aspect, including trips, itineraries, guest lectures, meetings, and classes. It was inspiring to see her in action during the workshops, actively engaging at the forefront of climate change issues. Johanna is not only an excellent professor in the classroom but also excels in field settings. This practical class was instrumental in building our portfolios and gaining essential experience in the field of climate studies.



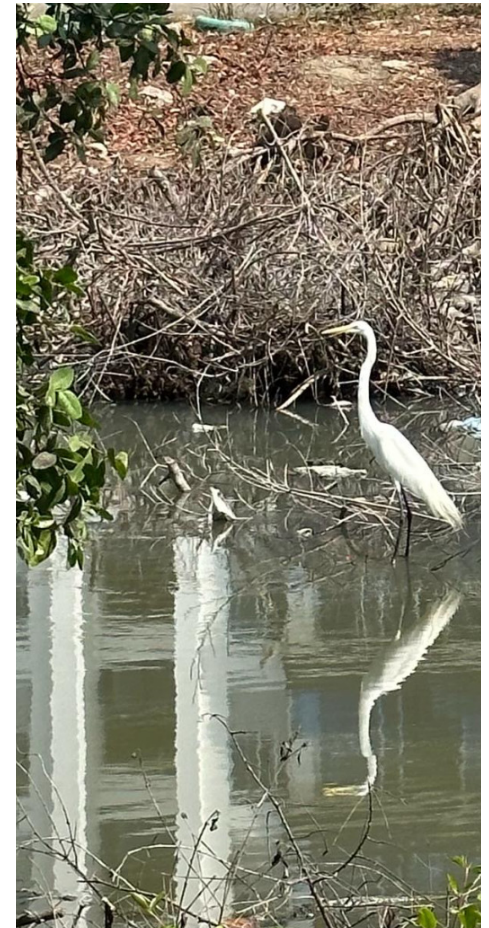
# THE VALUE OF HEARING ON THE GROUND EXPERIENCES AND NEED

Marion Powell

Image: A stork within Juan Angola Canal.  
Photo Credit: Marion Powell

Prior to visiting Cartagena, there was literature to provide background on the sociological and historical factors in Cartagena and how they relate to our respective topics. This class also allowed me to self-reflect as someone who will be providing recommendations for natural mangrove ecosystems and vulnerable populations when I have not visited the Caribbean region before. The opportunity to experience the mangrove restoration projects occurring on the ground provided me with significant experience to supplement my prior knowledge about Cartagena and add real work experiences and stories to the narrative of mangrove restoration. One of the most important stories was about the Juan Angola Canal, where the government eradicated the trees without consulting the surrounding communities. The Juan Angola Canal is a protected area with mangroves near the airport and has suffered for the last 20 years, according to a local fisherman, Guillermo. He revealed his story about how there used to be five types of fish in the canal due to mismanagement and the rapid urban growth. This issue was further exacerbated by the government eradicating mangroves without consultation.

As a result of this experience, I truly learned the value of hearing on the ground experiences and needs. Through this, we offer recommendations, such as a citizen science program that holds a database with the Global Mangrove Alliance. We also hold space for political advocacy through the Cartagena Alliance Action Plan and utilize existing monitoring programs to provide data to support policies that enforce accountability for the destruction of mangroves. Through this experience and recommendations, I learned a tremendous amount about my role as someone learning from an outside perspective and also how resources can be used to support communities facing extreme issues such as mangrove degradation and challenges to community livelihoods. Through these recommendations, I hope we can provide methods of resiliency to communities that depend on mangrove ecosystems.



# INTERPLAYS BETWEEN PRIVILEGE AND JUSTICE

I chose to enroll in Toward Climate Resilience and Justice: Caribbean Basin for several reasons. I had resolutely decided to explore class themes directly related to my cultural heritage. As a person of Guadeloupean heritage who grew up in mainland France but spent many summers in the Caribbean, I was excited to learn from climate principles that centered the Caribbean as a focus of study. I also wanted to fully understand the concept of climate justice, a central theme of the class that has a particular resonance in the West Indies, where nations have made a historically insignificant contribution to climate change while being disproportionately affected by its effects. My expectations for this class were to learn both independently and from my professors and classmates, but above all, to learn from local stakeholders with a deep expertise in the Caribbean context. I wanted to be challenged, have my perspectives questioned, and share my experience and knowledge.

Throughout the semester, and especially after our trip to Jamaica, my expectations for this class somewhat shifted. I was always doubtful about the efficacy of our contributions to the work of the Alligator Head Foundation. After all, we are only students with limited work and life experiences and without any prior knowledge of the Jamaican context. What was expected of us, and how could we truly add value or “help” local stakeholders facing a myriad of economic and environmental issues? I was slightly uncomfortable with being in a position of privilege as a student from an American Ivy League school and having to give recommendations to local experts in their field. It wouldn’t be truthful to say that all those doubts are now completely resolved. However, meeting with local stakeholders in Jamaica helped me understand and truly appreciate the value of this partnership between Columbia University and local organizations.

Hearing from Nickie Myers, Director of the Alligator Head Foundation, taught me to be open to change and take time to listen and take information in before formulating a judgment. One thing Nickie said still resonates with me today: Columbia students are in a position of power and can use this power to advocate for small islands in their future work. There lies the true power of a partnership between Columbia University and local organizations in Jamaica.

Another encounter that deeply impacted me was meeting Sheldon Bernard, a member of the Maroon community and our guide for the Watch Hill hike. Sheldon’s life story is one of resilience, passion, and commitment. Sheldon traveled around the world to pursue his passion for music, learning several languages in the process and working with dozens of critically acclaimed musicians. He then returned to his roots and first passion: to teach youth and travelers about the Maroon heritage and make them discover the natural beauty of his island. After visiting countless countries, Sheldon shared with me that Jamaica was still his favorite, and that he wouldn’t want to live anywhere else.

This attachment to the motherland and its natural wonders was easy to understand. Hiking to Watch Hill, I witnessed some truly beautiful natural landscapes rich in the history of the Maroons. It is impossible to see these views and not leave with a renewed sense of appreciation for Jamaican culture and an urge to want to protect it. This resilience and attachment to the land was also shared by Frank, a descendant of Maroons and our guide through the autonomous community of Moore Town. Frank and Sheldon both displayed a deep sense of connection to the land and an extraordinary expertise in the area’s history and nature.

These encounters made me reconsider the concept of climate justice. Beyond a just and sovereignty, rights of Indigenous people, and self-determination. We cannot separate climate issues from issues of land rights, sovereignty, community involvement, and the right to prosperity. In other words, a livable climate is a human right that includes the right to decide how to pursue happiness on this planet. The concept is especially relevant in places like Jamaica that have a deep history of exploitation, colonialism, and now climate impacts. The consequences of a truly just and equitable environmental transition would be life-changing for the peoples of the Caribbean.

Following Nickie’s calls to use our learnings from this class to become advocates for climate justice, I will continue to consider those principles in my future career and do my best to apply them in my life.

Shadé Jaiyeola

Image: Natural bounty of the Blue Mountains snapped on the way to Watch Hill.

Photo Credit: Shadé Jaiyeola



# CREATING A NEW MODEL THROUGH COLLABORATION

My experience in this course has been deeply enriching and transformative. The integration of theoretical knowledge with practical, community-focused projects provided a holistic understanding of climate justice and resilience. The most impactful aspect of the course was the site visits to Cartagena, where we engaged directly with local communities and stakeholders working on mangrove restoration and other resilience-building initiatives. This immersive learning experience highlighted the real-world implications of climate policies and the importance of community-driven solutions.

Community-based finance was significantly different from the traditional finance I had studied in past years. Unlike traditional finance, it often lacks direct, tangible returns, making it difficult to secure funding, which is a shift in my thinking. We had to create an entirely new finance model. This process involved continuous refinement and optimization through weekly meetings, feedback from community leaders, and discussions with GSAPP. I am particularly grateful to Maristella Madero from Fundación Grupo Social for her invaluable insights into Cartagena. She provided critical improvements to our strategies, such as creating sustainable, self-rooted profitability in the local community and addressing accountability issues. Additionally, my partnership with Fabio, a mangrove expert with extensive knowledge of agriculture, greatly benefited our project. Collaborating with him helped resolve many challenges.

During the site visits, I felt a stark contrast between reality and vision. But I also saw people with a firm belief in making a change. At Juan Angola Canal, Luis showed us the mural at the Fundación Planeta Azul office. Although it wasn’t fancy and even a bit dilapidated, the concept was innovative. Starting from the stairs on the first floor, it depicted the deep sea, gradually rising to the surface on the second floor. A massive mangrove tree grew from the corner, with roots connecting to underwater life and its canopy reaching the ceiling, where birds flew above (see pictures below). Luis explained that mangroves connect all the ecosystems here and are the essence of everything—without mangroves, nothing else would exist here. He had a deep, unwavering love for the mangroves in his community. Later, I took a boat ride and directly faced the mangroves cut down by the government. I spoke with fishers whose livelihoods had disappeared, and our conversation was interrupted by the roar of planes taking off from the airport that cut through the canal. The stark contrast between the beautiful vision of the mural inside and the harsh reality outside left me sighing with a heavy heart. The problems here were far more severe than I had imagined. Luckily, at least here, people like Luis devote their full passion to changing the future of the community.

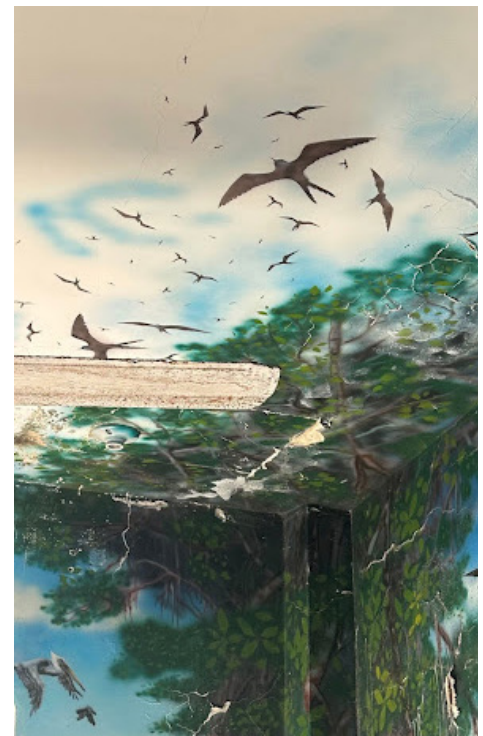
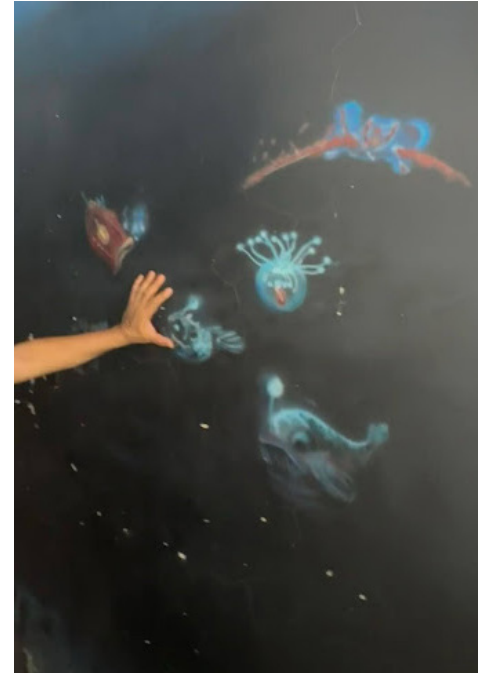
This course has been well designed. From grounding theories to executing fieldwork and framing final recommendations, every step was a learning curve that involved deep engagement with local realities. This iterative process reinforced the importance of aligning global knowledge with local contexts to create meaningful, lasting impacts. Before coming to Cartagena, I often doubted the real-world impact of the strategies proposed in our school projects and presentations. However, after our final presentation at Universidad Tecnológica de Bolívar, a shy boy from Comuna 6 told us that, “you are taking my community so seriously, I wanna cry.” His emotional response made me truly understand the significance of our project and motivated me to strive for an even greater impact.

Lastly, I sincerely thank Professor Johanna, who meticulously guided us through every aspect of our projects, from design and stakeholder engagement to classroom discussions and assignment assistance, like a caring mother.

Stephanie Su

Images: The deep sea depicted on the first floor; Mural at the Fundación Planeta Azul office.

Photos Credit: Stephanie Su



# BRIDGING GAPS BETWEEN CLIMATE JUSTICE AND URBAN DEVELOPMENT

This class was a great opportunity to learn more about the impacts of climate change, sea level rise, and the meaning of coastal resilience in the Caribbean. By analyzing and researching the ways in which climate change and coastal sea level rise impact various aspects of a country, from its different sectors to its communities, this class provided an opportunity to speak and learn from local communities working on these topics. It's truly a privilege to work outside the classroom with local professionals and experts, as we did with our colleagues and partners in Jamaica. I learned about various aspects of climate risk and how, to plan for and address these risks, in-depth on-the-ground research and collaboration with communities is crucial.

Another key component of this course is bridging the knowledge gaps that I had between climate justice and its relationship with urban design and development. How can design play a larger role in ensuring better climate resilience and distribution of equitable justice? This question was something we contemplated a lot in this course, on a theoretical and practical level. Listening to my peers' presentations and topics of focus also broadened my knowledge in this class. In addition to my own theme, which focused on sustainable eco and ethno-tourism and finding sustainable ways of stimulating East Portland's economy, I also had the opportunity to learn about coastal reef resilience, water security, land rights, policy, and many other topics that intersect with addressing climate change and climate resilience.

These learnings come at an extremely important time, when sea level rise is becoming an increasing concern in many areas in the Caribbean and in regions that have an aspect of their state's economies dependent on coastal communities. Coming from a country that also has this relationship with the sea and increasing concerns over sea level rise and coastal erosion, I am looking forward to discovering ways to apply this knowledge to my own contexts and geographic expertise. Thank you for a great semester and for the opportunity to meet, collaborate, and learn from great students, professionals, and professors.

Tamara Rasamny

Image: Port Antonio Coastline.  
Photo Credit: Chealsie Nalvarte



# TRANSFORMATIVE EXPERIENCES CHANGE YOU

Transformative experiences are usually hard. Going to Cartagena, meeting agents of change, and challenging my perceptions of climate change in the field, particularly among the mangroves in tandem with land tenure, was a transformative experience. Here is a story of climate adaptation with a lens on me, water, and amazing communities already in their own transformations.

The first challenge was understanding myself and what I'm doing here. As a passionate environmentalist but even more compassionate human, I was tasked with reconciling complicated interpretations of good governance. When people and our environmental goals are in conflict, I learned how to step back to ask who, why, and why now are they in conflict? The solutions may not be easy as we hope to make the most of our learnings in class and from our agents of change.

The agents of change were community leaders who showed us their work, communities, and livelihoods. Looking at marginalized communities grappling with tenure and environmental security, we assessed the impacts of colonialism and its lasting effects on the lives of Colombians and, more specifically, Cartagena and the communities we visited. We highlighted the right of the community to continue to seek tenure in places where they have settled, as displacement may only continue a vicious cycle of insecurity. The pressure they feel from real estate development and government policies should instead work in tandem with communities to protect their right to steward, live and grow versus displacing them.

The communities we visited show clear social cohesion and civic engagement in the face of external pressures such as real estate development and government agendas. To Juan Angola, La Boquilla, and Comuna 6, I salute you; your resilience is to be commended. Policies towards water governance and disaster management only support the work of community leaders who are already facilitating impactful change.

From the day I landed in Cartagena it felt close to where I'm from. Maybe it was the smell of the Caribbean or the impacts of Afro culture on the coast, but Fabio and I joked that this city could fit into any of our islands. The fishers spoke to us about their deep connection to the water and how it impacts their lives. I believe this connection, along with their stories, played a big role in my life and, in doing so, opened my eyes even more to challenging concepts of climate justice.

Monitoring and assessing the climate actions of non-state actors is essential for understanding the effectiveness of global climate efforts. My transformative experience in Cartagena with the climate school provided a hands-on opportunity to meet change agents and challenge my perceptions of climate change, particularly among mangroves and land tenure. This experience, highlighting the stories of climate adaptation and transformative community efforts, gave me a glimpse into the complexities of climate change policies.

While working in this field, I faced the challenge of understanding my role and the impact of my actions. As a passionate environmentalist and compassionate human, I was tasked with reconciling difficult interpretations of good governance. When environmental goals conflict with human needs, I learned to step back and ask critical questions: who is affected, why does the conflict arise, and why is it happening now?

Learning more about the landscape of non-state actors in climate action would significantly benefit my professional development. I'm excited to learn more about tying policies together to achieve funding and goals. By exploring how different nations with similar climate issues collaborate to promote good policies, I can gain insights into successful frameworks and practices. This knowledge will empower me to contribute more effectively to global climate initiatives, foster cooperation among stakeholders, and drive meaningful change in addressing the pressing challenges of climate change.

Wayne Dawkins

Image: Meeting with local fishermen at La Boquilla  
Photo Credit: Wayne Dawkins



# LOCAL KNOWLEDGE, DREAMS, AND CALLS FOR ACTION

I remember having a phone interview with one of the mangrove caretakers I met on the trip. I asked him what originally called him to care for the mangroves. He described his passion as “a silent call and pull from the mangrove itself.” That struck me as such a beautiful articulation, as I, too, felt the “silent call” to sit and meditate under a tree during my time there. Before then, I had been feeling a little overwhelmed with all the new things I was learning—and so chatting with such a kind local felt a lot like a reminder to slow down, pause, and reflect and listen to what the world around me had to offer.

On a day that felt particularly overwhelming with information, I sat amongst the roots of a big tree. I asked for a vision to help illustrate all the wishes of the Cartagena community while providing useful research tools for them in the name of climate justice. As I meditated, I visualized a small character falling asleep and dreaming beneath a tree, but I did not quite yet understand what it meant. A few days later, I was invited to attend a workshop with our community partners in Cartagena, as I had chosen to stay in Colombia a little later than my cohort to immerse myself in the cultural experience more. To my surprise, the workshop consisted of an exercise called “The Tree of Dreams,” where community partners utilized an “idea tree” framework to list the changes they wanted to implement in their community. The vision I had experienced suddenly made sense to me, and all the information I had learned on the ground suddenly started to fall into place into a wonderful illustration that was co-created with the help of the community.

This class was a life-changing experience, and I think it made me appreciate and see the value of local knowledge so much more. The element of being on the ground was quite literally “grounding” in ways that far surpass the traditional classroom setting. It truly is a class where one realizes just how much they can make a difference, actualize meaningful and real-world change, and make a significant impact in the lives of others. It was truly an honor to learn from the local community members of Cartagena themselves and learn about expanding on academic solutions and perspectives on climate justice.

Yumi Rodriguez

Images: Meditating under a Tree; Exploring Mangrove roots  
Photo Credits: Yumi Rodriguez



# PUTTING EVERYTHING I HAD INTO IT

I have long been frustrated with the typical separation between study and application in education at all levels. This class was the antidote to that feeling—being able to learn on the ground and actively apply everything I have read and discussed in other classrooms. In many ways, this made the course both one of the easiest and most difficult I have ever taken. It was easy in the sense that I really cared and felt activated every day by the work—before, during, and after the trip to East Portland. It was difficult because, well, I really cared and felt activated every day by the work, meaning I wanted to put everything I had into it.

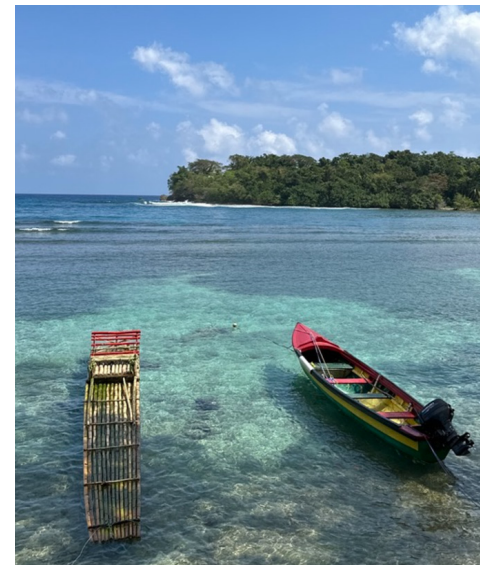
Being on the ground in East Portland and engaging directly with community members provided context, insight, and, most of all, feeling to our coursework. Understanding the complexities of a community and how they relate to action on climate is not something you can gain from a book or a journal article or even months of research—you can only gain this insight by talking, laughing, walking, and even eating with members of that community. While in East Portland, I spoke with community members and leaders of all ages who see their community and their ecosystems through vastly different lenses, yet all want to work to improve it.

The energy and ingenuity of the East Portland community in the face of issues as large as climate change and widespread political intransigence are infectious. ‘Community-led’ and ‘grassroots action’ can, at times, seem like buzzwords and empty ideas. But, in this course, their reality is shown clearly: creating change and resilience in East Portland and across the world requires empowering those facing these challenges every day. From learning about a born-and-bred East Portlander’s design of a personal, off-grid, self-managed, gravity-fed water access through rainwater harvesting for his home to ideas from fishers about beginning Irish sea moss harvesting and fish sanctuary monitoring to supplement their income and remain connected to the ocean, everyone I met was brimming with ideas about how to combat climate impacts in their community.

I have come out of this class with a deeper understanding of how critical community-led climate action is and hundreds more questions on how best to amplify it. I aim to return to and expand on the work I did this semester and hope to continue this work beyond Columbia.

Zoe Dansdill

Images: Community workshop meeting at the Alligator Head Foundation- Water Access & Availability table; Fishing boat and river raft at Sanco Bay  
Photo Credits: Johanna Lovecchio, Zoe Dansdill



# COLUMBIA UNIVERSITY'S ACCOUNTABILITY TO ACTION

## REFLECTIONS ON ACTION AND IMPACT

Students in *Imagining Climate Justice and Resilience* (Spring '24) ended their semester with an introspective inquiry into ourselves and our institution. This examination came at a particularly challenging time, when our university and many across the United States had become central sites of contestation and activism over the war in Gaza. We learned that the principles we explored in our class and with our partners, and how we put those principles into practice, became a touchstone for us as we navigated challenging discussions and intersections in our classroom. They also supported us in unpacking the entanglements of conflict, security, civil rights, speech, and finance to climate change.

By inquiring into our complex personal, social, and institutional relationships with climate justice, we considered futures of multidisciplinary, international, and multiscale learning, partnership, and advocacy. We hope that these recommendations support the Columbia Climate School as we collectively and urgently extend the classroom in service of the climate crisis.



# RECOMMENDATIONS TO THE CLIMATE SCHOOL

## Capacity Building

- Increase connection and collaboration with local stakeholders through long-term consistent communication and resource provisions.
  - Establish semesterly calls/meetings with local stakeholders.
  - Expand the course to include pre-semester stakeholder meetings with students and partners.
- Set up a system of monitoring and evaluation for the course—expanded management of multi-year relationship maintenance (e.g., Columbia World Projects).

## Resource Allocation

- Set up research initiatives for conservation-focused projects, including initiatives for conservation basic incomes.
- Offer mangrove monitoring resources to promote the citizen science program.
- Connect and serve as an intermediary between stakeholders and national and global resources.

## Program Expansion

- Expand funding for project extension into capstones for Climate and Society students to maintain momentum and realization of projects/partnerships with local communities.
- Organize capacity-building teams and centers to ensure equitable participation and learning between stakeholders and the university. Include resources for human and land-based rights.

## Financial

- Expand funding for project extension into capstones for Climate and Society students to maintain momentum and realization of projects/partnerships with local stakeholders.
- Increase funding for local stakeholder students (e.g., UWI) to visit Columbia for a similar exchange.
- Establish a system for stakeholder available grants and funding through existing funding pools at Columbia (e.g., Tamer Center for Social Enterprise).
- Set up a fund to finance Caribbean-based climate adaptation and conservation activities in the absence of sufficient Loss and Damage resources.
- Finance climate projects and initiatives.
- Clarify and simplify the process for local stakeholders to become vendors of Columbia and thus be able to receive funding and monetary compensation.
  - Create an operational structure and/or a handbook that outlines this simplified process.
  - Reduce or eliminate overhead and administrative charges for projects/academic offerings that engage directly with community stakeholders.



# Chapter 7 ACKNOWLEDGMENTS

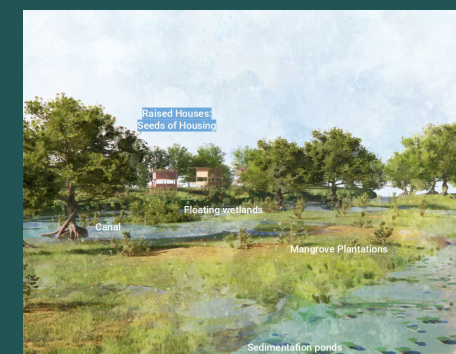
We would like to express our deepest gratitude to all who have contributed to this collective body of work. Your collaboration has profoundly enriched this endeavor.

First, our heartfelt thanks go to the Earth Studio Directors, Kate Orff and Johanna Lovecchio, whose leadership and commitment to this multidisciplinary initiative have been essential. We are deeply grateful to the entire faculty team for their expertise and mentorship, which have been critical in shaping the spatial visions and policy proposals within this publication.

We extend our profound appreciation to our local partners in Punta Cana, East Portland, and Cartagena. Your generosity in sharing your spaces, knowledge, and lived experiences has been a powerful source of inspiration. The stewardship and organizing initiatives you lead continue to guide and shape our approach to climate adaptation and justice.

We also want to acknowledge the students whose diverse skills, perspectives, and relentless dedication have shaped this publication. Your commitment to imagining a regenerative future for the Caribbean lies at the heart of this document. Our sincere thanks to the critics, whose insightful feedback and thoughtful critique have deepened the rigor of our research. It has been an honor to engage with you and share our vision.

This publication is a testament to the collective effort and shared purpose of all those involved. It reflects the partnerships, collaboration, and dedication that have brought this work to fruition.



# FRIDAY LECTURES

January 19

## Global Climate Action and Governance, Caribbean

- Joe Romm, Climate expert & author
- Isatis Cintron, Columbia Climate School, Climate Action Network International (CAN)

January 26

## Level Setting: On-Ground Stakeholders

- Shaney, Dominican Republic Ministry of Tourism
- Maristella Madero, Fundación Grupo Social
- Nickie Myers, Alligator Head Foundation

February 2

## Level Setting: Academic Partnership

- Mizooky and students, Universidad Nacional Pedro Henríquez Ureña (UNPHU)
- Dean Michael Taylor, University of West Indies
- Mauro Maza, Universidad Tecnológica de Bolívar

February 16

## Historical Geography

- Dr. Julian Cresser
- Natasha Lightfoot
- UWI recommendations

February 23

## Tourism and Blue Economy

- Jake Kheel, Grupo Punta Cana

April 5

## Culture and Climate

- Deborah Jack, Caribbean visual artist
- Cristal Ange, General Director, Fundación Herencia Ambiental Caribe (Caribbean Environmental Heritage Foundation)

April 11

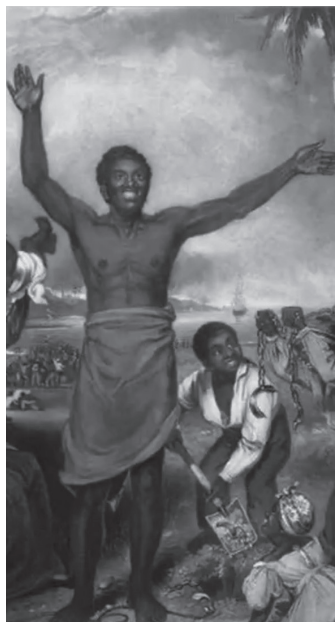
## Mess is More

- Matias Echanove, Cofounder of Urbz



Images (clockwise):

Artwork titled 'Intertidal Imaginaries' by Deborah Jack;  
Picture of King Street from Dr. Julian Cresser's presentation;  
Picture from Natasha Lightfoot's presentation



# CRITICS

Andres Pastoriza, Perkins Eastman

Andrew Padilla, NYU Department of Anthropology

Anna Rubbo, Columbia Center for Sustainable Urbanization

Austin Sakong, FX Collaborative

Beatriz Salas, Corporacion Desarrollo y Paz canal del Dique y Zona Costera

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Gustavo Rodriguez, FX Collaborative

Gustavo Valdez, Cristobal Valdez y Asociados

Henk Ovink, Global Commission of the Economics of Water

Hugo Vides, Fundación Grupo Social Cartagena

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