CLIMATE RESILIENCE AND DEMOCRATIC GOVERNANCE IN CENTRAL AMERICA'S NORTHERN TRIANGLE

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Available from:
Woodrow Wilson International Center for Scholars
One Woodrow Wilson Plaza
1300 Pennsylvania Avenue NW
Washington, DC 20004-3027
www.wilsoncenter.org

ISBN: 978-1-958844-07-6

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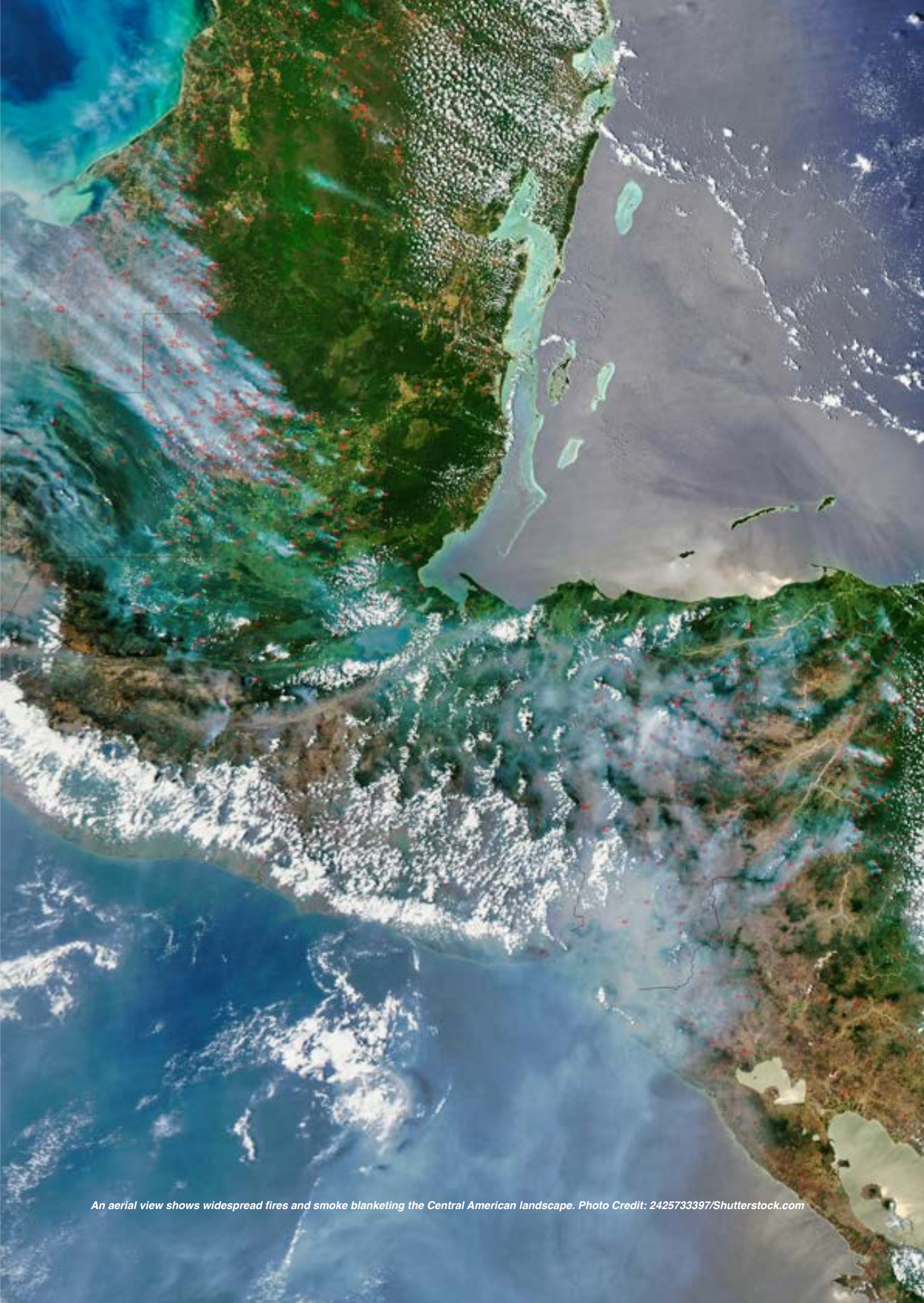

An aerial view shows widespread fires and smoke blanketing the Central American landscape. Photo Credit: 2425733397/Shutterstock.com

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ACKNOWLEDGMENTS

I am grateful above all to chapter authors Mónica Salazar Vides, Larissa Brioso and Alexandra Gálvez, and Arne Kristensen. Their original field work and broad knowledge of Central America provide fresh insights into the ways that local communities in the Northern Triangle are working, under very challenging circumstances, to adapt to climate change. The authors have endured many rounds of translation and editing and I thank them for their patience.

I am also grateful to my current and former colleagues at the Wilson Center, especially Anders Beal, Lauren Herzer Risi, Amanda King, Cynthia Brady, Benjamin Gedan, and Beatriz García Nice, for their contributions and support along the way. Oscar Cruz applied his outstanding design skills to the production of this report.

Special thanks as well to the participants in the Shut Up and Write group at the Chevy Chase Public Library, for providing a congenial space for research and writing.

Finally, our collective gratitude to the Open Society Foundations, without whose generous support this publication would not have been possible.

Cynthia J. Arnson
March 2024

A towering mountain peak pierces through the morning light in the Central American highlands. Photo Credit: 1113388697/Shutterstock.com

1 INTRODUCTION

CYNTHIA J. ARNSON

This book represents an exploration of the impacts of extreme weather events on the three Central American countries of the Northern Triangle—El Salvador, Guatemala, and Honduras—and the efforts of local communities, despite all odds, to build resilience in the face of the increasingly brutal impacts of climate change.

The Northern Triangle has long been characterized by its overlapping crises of governance, violence and insecurity, and lack of economic opportunity. For close to a decade, US policymakers have viewed deficits in these arenas as underlying drivers of migration. Since 2014, bipartisan majorities in the US Congress have directed billions of dollars to a "root causes" strategy put forward initially by the Barack Obama administration and aimed at diminishing migration pressures.[1] In 2021, the Joe Biden administration added "weather shocks" to the roster of push factors behind migration, including the building of "resilience to address climate change and food insecurity" as a strategic pillar of the root causes strategy.[2] The private sector, international and Central American non-governmental organizations, and European and Asian donors have contributed to ongoing efforts to improve livelihoods in Central America in pursuit of development, climate, and human security goals.

SETTING THE STAGE[3]

In 2022, the Intergovernmental Panel on Climate Change (IPCC) reported that "the countries of Central America consistently rank highest in the world for risks associated with extreme weather," in which, "devastating hurricanes and floods…alternate with extended periods of drought."[4] International organizations such as the United Nations' Food and Agriculture Organization (FAO) and World Food Program (WFP), the World Meteorological Organization, and the IPCC have played key roles in calling attention to the ways that catastrophic weather events have deepened the socio-economic vulnerability of populations in the Northern Triangle, particularly with respect to agriculture and food security.

Central America's geography is a central factor in its climate risk. It is bordered by the Atlantic and Pacific Oceans, the origin of increasingly ferocious hurricanes and cyclones. In addition, the sub-region lies within the Central American Dry Corridor, an ecosystem of dry tropical forest that stretches across Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala, and into southern Mexico, where extended periods of drought alternate with periods of intense rain. These extremes are amplified by *El Niño*, a warming of the Pacific Ocean's surface that further disrupts weather patterns.

The size and population of the Dry Corridor vary depending on which countries are included. The FAO notes that 44 percent of the territory of El Salvador, Guatemala, Honduras, and Nicaragua lies within the Dry Corridor, an area with approximately 11.5 million people, more than half of whom are engaged in agriculture and the small-scale farming of basic food grains.[5] Important for this study, and as noted in chapter 2, is that fully 80 percent of the Dry Corridor lies within the three countries of the Northern Triangle. The corridor encompasses not only rural areas but also the densely populated urban capitals of San Salvador, Guatemala City, and Tegucigalpa.

The Dry Corridor experienced five years of consecutive drought from 2015 to 2019,[6] with devastating effects on commercial agriculture and employment, subsistence farming, and food security. In 2019 alone, the United Nations World Food Program and the FAO reported that drought followed by heavy rains had "destroyed more than half of the maize and bean crops of subsistence farmers," affecting 2.2 million people and leaving 1.4 million in need of "urgent food assistance."[7]

Research carried out by the World Food Program and Inter-American Development Bank, among others, has found a strong relationship between food insecurity and migration. Reasons for emigrating from Central America are multidimensional, but according to focus group interviews with Northern Triangle residents, an estimated 90 percent of emigrants from Guatemala and Honduras and 76 percent

from El Salvador left their communities because of drought, which had a "direct impact on food production for self-consumption." Focus group members also indicated that migrants looked to be able to send remittances to remaining family members, "to mitigate the impact of adverse climate effects and socio-economic problems."[8]

In addition to drought and extreme rainfall, hurricanes and tropical storms have pummeled Central America with increasing frequency in recent years. The US National Oceanic and Atmospheric Administration (NOAA) reported that the 2020 Atlantic hurricane season broke the record for "the highest number of tropical/subtropical storms in a single year," dramatically laying bare the effects of warming oceans and air temperatures on storm frequency and intensity.[9]

In November 2020, for example—and compounding the devastating health impacts of COVID-19—the region was hit by the ferocious back-to-back hurricanes, Eta and Iota. US Admiral Craig Faller, then-head of the US Southern Command, helped mobilize US support, calling the devastation "beyond compare." According to a journalist surveying the damage:

> "The storms demolished tens of thousands of homes, wiped out infrastructure and swallowed vast swaths of cropland…The relentless rain and winds of Hurricanes Eta and Iota downed dozens of bridges and damaged more than 1,400 roads in the region, submerging a Honduran airport and making lagoons out of entire cities in [Honduras and Guatemala]. From the sky, Guatemala's northern highlands look as though they've been clawed apart, with giant gashes marking the sites of landslides."[10]

High winds, flooding, and landslides killed scores of people, displaced at least 1.5 million people, and destroyed tens of thousands of homes along with crops and livestock. All told, more than 7.5 million people were affected, according to the International Federation of the Red Cross.[11] Insurance companies

estimated total damages at $9 billion.[12]

By the time 2023 drew to a close, Central America had been hit by three tropical storms and three Category 4 or 5 hurricanes in a five-year period alone.[13] Fully a year later, the Red Cross was still calling for "urgent action… to protect people's livelihoods, prevent diseases, and ramp up the recovery from the social and economic impact of the hurricanes."[14]

FOCUS OF THIS REPORT

The foregoing discussion is aimed at providing enough context to situate extreme weather among Central America's profound challenges. The case studies presented in the following pages illustrate how climate change has deepened the vulnerability of rural as well as urban populations already impacted by high levels of poverty and inequality (especially with respect to land ownership); the violence perpetrated by gangs (*maras*) and organized crime; and discrimination based on race, ethnicity, and gender.

However, our goal in this report is to tell a different and, ultimately, more hopeful story, one centered on the ways that communities and actors on the ground, on their own or in coordination with local, regional, and national authorities and international supporters, are responding in ways that build resilience. Authors carried out extensive fieldwork in El Salvador, Guatemala, and Honduras, conducting interviews and on-site visits. Central questions, which are summarized in chapters 2 and 3, include the following:

- How can community-led local climate action promote climate resilience and democratic governance in the Northern Triangle, including by strengthening the capacity for collective action and political participation of formerly excluded groups?
- Do local, regional, and national governments welcome and/or participate in these community-led climate actions? If not, how can such collaborations be fostered in the interest of

achieving greater success?

- What opportunities and constraints have communities encountered when trying to influence climate decision making that affects them and their livelihoods?

KEY TAKEAWAYS

- *Campesino*, Indigenous, and Afro-descendant rural communities are typically the most directly affected by climate change. As a result, with or without outside support, they have been forced to develop creative strategies for adapting. Projects to enhance climate resilience that build on prior levels of community organization are likely to meet with greater success;
- Combining ancestral knowledge with technical expertise and financial and legal resources—and expanding the participation of traditionally excluded groups such as Indigenous peoples and women—help promote socio-ecological resilience. This is especially true with respect to forest management and restoration, central to preserving water resources and the hydrological balance of entire countries. An expanded and inclusive dialogue between ancestral and technical knowledge should permeate the design of and decision making around projects to address climate change;
- Similarly, the involvement of local stakeholders, including community leaders and relevant municipal authorities, helps ensure the ownership and sustainability of specific projects when external project financing ends. Such participation in the design and implementation of projects strengthens local governance and democratic practices;
- The promotion of social cohesion and social capital is as key to climate resilience as it is to economic development. Cohesion is built by reinforcing identities (for example, as a rural inhabitant or farmer) and fostering linkages among leaders, farmers, and their counterparts in other parts of the country. Improving the organizational capacity and leadership

skills of local farmers with respect to environmental resource management conveys benefits beyond local communities. The example of El Salvador demonstrates that it is possible to deepen social cohesion through community-based climate action. Fostering the inclusion and rights of young people, some of whom are the most prone to migrate, is also vital;

- While Central America contributes very little to greenhouse gas emissions, deforestation in the Northern Triangle affects local climate and ecosystems and increases vulnerability to natural disasters. As noted especially in chapter 4, systematic deforestation is often linked to criminal activities such as narcotrafficking and illegal logging, and requires both a national and international response;
- The rates of urbanization in the Northern Triangle range from 75 percent in El Salvador to 60 percent in Honduras and 53 percent in Guatemala, for a sub-regional average of 62 percent.[15] Extreme weather events impact cities through flooding and the destruction of houses as well as infrastructure. Community resilience in urban and rural areas differs. But the two are inter-dependent, in that cities depend on the water, food, and energy generation that originate in the countryside.

CHAPTER SUMMARIES

Chapter 2 by Mónica Salazar Vides provides working definitions of concepts that inform the case studies of El Salvador, Guatemala, and Honduras. Salazar defines resilience as "the ability to tolerate, absorb, and adjust to changing social and/or ecological conditions." With respect to climate, resilience refers to "the adaptation, transformation, and coping capacities of individuals, communities, and systems to survive and thrive amidst stressful climate conditions." Salazar notes the overlap between climate resilience and vulnerability, a "socially constructed process" by which certain groups, because of their ethnicity, gender, income level, or place of residence, become more susceptible to the harm caused by a changing climate. "Although vulnerability and

resilience may appear to be opposites," she argues, "in most cases they coexist in the same territory."

The concept of governance serves to relate ecological and social phenomena, through "networks of institutions—formal, informal, public, private, international, national or local—that make decisions on various issues, including climate change." She pays particular attention to indigenous, ancestral forms of governance and social organization that are based on "cultural norms such as reciprocity and solidarity," in which natural assets are viewed as collective, not individual goods. Salazar notes that more data is needed to document how communal governance structures assist in the protection of forests, water, and land. Yet in Guatemala's Western Highlands, she argues that such structures have served as "one of the main mechanisms" for forest protection, essential for maintaining Guatemala's hydrological equilibrium. She calls for greater dialogue between local communities and the state and for changes in how nature is viewed—not as something to be exploited for economic gain but rather, as something whose preservation contributes to collective well-being.

Salazar underscores the numerous challenges communities face in promoting greater climate resilience. These include "struggles for access, use, and control of natural assets; development models and land tenure systems; urban expansion and the undervaluation of rural and peri-urban spaces; and limitations on knowledge exchange due to ethnic, class, and gender discrimination." The concentration of land ownership, large-scale agribusiness, and organized crime are among the factors that have contributed to biodiversity loss and the heightened vulnerability of rural communities. Salazar argues that much can be learned from the adaptation and resilience strategies of local actors, even if they should "not bear the responsibility" for solving the climate crisis.

Chapter 3 by Larissa Brioso and Alexandra Gálvez summarizes recent climate change impacts in El Salvador. These include "a sustained rise in temperatures, changes in rainfall patterns

A man stands amidst the lush vegetation of a Central American forest. Photo Credit: 317746979/Shutterstock.com

encompassing both excessive precipitation and drought, and an increase in the number of tropical storms," such as the two that struck El Salvador in May and June 2020, causing massive flooding and landslides. Extreme weather poses risks to multiple sectors, including agriculture, health, infrastructure, power generation, and economic activity more broadly. Long-term environmental threats range from poor soil quality to pressures on water resources due to a failure to protect water recharge zones, inadequate sewage management, and deforestation.

Brioso and Gálvez explore successful projects in the departments of Ahuachapán and Chalatenango to foster higher agricultural yields by improving degraded soils, strengthening local economies, and supporting rural job creation. Catholic Relief Services (CRS) has implemented a Water and Soil for Agriculture strategy (ASA), part of a *Raíces* (Roots) project executed in coordination with local and regional authorities, international partners (including the U.S. Agency for International Development), and non-governmental organizations. Their two case studies involve Raíces Ahuachapán, implemented in one of El Salvador's departments facing the most severe drought, and "Raíces Chalatenango," located principally in the La Montañona micro-region in Chalatenango department, an autonomous inter-municipal entity devoted to the conservation, protection, and restoration of the forest massif of the Montañona and its productive landscapes.

According to Brioso and Gálvez, "a central tenet of the [Raíces] program is that community participation and the reconstruction of

the social fabric are essential to achieving climate change resilience and adaptation."

Over 37 percent of households in Ahuachapán live in poverty and dramatic changes in land tenure have deeply impacted environmental and food sustainability. The authors point out that, whereas the number of agricultural producers nearly doubled between 1971 and 2007, the decade from 2007 to 2017 saw a tripling of the number of farmers who had to rent land in order farm. And for renters, a bad growing season due to climate impacts adds to the level of debt. The loss of land ownership corresponded to a shift in population away from Ahuachapán's rural areas, which experienced a 19 percent drop in population between 1992 and 2007.

The Raíces project in Ahuachapán aims to restore the agricultural landscape and builds upon pre-existing levels of community organization. Farmers in the area have created local water oversight boards (*juntas de agua*) to deal with issues of water management, the protection of surface water, and underground aquifers. They have also worked to link coffee farmers in Ahuachapán's north to laborers in sugar plantations that dominate in the south, aware that "the response to environmental problems must derive from a vision that encompasses all of Ahuachapán as well as neighboring departments." The Raíces project has helped to promote inclusive and transparent decision making, expand participation, and foster collective action between and among communities. The project has also helped to scale up local water boards through the establishment of *mesas de agua* (water committees) that link multiple communities. All of these elements have enhanced democratic governance at the local level.

The Raíces project in Chalatenango recognizes the department's strategic role as "El Salvador's largest provider of water resources as well as energy." Brioso and Gálvez note that the department also has El Salvador's second-highest percentage of homes highly vulnerable to natural disasters, particularly landslides. Most of the

department's families depend on the production of staple crops—corn, beans, and sorghum—but many also find work in construction due a boom fostered by remittances. The project has helped spark a learning process enabling farmers to improve soil quality and lower the costs of production, contributing to greater food security for participants and surrounding communities.

Prior degrees of social cohesion have made it easier for multiple communities and municipalities to come together to confront shared problems. This is especially evident in joint efforts to preserve the forests of La Montañona, which are critical to absorbing and storing water that sustains the communities and that also feeds El Salvador's most important rivers. Forest regeneration includes agroforestry initiatives and the planting of local tree species. In addition, communities have worked with local authorities to ensure that most homes have running water.

Inclusive participation in decision making, the provision of information, the generation of a learning community, and outside accompaniment have contributed to the success of the Raíces initiative in Ahuachapán and Chalatenango. Brioso and Gálvez recognize the important efforts in El Salvador to strengthen regulatory and institutional frameworks to address climate change, together with efforts to strengthen communities and leadership capacities. However, they conclude, "the economic resources and the capacities of state institutions—and, above all, municipalities—are insufficient to deliver results of the scale and magnitude needed."

In chapter 4, Arne Kristensen focuses on rural communities in two Honduran departments—Olancho, on the edge of the forests of the Mosquitia region, and Lempira, located within the Dry Corridor. Both areas are characterized by high rates of poverty and food insecurity. The state has a limited presence in providing either social services or basic security. At the same time, residents exhibit strong commitments to collective action to improve their communities, a form of social capital essential to governance. This

community spirit can be leveraged on behalf of climate resilience and other development goals.

As recent events have dramatically demonstrated, Honduras has suffered devastating hurricanes which have affected its population and infrastructure. About 45 percent of Hondurans live in rural areas, where prolonged dry periods have alternated with torrential rains that cause flooding, landslides, and crop losses. Kristensen notes that deforestation, forest fires, and pollution add to the country's climate and environmental challenges. He says that, beyond the impact of an extreme weather event itself, the lack of preventive measures and a feeble disaster response compound the damage, exposing "the lack of resilience and capacity." Addressing climate change is not easy in a fragile context like the one in Honduras, where political polarization, land and other conflicts, and low levels of trust impede collective action and processes of reform.

Honduras' agricultural sector is large, Kristensen writes, providing about 31 percent of all employment, with small-scale farmers accounting for 70 percent of those in the sector. For decades, the government has given priority to the agricultural export sector, characterized by the large-scale production for export of coffee, palm oil, fruit, and other products. Kristensen notes the abundance of rich farmland in Honduras and argues that the country's food security has been negatively impacted by the country's shift away from the cultivation of basic grains toward the reliance on food imports. The neglect of small farmers in the rural sector deepens their vulnerability, adding to pressures to emigrate.

In Lempira department, one of the poorest and least food secure of all areas in Honduras, some 9 out of 10 inhabitants live in rural areas and many depend on agriculture. Prolonged drought and irregular rainfall have created water shortages that undermine sustainable livelihoods. The increased cost of farming inputs and the threat of a failed harvest impact individuals as well as entire communities. Farmers expressed a willingness to adapt to changing weather conditions but did not have the resources to do so without outside

help from the government, NGOs, or the international community.

Despite the precarious conditions, Kristensen found numerous signs of resilience within Lempira's communities. To manage water scarcity, for example, residents organized local water councils (*juntas de agua*), along with other committees to deal with women's, emergency, and other matters. Community elders, parent-school networks, and local churches exercised formal and informal leadership. Residents often came together to engage in projects of community benefit, contributing the labor to repair a road, build a bridge, or install a water pipeline when outside partners provided funding, materials, or expertise. Kristensen also sees the use of remittances from migrants abroad as a form of "solid connection" to the region and community. Investments in better housing, farms, or local businesses evidenced the desire of residents to better their own lives and those of their children. He witnessed a "longing for sustainable solutions to persistent agricultural challenges" that could not be implemented without external help.

The expansive wilderness and rainforests of La Mosquitia are partially located in eastern Olancho, Honduras' largest department. Over the last 20 years, Honduras has lost about one-fifth of its humid primary forests, with a third of the country's tree loss in Olancho alone. Kristensen notes that deforestation in Olancho and the Mosquitia is not new and accelerated from the 1950s to the 1970s as ranchers cut trees to expand cattle ranching and beef exports. Now, however, the "complex mix of cattle ranching, illegal logging, drug trafficking, land grabbing, and forest fires" has put unprecedented pressure on the forests and indigenous and other communities in Olancho. The presence of organized crime has expanded as drug traffickers use the Mosquitia as a transshipment point for cocaine destined for the United States. The weakness of state presence has allowed illegal activities to flourish, posing a "barrier to local governance and rural development."
As in Lempira, remote communities depend not only on agriculture but also remittances, and the lack of state presence has led

communities to organize to confront shared problems. Higher levels of inter-personal trust than in the country at large, trust in the church, and participation in joint projects such as improving school or community buildings reflect social cohesion that could benefit future climate interventions. Participatory decision making and reliance on local structures and NGOs, not just technological approaches to climate resilience, would build up democratic governance. That said, the expansion of organized crime in the area, and the overlap between illegal logging, drug trafficking, and the expansion of cattle ranching requires a national as well as international response.

Chapter 5 by Mónica Salazar Vides explores the relationship between climate resilience and forest management in two areas of Guatemala's Western Highlands, the Palajunoj Valley in the department of Quetzaltenango and Santa María Chiquimula in the department of Totonicapán. Both communities are almost entirely Maya *K'iche'* and rural, but the Palajunoj Valley lies within the broader metropolitan area of the provincial capital, Quetzaltenango City, with a population that identifies mostly as Ladino and non-Indigenous.

Salazar notes that more than a third of the Western Highlands are still covered by forests of pine and oak, constituting an important water recharge zone essential to water availability in cities and areas throughout the country. Despite deforestation risks and population pressures, she attributes the high degree of forest preservation to "the ancestral governance structures of Indigenous communities and their historical role in the collective care of highland forests." For indigenous groups, she explains, forests constitute "reference points for territory and identity;" that is, social spaces in addition to biophysical ones.

Over eighty percent of Santa María Chiquimula's inhabitants are poor and the area has suffered from natural disasters—landslides, floods, and drought—along with pollution, deforestation, and forest fires. Due to an advancing agricultural frontier, the expansion

of home building (much of it linked to remittances), and physical differences between highland and lowland areas, forest cover has declined in recent years. But it still represents over a third of the municipality. Lowland areas are drier and residents there poorer than their highland counterparts. To augment subsistence agriculture, some in the lowland have taken to cutting trees to sell firewood or to selling off communal forest land to private owners. The decline in tree cover has, in turn, contributed to the scarcity of water and thus, added pressure on crops.

Highland areas, by contrast, have more consolidated forms of ancestral governance, less deforestation, and hence, greater resilience to climate change, despite ongoing population pressures and fire risks. Ancestral collectives known as *parcialidades* have succeeded in allocating small agricultural plots to each family and to organizing collective forest care. Salazar notes how indigenous inhabitants of the *Parcialidad* León provide a variety of services, from patrolling to reforestation to tending to a community nursery. The Guatemalan government's National Forest Institute (INAB), the International Union for the Conservation of Nature, and the Universidad Rafael Landívar are among the institutions supporting Santa María Chiquimula's forestry efforts as part of the Resilient Altiplano Program (PAR).

Communities in the Palajunoj Valley are also supported through PAR but face numerous obstacles to forest preservation. The valley is surrounded by a mountainous volcanic chain and cloud forest ecosystem that is essential to the hydrology of the Quetzaltenango area. The local government has designated large portions of the valley as a protected area but has rejected indigenous communal management of the forests, thereby setting up conflicts with communities over traditional activities such as collecting firewood or allowing animals to graze. At the same time, Salazar indicates that the municipality has failed to curb construction or mining activities in the protected area and has located an open-air municipal garbage dump within it.

Salazar recognizes numerous initiatives by the Guatemalan government to sustainably manage forests, noting that local authorities have been given a greater role in forest protection. But in a country with a highly skewed distribution of land ownership and in which few indigenous communities have formal title to their land, many programs have failed to benefit those with proven traditions of communal forest management and care. "Power relations within each territory," she observes, govern whether local governments "cede the rights to use and manage the forests in their jurisdiction to the communities." She calls for public programs to legitimize communal forest care and for policies to "bring together technical *and* ancestral approaches" to forest management that will enhance climate resilience overall.

NOTES

1 Peter J. Meyer, "Central American Migration."

2 The White House, National Security Council, "U.S. Strategy," 4, 8.

3 For recent background in English on climate issues in the Northern Triangle, see Paul Angelo, *Climate Change*; Brady and Risi, "Addressing Climate Security;" Viscidi and Vereen, "Climate Threats;" Bermeo and Speck, "How Climate Change;" and Mia and Beckel, "How Climate Change."

4 IPCC, *Sixth Assessment* Report, Chapter 12.

5 United Nations Food and Agriculture Organization (FAO), "Regional Initiative;" and FAO, "Land of opportunities."

6 Talia G. Anderson, et al., "How Exceptional."

7 United Nations Food and Agriculture Organization (FAO), "Adverse climate events."

8 Inter-American Development Bank, et al. *Food Insecurity and Emigration*.

9 National Oceanic and Atmospheric Administration. "2020 Atlantic Hurricane Season."

10 Natalie Kitroeff, "2 Hurricanes Devastated Central America."

11 International Federation of Red Cross/Red Crescent Societies (IFRC), "Central America: Hurricanes Eta-Iota;" IFRC, "Communities affected by Hurricanes Eta and Iota."

12 *Insurance Journal*, "With Economic Damages." A report by the International Institute for Strategic Studies, citing the same source, used the lower figure of $7 billion. See Irene Mia and Juan Pablo Bickel, "How climate change."

13 World Food Forum and United Nations Food and Agriculture Organization, "Dry Corridor and Arid Zones."

14 IFRC, "Communities affected."

15 Population Reference Bureau, "International Data."

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Rows of corn and bean crops stretch toward the Fuego and Acatenango volcanoes in Guatemala. Photo Credit: 1018221121/Shutterstock.com

2 CLIMATE RESILIENCE AND DEMOCRATIC GOVERNANCE: THE IMPORTANCE OF LOCAL ACTORS

MÓNICA E. SALAZAR VIDES

Central America is currently experiencing one of the worst socioeconomic and political crisis since the period of civil wars that lasted from the 1960s to the early 1990s, in part due to the setbacks to democracy witnessed on the isthmus.[1] The anti-human rights discourse promulgated by powerful local political leaders and groups ignores the deep inequality and weak democratic institutionality still existing in most Central American countries. The global COVID-19 pandemic and the pronounced changes in the climate have only exacerbated and made this social vulnerability more visible.

In September 2020, when COVID-19 infections were at one of their peaks, five hurricanes swept through the region in quick succession, two of which with catastrophic consequences: Eta, which made landfall on October 30th and shortly thereafter, Iota on November 13th.[2] These extreme weather events caused socio-ecological disasters, including landslides and floods, that affected approximately four million people in Honduras and left 94 dead.[3] In Guatemala, 1.5 million people were evacuated from their homes[4] and crop failures caused by heavy rains resulted in a period of seasonal famine, to the detriment of families engaged in rural subsistence farming. As for El Salvador, tropical storms Amanda and Cristóbal swept the country between May and June 2020, impacting approximately 30,000 families and causing 30 deaths.[5] The frequency of storms and floods in the region has increased fivefold between 1991 and 2015 in comparison to the period between 1966 and 1990, a situation that is extremely alarming.[6]

"The link between climate change (CC) and human mobility in Central America is only recently receiving attention. Climate-related disasters, cyclical droughts associated with the El Niño phenomenon, and agricultural diseases such as coffee rust have preceded the massive northward waves of migration known as the 'migrant caravans.'"

The frequency and intensity of extreme weather are reshaping not only biophysical and social conditions in the territories, but also the relationships between the population and the natural world. Climate events interact with other social factors such as high rates of poverty, forcing many Central Americans to leave their communities and increasing the number of female-headed households in their places of origin.[7] The link between climate change (CC) and human mobility in Central America is only recently receiving attention. Climate-related disasters, cyclical droughts associated with the *El*

Niño phenomenon, and agricultural diseases such as coffee rust have preceded the massive northward waves of migration known as the "migrant caravans."[8]

The "Northern Triangle" countries of Central America—Guatemala, El Salvador, and Honduras—have international migration rates that are among the highest in the world.[9] The Northern Triangle constitutes a region infamous for its high rates of violence associated with *maras* and *pandillas* (youth gangs), as well as the prevailing high levels of social inequality and the weakness of state institutions.[10] In 2022 the overall poverty rate stood at 70.9 percent in Honduras, 65.8 percent in Guatemala and 42.8 percent in El Salvador.[11] Extreme poverty was at 34.7 percent in Honduras and 23.4 percent in Guatemala, while in El Salvador it dropped to 9.6 percent.[12] The Northern Triangle has made headlines as one the most violent regions in the world outside an actual warzone.[13] It also had the world's highest growth rate in migration to the United States between 2007 to 2017.[14]

Governments in the Northern Triangle countries have worked on national and regional agendas in response to CC. International cooperation has been essential in the design and financing of these plans. Despite advances on paper, however, there are significant gaps in implementation. Furthermore, although barely 0.15 percent of global greenhouse gas emissions (GHG) are produced in Northern Triangle countries,[15] governmental efforts have focused on *mitigation*, that is to say, on reducing GHG sources or upgrading carbon sinks,[16] at the expense of actions geared towards climate *adaptation* and *resilience*. The latter seek the ecological, social, and economic reorganization of entire societies in order to address the effects of CC. The active and sustained participation of communities, the achievement of equity, and the transformation of current power structures are considered fundamental elements in this effort.[17]

"Although barely 0.15 percent of global greenhouse gas emissions (GHG) are produced in Northern Triangle countries, governmental efforts have focused on mitigation, that is to say, on reducing GHG sources or upgrading carbon sinks, at the expense of actions geared towards climate adaptation and resilience."

How can community-led local climate action promote both climate resilience and democratic governance in the Northern Triangle? In

an effort to find answers, authors of the chapters in this publication undertook case studies of Guatemala, El Salvador, and Honduras, in order to learn more about how community actions to deal with CC at the local level promote climate resilience; whether or not local governments welcome these community-led climate actions; and what limitations and opportunities communities have encountered when trying to influence CC decision-making at the local level, i.e. among local governance structures.

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The aim of these studies is to explore whether climate action at the local level in Northern Triangle countries can serve to strengthen or promote democratic governance. A working hypothesis was that weak governance intensifies the effects of CC in the region. Another goal was to understand how actions at the local level can generate climate resilience by a) creating or strengthening social capital and cohesion between communities; b) strengthening the capacity for collective action and political participation; and c) including formerly excluded groups.

This comparative analysis aims to use well-grounded theory to identify common patterns and phenomena to address the questions posed above. Authors carried out field work in which they interviewed a wide variety of actors—residents, local and national authorities, and representatives of non-governmental organizations; organized focus groups; and observed interactions among individuals in a particular territory. Authors also consulted secondary sources on CC in the Northern Triangle, theoretical articles on climate resilience and democratic governance, and academic texts. This bibliography covered: a) the traditions of community organization; b) the nature of the state and setbacks in democratic governance; c) the reshaping of rural areas, cities, and peri-urban dynamics; and d) economic development and the struggles for access, control, and use of natural assets.

This chapter is divided into three sections. The first presents a brief analytical framework in which I explore the different categories of CC, resilience, governance, and their links from a socio-ecological

point of view. The second presents an outline of the effects of CC in the Northern Triangle and the commitments made by governments to counter them. Finally, I present some basic arguments about the link between climate resilience and democratic governance in the Northern Triangle, drawing on the actions, knowledge, and experiences of local actors, such as *campesino*, Indigenous, and Afro-descendant communities.

THE ANALYTICAL FRAMEWORK: CLIMATE CHANGE, RESILIENCE, GOVERNANCE, AND SOCIO-ECOLOGICAL PERSPECTIVES

From the Biophysical to the Social

There are at least two major CC paradigms that influence climate policy decision makers, plans, and programs at the global, national, and local levels. The first of these *concentrates on carbon dioxide emissions* and considers CC to be a biophysical and technical problem caused by an excess of GHG emissions. Resulting policies emphasize reducing these emissions efficiently (for example, by paying companies to reduce the amount of GHGs they produce.)[18] This vision of CC dovetails with the mitigation actions mentioned above. By contrast, an equity-focused paradigm proposes that GHG emissions are related to socioeconomic inequities: CC is viewed as a socioecological phenomenon.[19] The reduction of emissions is thus linked to social, economic, and democratic reforms that are not typically considered in climate policies and that highlight the social and structural aspects contributing to CC. Actions linked to climate adaptation and resilience are in keeping with this focus and aligned to the analysis that undergirds this study.

The connections between societal actions and CC can be seen by their effects, i.e., how CC worsens poverty, forced displacement, and social conflicts. However, the connection can also be conceived of causally, since aspects of a social nature—consumption patterns, production models (agribusiness, monoculture farming, etc.), the obstruction of public policies by powerful corporations that emit

large amounts of GHGs, or the weakening of social organization—all limit climate action, deepen the climate crisis, and limit the resilience of communities and societies.[20] In such a context, what is understood by resilience?

Climate Resilience, Vulnerability, and Social Issues

Resilience can be understood as the ability to tolerate, absorb, and adjust to changing social and/or ecological conditions and to reorganize in such a way as to conserve the critical elements of a structure, its functions and its identity.[21] Although the concept of resilience has been used by several disciplines and applied in a variety of ways, in the field of CC it can be conceptualized as the adaptation, transformation, and coping capacities of individuals, communities, and systems to survive and thrive amidst stressful climate conditions.[22]

"Climate resilience is closely bound up with vulnerability, understood as a socially constructed process in which certain population groups—constituted by age, gender, ethnicity, income level, and place of residence, for example—are more susceptible to the harm caused by CC."

Climate resilience is closely bound up with *vulnerability*, understood as a socially constructed process in which certain population groups—constituted by age, gender, ethnicity, income level, and place of residence, for example[23]—are more susceptible to the harm caused by CC. Vulnerability may be the result of weak coping capacities, but it also reflects how the livelihoods of some social groups are being overtaken by the pace and magnitude of socio-ecological changes.[24]

Although *vulnerability* and *resilience* may appear to be opposites, in most cases they coexist in the same territory.[25] It is important to consider the various factors that shape resilience and vulnerability to CC; these are conditioned not only by biophysical components but also by social, cultural, political, economic, geographic, and demographic factors that interact to different degrees and at different rhythms and moments in time. This is related to the concept of socio-ecological issues as well as to governance.[26]

A man and a child tend to a corn field in the rural Guatemalan countryside. Photo Credit: 317746979/Shutterstock.com

A Socio-Ecological Approach: The Importance of Governance

A *socio-ecological* approach to the environment highlights interconnections between people and nature, highlighting human activities that alter the structure and functions of ecosystems.[27] These activities are linked to markets, modes of production, political systems, and social hierarchies constituted by class, gender and ethnicity, among others.[28] Relationships between humans and ecosystems can both shape resilience and exacerbate vulnerabilities.

One of the processes that relates the social to the ecological is *governance*, which is essential to building resilience, but requires conceiving of CC beyond its strictly biophysical meaning. For several authors,[29] one of the keys to promoting socio-ecological resilience is by expanding levels of participation and the equitable distribution of power in climate decision making, with an emphasis on the voices and knowledge of those actors most vulnerable to CC, such as Indigenous peoples, women, and the rural population.

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Governance usually refers to networks of institutions—formal, informal, public, private, international, national or local—that make decisions on various issues, including climate change.[30] However, the way in which governance structures are organized can both foster and restrict resilience, since interactions between groups are shaped by power relations of various kinds.[31] These interactions, in turn, depend on how democratic the governance networks are in practice. Governance can thus be defined as a compromise

involving limitations and opportunities that are activated according to the interests, resources, and strategic capacities exercised by actors who are positioned unequally, according to, for example, class, ethnicity, and gender.[32]

THE NORTHERN TRIANGLE: CLIMATE CHANGE AND STATE RESPONSES

Climate change can be defined as those permutations in regional and global weather patterns that persist over time, lasting for decades or longer.[33] Changes in climate have been occurring for 1.8 million years, slowly transforming natural habitats.[34] However, since the Industrial Revolution began in the 18th century, the planet has experienced a drastic and continuous increase in global temperatures due to the amount of GHGs released into the atmosphere. Population growth, the expansion of cities, as well as current development models have accelerated the fragmentation and degradation of landscapes.[35] This means that human activity is primarily responsible for the current changes in the climate; the world economy depends on the burning of fossil fuels such as coal, oil, and natural gas, the main sources of energy and industrial production, as well as intensive agricultural practices that change land use and cause deforestation.

"Central America, for example, emits a very low percentage of global GHG, but it is one of the regions in the world most sensitive to climate change due to its geographical location, climate characteristics, and social inequality."

The costs of increases in temperature are both produced and experienced unequally by countries and people.[36] Central America, for example, emits a very low percentage of global GHG, but it is one of the regions in the world most sensitive to climate change due to its geographical location, climate characteristics, and social inequality.

Central America comprises a land area of 522,769 square kilometers, which contains 7-10 percent of the world's biodiversity.[37] An estimated 66 different Indigenous peoples live on the isthmus, occupying 40 percent of its land and sea surface. Central America consists of two regional corridors, the Mesoamerican Biological Corridor on the Caribbean side, and the Central American Dry

Corridor (CADC), which stretches across Guatemala, Honduras, El Salvador, and Nicaragua, along the Pacific Coast.[38] Climates vary, as do ecosystems, ranging from sea-level to subalpine, with some mountainous areas reaching almost 4,000 meters.[39] The most extensive ecological regions are tropical rainforest, tropical dry forest, and premontane rainforest, covering over 100,000 square kilometers, as well as subalpine rainy moorland, highland rainforest, and very dry tropical forest, the latter in an area of less than 2,500 square kilometers.[40]

Central America's location between two oceans and within an inter-tropical convergence zone, as well as its rugged topography,[41] makes it susceptible to different geodynamic and hydrometeorological phenomena,[42] exposing its population to both heavy rainfall and drought. According to the Intergovernmental Panel on Climate Change (IPCC), Central America constitutes "the tropical region most sensitive to climate change."[43] On a global scale, it is the second most vulnerable to climate risks.[44] In recent years, temperatures have risen and storms, floods, and droughts have intensified, reducing the number of cold days and nights.[45] The Prevalent Vulnerability Index, a composite indicator of hazard events, shows that the three Northern Triangle countries have the highest level of vulnerability in Latin America and the Caribbean, after Haiti.[46] A biophysical characteristic that contributes to the pronounced fragility of the Northern Triangle countries is the Central American Dry Corridor.

"According to the Intergovernmental Panel on Climate Change (IPCC), Central America constitutes 'the tropical region most sensitive to climate change.' On a global scale, it is the second most vulnerable to climate risks. In recent years, temperatures have risen and storms, floods, and droughts have intensified."

The CADC is 1,600 kilometers long and 100 to 400 kilometers wide, stretching from southern Chiapas, Mexico, to Guanacaste in northern Costa Rica. It represents 30 percent of the entire Central American isthmus; but 80 percent of its area lies within the three countries of the Northern Triangle. Approximately 22.5 million people live in the corridor,[47] often in densely populated municipalities, including the largest urban areas: the capital cities of San Salvador, Tegucigalpa, and Guatemala City. Although 62 percent live in urban settings and 38 percent in rural areas, many households that depend on subsistence agriculture are affected

by a dual hydrometeorological pattern. The *El Niño* phenomenon determines an annual period of intense drought, followed by a season of torrential rains and floods.[48] This affects the harvest cycles of more than a million families who resort to borrowing or selling their assets or are forced to reduce their food intake.[49]

The foregoing indicates that climate vulnerability in the Northern Triangle interacts with social factors such as poverty, agriculture, urbanization, and unequal access to social and natural assets, thus configuring a socio-ecological matrix that governments must address in order to achieve climate resilience.

Climate Change, the State (Regional and National), and the Role of International Financing and the Private Sector

Both regional and national climate initiatives respond to international conventions such as the United Nations Framework Convention on Climate Change (UNFCCC), signed in 1992 in Rio de Janeiro; the Kyoto Protocol, a global agreement to reduce GHG emissions reached in 1998 and that entered into force in 2005; and the Paris Agreement, signed in December 2015 and in force since November 2016.[50] The Paris Agreement is part of the UNFCCC and was adopted by 196 signatory countries and the European Union. Its general objective is to curb GHG emissions, to ensure that global temperatures do not increase by more than 1.5 degrees Celsius. However, the agreement was designed so that each nation could define its own goals. These national pledges are known as Nationally Determined Contributions (NDCs)[51] and their accumulated total would constitute the Paris Agreement as a whole. Another important milestone is the 2030 Agenda driven by the United Nations Development Program (UNDP), which influences and assists governments in achieving the Sustainable Development Goals (SDGs). All these agreements have served to pressure actors in the Northern Triangle to draft laws, policies, plans, and strategies at the regional and national levels and in tandem with the advisory services provided by international cooperation. Some of these initiatives are summarized in Table 1.

Table 1: National and Regional Climate Laws, Policies, Plans and Strategies

Regional

1. Regional Agro-environmental and Health Strategy (ERAS) 2009-2024
2. Central American Policy for Comprehensive Disaster Risk Management (PCGIR)
3. Central American Strategy for Rural Territorial Development (ECADERT)
4. Regional Policy for the Development of Fruit Farming, Regional Climate Change Strategy (ERCC)
5. Food and Nutrition Security Policy for Central America and the Dominican Republic
6. Strategic Action Plan to Strengthen the Conservation and Use of Mesoamerican Plant Genetic Resources in Adapting Agriculture to Climate Change
7. SICA Climate-Adapted Sustainable Agriculture Strategy (EASAC) 2018-2030

Guatemala

Guatemala has a National Climate Change Action Plan (PANCC) and a Framework Law to Regulate Vulnerability Reduction, Mandatory Adaptation to the Effects of Climate Change, and Greenhouse Gas Mitigation (Decree 7-2013). The Guatemalan System of Climate Change Sciences (SGCCC) and the National Council on Climate Change (CNCC) were created as a result of this law. State officials, the private sector, environmental NGOs, universities, and representatives of Indigenous and *campesino* organizations participate in both bodies.[52] The law emphasizes the need to formulate strategic plans for the reduction of vulnerability, adaptation, and mitigation of climate change in five areas:

h. Human health
i. Coastal marine areas
j. Agriculture, livestock, and food security
k. Forest resources, ecosystems, and protected areas; and
l. Infrastructure[53]

In partial fulfillment of its commitments as a signatory of the Paris Agreement, the Guatemalan government presented its NDC in 2015 and in 2021 began work to update it. These efforts were led by the Ministry of Environment and Natural Resources (MARN), with support from the UNDP and the Climate Action Enhancement Package (CAEP) project.[54] Four workshops were held in May and June 2021 to review the goals.

In 2015, a National Landscape Restoration Strategy was devised, focusing on mitigation in the forestry sector. The strategy runs parallel to the initiatives carried out under the National Strategy for the Reduction of Emissions due to Deforestation and Forest Degradation (REDD+).[55]

In addition, the National Institute of Seismology, Vulcanology, Meteorology and Hydrology (INSIVUMEH) has been engaged in the preparation of agro-climate tables at territorial level. The objective is to collect climate information at the local level, which assists in making recommendations on risk reduction. Ideally, the initiative would focus more on adaptation and resilience, but this would depend on the dissemination of information in the territories.[56]

Honduras

The Ministry of Energy, Natural Resources, Environment and Mines (MiAmbiente+) in Honduras is responsible for the government's climate agenda, which is aligned with the Sustainable Development Goals (SDGs) and the 2030 Agenda promoted by the UN. The objective of the

climate agenda in Honduras is to "reduce poverty, inequality and exclusion through the creation of capacities and opportunities offered by joint climate change mitigation and adaptation activities."[57] According to MiAmbiente+, all land management and territorial planning strategies must take this agenda into account. The Honduran climate agenda includes an Institutional, Legal and Programmatic Framework with two main pillars: a National Adaptation Plan and a National Mitigation Plan.

In addition, the country has a:

1. National Climate Change Strategy (ENCC)
2. National Strategy for Adaptation to Climate Change by the Honduran Agrifood Sector (2014-2024)
3. National Strategy for the Reduction of Emissions due to Deforestation and Forest Degradation (REDD+)[58]
4. National Plan for Sustainable Rural and Urban Development (2012)
5. Master Plan for Water, Forests, and Soil (2018)
6. Strategic Framework for Sustainable Consumption and Production (2018); and
7. Food Assurance and Security Program (2020)

Consultative mechanisms such as the Climate Change Inter-Institutional Committee (CCIC) and the Climate Change Inter-Institutional Technical Committee on Climate Change (CCITC) have allowed the business sector and civil society to participate in conceptualizing the climate agenda and monitoring its implementation, together with governmental bodies. These committees have sectoral or thematic subcommittees on issues such as health, food security, and REDD+, among others.[59] However, they have been inactive since 2019.[60]

El Salvador

El Salvador's Environmental Law was drawn up in 1998. It was reformed in 2012 to create the National Climate Change Plan (PNCC). These instruments declare adaptation and reduction of vulnerability to climate change to be of national interest, emphasizing the need to coordinate actions around issues such as agriculture and food security. The PNCC was prepared by the Ministry of the Environment and Natural Resources (MARN), with the support of the United Nations Environment Program (UNEP) and the UNDP. It includes eight priority programs:

a. Program for the incorporation of climate change and disaster risk reduction in development plans, public policies, and institutional modernization
b. Program for the protection of public finances and reduction of losses associated with the adverse effects of climate change
c. Biodiversity and ecosystem management program for adaptation and mitigation of climate change
d. Program for the transformation and diversification of agricultural, forestry, and agroforestry practices and activities
e. Comprehensive program for adaptation of water resources to climate change
f. Program for the promotion of renewable energy, efficiency, and energy security
g. Program for climate-resilient and low-carbon urban and coastal development; and
h. Program for the creation of conditions and capacities to address climate change

In 2015, El Salvador signed the Paris Agreement, and between 2015 and 2022 it approved a series of instruments to address climate change, with a focus on adaptation and resilience. These include:

1. Environmental Strategy for Climate Change Adaptation and Mitigation in the Agricultural, Forestry, Fisheries and Aquaculture Sector (2015)
2. Climate Change Policy for the Agricultural, Forestry, Fisheries and Aquaculture Sectors (2017)
3. National Plan for Climate Change and Agroclimatic Risk Management for the Agricultural, Forestry, Fisheries and Aquaculture Sectors (2017)
4. Agricultural Plan in Dry Corridor Municipalities, Eastern Region (2017)
5. Climate Change Policy for the Public Works, Transportation, Housing and Urban Development Sectors 2018-2036 (2018)
6. National Drought Contingency Plan (2018); and
7. General Water Resources Law (2022).

In addition, there is a National Council for Environmental Sustainability and Vulnerability, which brings together actors from the government, private sector, foreign donor community, academia, and civil society. The main output of this Council is the Sustainable El Salvador Plan. However, most commitments have not been met and the government that came into office in June 2019 has shifted priorities. The new administration refused to sign the Escazú Agreement, which civil society organizations interpreted as an abandonment of the country's environmental agenda.[61]

Source: Prepared by the author based on regional and national laws, plans, and strategies.

Although on paper national authorities have developed multiple climate initiatives, many continue to view CC as a matter of concern only to the international donor community and question the objectives and recipients of climate financing. Multilateral organizations like the Green Climate Fund (GCF), international banks such as the World Bank (WB) and the International Monetary Fund (IMF), as well as bilateral cooperation agencies, among them the U.S. Agency for International Development (USAID), are the main sources of financing in support of climate goals.[62] However, most climate finance in Latin America goes to the largest countries. Between 2003 and 2020, for example, just three countries—Brazil, Mexico, and Colombia—received 41 percent of total international climate finance for Latin America.[63] In addition, climate financing is usually not managed directly by communities, but rather, by foundations or NGOs.

"Most of the international financing received by Central American countries is used for mitigation rather than adaptation. This is also the case elsewhere in Latin America, where 75 percent of climate financing during the period 2003-2020 focused on mitigation activities and only 12 percent on adaptation. Spending by the governments of the Northern Triangle mirrors this breakdown."

Another important consideration is that most of the international financing received by Central American countries is used for mitigation rather than adaptation. This is also the case elsewhere in Latin America, where 75 percent of climate financing during the period 2003-2020 focused on mitigation activities and only 12 percent on adaptation.[64] Spending by the governments of the Northern Triangle mirrors this breakdown. For example, between 2014 and 2017 Guatemala allocated only 16 percent of its CC spending to adaptation;[65] in 2020, adaptation projects in Honduras received 23 percent of spending, while mitigation projects received 40 percent, and 30 percent went to projects directed at both.[66] The exception is El Salvador, which from 2011-2015 allocated 63 percent of funds to adaptation, 11 percent to losses and damage from extreme weather events, and 27 percent to mitigation; ninety-five percent of these monies came from state funds.[67] However, as mentioned, the administration that came into office in June 2019 has changed priorities, and civil society organizations perceive a significant setback in terms of the domestic environmental agenda and the rule of law.[68]

It is also important to examine the sectors financed through mitigation-oriented actions. According to a detailed analysis by the Regional Program for Research on Development and the Environment (PRISMA), between 2017 and 2021, the Northern Triangle received approximately $6 billion to combat CC.[69] Of this total, 32 percent went to the energy sector, primarily hydroelectric projects. Of note is that, while such projects do contribute to mitigation, they also harm the livelihoods of communities, which rarely derive a direct benefit. The infrastructure and transportation sector absorbed 28 percent of financing. The Northern Transversal Strip in Guatemala is worth highlighting; since its development in the 1970s, it has been linked to a vision of Central America as a commercial platform and has led to the forced displacement of rural *campesino* and Indigenous communities. Another 18 percent of climate financing was allocated to addressing natural disasters; but the focus was on responding to climate emergencies, not on risk reduction and the transformation of socio-ecological conditions for

prevention purposes. The agriculture sector received 16 percent of the funds. However, these were used to upgrade coffee plantations and, to a lesser extent, were focused on projects to restore and build resilience among rural agricultural and Indigenous communities.[70] The forestry sector received only 4 percent, and water-related projects 2 percent, notwithstanding that in the forestry sector there exist strategies in which communities are a principal actor. Access to and control over water resources are also matters of widespread concern and struggle.

Although the private sector in the Northern Triangle contributes very little to climate change adaptation measures, it sometimes benefits from mitigation actions financed by public and/or international funds. For example, in 2003 in Guatemala, the private sector contributed to the passage of the Law of Incentives for the Development of Renewable Energy Projects, with support from the governmental National Electric Power Commission and the Ministry of Energy and Mines (MEM). In Honduras, the Emission Reduction Certificates under the Kyoto Protocol Clean Development Mechanism have been a source of income for the hydroelectricity sector.

"The Northern Triangle's campesino, Indigenous, and Afro-descendant rural communities are often the most directly affected by climate change; as a result, with or without support, they are forced to develop creative strategies for adapting."

Where are the contributions and voices of local communities in devising and implementing these climate agendas?

LIMITATIONS AND OPPORTUNITIES FOR COMMUNITIES TO INFLUENCE CLIMATE POLICY DECISIONS

The Northern Triangle's *campesino*, Indigenous, and Afro-descendant rural communities are often the most directly affected by climate change; as a result, with or without support, they are forced to develop creative strategies for adapting. Some of these draw on long-standing forms of organization, networks, and identities that are rooted in local territories. Territories can be understood as places of deep meaning for communities that have a physical and/or emotional connection to them.[71] That said, the relationship between communities and territories is not

static; these same places are also shaped by changing ecological, socioeconomic, and political phenomena.

The collective actions of communities to promote greater climate resilience face a range of challenges. These include struggles for access, use, and control of natural assets; development models and land tenure systems; urban expansion and the undervaluation of rural and peri-urban spaces; and limitations on knowledge exchange due to ethnic, class, and gender discrimination. Each of these aspects will be explored below, starting with an examination of the organizational traditions of the communities, one of the cornerstones of climate resilience in the Northern Triangle.

"The intimate relationship between population and place creates and furthers greater resilience to climate change, since a heartfelt responsibility to protect and care for nature has been nurtured for generations."

Community, Territory, and Climate Resilience

In the countries of the Northern Triangle, the identity and livelihoods of Indigenous, Afro-descendant, *campesino*, and rural populations largely depend on a deep historical relationship to and sustainable use of natural resource endowments. The intimate relationship between population and place creates and furthers greater resilience to climate change, since a heartfelt responsibility to protect and care for nature has been nurtured for generations.[72] This socio-ecological coexistence, however, is threatened in places where natural assets are increasingly scarce and coveted by others, leading to forced displacement or even the repression of community leaders who defend their territories. The connection to territory can thus be a source of both resilience and vulnerability.

In the case of Guatemala, 41.44 percent of its 18.1 million inhabitants self-identify as Indigenous.[73] Although the official language is Spanish, more than 22 native languages are spoken. The majority of the Indigenous population inhabit two territories that are critical to CC mitigation and adaptation, namely, the Western Highlands and Northern Lowlands. In Honduras, with a population of 9.1 million, approximately 600,000 are members of native peoples, the Lencas being the largest of these, with a population of 450,000.[74] The Miskitus, one of the nine Indigenous and Afro-descendant peoples

in Honduras, protect the Honduran Mosquitia, an extensive forest area known as the "Heart of the Central American Biological Corridor" and also as the "Central American Amazon."[75] Similar to Honduras, the Indigenous population in El Salvador stands at roughly 7 percent of the population, most of whom live in the municipalities of Izalco and Nahuizalco. Although El Salvador is the second most urbanized country in Central America, three-quarters of its land is still used for agricultural production.[76] The Salvadoran Dry Corridor is home to numerous cooperatives, family farmers, and rural communities that are especially sensitive to intense droughts and extreme rainfall.

An example of the connection between community organization, land, and climate resilience can be found in the Indigenous communities in the Western Highlands of Guatemala. The region encompasses the four departments of Quetzaltenango, Totonicapán, Quiché, and San Marcos, which are subdivided into 42 municipalities; most of the Mam and K'iche Mayan population live in this area.[77] The region is characterized by commerce, high rates of international migration, and disorderly urban sprawl, along with mountainous topography and communal forest management. Forest care involves a social and community network of families organized in kinship alliances that govern, protect, and restore ancestral lands that for centuries have been exploited for economic gain.[78]

"Forest care involves a social and community network of families organized in kinship alliances that govern, protect, and restore ancestral lands that for centuries have been exploited for economic gain."

Community work, known as *k'ax k'ol*, consists of tasks that each individual must perform in order to enjoy shared social, economic, and political benefits.[79] These may involve duties such as serving as a forest ranger, harvesting rainwater, cutting brush, or working at the community tree nurseries. Decision-making takes place in assemblies that are chaired by a member of each family unit. This ancestral system of governance has persisted despite colonization, the establishment of the nation-state, and the internal armed conflict (1960-1996). The system does not function in the same way as modern governance and representative democracy. One of the nuclei of ancestral governance is communal land tenure, which

"The climate resilience of communities depends on their own decision-making power to respond to the environmental crisis in their territories, as well as a belief in their ability to have a degree of control over the climate-related events that affect them. This requires that communities have the power and freedom to mobilize their assets, knowledge, and collective actions in order to shape their own future. It also requires that their individual and collective rights be recognized."

escapes the individualistic logic of private property.

The social organization of communities is closely rooted in the notion of "the commons," according to which natural goods are seen as collective assets. Cultural norms such as reciprocity and solidarity depend on interpersonal trust, the legitimacy of local leadership, and community unity.[80] The climate resilience of communities depends on their own decision-making power to respond to the environmental crisis in their territories, as well as a belief in their ability to have a degree of control over the climate-related events that affect them.[81] This requires that communities have the power and freedom to mobilize their assets, knowledge, and collective actions in order to shape their own future.[82] It also requires that their individual and collective rights be recognized.

However, as mentioned above, the organizational traditions prevailing in these communities face several challenges. One of the most problematic is access, use, and control of natural assets, due to current development models and land tenure systems. Alternative definitions of territory shed light on the power relations that (re)configure landscapes, livelihoods, and social links to the natural world.

STRUGGLES TO USE, CONTROL, AND ACCESS LAND AND NATURAL ASSETS

Due to their large areas of humid tropical forests, biodiversity, natural assets, and rich ecosystems, countries of the Northern Triangle have historically been attractive to the private sector and transnational companies, many of whose activities depend on the large-scale exploitation, extraction, and export of natural goods.[83] These activities have resulted, however, in the degradation of land, forests, and water, all of which are vital to the lives of *campesino*, Indigenous, and Afro-descendant communities. Such degradation has led both to international migration and to internal displacement. Many of the rural areas in the Northern Triangle are undergoing socio-ecological changes linked to transnational economic

activities based on the extraction of natural resources, agribusiness, monoculture, and organized crime. These tend to deepen the concentration of land in relatively few hands and the loss of biodiversity, thus exacerbating social inequalities and the vulnerability of Indigenous, *campesino*, and Afro-descendant peoples to climate change.[84] Conditions in the territories are not static; they change over time. Transformations underway reflect the apportioning of power and agency of various state, business, social, and community actors.

Territory can thus also be understood as a geographically defined expression of disputes—over material assets and identity—among different social actors. Unequal power relations among these actors based on class, gender, or ethnicity enable and/or constrain their power to physically and symbolically reorder space. The relationships between these actors transcend local interactions, as the space in question is also shaped by national, regional, and global dynamics.[85]

"Territory can thus also be understood as a geographically defined expression of disputes—over material assets and identity—among different social actors. Unequal power relations among these actors based on class, gender, or ethnicity enable and/or constrain their power to physically and symbolically reorder space."

In Honduras, cattle ranching (some of it linked to organized crime) and oil palm plantations are the main causes of deforestation and environmental degradation. In fact, Honduras produces more palm oil than food. Between 2005 and 2019, oil palm plantations expanded from 75,000 hectares to 200,000 hectares. The mining and hydroelectric sectors also expanded. By the year 2020, 17 hydropower projects were under construction in Lenca territory alone.[86] Community demands to protect the land, forests, and rivers—far from being heard by government authorities and large corporations—unleashed a wave of repression that resulted in the assassination of a prominent Indigenous and environmental leader, Berta Cáceres, who opposed the construction of a hydroelectric plant.[87] Many other Honduran leaders have been killed when trying to defend their territories and natural resources against extractive activities.

In Guatemala, the Northern Lowlands are inhabited by a population that is mainly Mayan Q'eqchi,' living in the departments of Alta

After the annual harvest, a corn field lies fallow with cut stalks near Guatemala City. Photo Credit: 449041225/Shutterstock.com

and Baja Verapaz, a part of Izabal, and the southern Petén. These are lands of considerable biodiversity and extensive fertility. Since the 19th century they have been attractive to national and foreign businessmen for coffee cultivation, cattle ranching, and oil exploration. These economic interests help explain why the Q'eqchi' were singled out for such violent attacks by the Guatemalan army during the civil war. One of the most infamous massacres occurred in Panzós, Alta Verapaz, in 1978. Over the past twenty years, several mining and monoculture companies have moved in, as have individuals and interests linked to drug trafficking. This has led to the internal displacement of communities, the criminalization of human rights defenders, deforestation, and the degradation and contamination of land, forests, and water. One of the most emblematic cases occurred in Sayaxché, a municipality in southern Petén. In 2015 the company Reforestadora de Palmas del Petén (REPSA) was accused of responsibility for the death of between 40 and 70 tons of fish along 150 kilometers of the La Pasión River.[88] Local communities and environmental NGOs had long denounced the pollution of the river by the oil palm plantations—an ecocide—while the government turned a deaf ear.

A community logic emphasizing communal public goods such as water, land, and forests runs counter to a business logic centered on profit. A 2012 study of Guatemala, for example, found that 86 percent of water used in irrigation went to large companies producing sugarcane, oil palm, and bananas for export.[89] Similarly, in Honduras, a 2014 study found that 92 percent of irrigation resources were directed toward export crops such as bananas,

tobacco, and sugarcane.[90] In El Salvador, meanwhile, the demand for water comes mainly from the agricultural, fishing, livestock, and sugarcane sectors.[91] Patterns of water use help to explain the tensions over development models and land tenure systems.

DEVELOPMENT MODELS AND SYSTEMS OF LAND TENURE

Processes of democratic transition in the Northern Triangle in the 1990s sought to leave behind authoritarian models of politics and to strengthen the rule of law in Honduras, Guatemala, and El Salvador.[92] Peace agreements in El Salvador and Guatemala that brought bloody civil wars to an end did nothing to reform underlying economic structures; internationally, the dominant Washington Consensus pointed countries in the direction of neoliberal reform, emphasizing a smaller state and free markets in order to spur growth and competitiveness.[93] With respect to agriculture, the World Bank strongly supported a land market model by which national and international landowners acquired individual, private land titles and proceeded to expand mining, oil palm, and hydroelectric projects in the region.

The logic of private and individual land tenure conflicts with the communal logic of collective land tenure, which is central to their sociopolitical organization, reproduction of life, identity, and climate resilience.[94]

The case of the Honduran Mosquitia, located between the departments of Gracias a Dios, Olancho, and Colón in eastern Honduras, helps to illustrate this phenomenon. Historically marginalized from urban centers of economic development, this large expanse of forest, shared with Nicaragua, covers some 22,568 square kilometers; it is the second largest forest in Central America after the Maya Biosphere Reserve in Petén, Guatemala.[95] One of the most important processes for the Miskito and Garífuna communities inhabiting the area has been the securing of collective property titles in 2012 through the Territorial Councils. These councils emerged organically in 1998 to organize the lands on

which the communities lived. At this time the state recognized the Miskito and Garífuna communities as subjects of collective rights to access, use, and manage the land and other natural assets in their region.[96] However, the expansion of oil palm plantations in neighboring municipalities attracted settlers who began to grab land belonging to local communities. In addition, organized criminal gangs have used the forests as routes for transnational drug trafficking; the gangs have illegally purchased land for cattle ranching, engaged in deforestation, and constructed roads not regulated by the state.[97] Rural landscapes in the Northern Triangle are being rapidly reshaped by phenomena such as the ones described above. An additional factor concerns urban expansion in recent years.

Urban Expansion and the Undervaluation of Rural and Peri-Urban Spaces

"At the same time, Central America is the region in the world with the second-fastest urbanization process, and its urban population is expected to double by 2050."

In Guatemala and Honduras, much of the population living in rural areas depends on subsistence agriculture; such farmers are especially sensitive to changes in the climate.[98] In 2021, 74 percent of the population of El Salvador, the smallest country in Central America, lived in urban areas.[99] El Salvador has the second highest level of urbanization on the isthmus, surpassed only by Costa Rica, with an urban population of 81 percent.[100] By contrast, Honduras was 59 percent urbanized[101] and Guatemala, 52 percent.[102] Each country thus faces different climate risks, even though the boundaries between rural and urban areas in the Northern Triangle are increasingly diffuse and porous.

There are approximately 2.3 million small farmers in Central America, many of whom farm on steep slopes with thin soils and who suffer from seasonal food insecurity.[103] Approximately one million *campesinos* grow corn and beans for family and local consumption, while others grow coffee.[104] Both staple grains and coffee are vulnerable to rising temperatures and changing rainfall patterns.

At the same time, Central America is the region in the world with the second-fastest urbanization process, and its urban population is expected to double by 2050.[105] From 1960 to 2020, that population grew by 36 percent in Honduras, 35 percent in El Salvador, and 21 percent in Guatemala.[106] The result has been an accumulation of informal settlements, overcrowding, and an informal economy flourishing in disaster-prone areas that exist side by side with green areas in which crops are grown.

The case of El Salvador is alarming, since 89 percent of the territory is exposed to risks. Sixty-five percent of the population live in such areas and 96 percent of the country's Gross Domestic Product (GDP) is generated there. Unlike Guatemala and Honduras, where agricultural exports underpin the economic model, in the 1990s the Salvadoran economy shifted, with trade and services becoming dominant. Investment in real estate and construction contributed to internal migration to the capital, San Salvador, reshaping rural areas and contributing to environmental degradation.[107]

"Although common sense tells us that rural areas are the most vulnerable to CC due to their direct relationship with nature, cities are also sensitive to these changes. This is due not only to the infrastructure damage caused by extreme weather events and poor urban planning, but also to the fact that cities are dependent on their links with rural and peri-urban areas."

For example, although the San Salvador metropolitan area takes up only 3 percent of the country, it is home to one-third of the population. This has led to disorderly urban sprawl, bringing with it the expansion of human settlements, the informal economy, and a growing demand for services and increasingly scarce resources such as land and water. The capital city's geological characteristics add to its susceptibility to flooding and landslides that damage infrastructure, while periods of drought reduce aquifer recharge.[108]

According to the United Nations Organization for Human Settlements, cities occupy only 2 percent of the earth's surface, but consume 75 percent of available energy and are responsible for 80 percent of GHG emissions.[109] Although common sense tells us that rural areas are the most vulnerable to CC due to their direct relationship with nature, cities are also sensitive to these changes. This is due not only to the infrastructure damage caused by extreme weather events and poor urban planning, but also to the fact that cities are dependent on their links with rural and peri-urban areas.

Rural zones supply cities with food, workers, and raw materials, as well as with environmental goods and services, among them forests that produce oxygen and timber, areas of water recharge, and tourist attractions.[110] The boundaries between rural and urban become blurred in a process of peri-urbanization characterized by flows of environmental services, goods, people, and the waste they produce.[111] However, these rural and urban interactions are generally unequal, to the detriment of rural areas. Inequalities are reflected in the limited availability of basic services in the communities, their low level of participation in decisions affecting their lives, and the extraction of natural assets.

The Palajunoj Valley, located in Guatemala's central highlands, is a rural K'iche' area within the broader municipality of Quetzaltenango, the second largest city in the country. The upper parts of the valley's volcanic chain are water recharge zones essential to the hydrological balance of local communities, the city, and surrounding territories. Care of the zone's forests, which are in a protected area, is vital. However, mining for construction materials takes place on the slopes of the volcanoes, while the municipal garbage dump receives the city's daily waste.

For the K'iche' communities this is alarming, as the quarries and the dump are sources of disease as well as deforestation: the less tree cover on the mountains, the greater the likelihood of floods and landslides in the rainy season. The municipal government rarely engages in dialogue with the communities. Nor does it recognize their collective ownership of the forests. This is despite the fact that Mayan sacred sites are located in the mountains of the protected area and that ancestral governance has proven to be efficient in forest restoration and protection. Young members of the community responded by creating a non-governmental organization, establishing a nursery and organizing reforestation campaigns on communal land. These activities were carried out with the help of the community and international organizations.

This example helps demonstrate the strategic importance of rural communities, not only for cities but also to address the consequences of CC; it also reflects patterns of ethnic and class discrimination. As an ancestral authority from the Palajunoj Valley stated in an interview: "Excuse my use of the word, but the mayor's office does not talk to us because they see us as 'Indians'! But we are Indigenous people and thanks to our ancestry we know how to take care of our forests, our water, our territory." Racial and class discrimination on the part of local authorities has prompted communities to seek their own channels of organization and international support.

KNOWLEDGE-BASED DIALOGUE: BEYOND WELFARE, PATERNALISM, AND DISCRIMINATION

International law has been very important to the struggles of Indigenous organizations and the recognition of their collective rights. Some of the most important instruments to legitimize these demands are the International Labor Organization (ILO) Convention 169 on Indigenous and Tribal Peoples (1989) and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP, 2007). The free, prior, and informed consultations proposed by the ILO seek to ensure the participation of communities regarding measures that might affect their collective rights and territories. Consultation, however, does not guarantee consent. Peruvian social scientist Roger Merino therefore posits that it is necessary to go beyond these tools, as they can become bureaucratic requirements that depoliticize the collective actions of communities.[112] The UNDRIP, a non-binding instrument under international law, does go a step further. It emphasizes that the objective of consultation processes should be to learn whether or not communities consent to measures that are to be implemented in their territories.

There are three main types of consultations: a) those that require obtaining the consent of the communities in cases recognized by UNDRIP and international jurisprudence; b) those limited

to recognizing the participation of the communities, as spelled out in ILO Convention 169 and adopted by many international organizations; and c) those recognizing consent as an expression of self-determination and full decision-making power on the part of Indigenous peoples, something that is not fully recognized in national and international standards.[113] Demands put forth by Indigenous organizations in Guatemala concerning collective rights, the defense of ancestral territories, and the protection of natural assets and self-determination are of the third type mentioned above.[114] Indigenous demands can be summarized as follows:

Table 2: Demands by Indigenous Organizations in Guatemala Related to Climate Resilience[115]

Self-determination	Promote the right to self-determination of peoples as recognized in the UN Declaration on the Rights of Indigenous Peoples (2007) and the Organization of American States (2016).
Prior, free, and informed consultation and the development model	Promote the law on prior, free, and informed consultation of Indigenous peoples regarding all measures that may affect them, as a channel for their participation in decision-making and a mechanism for critical dialogue about the development model.
Collective and individual land rights	Make the needed reforms to the Civil Code regarding the legal recognition of the collective right to land of Indigenous peoples and ensure compliance with the individual rights of the entire population.
Ancestral right to territory	Recognition of ancestral rights of First Nations to the territory, land, subsoil, air and maritime space, and the restitution of communal lands and territories usurped since the colonial period.
Extractive activities in the territories	Prohibit the establishment of mining, monoculture, logging, and cattle-ranching on lands and territories of First Nations.
Rights of Mother Earth and its goods	Constitutionally recognize the rights of Mother Earth and its assets: water, mountains, forests, ecosystems, subsoil, air, and sky, and recover ancestral knowledge for their protection, while ensuring forests receive proper communal care.
Ancestral knowledge and dialogue of knowledge	Promote forms of healing and recovery of trees, forests, and native plants; make an inventory intended to transmit this knowledge to young people and children; and ensure that universities incorporate this knowledge in their curricula.

Source: Prepared by the author

These demands reflect an alternative to the current development model, counter-posing a concept of *vivir mejor* ("living better") with what Mayan groups describe as *buen vivir* ("living well").[116] *Vivir mejor* implies individualism, accumulation, consumption, and the degradation of natural, economic, and human resources, while *buen vivir* seeks harmony and balance between the human and the non-human, ascribing other meanings and narratives to land and territory.[117] One of the keys to living well is the affirmation of the collective rights of Indigenous peoples as set forth in international law, but also including the restitution and protection of ancestral lands through the recognition of collective ownership and ancestral governance of the forests.[118] The latter requires a knowledge-based dialogue in which Indigenous and community expertise, needs, and technologies are treated as no less important than Western and/or technocratic scientific knowledge.

"Climate resilience is enhanced by putting into practice the knowledge, technologies, skills, and philosophies of communities with respect to nature and ensuring them access to needed legal, financial, technical, and service assets."

The 1990 creation of the Maya Biosphere Reserve (RBM) in Petén, Guatemala, caused conflict between the governmental National Council of Protected Areas (CONAP) and the communities living in the Reserve; this was because the plan for the protected areas restricted access to the forests and therefore, their livelihoods. Agricultural communities and small producers of wood and gum organized to create the Association of Petén Forest Communities (ACOFOP). Between 1997 and 2002, this Association successfully secured a 400,000-hectare concession within a Multiple Use Zone in the RBM for the communities and their community-based business activities. The concession has served as a barrier against access by other economic interests to a large area to the north; it remains intact thanks to the protection efforts of organized communities.[119]

Climate resilience is enhanced by putting into practice the knowledge, technologies, skills, and philosophies of communities with respect to nature and ensuring them access to needed legal, financial, technical, and service assets. This material and symbolic repository of accumulated experiences and learning associated with the territory helps communities understand, foresee, and adapt to CC; communities can then also develop projects for the

conservation and/or restoration of natural assets. To draw on this knowledge, however, the decision-making power of communities over their land and assets must be legitimized. At the same time, it is important to recognize that communities alone are not the sole actors responsible for counteracting climate change.

In El Salvador, the Dry Corridor runs through approximately sixty municipalities, a significant part of the country. Although eastern El Salvador is the most negatively affected, some of these municipalities—for example, Ahuachapán, the capital of the department of the same name—are to the west, along the Guatemalan border.[120] Regular cycles of intense drought and extreme rainfall increase soil erosion and degradation, thus reducing agricultural production and endangering the food security of cooperatives, small landholders, and rural communities.[121] Community organization, together with projects backed by international donors, have been essential to developing climate adaptation strategies that enhance sustainable agriculture and food security. An important aspect of these projects has been the prior organization of communities and the adaptation of technical expertise to their cultural knowledge, thereby moving beyond a welfare-oriented and paternalistic logic that limits collective action.

"The resilience of communities is closely related to the idea of territory as a space where physical and/or emotional ties are a source of social organization, political power, and identity."

CLIMATE CHANGE AND TRANSFORMATIVE GOVERNANCE: *CAMPESINO*, INDIGENOUS, AND AFRO-DESCENDANT COMMUNITIES AS POLITICAL ACTORS

> "Me, poor? The newspapers say that I'm poor, unhappy, and that someone has to come teach us how to organize. They are ignorant, as if they didn't know how much my *huipiles*, which have taken a year to weave, are worth. The poor ones are the journalists, who don't have land on which to grow their food, who only rent a house in the cities. They are the ones who don't know how to organize themselves. We have always done everything to secure our own water sources, to organize our festivities. We have defended our lands."
>
> *Julia Tohom, a Maya-K'iche' woman and community leader*[122]

The resilience of communities is closely related to the idea of territory as a space where physical and/or emotional ties are a source of social organization, political power, and identity. This transgenerational connection is the basis of a deep-seated sense of responsibility to protect natural assets that the community views as common goods for the reproduction of human and non-human life. Protection benefits communities as much as it does entire cities and countries, since the communal preservation of forests, biodiversity, and rivers contributes to the production of oxygen, carbon sequestration, and hydrological balance.

Valuing and promoting the climate actions of *campesino*, Indigenous, and/or Afro-descendant communities requires overcoming the notion of rural areas as empty places ripe for exploitation. What must be surmounted is a view of nature as an exploitable and exportable means of generating wealth, with the local population serving merely as a cheap labor force and/or seen as expendable people whose hunger and suffering is irrelevant. Barriers that hinder access to land and the current systems of land tenure perpetuate the cycle of vulnerability.

"Valuing and promoting the climate actions of campesino, Indigenous, and/or Afro-descendant communities requires overcoming the notion of rural areas as empty places ripe for exploitation."

The state's failure to acknowledge the collective land rights of communities makes them more vulnerable to forced displacement, limiting their livelihoods and ways of organization. Although communal land titling does not guarantee respect for individual and collective rights, it does ensure that communities are recognized by the state and the international community as political actors with whom they must negotiate. Collective land titles are a source of political power in countries in which land ownership is concentrated in the hands of a few private owners and which privileges a system based on individual private property. This inequality has forced many rural families to rent land on which to farm.

There is an urgent need to foster exchange between, on the one hand, the ancestral knowledge of communities and, on the other, the logic of the state; this dialogue, moreover, must be based on an environmental justice approach. For example, completely

restricting community access to forests by declaring them protected areas limits communities' capacity for survival, organization, and self-governance. Ancestral and up-to-date technical knowledge must complement one another; at the same time, more data is needed to document the ways that communal governance of territories aids in the protection of forests, water, and land.

"Ancestral and up-to-date technical knowledge must complement one another; at the same time, more data is needed to document the ways that communal governance of territories aids in the protection of forests, water, and land."

Similarly, it is important to examine how the uncontrolled growth of urban areas increases environmental risk and degradation that extend beyond the city. Minimizing these negative effects requires territorial and urban planning that integrates rural actors. Such planning must recognize both the importance of rural areas and the peri-urban dynamics that connect rural communities and cities. It is necessary to understand not only the multiple exchanges between urban and rural areas, but also to devise approaches to each based on their different needs, vulnerabilities, resilience strategies, and sociocultural values.

Promoting climate resilience requires paying attention to a number of additional factors. The first relates to the growing fragility of the land itself due to increased use of chemical pesticides and insecticides that pose a risk to human health. Some youth organizations and communities advocate for the recovery of ancestral knowledge that, in dialogue with modern techniques, can be adapted to the socio-ecological and cultural characteristics of the communities.

A second aspect concerns the link between climate action and violence. Communities face actual or threatened violence from multiple sources—the state, economic interests, and drug traffickers and others linked to organized crime. The struggle for territorial control by violent actors has deeply impacted rural communities. Democratic transitions in Central America have failed to alter the fundamental dynamics that contribute to human rights violations, authoritarian practices, and social inequality.

A third issue relates to international cooperation and its impact at the local level. International financing is rarely managed by the communities themselves. This raises questions about the overall approach of international donors as well as the long-term sustainability of projects.

Finally is the issue of gender. *Campesino*, Indigenous, and Afro-descendant women play a critical role in the preservation of nature and are often at the forefront of the struggles for territory and public or communal goods. It is important to analyze women's particular place in decision making structures as well as their unique vulnerabilities as women. For example, territories where extractive industries operate have seen an increase in male workers, bars, and prostitution. The increase in gender-based violence in these areas has also begun to draw attention.

DEMOCRATIC GOVERNANCE AND CLIMATE RESILIENCE IN THE NORTHERN TRIANGLE

Rural *campesino*, Indigenous, and Afro-descendant communities are the most vulnerable to CC due to their dependence on natural resources and/or social vulnerability. Due to socio-ecological pressures, these groups have developed adaptation and resilience strategies at the local level even if these communities are not the sole or even the main parties responsible for responding to CC. State policies vis-à-vis economic growth that are rooted in the exploitation of nature, coupled with the disorderly and uncontrolled expansion of cities, hinder climate resilience: of communities, nations, and the entire region. Political, economic, and international actors must value and support the climate actions of communities, and, at the same time, work to promote structural changes in ecological, economic, social, and political arenas. In other words, even if communities are the most vulnerable to CC, they must not bear the principal responsibility for solving the crisis, especially when they face socio-ecological and political conditions that threaten their dignity and very survival.

In San Juan, Intibucá, Honduras, a farmer carefully harvests ripe yellow coffee berries. Photo Credit: 1780027358/Shutterstock.com

"It is critical to question why national and international climate finance is focused on mitigation in a region that is responsible for only a very small proportion of GHGs."

It is critical to question why national and international climate finance is focused on mitigation in a region that is responsible for only a very small proportion of GHGs. Giving priority to climate adaptation and resilience actions requires thinking beyond a paradigm focused on GHG emissions. There must be a more comprehensive vision that takes into account the social, economic, and political factors that produce such emissions, together with their sociological impacts.

Such a vision must legitimize community leaders as central political actors in local, national, and regional decision making regarding CC. Promoting climate resilience means going beyond technical and scientific knowledge and the pledges that exist on paper, to incorporate the organizational traditions, support networks, and knowledge about the natural world passed from generation to generation in the territories. This requires overcoming the view of *campesino*, Indigenous, and Afro-descendant communities as backward, ignorant, problematic, or opposed to development. Failing to change perspectives merely reproduces the power relations of class, ethnicity, and gender that have been perpetuated for centuries and that, in face of the climate crisis, have become unsustainable. As Julia Tohom, the aforementioned K'iche' woman stated, communities are rich too, and perhaps we are the ones who have to learn about alternative ways of being rich in order to live well.

To prevent historical power relations from drowning out the voices of Indigenous peoples, Afro-descendants, *campesinos*,

and women, it is necessary to move towards a new model of transformative governance.[123] This means including actors with alternative views of what socio-ecological objectives are desirable and for whose benefit.[124] Transformative governance can lead to resistance,[125] as the focus is on producing fundamental ecological, social, economic, and political change that questions current power hierarchies and development models. The goal is to foster a more equitable kind of resilience that is sustainable over time, based on long-term transformations and the inclusion of voices that historically have been silenced.

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The setting sun casts a glow over a volcano in El Salvador's Cerro Verde National Park. Photo Credit: 1008602407/Shutterstock.com

3 CLIMATE RESILIENCE AND GOVERNANCE IN EL SALVADOR

LARISSA BRIOSO AND ALEXANDRA GÁLVEZ

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a "change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods of time."[1] Climate change entails rising temperatures as well as extreme meteorological phenomena such as hurricanes, cyclones, blizzards, floods, soil desertification and so on, all of which negatively impact the economic, social, environmental, community, and personal aspects of life at local as well as global levels.

Recent climate change impacts in El Salvador include a sustained rise in temperatures, changes in rainfall patterns encompassing both excessive precipitation and drought, and an increase in the number of tropical storms. These changes carry implicit risks for agriculture, human health, infrastructure, power generation, ecosystems, livelihoods, and economic activity overall.[2] In 2021, El Salvador was ranked 103rd in the Global Climate Risk Index (GCRI), a measure of the level of exposure and vulnerability to extreme weather events between 2000 and 2019. El Salvador was thus the second most vulnerable country in the Central America, behind Guatemala (16) and somewhat ahead of neighboring countries Belize (33) and Nicaragua (35).[3] Countries should interpret the GCRI as a warning to be prepared for more frequent and/or more severe weather events in the future.

"Recent climate change impacts in El Salvador include a sustained rise in temperatures, changes in rainfall patterns encompassing both excessive precipitation and drought, and an increase in the number of tropical storms."

The legal framework guiding the actions of the Salvadoran government reflects international commitments such as the UNFCCC and the Kyoto Protocol. The government approved an Environmental Law in 1998[4] that was reformed in 2012, leading to the preparation of the National Climate Change Plan.[5] Article 4 of the law states that it is in the interest of society to adapt and reduce vulnerability to climate change, establishing that "public or municipal institutions are obliged to include as a priority in all their actions, plans, and programs, environmental aspects and climate change." The Plan thus lays out the fundamental actions needed to respond to development challenges, emphasizing that

agriculture and food security are the areas that may suffer the more immediate effects of climate change. El Salvador's Plan also lays the technical and institutional foundations for addressing the factors that generate slowly progressing, long-term impacts.

In 2015, El Salvador signed the Paris Agreement, which is based on the principle of "common but differentiated responsibilities."[6] Each country has different climate change responsibilities and goals depending on its level of development and capabilities, with a special emphasis on increasing adaptive capacity, strengthening resilience, and reducing vulnerability. From 2015 to 2022, El Salvador approved a number of plans that make explicit reference to tackling climate change: the Environmental Strategy for Adaptation and Mitigation of Climate Change in the Agricultural, Forestry, Fisheries, and Aquaculture Sectors (2015 and updated in 2017); the National Plan for Climate Change and Agroclimatic Risk Management in the Agricultural, Forestry, Fisheries, and Aquaculture Sectors (2017); Agricultural Plan for Municipalities in the Dry Corridor, Eastern Region (2017); Climate Change Policy in the Public Works, Transportation, Housing, and Urban Development Sectors 2018-2036 (2018); the National Drought Contingency Plan (2018); and the General Water Resources Law (2022).

"El Salvador lies within the Central American Dry Corridor, one of the areas of the planet most vulnerable to climate change. The country's physical location places it in the crosshairs of impacts related to agriculture, water resources, human health, ecosystems, infrastructure, and energy. El Salvador's climate challenges are augmented by a socio-environmental crisis, high population density, the deterioration of ecosystems due to the overuse and overexploitation of natural resources, and exposure to various extreme hydrometeorological phenomena."

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The high levels of environmental and socioeconomic vulnerability have had negative consequences for the most economically disadvantaged sectors of the population. and those most exposed

to risk are mostly women and children. El Salvador faces an urgent need to develop policies and mechanisms for addressing climate, based on national and regional alliances that can influence structural and cultural change and reorient patterns of production and consumption according to the capacity of each territory.

Governmental and non-governmental approaches to climate change adaptation and resilience are closely linked to processes of planning and development.[8] Various projects aim to ensure sustainable livelihoods through the restoration and recovery of ecosystems, soil conservation, water harvesting, the development of small-scale irrigation systems, reforestation, and the building of productive capacity, including the local manufacture and sale of fertilizers and pesticides.

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Noteworthy among the organizations promoting these kinds of initiatives is Catholic Relief Services (CRS). Their Water and Soil for Agriculture Strategy (ASA), which is being implemented through the *Raíces* (Roots) project, integrates soil and water management in order to increase agricultural yields. Raíces has been underway since 2018. Its main objective is the strengthening of agricultural livelihoods and human security, based on the restoration of natural resources and the strengthening of a local economy that creates jobs. The project is being carried out in coordination with local governments in the departments of Ahuachapán, Morazán, and Chalatenango and involves a number of international, governmental, and non-governmental organizations: Caritas Santa Ana and Chalatenango; the "Enrique Álvarez Córdova" National Center for Agricultural and Forestry Technology (CENTA); the Salvadoran Program for Research on Development and the Environment (PRISMA); the International Center for Tropical Agriculture (CIAT); the Ministry of Environment and Natural Resources (MARN); the Ministry of Agriculture and Livestock (MAG), the Ministry of Education, Science and Technology (MINEDUCYT); the Agricultural Landscape Management Committee (ACOGESPA), and the water committees in the La Montañona *mancomunidad* or micro-region.

A central tenet of the program is that community participation and the reconstruction of the social fabric are essential to achieving climate change resilience and adaptation. Understanding the dynamics at play in each territory is essential. The central questions regarding the two cases explored in this chapter are:

- What are the conditions that facilitate or restrict community participation in local decision making on issues of climate change resilience or adaptation?
- What actions do local populations undertake to improve resilience and adaptation?
- What limits and opportunities have community actors encountered when trying to influence local decision making?

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OBJECTIVES

The basic objective of this study is to explore whether climate action at the local or sub-national level can help promote or strengthen democratic governance. More specifically, the aim is to understand whether climate action can (1) strengthen social capital and social cohesion between and among communities; (2) improve the capacity for collective action and political participation; and (3) contribute to the inclusion of historically excluded groups. In addition, the study asks what lessons can be learned from the implementation process.

This chapter focuses on two cases studies and three different types of climate interventions: those aimed at prevention; attention or response; and adaptation to the effects of climate change. Various projects focus on technical assistance to help communities deal with the impacts of extreme weather events; the promotion of a strategy to reconstruct territorial governance, social cohesion, and a culture of peace; and the development of a collaborative vision among national government institutions, municipal governments, and non-governmental organizations at the local level.

"The basic objective of this study is to explore whether climate action at the local or sub-national level can help promote or strengthen democratic governance."

This study focuses on two projects carried out by CRS, both of which employ a Water and Soil for Agriculture (ASA) approach.[9] The first project, "Raíces Ahuachapán," is being implemented in one of the departments facing the most severe drought, as indicated on the map of the Central American Dry Corridor.[10] The second project, "Raíces Chalatenango," is located principally in the La Montañona micro-region in Chalatenango department and consists of an effort among several municipalities to promote local development and citizen participation. The methodology for answering the research questions is qualitative in nature and adopts a phenomenological approach.[11]

RESTORING THE AGRICULTURAL LANDSCAPE IN THE DEPARTMENT OF AHUACHAPÁN

Ahuachapán is located in western El Salvador. It is bordered to the north and west by Guatemala, to the northeast by the department of Santa Ana, to the east by the department of Sonsonate, and to the south by a strip of coastline along the Pacific Ocean. Ahuachapán was founded in the fifth century by Mayans of the Pokomames tribe. The department covers a territory of 1,239.06 square kilometers and is divided administratively into 12 municipalities. According to the Multi-Purpose Household Survey, 37.11 percent of households live in poverty.[12] The department thus has the largest number of households that lack sufficient income to cover the cost of an expanded basic food basket.

The National Territorial Management and Development Plan divides the department into two large regions.[13] The northern plateau or Paz River valley is made up of eight municipalities: Ahuachapán, Atiquizaya, Apaneca, Concepción de Ataco, El Refugio, Tacuba, San Lorenzo, and Turín. Most of the population live in these municipalities. To the south are another four coastal municipalities: San Francisco Menéndez, Jujutla, Guaymango, and San Pedro Puxtla. This southern zone is more closely integrated with the productive economy of Sonsonate municipality. Road infrastructure and the way that land is used help define the

socioeconomic division within Ahuachapán.

The northern plateau or Paz River valley is connected by two main highways, the Pan-American highway (RN-13), which runs from Santa Ana to Ahuachapán, and CA-8, going across the country from Ahuachapán to the Las Chinamas border post as well as to Guatemala. On the southern side, coastal highway CA-2 includes the section of Sonsonate, from Sonsonate city and Acajutla to the border at La Hachadura, Ahuachapán, connecting the area with Guatemala. This road infrastructure has been vital to urban, economic, and political development as well as to environmental management.

Ahuachapán department has undergone important economic changes with respect to land use and agriculture, the main economic activity. One of the main problems affecting environmental and food sustainability is land ownership. Consider the following: in most of the department's municipalities, the number of agricultural producers almost doubled between 1971 and 2007. But in the subsequent decade, from 2007 to 2017, the number of farmers who had to rent land in order to grow crops almost tripled.[14] In many cases this meant that they were losing the ownership of their lands and the benefits that come along with it. According to El Salvador's census in 1992, 77 percent of the population of Ahuachapán lived in rural areas. By 2007, that number had dropped to 58 percent.

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Residents of Ahuachapán department engage in a variety of livelihoods, depending on the availability of natural resources in different geographical areas. The World Food Program's map of El Salvador by zones of livelihood illustrates this distribution clearly.[15] The northern plateau or Paz River valley has historically been a coffee-growing area. The landscape is dominated by shade-grown coffee plantations that provide a range of goods and services of vital importance to the population as well as to the functioning of the natural ecosystem. Employment during the coffee harvest between November and January allows area families to earn income that they then supplement with the growing of vegetables and

staple grains and the raising of cattle and poultry. In recent years, investments in tourism have led to a demand for and supply of restaurants, hostels, and recreational areas focused on ecotourism. This, in turn, has led to urban growth, the phenomenon of second homes, and an increase in the price of land.

In southern Ahuachapán sugar plantations are dominant, with small communities of artisanal fishermen along the coast. Sugarcane cultivation exerts significant pressure on land use, displacing subsistence crops such as corn and beans and decreasing the amount of land available for raising cattle and poultry. But for the poorest families, sugarcane plantations also represent an opportunity to earn a subsistence income during seasonal employment, which they supplement by selling their crops or raising animals. In coastal areas such as Barra de Santiago, Garita Palmera, and Bola de Monte, the recent boom in ecotourism along the coast and in the protected areas of *El Imposible* National Park and the Santa Rita Natural Reserve has allowed some families to earn additional income, either from the offer of services or by setting up small businesses that cater to tourists.[16]

"Sugarcane cultivation exerts significant pressure on land use, displacing subsistence crops such as corn and beans and decreasing the amount of land available for raising cattle and poultry."

The department includes protected areas: in the northern plateau, the Apaneca-Ilamatepec Biosphere Reserve[17] and in the south, the aforementioned Santa Rita Reserve and the *El Imposible* National Park.

Living Conditions in the Areas of Project Implementation

The problems faced by those who live in the territory are complex and influenced by the widespread violence in the country, most of which is caused by organized gangs or *maras*. For decades this violence undermined the population's development potential. But those most affected are young people, whose restricted mobility has made it impossible to access the few available opportunities in education, employment, recreation, and other forms of organized participation. This has led to a sense of uprootedness, of not belonging. According to one interviewee: "Violence, especially

An expansive sugarcane plantation dominates the agricultural landscape of El Salvador. Photo Credit: 2020157501/Shutterstock.com

gang violence, affects us young people because our parents or heads of household are afraid for our safety."[18] In the context of the current state of emergency, gang activity has diminished, but fear and distrust continue to determine social relations. This erodes the social fabric of the communities.

A second problem involves the sustainability and quality of livelihoods, which depend upon land, soil, and water. Community leaders are well aware that the lack of land ownership, the degradation of the soil due to misuse or mismanagement, the loss of water recharge zones, low productivity, the commercialization of agricultural products by third parties, and climate change are all factors that erode sustainability, food security, and opportunities for rural development.

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Issues of violence and sustainability widen the gap between men and women, girls and boys, with respect to challenges and opportunities. Said one project leader, "young women have a certain role in the community and the family, unlike the young men who have more opportunities to work and study…[I]f the family has to decide between three children, then the eldest, if it's a boy, gets the chance [to study]."[19] Poorest families are the most negatively affected as they depend wholly on the land and on agricultural work. They live in high-risk areas and their homes are made of recycled, cast-off materials that are in chronically poor condition. Under these conditions the effects of climate change are more visible and trigger a sense of urgency in terms of finding alternative livelihoods.

CLIMATE CHANGE AND SOCIO-ECOLOGICAL DYNAMICS

Ahuachapán has historically suffered the impacts of nature-based phenomena, especially those involving extreme weather and rainfall. [20]Hurricane Mitch, which struck El Salvador in October-November 1998, was one of the most powerful and deadly tropical hurricanes to have hit Central America in recent decades, causing thousands of deaths and disappearances. The storm set off alarms for the entire region regarding the powerful consequences of climate change, highlighting the many vulnerabilities and limited capacity of states in terms of prevention, mitigation, and response. The heavy rains from Hurricane Mitch led to flooding and landslides in Ahuachapán, destroying the department's infrastructure and causing millions of dollars in losses. Mitch was followed by tropical depression Adrián (May 2005), which particularly damaged coffee crops in the municipalities of Ataco and Tacuba; that same year, tropical storm Stan swept through coastal municipalities, followed by tropical depressions Alma (2008), Ida (2009), 12E (2011) and tropical storm Agatha (2010).[21]

The most recent high-impact weather events in El Salvador have been storms Amanda and Cristóbal (May-June 2020).[22] Households in coastal areas and the volcanic mountain range or *cordillera* bore the brunt of the damage. In Ahuachapán alone, floods and landslides affected 1,459 families, causing losses in agricultural production.[23] These massive storms occurred following a period of prolonged drought in the department. The year 2015 witnessed one of the most severe droughts in the country's history—50 days without rain. This impacted the cultivation of basic grains, cattle ranching, access to drinking water, and energy production, all posing a threat to human health.[24]

According to a representative of the community-based Agricultural Landscape Management Committee (ACOGESPA), the effects of all the extreme weather events demonstrate Ahuachapán's vulnerability to climate change. ACOGESPA is a voluntary, participatory local institution of agricultural promoters, social

facilitators, farmers, local organizations, and others who manage, promote, and play a role in decision making aimed at "Restor[ing] the Agricultural Landscape." The association is made up of 130 territorial leaders, 62 from the northern zone and 68 from the southern zone of the department.

During 2022, according to one community representative, "disasters hurt the economies of farming families. Several lost 15-60 percent of their crops."[25] The situation is especially discouraging for smallholders. "People lose motivation when they lose everything. I thought, 'Lord, don't let another hurricane come, because it's going to destroy the little I have left.'"[26] For farmers who rent land, production losses mean even greater indebtedness, as they have to borrow simply to cover the cost of rent.

Beyond the direct, immediate impacts of climate-related disasters, farmers are conscious of long-term environmental threats concerning (a) soil quality, mainly due to erosion, the use of agrochemicals and poor agricultural practices; (b) the availability of quality water resources, due to the lack of protection of water recharge zones, the loss of the soil's absorptive capacity, inadequate or non-existent sewage management leading to the contamination of rivers and lakes; and (c) deforestation.

"Members of the group also believe that, even if the dynamics of climate differ from zone to zone, the response to environmental problems must derive from a vision that encompasses all of Ahuachapán as well as neighboring departments."

Farmers also express concern about the psychosocial impact on people who face great uncertainty about how meteorological phenomena will affect their lives and means of production, nutrition, physical security, and homes each year. "Being there, just waiting for something to happen, for a disaster to happen, affects their health, both emotionally and physically…there are people who already suffer from allergies, respiratory and intestinal diseases, all kinds of things." The damage caused by these events leads farmers to lose hope in their livelihoods: "It discourages them from wanting to continue growing crops when they see how hard the disasters hit, or because they just keep losing."[27] This uncertainty encourages the idea of migration, especially among the young.

GOVERNANCE, CLIMATE RESILIENCE, AND SOCIAL COHESION

Leaders of ACOGESPA see climate change and its effects as a "red alert" that forces them to prepare. They have concluded that the organization and construction of a territorial identity that transcends a particular community or canton is essential to dealing with the effects of a changing climate. Members of the group also believe that, even if the dynamics of climate differ from zone to zone, the response to environmental problems must derive from a vision that encompasses all of Ahuachapán as well as neighboring departments. Likewise, the group values the promotion of inclusive leadership in which men and women, adults and young people, participate in decision making and collective action.

"Governance is built through strengthening community organization, training, developing a training and informative curriculum that reflects the needs and expectations of residents, and the scaling up of programs that add to and enhance pre-existing organizational efforts."

The term "governance" has become part of the vocabulary of daily life thanks to the inclusive vision of the territories held by those who live there, their leaders and organizations. The term itself evokes shared decision making at the local level. Governance is built through strengthening community organization, training, developing a training and informative curriculum that reflects the needs and expectations of residents, and the scaling up of programs that add to and enhance pre-existing organizational efforts.

The Raíces project has fostered collective action among local actors around the common objectives of strengthening agricultural livelihoods and human security, restoring natural resources, and strengthening the local economy to generate employment. For project implementers and partners, promoting inclusive participation through transparency in decision making and action is key. In the words of one participant, "When people's opinions are taken into account and they are respected, people are motivated to take part."[28] An important aspect of Raíces involves the prior organization of communities, something that must be recognized as well as strengthened. As noted by a participant, "in one way or another, the organizational aspect always happens at the

community level. [People organize] in their own way and with the resources they have. Some actions are already underway. That is, they are not limited to whether or not [Raíces] exists."[29]

Stakeholders consulted said that constant dialogue has helped to consolidate a vision of natural resource conservation through agroforestry, by which the planting of crops and trees occurs sequentially and according to practices that conserve the soil.[30]

Regardless of the project or sponsoring institution, the promotion of social cohesion and social capital is key. Participation must reinforce identities—for example, as a rural inhabitant or farmer—and foster linkages among leaders, farmers, and those in different territories. Projects which encourage identification with the projects themselves or with the sponsoring institutions can, by contrast, lead to disempowerment; this is because the status of participants among local actors and other community members may diminish or disappear altogether when the project concludes. Organizational power must be situated at the local level.

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A consensus has emerged that various projects, including Raíces, have contributed to the fostering of organized participation, thereby generating capacities in the population. According to a project leader, "Other programs also contributed to and generated certain capacities…this was reflected by the fact that people were already able to do certain things."[31] In addition, recognizing and promoting the rights of young people has been vital. This means overcoming an adult-centric paradigm, devising and implementing programs that not only are sustainable but also respond to young people's views. As one participant indicated, "we need to stop thinking that young people are not interested in issues such as water. Instead, we need to approach things through dialogue and, together with the kids, think about and formulate what comes next."[32]

Various local actors acknowledge that local governments play a fundamental role in coordination efforts. Notwithstanding their

proactive participation, however, they have not developed their own strategy regarding environmental, climate change, or agricultural landscape recovery issues. This means that the actions of local governments are largely reactive vis-à-vis projects that reach the territory. In the words of one participant, "The mayor's offices do not have a specific plan for these issues. In practice they do things as the occasion arises, but there is no real planning and therefore no follow-up."[33] Furthermore, respondents expressed concern that actions promoted at the local level may be politicized by adherents of a particular political party, something that discourages and weakens broad-based participation.

Governance and resilience at the community level intersect with issues of water management and the protection of surface water and underground aquifers. Although water oversight boards (*juntas de agua*) already operated in each community, the scaling up of these boards through the establishment of water committees (*mesas de agua*) and of representative, inter-institutional oversight committees premised on inclusion and constant dialogue, have bolstered participation in the boards as well as leadership capacity and the ability to influence decision making. According to an interviewee, one community objective is to secure protected status for the Laguna Verde area. "Creating the water committee has served to strengthen the capacities of each of the participating water boards and to support the committee overseeing the waters of Laguna Verde."[34]

The effort to protect Laguna Verde has involved leaders, young people, and institutions nationwide. Fostering inter-generational exchange has been a central principle.

PROTECTING FORESTED AREAS OF THE LA MONTAÑONA MICRO-REGION, DEPARTMENT OF CHALATENANGO

The department of Chalatenango is situated in northern El Salvador. To the north is the Sumpul River delineating the border with Honduras; to the south are the departments of San Salvador

and Cuscatlán; to the southeast, the department of Cabañas; to the southwest, the department of La Libertad; and to the west, the department of Santa Ana. Chalatenango covers an area of 2,017 square kilometers and is home to more than 200,000 inhabitants. It was established in 1855 and its capital is the eponymous municipality. The department is subdivided into 33 municipalities, each of which is administered by a municipal council and a mayor, elected every three years.[35]

Chalatenango's territory ranges from 100 meters above sea level (the Cerrón Grande reservoir) to mountains that are 2,730 meters above sea level (Cerro El Pital). The climate is quite humid and cool in the higher altitudes and warm and dry in the lower ones. There are cloud forests and large green areas in the highlands as well as thermophilic forests (that grow best in warm temperatures) and arid land in low-lying regions. The department's hydrography includes fifteen rivers, one of which is the Lempa, the most important in the country given its significant water volume and the presence of two hydroelectric dams. Chalatenango is thus strategic in terms of national development: it is El Salvador's largest provider of water resources as well as energy.[36]

La Montañona is in the mountain range that crosses northeastern El Salvador through the departments of Santa Ana and Chalatenango. It is in the center of a micro-region which comprises the municipalities of Concepción Quezaltepeque, Comalapa, La Laguna, El Carrizal, Chalatenango, Ojos de Agua, and Las Vueltas. La Montañona was created in 1993 through the Land Transfer Program (*Programa de Transferencia de Tierras*, PTT), an element of the 1992 peace agreement that granted property rights to former combatants of the Farabundo Martí National Liberation Front (FMLN). Initially, around 15 families settled in an area of approximately 11 hectares of pastureland belonging to a former plantation. Each family received a plot with forested land as well as an area for a home. However, some of these families decided to sell their rights to the forested section.[37]

The municipality of El Carrizal, part of the La Montañona micro-region, is one of eight large, critical areas of the country susceptible to landslides that can cause deaths and damage to infrastructure. The impact of climate change is an even greater concern considering that Chalatenango is the department with the second-highest percentage of homes in El Salvador that are highly vulnerable to natural disasters (53.79 percent).[38]

Landslides generally occur during the rainy season, between May and October. Rain adds to the weight of the soil; it also causes erosion and mineralogical changes that detract from the soil's resistance, making collapse more likely. Among the most notable landslides triggered by rainfall between 1982 and 2012 are the ones that occurred in the canton of Vainillas and the settlement of El Camalote, municipality of El Carrizal, Chalatenango.[39]

Living Conditions in the Territories of Project Implementation

According to the World Food Program's 2018 study of livelihoods,[40] most of the municipalities in Chalatenango depend on the production of staple crops such as corn, beans, and sorghum, grown during the agricultural cycle that runs from May to August. This activity generates a high demand for labor and allows families to generate income over and above production for their own consumption. Families also frequently raise poultry for their own consumption and for sale on holidays. Cattle-raising, mainly during the rainy season, also creates jobs. Remittances from abroad have also become an important complement to the family economy, used to purchase consumer goods and services.[41] As told by a project leader "Many people don't see agriculture as profitable, but rather as a means of subsistence or family consumption, so they look for work elsewhere, for the most part in brickwork and hardware stores. There is a great boom in Chalatenango, above all due to remittances, and a lot of construction is underway."[42]

Within the microregion, the La Montañona forest is a key element of territorial integration, as various communities and municipalities share the resource and all depend on water from the forested area.[43] This integration has led to a certain level of cooperation in the search for sustainable forest management.[44] "The objective is to conserve the wooded areas so that the agricultural frontier does not advance any further; and where it does advance, farmers should at least use good practices so that the effects are reduced. The seven municipalities have agreed on this goal thanks to international cooperation."[45]

The issue of water management has generated broad-based participation. La Montañona is located in the Lempa river basin and specifically in the sub-basins of the Tamulasco, Azambio, Motochico and Sumpul rivers. The forests of La Montañona serve as the source for these rivers and are very important in the collection, absorption, and storage of water throughout the year, including by supplying the rivers during the dry season.[46]

CRS has long-time alliances with Cáritas El Salvador and its office in Chalatenango, as well as with the La Montañona micro-region. Projects using the ASA approach had been implemented previously in order to determine how ASA practices improve agricultural yields and become established in the territory, under what conditions and with what results.

The Raíces project in Chalatenango served as an opportunity for CRS and the U.S. Agency for International Development (USAID) to support communities whose food insecurity and economic vulnerability were aggravated in 2020 by 1) the COVID-19 pandemic; 2) the tropical storms Amanda and Cristóbal that slammed El Salvador in quick succession in May and June; and 3) the hurricanes Eta and Iota in November. The storms damaged the land and crops. Before the storms, according to one resident, "there were places that had had weeks of moderate drought, according to the Ministry of Agriculture and Livestock. After that there came three or four days of heavy rain. In one municipality

Cerro El Candelero stands tall in Dulce Nombre de María, Chalatenango, El Salvador. Photo Credit: Esther Sorto/Unsplash

fully 218 millimeters of water fell in 48 hours. The huge amount of water was bad for the crops."[47]

Project leaders knew that, in addition to the storms, the population had been deeply impacted by five years of drought and diminishing water levels. Combined with soil degradation due to poor agricultural practices, production declined. "Almost all of El Salvador is part of the Central American Dry Corridor," noted one leader. "Obviously this affects not only agricultural production, but also [water] security."[48] CRS began work with its main partner in the La Montañona micro-region, which covers the aforementioned seven municipalities. Cáritas Chalatenango included four additional municipalities: Dulce Nombre de María, San Fernando, El Paraíso and San Francisco Morazán.

"If we do the math, we don't even cover our production costs…There are really no other jobs available, because here in Chalatenango there is no industry. Only temporary work. Employment in construction has increased a little…but for most people, migrating is the way to improve their economic situation."

Climate Change and Socio-Ecological Dynamics

Farmers in recent years have faced production losses that have led to decreased profits and greater food insecurity, both for families and the community in general. Added to these challenges is the problem of debt when farmers grow crops on rented land and/or borrow money for agricultural inputs. Said one participant, "with all the problems—high winds, drought—those who lose their crop are the ones who suffer directly. But prices go up for all of us. There is also the disappointment that stems from wanting to work the land, but the effects of climate change keep us from producing what we want. That's a disincentive to continue farming."[49] These concerns are similar to those expressed by farmers in Ahuachapán.

Some community leaders have been forced by circumstance to abandon agriculture merely to survive and pay off debts. Some have found temporary jobs in the booming construction sector in the zone. Those who do not find an alternative income opt to migrate, including many young people who no longer see farming as a means of making a living. The same is true of adult heads of households who migrate, leaving behind children and the elderly. The situation was summed up as follows:

"Most young people here have migrated. There are no jobs right now [but] we are working hard on the issue of agriculture. We're worried about the price of inputs we need in the fields and the cost of living relative to what we earn from our produce. If we do the math, we don't even cover our production costs…There are really no other jobs available, because here in Chalatenango there is no industry. Only temporary work. Employment in construction has increased a little…but for most people, migrating is the way to improve their economic situation."[50]

Circumstances are so difficult that some of those who have given up and migrated include project participants. This represents a loss of the knowledge and best practices people have acquired, including the loss of knowledge transfers to their communities. The social fabric is weakened as a result. "Up until a month or so ago, 16 percent of participants—many of them good leaders—had abandoned the project and migrated. So the social fabric continues to deteriorate."[51]

GOVERNANCE, CLIMATE RESILIENCE, AND SOCIAL COHESION

The Raíces project aims to strengthen agriculture while accounting for the characteristics of the territories as well as the difficulties described, such as participation, soil and water resources, and the effects climate change. Promoting climate resilience is critical; resilience can be defined as enabling a system to cope with the consequences of climate change, through self-organization, the

"Promoting climate resilience is critical; resilience can be defined as enabling a system to cope with the consequences of climate change, through self-organization, the building of capacity to learn and adapt, while working to prevent the effects of climate change from worsening."

building of capacity to learn and adapt, while working to prevent the effects of climate change from worsening.[52] For project participants, facing and preventing these impacts depend to a large extent on the degree of social cohesion and governance in the community and between the micro-region and other local and external actors. "People have seen that if they are not organized, support will not come. As the saying goes, there is strength in unity…People can see that when they are organized, the benefits for the community are greater. Our need is forcing us to associate, to stick together, to support each other."[53]

Project participants indicate that the provision of information as well as accompaniment during the learning process are essential aspects of implementing climate resilience practices. Participants say that although there were initial difficulties in implementing alternative agricultural and water-related measures, the processes themselves and the eventual results have strengthened social cohesion, both through existing social ties and by generating consensus among members as they mount a response to a shared problem. "We have a motto," said one participant. "I learn, I practice, and I teach. That is one of our formulas. I go there to learn. I practice it in my field, and I teach it to my peers, the other farmers."[54]

With respect to climate resilience actions focused on agriculture, the first task is to evaluate the soil. Typically, it has been degraded by years of burning of crop residues and by the application of chemical fertilizers and pesticides. Then the focus is on preparing the land for sowing, fertilizing, harvesting, and improving the land for the next agricultural cycle. "The idea is to renew our agriculture; it is no longer just about sowing seeds and then that's it. You have to take care of the plants, take care of the land, which is the hardest part. But we've made progress, we're doing well."[55]

Farmers have identified some of the best practices they have learned for taking care of the land and obtaining higher crop yields. These include determining the soil condition so as to apply the

appropriate fertilizers; using "green" fertilizer from legumes such as jack beans and the stubble from the previous harvest, which put nitrogen back into the soil; collectively purchasing inputs for the preparation of organic fertilizers and insecticides; and adding these to the soil at the time of planting, not when the seedlings emerge. That way, the fertilizer and insecticide are not washed away with the first rains but instead, are fully absorbed.

Through these practices farmers have been able to reduce spending on inputs that did not necessarily improve production. In addition, they have improved both the quantity and quality of crop yields in each production cycle.

"We are saving on fertilizers, reducing costs, and improving the soil. Water infiltration is better. There are many advantages. Using fertilizer when we sow costs a little more, but if we look at the numbers, how many *quintales* of fertilizer do we throw away when we sow? We start by analyzing the soil to measure acidity and decide how much lime should be added to balance it. This can't be done with only one, two, or three applications, it's a process… The experience we've had in La Montañona has shown us that over time we are improving the land, the absorption, and the plants yield more and better crops…It is much less expensive to do things this way and the production has increased."[56]

The issue of governance is more evident with respect to water: through successful organization, the community has ensured that most homes now have running water. This achievement is the result of multiple factors, including previous projects undertaken in the micro-region and by municipal mayors. Inclusive participation in decision making has been crucial, through the formulation of clear governance mechanisms—such as the convening of general assemblies, the drafting of official records that the entire community agrees on, and the updating of association by-laws.

Additional steps are still needed to ensure sustainable access to water. The Montañona and its forests constitute the source

of the water recharge for seven municipalities. Hence, efforts to care for the area must be coordinated among them. Likewise, the communities recognize the importance of treating the wastewater generated by each home, which ultimately returns to the zone's aquifers. Although wastewater treatment is crucial to maintaining a supply of drinking water of sufficient quantity and quality, currently no wastewater treatment is taking place. Wastewater from domestic uses, such as bathing and the washing of cookware and clothing, is discharged directly into the street. This can become a source of disease. And the soil ultimately absorbs the substances wastewater carries. Residents indicate that they are working to obtain support for the installation of filters in each home and acknowledge the interest of institutions such as the Ministry of Health.

"Successful projects that have improved the capacity of local farmers to act in an organized fashion and that have strengthened leadership skills have generated a sense of belonging to the territory. This has contributed to a comprehensive vision of environmental resource management—not just at the community level, but for the entire micro-region."

Local residents are also worried by the yearly advance of the agricultural frontier towards the mountains, which signifies that people are planting crops at the expense of the forest. As a result, communities are strengthening agroforestry initiatives through the planting of local tree species that help with forest regeneration. A significant proportion of protected forest area is located on private property. This means reaching agreements with landowners so that they can derive some economic benefit from the forest without degrading the area. Owners, too, share responsibility for taking care of the forested area and assuming the costs of its upkeep.

LESSONS LEARNED REGARDING GOVERNANCE AND CLIMATE RESILIENCE

Addressing climate change is an urgent task. Meeting this challenge requires understanding the governance and climate resilience mechanisms in each specific area. These are of the essence in developing efficient production systems, diversifying livelihoods, ensuring adequate living standards, and protecting the environment. The two case studies discussed in this chapter have aimed to identify the dynamics that facilitate or restrict community participation in local decision making on issues of resilience or adaptation.

It is important to recognize that the participation of residents in both departments is primarily the result of their own organizational capacity. This helps explain the establishment of committees such as ADESCOs, or water boards. Over the years, these organizational spaces have been strengthened—as well as weakened—by projects sponsored by both governmental and non-governmental organizations.

Successful projects that have improved the capacity of local farmers to act in an organized fashion and that have strengthened leadership skills have generated a sense of belonging to the territory. This has contributed to a comprehensive vision of environmental resource management—not just at the community level, but for the entire micro-region. The construction of a common language—through training, information, continuous education, and putting lessons into practice—has been fundamental. Also important has been the scaling up of organizational capacities, beginning with pre-existing organizations in each area, and the mapping of actors present in each territory. Such scaling has created new spaces for nurturing transparent and fruitful relationships, transferring technologies and knowledge, influencing programs and plans, and creating value chains for the marketing of produce.

"Strategies for the recovery of the agricultural landscape and for food and water security incorporate soil care; the local preparation and use of organic fertilizers and pesticides; the protection of forested areas and local ecosystems; advocacy on behalf of expanding protected areas (the forest, in Chalatenango, and Laguna Verde, in Ahuachapán); and the diversification of livelihoods, among others."

For external actors, the challenge for achieving sustainable participation over time is to understand the specific dynamics in each territory with respect to land tenure, natural resource management, pre-existing forms of association, and the ways in which power is exercised. For residents of each territory, the challenge is to be open to new ways of farming, caring for the forest, and relating to the environment, and to include women, the young, and children in decision-making processes. This means promoting generational diversity and intergenerational dialogue.

This chapter has identified the actions farmers have undertaken to achieve climate resilience as well as the strategic partners that have supported these efforts. In both Ahuachapán and Chalatenango, the approach has involved the incorporation of

An elderly fruit vendor awaits customers at a local farmers' market. Photo Credit: 2319897781/Shutterstock.com

agricultural knowledge, the generation of a learning community, and the promotion of informed participation as the foundation for decision making. Strategies for the recovery of the agricultural landscape and for food and water security incorporate soil care; the local preparation and use of organic fertilizers and pesticides; the protection of forested areas and local ecosystems; advocacy on behalf of expanding protected areas (the forest, in Chalatenango, and Laguna Verde, in Ahuachapán); and the diversification of livelihoods, among others.

Both departments count with an extensive presence of governmental and non-governmental institutions that work on environmental, climate change, and water resource management issues. This makes it crucial to think through the strategy that each of them has adopted, the way they seek to position themselves vis-à-vis decision-making structures, the principles that undergird their actions, and their impact on the social fabric and the creation of social capital. Also important is the relationship they establish with community-based organizations and local residents. One key take-away from this inquiry is that actions based on a paternalistic or welfare-oriented (*asistencialista*) approach, or that are implemented in a disjointed, biased manner without taking into account the specific characteristics of the territories, negatively impact governance in the face of climate change.

Finally, community organizations attempting to influence decision making on local climate resilience face both opportunities and limitations. El Salvador has made significant progress in

strengthening the regulatory and institutional framework that makes it possible to address the effects of climate change in a timely and efficient manner. That said, the economic resources and the capacities of state institutions—and, above all, municipalities—are insufficient to deliver results of the scale and magnitude needed. To this is added the uncertainty regarding the recently approved Special Law for Municipal Restructuring that reduces the municipalities from 262 to 44. Community leaders remain wary of the possibility that their organizations and actions—which seek to open spaces for influencing how environmental resources are managed—may be coopted or politicized by political actors for their own ends.

NOTES

1 United Nations, Framework Convention on Climate Change.
2 Ministry of Environment and Natural Resouces (MARN), *Evaluación de Vulnerabilidad*.
3 Eckstein and Schäfer, *Global Climate Risk Index*, 42-45, table 4.
4 *Ley del Medio Ambiente*, 1998.
5 MARN, *Plan Nacional*.
6 United Nations, *Paris Agreement*.
7 FAO, *Dry Corridor*.
8 MARN, *Evaluación de vulnerabilidad*.
9 For purposes of gathering information, the authors carried out semi-structured interviews and reviews of the available documentation. Six interviews were conducted, three in each territory. Raíces project implementers and community leaders participated in the interviews. To coordinate the information-gathering phase, we prepared a fact sheet about the study, an interview script, and an informed consent form. We made initial contact with the director of the CRS agriculture unit, who facilitated contact with the managers and coordinators of each project. After that, we planned field visits and interviews. For ethical reasons, we explained the objectives of the study, the uses to be made of the information, and the scope of each respondents' participation, using an informed consent form which stated that their participation was voluntary and that the information provided would be handled anonymously and confidentially. We requested authorization to record the interview and take photos. We made it clear that answering questions or being part of a focus group would not lead to a direct benefit or a negative effect, and that interviewees were free to ask questions about their participation at any time during or after the activity. Respondents were then asked to sign the informed consent form.
10 FAO, *Dry Corridor*.
11 Castillo Sanguino, *Fenomenología*, 7-18. A phenomenological approach investigates the everyday experiences of human beings while suspending the researchers' preconceived assumptions. It studies lived experiences to gain deeper insights into how people understand their own experiences.
12 Dirección General de Estadística y Censos, *Encuesta*.
13 Ferrufino, Gutiérrez, and Zeledón, *National Plan*.
14 Dirección General de Estadística y Censos, *Encuesta*.
15 World Food Program, *Medios de vida*.
16 MARN, *Áreas naturales*.
17 UNESCO, *Man and the Biosphere*.
18 Interview 1 - Ahuachapán, April 17, 2023.
19 Ibid.
20 PRISMA, *Dinámicas*.
21 Ibid.
22 United Nations Office for the Coordination of Humanitarian Affairs (OCHA), *Panorama de impacto*.
23 United Nations, *El Salvador*.
24 MARN, *Plan nacional*.
25 Interview 3 - Ahuachapán, April 21, 2023.
26 Ibid.

27 Ibid.
28 Ibid.
29 Interview 2 - Ahuachapán, April 21, 2023.
30 Pavón et al., *Sistema agroforestal*, 14-20.
31 Interview 2, April 21, 2023.
32 Interview 1 - Ahuachapán, April 17, 2023.
33 Interview 2, Ahuachapán, April 21, 2023.
34 Interview 3 - Ahuachapán, April 21, 2023.
35 Alemán, Misael. *ChalatenangoSV*.
36 FUNDE, *Desarrollo Económico*.
37 PRISMA, *Inventario participativo*.
38 MARN, *Informe Nacional*.
39 Ibid.
40 World Food Programme, *Chalatenango Livelihood Map*.
41 CRS, *Study on Migration*.
42 Interview 4 - Chalatenango, April 17, 2023.
43 PRISMA, *Gestión territorial*.
44 PRISMA, *Inventario*.
45 Interview 6 - Chalatenango, April 22, 2023.
46 PRISMA, I*nventario*.
47 Interview 4 - Chalatenango, April 17, 2023.
48 Interview 5 - Chalatenango, April 18, 2023.
49 Interview 6 - Chalatenango, April 22, 2023.
50 Ibid.
51 Interview 4 - Chalatenango, April 17, 2023.
52 Gunderson, and Holling, *Panarchy*.
53 Interview 6 - Chalatenango, April 22, 2023.
54 Ibid.
55 Ibid.
56 Ibid.

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Rural Honduran homes amid the lush cloud forest vegetation of Sabana Grande, Honduras. Photo Credit: Alex McCarthy/Unsplash

4 CLIMATE RESILIENCE AND LOCAL GOVERNANCE IN HONDURAS

ARNE KRISTENSEN

Aerial view of natural landscape in Santa Cruz de Yojoa, Honduras. Photo Credit: Esteban Benites/Unsplash

INTRODUCTION

Honduras is a land of breathtaking nature and rich cultural heritage, from the untamed beauty of the Mosquitia region, one of the largest rainforest areas in Central America, to the Mayan ruins and the Bay Islands, surrounded by the world's second-largest coral reef. The unique geographical location between the two oceans holds a rich biodiversity, fertile farmland, rivers, mountains, and a diverse array of Indigenous peoples and ethnic groups. Honduras is also vulnerable to extreme weather events, such as the two hurricanes, Eta and Iota, which devastated the region in 2020. The south and southwest regions within the Central American Dry Corridor often suffer from irregular rainfall and drought, and the whole country has long experienced forest fires during the dry season. Over the last decade, the tropical rainforest of La Mosquitia has seen increased deforestation, cattle ranching, and drug trafficking.

When addressing climate change, it is important to distinguish between a country's exposure to climate change and its resilience or ability to cope with the consequences. The World Risk Index ranked Honduras 29th out of 193 nations in 2023.[1] The index does show high exposure to extreme weather events. Still, the country's lack of capacity to cope and adapt—due to the absence of structural conditions, resilience, and resources to mitigate extreme events—worsens the ranking. Other countries are more exposed but rank better due to higher resilience and capacity. The Global Adaptation Initiative Index arrives at similar conclusions. It ranks Honduras 113 out of 185 countries in climate change *vulnerability*

but a far lower rank of 177 out of 192 in *readiness* or ability to deal with climate change and improve resilience.[2] Thus, while Honduras is exposed to risk, the situation is worsened by low resilience and capacity to deal with climate change, again pointing to low levels of capacity in governance. This chapter explores the relationship between climate resilience and local governance, focusing on the department of Olancho at the edge of the Mosquitia region and the department of Lempira within the Dry Corridor. The study assesses socio-ecological challenges, vulnerability, resilience, and how a fragile context influences local governance.

Focus of the Study

The case studies in Olancho and Lempira are based predominantly on individual and group interviews with local community leaders to identify problems, strategies, and lessons learned. In eastern Olancho, three communities were visited: Mata de Maíz and Subirana on the edges of the Río Plátano Biosphere Reserve and Capapán in the Patuca National Park. Three communities—La Virtud, Mapulaca, and Virginia—were visited in the western department of Lempira along the border with El Salvador. The community visits were conducted with local NGOs with knowledge of the regions.[3] Group meetings were held with 5-40 community leaders, and individual sessions with local leaders or technical experts. These interviews helped identify the community's history, challenges, and local structures and initiatives.

"This study examines the relationship between climate initiatives, resilience, and governance. However, by linking these concepts, we also risk diminishing other factors that affect governance and climate resilience, such as under-resourced public institutions, polarization, corruption, violence."

This study examines the relationship between climate initiatives, resilience, and governance. However, by linking these concepts, we also risk diminishing other factors that affect governance and climate resilience, such as under-resourced public institutions, polarization, corruption, violence, and many more. Considering this complexity, we should exercise caution in reaching definitive conclusions about causalities and correlations between climate initiatives and the building of governance. There is also complexity related to establishing the direct societal consequences of climate change without addressing other factors. For example, the

destructive force of a hurricane is apparent to anyone. Still, poor preventive measures or emergency response can end up affecting more people than the actual disaster. Climate change can lead to migration, but so can multiple other factors. That said, climate change usually exacerbates existing societal problems and exposes the lack of resilience, capacity, and good governance.

CLIMATE CHANGE, VULNERABILITY, AND RESILIENCE

Honduras is often categorized as highly exposed to climate change; vulnerability is further worsened by the lack of resilience and capacity to mitigate the consequences of climate change. The Climate Risk Index identifies the countries most affected by weather-related loss events over a 20-year period. Thus, until 2018, Honduras often ranked as one of the most affected countries, partly due to the unparalleled destruction of Hurricane Mitch in 1998, as this event remained within an accumulated 20-year data period. However, once Hurricane Mitch was no longer within the 20-year data period, Honduras was given a much lower ranking. In the most recent survey from 2000 to 2019, Honduras "only" ranks as the 44th most affected nation of 180 countries.[4] However, a newer Climate Risk Index, including the 2020 hurricanes, has not yet been published. The country often experiences tropical storms and heavy rainfall during the rainy season, causing river flooding and damage. In addition, small-scale farmers suffer from irregular rain patterns and prolonged periods of drought.[5] The damaging effects of deforestation, forest fires, water shortages, and pollution also add to the climate and environmental challenges.

"The arrival of a new center-left government in 2022 raised expectations that the climate agenda would be better addressed. However, though new initiatives have been launched, the task is still overwhelming."

To some degree, Hondurans have become accustomed to living with these risks. They build up a certain toughness as individuals attempt to navigate and overcome these challenges. Still, considering the known risks, the need for a more comprehensive nationwide climate response seems obvious. A recent report from the Organization for Economic Cooperation and Development (OECD) underscores Honduras' vulnerability:

> "Resilience to shocks, as highlighted by the COVID-19 pandemic and climate-related hazards, is low and puts the country in a vulnerable position. (…) Challenges in public governance are at the root of such outcomes. Corruption and capture of institutions by vested interests further divert resources and distort investments away from public services, foster inequalities, and ultimately limit the accumulation of human capital, pushing many to migrate."[6]

The arrival of a new center-left government in 2022 raised expectations that the climate agenda would be better addressed. However, though new initiatives have been launched, the task is still overwhelming.

Hurricanes and the "Second Disaster"

Honduras has long been vulnerable to hurricanes, with the devastating Hurricane Fifi (1974) and Hurricane Mitch (1998) as historical reference points. A report with a historical perspective on disasters in Honduras finds that the 2020 hurricanes, Eta and Iota, caused 95 deaths, affected 3.9 million people, and caused damage of about $2.1 billion, or about 9 percent of the country's GDP.[7] Natural disasters will also reveal a country's lack of emergency preparedness or capacity shortcomings, sometimes referred to as the "second disaster." Expert in disaster management David Alexander argues that reducing a natural disaster to simply a weather event is a mistake. The overall catastrophe is also a product of poor preventive measures, poor infrastructure, and poor disaster response, all of which can start a domino effect. He argues that "the secondary disaster could be worse than the primary one." The hurricane causes the initial flood; the flood might fill unprotected buildings, after which wrongly placed generators in basements are damaged. The lack of electricity then affects communication, causing help to arrive late, and so on.[8] The 2020 hurricanes exposed vulnerabilities already well-known from Hurricane Mitch over two decades earlier. Alexander argues that poor governance undermines an effective disaster response:

"Reducing a natural disaster to simply a weather event is a mistake. The overall catastrophe is also a product of poor preventive measures, poor infrastructure, and poor disaster response, all of which can start a domino effect."

> "People, governance, democracy, and livelihoods are weakened by a disaster, and this leaves them vulnerable to exploitation. (…) Corruption is a major factor in weakening efforts to bring the problem of disasters under control."[9]

In 2020, people criticized the government's poor disaster response, yet some politicians tried diverting attention from their responsibility and instead blamed climate change.[10] Such a lack of accountability further erodes public trust in authorities.

Conflicts over National Resources

"As we explore the link between climate issues and governance, we should not forget how many conflicts relate to access to, or control of, national resources."

As we explore the link between climate issues and governance, we should not forget how many conflicts relate to access to, or control of, national resources. These conflicts might not be directly linked to climate change in a traditional sense, but the pressure on natural resources can make matters worse. Since the murder of environmentalist Berta Cáceres in 2016 and until 2021, at least 48 environmental or human rights defenders were killed.[11] One of the longest-standing conflicts is in the fertile Bajo Aguán region, with land disputes and water rights struggles between local farmers and large landowners, large-scale agriculture, and mining companies. Such complex conflicts are often rooted in a history of insufficient land and agricultural reforms, land disputes, and the interests of the economic and political elite.[12] Such conflicts are likely to continue when violence and killings go unpunished and when there is impunity for environmentally related crimes. The weak mediating role of the state and the inability to find solutions to such conflicts are clear examples of poor governance. Unsolved conflicts and impunity add to the distrust of authorities. Therefore, climate initiatives should focus not only on practical or technological solutions but also consider elements of dialogue, mediation, and the reduction of impunity.

The Urban-Rural Divide and the Political Divide

"Smaller local or provincial NGOs have a rural presence and are likely to have a more cost-efficient setup than large international agencies and NGOs in the capital."

The urban-rural divide also tells a story about governance and priorities. Many community members said they felt forgotten by this government and the ones before it. About 45 percent of the 9.6 million Hondurans live in rural areas,[13] where poverty is often higher and where there are fewer public services, jobs, opportunities, and resources to address numerous needs. If rural development remains a low priority, migration from these areas will likely continue. As international actors engage in rural and climate-related interventions, they must consider with whom to partner. Smaller local or provincial NGOs have a rural presence and are likely to have a more cost-efficient setup than large international agencies and NGOs in the capital. These smaller organizations might lack experience with international donors, but funds for rural climate adaptation might last longer if donors are more flexible.

International actors should also be aware of the dominant political polarization in Honduras since the 2009 coup d'état. This polarization is not only found among the political actors but also among Honduran civil society organizations, especially in the capital. Some NGOs sympathize more with one political wing and might therefore be perceived as politically biased by societal actors sympathizing with or belonging to the other wing. NGO networks and alliances also tend to group along the political divide and leading NGOs tend to distrust one another. It might not seem extraordinary to have civil society organizations with ideological differences criticize one another. Still, it sometimes seems as if the perceived political association carries much more significance than the primary shared identity as *civil society* organizations. International actors need to be aware of this, take an inclusive approach, and engage a diverse group of civil society actors. This can help bridge the political divide and rebuild trust while exposing international actors to a broader range of views and capacities in civil society. Some foreign donors tend to have their "favorites" within civil society and remain partly unaware of the polarization within civil society and other NGOs' valuable skills and experience.

GOVERNANCE AND CLIMATE ACTIONS IN A FRAGILE CONTEXT

The levels of governance, institutional capacity, fragility, and corruption influence a country's ability to assemble a comprehensive climate change response. A country like Honduras has less adequate infrastructure, financial resources, and technology to cope with extreme weather events than more developed nations. A good climate response also requires regulatory frameworks, structural capacity, and public support. Though the Honduran climate debate is advancing, other competing issues, such as employment, healthcare, education, corruption, and security, are perceived as more important by the general public.[14]

Fragility and Vulnerable Institutions

A recent OECD report provides a detailed analysis of Honduran governance and concludes:

> "Despite improvements in some policy areas, (…) Honduras still faces critical challenges and ranks behind its regional peers in several dimensions. Major inequalities, social exclusion, and low trust represent common denominators in public life. (…) Access to and quality of services and infrastructure are low and unequal, especially for rural communities."[15]

The report indicates that low trust in public institutions is a significant challenge for building governance and democratic practices. The well-known development indexes reconfirm the governance challenges. The Fragile State Index (FSI) shows no notable progress since Honduras' 2009 coup d'état.[16] In the years before the coup, the score was 75-77 points, and in 2023, an almost identical 79.6 points.[17] The Democracy Index score fell from 6.18/10 in 2008 to 4.98/10 in 2023.[18] The Worldwide Governance Index also reveals similar or lower scores,[19] while Freedom House marks a slight improvement in 2023 compared to 2008 on political rights and civil liberties.[20] Historically, the collusion between state

A pregnant woman is carried out of an area flooded by water brought by Hurricane Eta in 2020. Photo Credit: 1848872398/Shutterstock.com

institutions, politicians, and organized crime has fueled public distrust.[21] In 2022, the former president of Honduras and long-time U.S. ally, Juan Orlando Hernández, was extradited to the United States and later convicted of taking bribes in exchange for facilitating tons of cocaine shipments to the United States.[22] In 2023, only 20 percent of the population were satisfied with democracy.[23] Poverty, unemployment, crime, and poor public services add to the dissatisfaction, and for a decade, local surveys have shown how four out of ten Hondurans consider migrating.[24]

Overcoming Collective Action Problems

Honduras' presidential election in 2021 had the highest voter turnout (68 percent) in 24 years. This raised expectations of change, but current surveys show continuing public dissatisfaction.[25] The polarization and lack of capacity for genuine dialogue hinder the process of needed reforms. Anti-corruption author Michael Johnston finds that in a fragile context, "…two difficulties are particularly acute: low levels of trust and collective-action problems…" He insists on lowering expectations and stresses that, "Without a workable level of trust, reformers have little hope of overcoming collective-action problems."[26] Trust is the "glue" of society, and without it, progress is slow. Thus, a certain level of trust is needed for reforms to succeed. Johnston suggests an alternative, slower process of "deep democratization," with a long-term focus on building institutional capacity and robust social cohesion. This approach might be helpful when working towards a comprehensive climate response with collaboration across

all sectors. Yet, this is difficult precisely in a fragile context with conflicts and low trust levels.

Hondurans have little trust in each other, as shown by an interpersonal trust of just 18 percent. Only 14 percent trust the political parties, 23 percent the justice system, 31 percent the police, 40 percent the NGOs, and 74 percent the church.[27] It is hard to collaborate on solving big problems when people distrust institutions and each other. While the opposite of trust—no trust—is relatively harmful, distrust is destructive, discredits others, and destroys collaboration. Distrust can also foster "tribalism," whereby people pursue their own individual benefits instead of the common good. Political scientist Bo Rothstein calls this situation a "social trap," defined as "…a situation where individuals, groups or organizations are unable to cooperate owing to mutual distrust and lack of social capital, even where cooperation would benefit all."[28] This very precisely describes the polarized Honduran reality. Decision makers are caught in a "social trap," which hinders progress through needed reforms. It is hard to escape the trap and strengthen governance without addressing the underlying distrust and conflicts.

COMMUNITIES IN LEMPIRA

"Lempira ... department has one of the highest rates of extreme poverty and the second-highest level of food insecurity."

The western department of Lempira is named after the Indigenous leader Lempira, who defended his people against Spanish colonization and became a symbol of resistance and freedom. Legend says he defended the lands from the mountain of Congolón, today a vital water source to some of the villages visited during this study. Nowadays, the people of Lempira fight different problems. The department has one of the highest rates of extreme poverty[29] and the second-highest level of food insecurity.[30] About 9 out of 10 of Lempira's 350,000 inhabitants live in rural areas and their livelihoods depend on agriculture.[31] Many also rely on remittances, which keep the economic wheels spinning for local businesses. The three villages visited were La Virtud, Mapulaca, and Virginia, with a combined population of about 13,500

inhabitants. The villages are located within a 15-mile radius close to the border of El Salvador and the vital Lempa River, connecting the two countries. The visit was facilitated by and carried out with the Association of Non-Governmental Organizations (ASONOG),[32] a civil society network that has years of experience in the area. Meetings were held with local community leaders, farmers, and a few politicians, institutions, and experts. Around the three villages, there are several smaller communities. We visited the community of El Limón in La Virtud and the community of El Rodeo in Virginia. The villages and communities shared many similarities; below are the main observations from the many visits.

Climate and Socio-Ecological Challenges

Farmers in the communities shared stories about irregular rain patterns, prolonged dry seasons, and water shortages. The older farmers explained how weather patterns have changed over the decades and how farming has gradually become less profitable due to increased production costs. Unpredictable rainfall, heat waves, and drought in this part of the Dry Corridor are not new. In 2015 and 2016, due to drought, Honduras lost 80 percent of the bean and 60 percent of the corn harvest. In 2023, the Honduran government declared an emergency alert for 140 municipalities, predominantly in the Dry Corridor, due to a 40 percent deficiency in national rainfall.[33] Many areas were affected, yet despite the delayed rainfall in 2023, the country still met expectations for the production of basic grains, according to the Secretariat of Agriculture and Livestock (SAG). This will help the food supply in 2024.[34]

Unpredictable rainfall creates difficult farming conditions. Older farmers said that the start of the rainy season used to be more predictable and rainfall more evenly distributed. It still rains, but it is unpredictable and in uneven patterns, which makes it harder to plan when to plant or harvest. Farmers must gamble. Do you sow when the first rain comes or wait to see if the rain continues? If you can only afford to plant once, do you take a chance and risk

losing the investment? The irregular rainfall caused frustration and concern, especially in light of the gradual increase in production costs. A 2021 resilience report found that farmers in the Dry Corridor "generally have limited adaptive capacity to cope with climate variability and extreme weather events,"[35] something also reflected in the farmers' testimonies. Several expressed willingness to adapt, plant different crops, or use new cultivation methods, but said they could not afford to. While a few farmers did have private wells, rainwater harvest facilities, or access to irrigation from a nearby river, many other farmers apparently did not have the resources to make such adaptations. The higher probability of a failed harvest and increased production costs contribute to a downward spiral. Less harvest revenue means less money to invest in new cultivation methods or equipment. A failed harvest affects not only the farmer but also the community, where the local economy revolves around agriculture.

Reliable Water Sources and Water Shortage

"Community leaders said that the attitude towards slash-and-burn agriculture, garbage burning, and land clearance had improved. Such practices are viewed more negatively today than in the past."

Despite the communities' proximity, people spoke of notable differences in water accessibility and reliability. Some farmers said that some older water sources gradually became less reliable and found it necessary to explore new ones. Others told of private and community well-drilling projects, some more successful than others and usually expensive. Finding new, reliable water sources and investing in new, adequate infrastructure will be necessary to overcome future water scarcity. Solutions could involve water harvesting, water distribution, and irrigation systems, combined with more sustainable and water-efficient farming methods with reduced water losses. The notable variation in water access and reliability, even to closely located communities, might also tell a story of the shifting quality of governance and capacity or ability in the different municipalities to mobilize resources and establish reliable water sources. It could also indicate that improved local conditions are possible if the right resources, technology, and leadership are present.

Changed Attitude Towards Forest Fires and Logging

Those interviewed mentioned fewer forest fires and cases of illegal logging in their area compared to earlier years. However, it should be noted that this part of Lempira has fewer dense forests and less large-scale cattle ranching than Olancho. Community leaders said that the attitude towards slash-and-burn agriculture, garbage burning, and land clearance had improved. Such practices are viewed more negatively today than in the past. That said, fires still break out and can spread faster during an extended dry season. Many also expressed an awareness of the risks and environmental consequences of wildfires. A local politician described how awareness-raising campaigns and fines had helped. Community members also highlighted NGO and municipality initiatives to create awareness. It is not easy to change old habits, but the changed attitude speaks to the success of these multiple efforts.

Agriculture and Food Security

Most of the rural population is directly or indirectly involved in agriculture and rural climate initiatives often involve farmers. Thus, rural initiatives require an understanding of the farmers' conditions. The agricultural sector is one of the largest sources of employment, providing about 31 percent of all jobs,[36] and small-scale farmers represent about 70 percent of the farming community.[37] With such a large agricultural sector, it can seem odd that food insecurity is an issue. In 2023, it was estimated that 2.4 million Hondurans faced food insecurity.[38] Farmers have appealed to the National Commissioner for Human Rights (CONADEH), who requested that the government address food insecurity issues.[39]

"The agricultural sector is one of the largest sources of employment, providing about 31 percent of all jobs, and small-scale farmers represent about 70 percent of the farming community."

Farmland is unevenly distributed and a typical small-scale farmer has only a few hectares. If extreme weather destroys crops and infrastructure or causes the death of livestock, it is a devastating setback. A 2018 study found that 95 percent of farmers in Honduras, Guatemala, and Costa Rica had experienced rising temperatures, unpredictable rainfall, and extreme weather events.[40] A third had

"The growth in food insecurity has sparked debate in Honduras about the overall design of the agricultural sector."

experienced food insecurity, but about half had found ways to adapt. Still, the World Food Programme (WFP) notes that despite crop diversification projects, many Honduran farmers still practice subsistence agriculture, growing mainly corn, beans, rice, and sorghum. We should not oversimplify the food security situation by attributing it solely to climate change, as multiple factors affect the situation. The WFP also points to the role of the pandemic[41] and others to rising food prices, unemployment, the Russia-Ukraine war, and increased production costs.[42] The farmers we visited mentioned the lack of support from the central government and how increased production costs had made basic grain cultivation less profitable.[43] The inflation rate on basic food and household essentials is another key factor; for instance, the price of beans has increased 60 percent over the last two years.[44] The growth in food insecurity has sparked debate in Honduras about the overall design of the agricultural sector. The president of the Chamber of Commerce and Industry of Cortés (CCIC), Eduardo Facussé, calls for increased national production and reduced importation:

> "We must stop thinking about importing if Honduras has the resources to be able to provide for our needs, (...) we need to reverse this import model because every time the products rise at the international level, the cost of living is negatively affected. We have fertile valleys and rivers; there is no explanation why this [corn, beans, rice] is being imported; we must take another look at what can be done to encourage the producers and how we can ensure a fair price for the product. We need to give the producer a better price than the importer."[45]

In Honduras, rice, beans, and corn are fundamental components of the traditional diet, and local production is crucial for the country's food security. Honduras' overall food production grew from the 1980s and into the 2000s but then slowed in the 2010s,[46] gradually becoming insufficient for the growing population.[47] At the same time, Honduras' agricultural sector gradually became more export oriented.[48] Over the last decades, the export of coffee, palm oil, fruit, and other agricultural products has grown and played a crucial

role in the economy. But this export-oriented focus has arguably also happened at the expense of more sustainable domestic food production and local food security. The dependency and import of predominantly U.S. basic grains has increased substantially since the 2000s.[49] For instance, U.S. exports of corn to Honduras have grown 133 percent in the last ten years,[50] reaching a record share compared to local production.[51] The agri-food trade balance has long shown a downward trend, in which the overall food imports have grown at a faster rate than agri-food exports.[52] A report from the Wilson Center on food security in Guatemala, El Salvador, and Honduras describes how, despite having significant exports of agricultural products, the import dependency on staple foods has been on the rise. "Given the significance of maize and bean production in terms of household food security, cultural heritage, and biodiversity preservation in the region, this trend is concerning."[53]

"Over the last decades, the export of coffee, palm oil, fruit, and other agricultural products has grown and played a crucial role in the economy. But this export-oriented focus has arguably also happened at the expense of more sustainable domestic food production and local food security."

In sum, less local food is produced for a growing population while the dependency on food imports has grown.[54] With so much farmland, more self-sufficient food production should be possible, and this could help reduce vulnerability to food insecurity. From a carbon footprint point of view, it would also appear to make more sense to produce at home rather than import large quantities of basic grains. Due to the food security issue, the Honduran government and other countries[55] want to renegotiate the U.S.-Central America-Dominican Republic Free Trade Agreement (CAFTA-DR).[56] Protections for some products end in 2025, which President Xiomara Castro criticized as "exposing our producers to imminent ruin and threatening our food security."[57] Critics of the free trade agreement argue that it has benefited the United States the most through a trade surplus that, with Honduras alone, grew to $163.6 million in 2022. The U.S. Department of Agriculture (USDA) has highlighted record U.S. exports: "In 2022, U.S. agricultural exports to Honduras reached record values. (…) The total value of U.S. agricultural exports in 2022 was $1.3 billion, up 12.9 percent from the previous year."[58] A U.S. export association even categorizes Honduras' low food production as a U.S. sales opportunity, noting

that, "Advantage: Honduras is not self-sufficient in the food supply, and reliance on American suppliers for pork, rice, corn, and other foods has increased in 2021."[59] Today, twenty years after the signing of the CAFTA-DR agreement, we know more about food security, sustainable agriculture, and climate change. Such issues should be considered in a possible renegotiation.

RESILIENCE AND VULNERABILITY

"It was easy to observe the vulnerability of the remote Lempira communities, which have limited public services, unreliable water sources, and a high dependency on agriculture and remittances. The heavy migration from the area reveals the lack of opportunities."

It was easy to observe the vulnerability of the remote Lempira communities, which have limited public services, unreliable water sources, and a high dependency on agriculture and remittances. The heavy migration from the area reveals the lack of opportunities. Despite the challenges, however, there were several signs of resilience among the proactive community leaders trying to overcome the challenging circumstances. Ramiro Lara of ASONOG indicated that people's mindset towards climate and environmental issues has changed compared to a decade ago. Previously, people experienced similar challenges but were less likely to attribute these to climate change and less open to learning and adapting. A 2012 socioeconomic study of this part of Lempira underscores this point.[60] In a 145-page report, the words "climate change" are not at all mentioned, even though it describes similar challenges of poverty and difficult farming conditions as are known today. During our visit, a recognition of the problems and a sense of urgency to adapt and find solutions were apparent. Topics such as conserving water, preventing forest fires, finding new water sources, or adapting farming practices often arose. That said, wanting to adapt is not the same as having the resources to improve farming conditions. Implementing climate-smart agriculture requires more than just training and knowledge but also initial investments in equipment, irrigation, alternative crops, and cultivation methods. In the group sessions, farmers expressed a great deal of frustration with the lack of help from government authorities and the increased production costs.

Migration and Remittances

Several Honduran departments have higher migration rates than Lempira if we look at apprehensions at the US border. But the number of people leaving the Dry Corridor can be hard to estimate, as some might relocate to larger Honduran cities before migrating. In the group meetings, we asked, "How many have a relative in the US?" and about one-third raised a hand. The mayor of La Virtud said that 2,500 inhabitants had left his municipality, which now had 7,300 inhabitants. When families choose to have one family member leave for the United States, it represents a specific solution to the pressing issues. The sheer number could suggest that everyone wanted to leave the area, but instead, many articulated a solid connection to this region and their community. This rootedness could also be seen in how the remittances were reinvested in better housing, living conditions, farms, or local businesses. Remittances were a key financial catalyst in the area. Remittances constitute around 25 percent of Honduras' GDP,[61] but the percentage in this part of Lempira is probably higher. Several newer and larger houses in the area stood out, likely built with remittances. We heard several stories about family members living abroad and investing in a business back home. In Mapulaca, we stayed in the "Hotel California" and were told that the owner lived in the United States. When migrants send money home for a new house or the family farm or business, it represents a long-term commitment to their family and home village. Family and cultural bonds arguably make migrants invest in their home region, despite the many challenges. This rootedness and investments can drive further development and create opportunities.

Local and Community Governance

Shared circumstances can be seen as part of the foundation of local governance. In the communities visited, one notes an "everyone knows everyone" atmosphere, with many friendship and family ties, people likely attending the same church or having the kids in the same school. The farmers also articulated

A man plowing a field with a traditional yoke and oxen in Catacamas, Olancho, Honduras. Photo Credit: 1849498510/Shutterstock.com

"While scarce resources can also create tensions and conflict, in community meetings, residents conveyed the impression that there were more connecting than dividing factors in the joint search for ways to better the situation."

their concerns in a similar way. Questions posed to the farmers were typically answered with a collective "we" rather than "I." If someone said, "we experience higher production costs," others would nod and reaffirm. They are affected by the same difficult farming conditions, unemployment, poverty, and water scarcity and depend on the land or on remittances. It could be argued that these shared circumstances add to the community bond. While scarce resources can also create tensions and conflict, in community meetings, residents conveyed the impression that there were more connecting than dividing factors in the joint search for ways to better the situation. In theory, this connectedness and the many interpersonal relationships can create a good foundation for better local governance and collective action.

Existing Local Structures

When NGOs or government agencies implement rural development projects in these remote areas, they usually collaborate with local authorities and committees. A crucial committee in every community is the *junta de agua*—the local water council—that manages and maintains water sources. Due to irregular rainfall and overall water scarcity, water councils are arguably among the most essential local actors. They have a formal structure with statutes, a general assembly, and an elected board. Besides the elected board members, other community members also prioritized participating in the water council meetings. In one community, our group interview was part of an ordinary water council meeting with around 40 participants.[62] The communities

visited also had other committees, such as women's committees, emergency committees, and other informal groups. They had a small multi-use community building, and local churches and school-parent networks played a vital role. Besides the formal leadership in the committees, the natural leadership of community elders and the informal networks and relationships also appeared to affect the local decision making. From a perspective of democratic participation, frequent rotation on the committees would be preferable, but given the size of the communities, that is not always possible. Residents said NGOs had worked in the area and some had helped support and train local committees and systemize their work.[63] The three villages are also covered by the public agency MOCALEMPA,[64] which operates with a general assembly in which local civil society actors participate. MOCALEMPA focuses on healthcare, food security, water, and environmental issues.

Local Governance is Strengthened Through Inclusion

Local leaders and experts explained how communities engage in projects benefiting their community. There would often be a division of labor to fix a dirt road, construct a small bridge over a creek, or install a water pipeline. Public institutions or NGOs might provide the funding, machinery, materials, or expertise, while community members would provide coordination and manual labor. This kind of division is often seen in NGO projects, and such participation demonstrates the local capacity to organize and engage. New climate-related interventions could have a higher impact and become more sustainable if implemented with a participatory approach. Some might argue that relying too much on local structures means slower, less efficient, or more complicated implementation. Still, the slower participatory approach arguably fosters long-term ownership of the applied solutions. Well-designed rural development projects with classic participatory and collaborative elements help consolidate the existing structures and empower communities. The participatory approach thereby both recognizes and strengthens local governance. This, in turn, can translate into remote communities gaining regional or

national influence to advocate for their issues and concerns. Some participants said that the success of earlier projects had made them more confident and proactive in approaching authorities or NGOs to seek even more influence and assistance. Some, however, expressed disappointment that other exploratory visits or surveys by public institutions, consultants, or NGOs had not led to any concrete results or added value to the community. Such exploratory visits, including this study, can unintentionally raise expectations and ultimately increase feelings of abandonment.

Access to Knowledge and Resources

Many participants highlighted the positive experience of participating in NGO projects on agriculture, water, risk management, etc. Such initiatives added value through specific solutions (water tanks, irrigation, etc.), adaptive approaches (better water management, cultivation methods, etc.), and increased awareness of climate and environmental issues. However, these projects had been few and limited, as people often highlighted projects dating from several years ago. People were open to learning and engaging in whatever initiatives could bring resources to the communities. Past NGO projects have given access to new knowledge about adaptive agricultural practices or facilitated collaboration with other farmers or government agencies. Despite these highlights, many explained how the challenging weather conditions and scarce resources make adaptation difficult. As one person explained, substantial initial funds and equipment are needed to access new and reliable water resources, install water conservation infrastructure or irrigation systems, or test new drought-tolerant crops. Some also mentioned the possibility of better access to more favorable loans and financial support. Local communities rarely have these funds, as any possible revenue from farming is needed just to get by. Therefore, it is difficult to see how communities in this part of Lempira can establish more resilient practices and infrastructure without external help from the government, NGOs, or international actors.

"It is difficult to see how communities in this part of Lempira can establish more resilient practices and infrastructure without external help from the government, NGOs, or international actors."

Summary of Findings in Lempira Communities

Unpredictable rainfall, unreliable water sources, and increased production costs have gradually made farming conditions in this part of Lempira more difficult. Community leaders showed openness to adapting and finding solutions but expressed that the resources for such adaptation were lacking. One could also sense the community spirit and the collective concern and longing for sustainable solutions to persistent agricultural challenges. This cohesion, along with the existence of local structures and the ability to organize, represents local capacity. Local experts also pointed to increased openness and recognition of the need to adapt compared to prior years. Migration from this part of Lempira reflects the lack of economic opportunities and difficulties in making agriculture profitable, conditions exacerbated by unpredictable rainfall and heat waves. Though emigration from this area can be seen as a sign of vulnerability, the notable quantity of remittances flowing back into these communities also tells a story of resilience, rootedness, and a desire to invest in better housing and local businesses. Geographical remoteness and limited public services are defining factors that generate a feeling of being forgotten. But such conditions can also bring communities together in the search for solutions to common problems. There was a willingness to learn, organize, and provide manual labor to improve local conditions, but external assistance and resources were still needed.

"Geographical remoteness and limited public services are defining factors that generate a feeling of being forgotten. But such conditions can also bring communities together in the search for solutions to common problems."

COMMUNITIES IN OLANCHO

Olancho is the country's largest department, known for its forests, farmland, and cattle ranching. It is often given a "Wild West" label due to its ranching heritage and remoteness. To get to many villages, you drive on long dirt roads—what is popularly known as "Toyota territory." You constantly see old pickup trucks along the road, which embody the essence of Honduran farming culture.

The three communities we visited are located in eastern Olancho, where the Mosquitia region begins. La Mosquitia is a large

wilderness with dense rainforests, rivers, and diverse ecosystems; it is also home to various local and Indigenous communities. La Mosquitia consists of four reserves: the Río Plátano biosphere reserve;[65] the Tawahka Asagni reserve; and the Patuca National Park, which connects with the Bosawás biosphere reserve in Nicaragua. To get to the communities, you pass Catacamas, the home city of President Castro and her husband, former president Manuel "Mel" Zelaya. The Zelaya family goes back several generations in Olancho. President Castro recently declared a halt to the deforestation of the Mosquitia region, which attracted international attention.[66] Catacamas has also been called a "logging mecca" due to the historic presence of both legal and illegal logging and the city's proximity to the Mosquitia forest.[67] In 2021, Honduras and the European Union signed a Voluntary Partnership Agreement on Forest Law Enforcement, Governance, and Trade (VPA-FLEGT), aimed at addressing illegal logging and promoting the legal trade of timber. Indigenous and agroforestry groups participated in the negotiation. Community-based groups have expressed optimism about the agreement's role in curbing illegal logging affecting the forest and local communities.[68]

The first community, Santa Cruz de Capapán, is in the northern part of the Patuca National Park and has about 45 families. This visit was facilitated by the local author and expert on the Mosquitia region, Juan Pablo Suazo.[69] In the 1960s, people started moving to this forested area in search of land.[70] The second community, Mata de Maíz, in the Río Plátano reserve, has about 125 families, many of whom settled in the area several decades ago. Olancho is also known for several smaller Indigenous Pech communities, and we visited one of them, the Pueblo Nuevo Subirana, with around 900 inhabitants[71] and located at the edge of the Río Plátano reserve. These two visits were carried out with the Foundation for Rural Business Development (FUNDER), an NGO that forms part of the EU-funded project "My Biosphere."[72] In this area of Olancho, the main sources of livelihood come from livestock, agroforestry, coffee, cacao, and basic grains. Many also depend on remittances. In Capapán, we met with a few community leaders; in Mata de

Maíz, about twenty-five; and in Subirana, with about ten community leaders. Below, we look at tendencies and observations across the three communities and about the Olancho and Mosquitia regions.

CLIMATE AND SOCIO-ECOLOGICAL CHALLENGES

The concerns of community members in Olancho were similar to those found in Lempira, as both areas are remote and depend heavily on agriculture. In Olancho, cattle have died due to heat waves and farmers are also affected by the lack of rain,[73] but the farmers did not express concern about rainfall as frequently and consistently as in Lempira. The communities were all surrounded by beautiful green hills, scattered forests, and occasionally, grazing cows. At first glance, everything looked normal and peaceful, as if the landscape had always been this way. Nevertheless, in all three communities, older members stated, "There used to be more trees here." In discussing changing rainfall and warmer weather, residents also tended to reflect on the link to deforestation. Though much of the deforestation around the visited communities took place decades ago, community members still expressed concern about current deforestation elsewhere in Olancho and the Mosquitia. One community member in Mata de Maíz said the heavy, dense forest in the Río Plátano reserve helped shelter them from hurricanes and was nervous about the consequences of continued deforestation. Reliable water sources were also a recurrent topic in the talks in Olancho, but not with the same sense of urgency as in Lempira. Still, many highlighted the role of local water councils and the importance of forest protection around sources of water.

"In discussing changing rainfall and warmer weather, residents also tended to reflect on the link to deforestation."

Deforestation

Deforestation is a significant driver of climate change and also affects local climate and ecosystems. Fewer forests also increase vulnerability to natural disasters. Systematic deforestation in Olancho and the Mosquitia is caused by a complex mix of cattle ranching, illegal logging, drug trafficking, land grabbing, and forest fires. Because deforestation is often related to other criminal

"Systematic deforestation in Olancho and the Mosquitia is caused by a complex mix of cattle ranching, illegal logging, drug trafficking, land grabbing, and forest fires."

activities, a more comprehensive national response is required. President Castro has launched several new reforestation and conservation initiatives, including a military "Green Battalion" for forest protection.[74] The current administration claims that the deforestation rate has slowed.[75] However, it is still too early to predict whether the measures being implemented will have a positive and lasting effect.

Global Forest Watch (GFW) estimates that humid primary forests in Honduras decreased by 22 percent (465 kilohectares) from 2002 to 2022;[76] others report that 25 percent of the Mosquitia forest has been lost.[77] A third of the national tree loss occurred in Olancho alone. Various governments have launched reforestation programs, but from 2000 to 2020, the net forest change was still negative (-255 kilohectares / -3.0 percent), and 96 percent of all tree cover loss was natural forest.[78] National data from the Forest Conservation Institute (ICF) indicated that 226,000 hectares of forest were lost between 2020 and 2021, of which 45 percent was in the protected Mosquitia region,[79] but also that 217,109 hectares had been restored from 2014 to 2022.[80] Planting new trees constitutes a positive step but cannot fully replace the biodiversity lost when primary forests are cut down.[81] Over the years, many areas have been declared protected, but local biologists and experts find that the state historically has abandoned such territories, making deforestation possible.[82]

Deforestation in Olancho and the Mosquitia is not new, and analysts have often highlighted the overlap of cattle ranching, illegal logging, and drug trafficking. The prevalence of these phenomena underscores poor governance and the weakness of state presence and regulation. Criminal activities also pose a barrier to local governance and rural development, and new climate initiatives should consider how to deal with such issues. In Honduras, other factors have also contributed to deforestation. From 2013-17, the country lost 500,000 hectares of pine forest due to a pine weevil infestation.[83] Another issue is the conversion of forests to coffee plantations, as Honduras is a large coffee exporter.[84] A third driver

of deforestation is the increase in palm oil production.[85]

Deforestation Due to Cattle Ranching

Today's deforestation reality is shaped by a practice that started long ago of converting forests to pasture. From the mid-1950s to the mid-1970s, Central America's pasture area grew from 3.9 to 9.4 million hectares,[86] and beef exports to the United States grew nine-fold.[87] Historic literature discusses the "Hamburger Connection"[88] as the US demand for low-cost beef created a "cattle boom" in areas like Olancho.[89] In earlier decades, favorable local and international loans made this export growth possible.[90] Governments prioritized cattle ranching and export-driven economic growth over environmental concerns, and many farmers switched to cattle ranching as basic grain prices fell—in part due to the reduction of government protections of local production.[91] Thus, from 1952 to 1993, Honduras' cattle herd almost doubled from 1.1 to 2.1 million head.[92]

During the 1980s, beef exports declined due to market changes and US import restrictions, yet Olancho still has one of the country's largest cattle herds today.[93] The early growth in the cattle industry was important economically and helped supply food for Honduras' growing population, but the unregulated growth also normalized the conversion of forest to pasture. Farmers grew up with this practice, and changing mindsets is difficult. The growth of the cattle industry slowed in the late 1990s, but deforestation has continued. This indicates that other factors, not just the total number of cattle, are at play. Since 2000, Honduras' total cattle herd has been around 2-2.5 million head, but in 2023, it was (only) 1.7 million head.[94] Costa Rica has a total cattle herd of 1.5 million in a territory about half the size of Honduras.[95] In Costa Rica, a more climate-smart approach requires farmers to keep trees on their land, and cattle farms have managed to "preserve 18 percent of the country's forests and protect at least 23 million trees scattered across pastures."[96] In Costa Rica, deforestation was reversed decades ago, and today the country is seen as a success story

when it comes to reforestation. From this comparison with Costa Rica, it is tempting to suggest that Honduras' main problems are poor forest governance and lack of regulation, not the number of cattle *per se*. In Mata de Maíz, a few cattle ranchers with smaller herds expressed awareness of the importance of the forest.

Drug Trafficking Causes Deforestation and Affects Local Governance

Drug trafficking and narco-deforestation[97] also affect Olancho and the Mosquitia region. In 2017, researchers pointed to the "highly significant relationship between anomalous forest loss and the timing of increased drug trafficking," estimating that about 15-30 percent of annual forest loss was due to cocaine trafficking.[98] The Mosquitia region is a main entry point in Honduras for US-bound cocaine from South America.[99] From the Mosquitia, traffickers use the so-called narco-highway, an illicit dirt road through the protected rainforest, to reach Olancho.[100] Clandestine landing strips have long existed in this region and coca growing has increased.[101] Before reaching the communities, we stopped in the town of Catacamas. In a random conversation, a young man joked about how money laundering was probably the second-largest source of employment after agriculture. As we left Catacamas, we passed police officers examining an old Jeep left in a cornfield beside the road. Later, we found out a homicide had occurred earlier that morning.

"The Mosquitia region is a main entry point in Honduras for U.S.-bound cocaine from South America."

Olancho is a large department.[102] Drug trafficking does not affect all local communities, but criminality is an underlying reality. In Olancho, the mix of cattle ranching, drug trafficking, and illegal logging is widely documented. According to InSight Crime, "Cattle ranching acts as a façade for territorial control," which "allows drug trafficking organizations to develop the infrastructure needed to receive cocaine shipments."[103] Traffickers in La Mosquitia burn forests to claim land or cut down trees to sell the timber in Olancho.[104] Thus, on the surface, this kind of deforestation might appear to be caused by ordinary cattle-ranching, but it is actually

Deforestation in a Honduran forest. Photo Credit: 774821032/Shutterstock.com

narco-cattle ranching for the purpose of gaining control over strategic routes and areas or to launder money.

The minister of the Forest Conservation Institute, Luis Solíz, has explained how the government has little control over some parts of the Mosquitia area. "There are areas where you must ask permission to circulate because they are controlled by organized crime." Even the police do not dare to enter these areas taken over by drug traffickers and organized crime, he told a local reporter.[105] A local mayor in Olancho concurred: "Here it is not the authorities that rule; here it's the narco-traffickers that dominate."[106] Locals might know who is involved in criminal activities but remain silent; this is understandable given that Olancho has the third-highest homicide rate in the country.[107] The Indigenous communities in the protected areas have also long suffered from these criminal activities.[108] A 2021 survey finds that drug trafficking affects almost all aspects of life in rural communities and the possibilities of local development:

> "Narcotrafficking had a large effect on illicit cattle ranching, crop cultivation, land speculation, mining, selling land, and timber extraction. Narcotrafficking was reported to have a high impact on governance, economy, and land challenges, and a significantly higher impact than other kinds of illicit activities for governance, economy, and land, respectively."[109]

Intimidation and violence affect civic engagement, and the presence of organized crime nurtures people's distrust of local authorities,

"Intimidation and violence affect civic engagement, and the presence of organized crime nurtures people's distrust of local authorities."

who might collaborate with illicit actors. Criminal activities are not the reality in all Olancho communities, but interventions seeking to improve civic participation and local governance will likely run into these challenges.

Forest Fires

Olancho has experienced many forest fires. It would be misleading to say that climate change is the direct cause, but fires do spread faster due to higher temperatures or periods of drought. President Castro has stated that 99 percent of wildfires are related to human activities,[110] and data support her claim. National surveys show that between 1998 and 2010, 56 percent of forest fires were related to human criminal acts and 24 percent were agriculture-related.[111] The most recent 2022 study found that 87 percent of forest fires were due to human criminal acts and 12 percent were related to agriculture or the burning of garbage.[112] That means that practically all forest fires result from deliberate human activity, which in this part of Olancho is often associated with cattle ranching, drug trafficking, or illegal logging.[113] Traditional slash-and-burn agriculture is still a challenge,[114] although community members in both Lempira and Olancho said that the attitude toward this practice has improved. In the mid-1990s, 40-60,000 hectares per year were affected by wildfires,[115] but in 2023, that had increased to 223,374 hectares.[116] The increase—driven by human activity, as indicated above—also suggests that warmer and drier conditions are an amplifying factor. However, a reduction in fires is more likely to result from limiting human activity through increased control and penalties. Forest fires usually go unpunished and people might be afraid to report them. However, increased control and legal consequences ultimately become a matter of institutional capacity.

VULNERABILITY AND RESILIENCE

All the factors mentioned above add to the vulnerability in this part of Olancho, although other communities arguably are more affected than the ones we visited. The remote communities are

also highly dependent on agriculture and remittances. Small-scale farmers might have the advantage of having more fertile farmland compared to elsewhere in Honduras but still face vulnerability due to changing weather conditions. Olancho produces a significant share of the country's dairy products, meat, and basic grains, giving it a strategic role in overall food security. However, the factors discussed above could hinder future agricultural investments or complicate the possible upscaling of climate-resilient farming methods. Increased agricultural investment is less likely to bear fruit if the central government fails to address the systemic issues around the lack of conservation, regulation, and territorial control, including the failure to control illegal activities.

The level of vulnerability and resilience can vary depending on several factors, including how well a community is organized, the reliability of water sources, and the presence of criminal activity. Members of the Pech community shared their story about the long struggle for rights, recognition, and ancestral lands. According to the Pech leaders, local farmland is unequally divided, and small farmers struggle with a few hectares of land. This uneven distribution of farmland is a challenge in most parts of Honduras. Another challenge for this Indigenous community has been the constant effort to preserve the unique culture of the Pech people. In all three communities in Olancho, residents showed dedication to their communities in various ways through serving on committees and engaging actively in the search for solutions to everyday problems. This commitment in and of itself indicates a form of resilience and social cohesion despite limited resources and amidst adverse conditions.

"In all three communities in Olancho, residents showed dedication to their communities in various ways through serving on committees and engaging actively in the search for solutions to everyday problems."

Migration from Olancho

Many community members confirmed that numerous friends or family members had migrated. From 2012 to 2019, the second-largest number of Honduran migrants apprehended at the US border were from Olancho.[117] Twenty-three percent of households in the department received remittances.[118] This shows the two

faces of migration. Challenging living conditions push people to migrate, but migration is also an adaptation strategy and form of resilience. A family member who migrates can lead to remittances, which will help the rest of the family improve its situation. The push factors that make people leave are poverty, unemployment, lack of opportunities, and security issues. Decades of migration from Olancho have also built strong cross-border networks that enable migration. As one study found, "Past migration by some family and/or community members may instill in others the desire to migrate and provide the means to do so for some, as well as information about how best to travel, and a destination where people they know live."[119]

This interconnectedness across borders should not be underestimated. A historical study of Olancho notes that migration took off after a decline in prices for basic grains during the 1980s due to the "withdrawal of federal government protections of local production with the opening up of markets to international competition." This affected local farmers' livelihoods, caused migration, and made many farmers shift to cattle ranching, "replacing grain fields and forested lands with pastures."[120] This shows the very early connection between the overall agricultural strategy, deforestation, and migration. Today, remittances are still often invested in cattle, and so deforestation continues due to the lack of regulation.[121] As we examine the link between climate change and migration, we must remember that migration from areas like Olancho began long before we even began discussing climate change. Many factors that caused people to migrate half a century ago still affect people today. Farming is not sufficiently profitable, people lack jobs and income, and various governments have not succeeded in creating sufficient opportunities, security, and reasons to stay. Many communities are shaped by decades of migration, remittances, and close relationships with friends and families in the United States. This affects the development of communities today and the decision of each individual to either stay or leave.

LOCAL AND COMMUNITY GOVERNANCE

Observations on local governance in the Olancho communities overlap with those in Lempira. Inhabitants of these two areas share similar living conditions, including limited public services such as health care, law enforcement, education, and other social services. As in Lempira, one quickly sensed the community spirit of how "everyone knows everyone." People took pride in their area, and this kind of ownership provides a good foundation for local governance. There was a sincere openness to and interest in discussing problems and solutions, be they expanding the school, renovating the church, paving the road, or planting more trees. Despite the possible nearby presence of illegal logging or narco-activity, people's needs and desires were similar to those elsewhere in the country—to see their village develop and improve the opportunities for their children.

Existing Local Structures

All three communities had a local *patronato*, a community council dealing with various issues. Another crucial committee is the *junta de agua*, or water council, overseeing water sources. These councils hold yearly assemblies, review statutes and priorities, and elect board members. One member explained that ideally, the councils would meet bimonthly, but decision making was often more informal and ad hoc. Another explained that most people would take part in community projects, but fewer wanted to hold formal council positions. Ad hoc working groups would be formed for specific projects, and leaders would meet with neighboring councils. Other local committees related to health, environment, emergencies, women, and rural savings and loan groups known as *cajas rurales*.[122]

It was easy to observe the overlap between formal leadership in the committees and the informal leadership of community elders. The school networks of parents and church leaders were other vital actors. Many community activities revolve around

these two institutions. People mentioned the importance of the school in teaching children about environmental issues. The role of local churches might be considered when designing climate interventions, as they are among the most trusted institutions in Honduras. In each community, several participants pointed out the role of the local church—for instance, regarding the idea of good stewardship of God's creation or seeking God's guidance in tough times of drought or hurricanes. One community member mentioned how getting the church leadership on board with respect to the environmental agenda helped mobilize more community members. In Subirana, the Pech community council had successfully attracted international support for various projects and obtained the Equator Prize.[123] The Pech community has also signed an agreement to protect the Pech anthropological and forest reserve known as the Montaña del Carbón.[124]

"The role of local churches might be considered when designing climate interventions, as they are among the most trusted institutions in Honduras."

Shared Needs Foster Trust and Collaboration

Many participants pointed to the community's many needs as a natural reason to stick together on issues related to education, health, infrastructure, security, or the environment. Given the limited assistance from local municipalities, pooling skills and resources to solve problems makes sense. People were quick to express distrust and criticism of local politicians and authorities, but the absence of assistance also forced people to confront their own challenges. As in Lempira, the feeling of "being in the same boat" seems to foster a sense of unity, and people rely on each other to meet daily challenges. It seems fair to assume that the level of interpersonal trust is much higher in such small rural communities compared to the generally low levels of trust noted above. Other studies of local communities have confirmed that they often are well organized.[125]

Local Governance is Strengthened through Participation

When communities come together in collective action, it strengthens local governance and cohesion and allows people to apply democratic principles. The practical experience of

collaborating on a specific project generates ownership and sustainability. Residents in Mata de Maíz were excited about expanding the school with additional classrooms and offering 7th-9th grade for the older children. They explained that this would increase the incentive for families to stay in the area. The school was a high priority for the entire community, and many were involved in planning, fundraising, and construction. Similarly, in Subirana, many had taken part in constructing a multi-use community building. In Santa Cruz de Capapán, a storm had damaged the school roof, and the community collected money for materials and fixed the roof together. There were also testimonies describing how people would repair a local road or a small bridge over a creek together. The robustness of these small communities arguably comes from the experience of collaborating around such projects over time. Future local climate-related projects could benefit from building on this approach. An NGO project typically lasts 3-5 years; in such projects, sustainability is often defined as the extent to which the net benefits of the intervention can continue when funding ends. The chance that such sustainability would be achieved is likely to increase with a participatory and "deep democratization" approach involving all local actors instead of just focusing on an "effective" technical implementation of so-called innovative solutions.

Community Capacity and Government Responsibility

In our conversations, one could sense the curiosity about how climate issues might impact the area in the future. Even if small communities can protect the nearby forest and natural resources, the more systemic problems of illegal logging, expansive cattle ranching, and drug trafficking require a comprehensive government response. Thriving cattle ranching can represent a dilemma for some communities. It generates resources that help communities grow but also contributes to deforestation due to the lack of regulation. While local awareness of these issues seems to have increased, external assistance and more climate-smart agricultural solutions are still needed. Another problem relates to garbage disposal, as we saw a lot of garbage along the road and small,

improvised garbage dumps in and around the small villages.

Studies have also indicated that the term "protected area" is too often subject to personal interpretation.[126] From what we observed in both regions, it is clear that categorizing an area as "protected" is not enough. There needs to be a change in mindset towards national resources and a more comprehensive response from the relevant authorities regarding protection and conservation. The people we met were generally open-minded about obtaining knowledge, finding solutions, and accessing resources to help their communities. They might lack resources to confront climate-related problems, but the willingness to learn and adapt seemed genuine. Participants mentioned the importance of past and current NGO projects that have helped their communities on issues of agriculture, education, health, and the environment.[127]

CONCLUSIONS AND LESSONS LEARNED

Climate interventions can be designed in a manner that reinforces local governance. When communities achieve solid local governance and capacity, they are better equipped to manage extreme weather events. Findings on the link between climate interventions and local governance include:

"Climate interventions can be designed in a manner that reinforces local governance."

1. **Poor Governance Increases Vulnerability.** Honduras is more vulnerable to extreme weather events than countries with similar exposure. This is partly due to the lack of ability to adapt and cope with such events, which demonstrates how fragility, corruption, and low institutional capacity increase vulnerability. The conditions in the Dry Corridor and the vulnerability to hurricanes have long been known, but Honduras has struggled to develop a comprehensive climate response. Reducing a natural disaster to simply a weather event is a mistake. The "second disaster"—caused by poor disaster management—contributes to the overall catastrophe. Thus, an adequate climate response requires a review of the multiple factors driving vulnerability. The 2020

hurricanes, for instance, exposed Honduras' insufficient food reserves. Despite large areas of fertile farmland, domestic food production is inadequate. The government has prioritized export-driven agriculture for decades, and the dependency on US-imported basic grains has increased. Hence, greater food security, besides being rooted in more climate-smart solutions, also calls for a review of the overall composition of the agricultural sector, the uneven distribution of farmland, the production costs and profitability of small-scale farming, and the nature of trade agreements.

2. **Multiple Factors Cause Vulnerability.** Climate change exposes underlying societal problems with respect to resilience, capacity, and governance. Lempira's unpredictable rainfall affects farming conditions, but so do increased production costs or the lack of access to loans, investments, and solutions. Farmers stated that they felt forgotten by shifting central governments. In Olancho and the Mosquitia region, the problems of deforestation, illegal logging, drug trafficking, and forest fires have long been rampant. These systemic and criminal issues are beyond the control of small local communities and require a broader governmental response.

"Participation in designing and implementing interventions strengthens local governance, democratic practices, and community-based collective action."

3. **Participation and Inclusion.** Future climate interventions should involve all relevant local stakeholders, as collaboration with the municipality and community leaders is crucial to ensure ownership and sustainability beyond when a particular project's funding ends. Participation in designing and implementing interventions strengthens local governance, democratic practices, and community-based collective action. This study found that community leaders are open and willing to adapt. Local experts confirmed that, over the years, people have demonstrated increased concern and awareness about environmental and climate issues. This speaks to the historic work of NGOs who have trained the communities and helped raise awareness.

4. **Deforestation Due to Lack of Regulation and Governance.** The current Xiomara Castro government has launched ambitious forest protection and conservation initiatives in Olancho and the Mosquitia area. These initiatives could be a game changer, but it is still too early to predict their success or lasting effect. The conversion of forest to pastureland began in the 1950s and still constitutes the norm. In previous decades, it was to supply the United States with low-cost beef. Nowadays, US demand for cocaine causes deforestation as drug traffickers use cattle ranching as a façade to gain territorial control. The state's historical inability to control and regulate expansive cattle ranching, illegal logging, drug trafficking, and forest fires also reflects how poor governance, rather than the number of cattle, has been the main problem. The state still lacks control of some areas, and there is high impunity for environmental crimes.

"The state's historical inability to control and regulate expansive cattle ranching, illegal logging, drug trafficking, and forest fires also reflects how poor governance, rather than the number of cattle, has been the main problem."

5. **Overcoming the "Social Trap" and Collective Action Problems.** A comprehensive climate response requires collaboration across sectors, which is difficult in a fragile context. The situation in Honduras can be viewed as a "social trap" in which political actors struggle to collaborate on needed reforms due to power struggles, mutual distrust, and low capacity for dialogue and consensus-building. Hence, it would seem appropriate to design climate interventions in an inclusive way that builds trust across sectors and politically opposing forces. While the need for climate solutions is urgent, well-intended projects and reforms carried out too hastily may not have the desired effect or sustainability. A reform strategy emphasizing "deep democratization" might prove more effective through a long-term perspective aimed at building the social foundations for reform, enhancing the capacity of institutions, and empowering communities and civil society to defend their interests.

6. **Building Governance through Existing Structures and Co-creation.** Solid local governance structures and democratic

practices are not built overnight; they are learned over years of civic engagement. By incorporating local rural actors in climate interventions, it is possible to strengthen local democratic practices and cohesion while ensuring sustainability after projects end. From a donor perspective, relying too much on minor local actors might appear slow and complicated. Yet more funds might actually reach the communities suffering from extreme climate events if donors are more flexible with bureaucratic requirements. A more community-based approach involving local NGOs, municipalities, and councils with local presence and knowledge would help increase ownership and sustainability. The communities expressed a willingness to learn and adapt. One could sense a high level of mutual trust and community spirit; these are significant assets. Due to the limited public services and assistance, these remote communities often take matters into their own hands, with notable engagement and entrepreneurship to improve conditions. However, external resources are still needed.

7. **Urgency Should not Stand in the Way of Long-Term Solutions.** A fragile context with many uncertainties, risks, and changing circumstances sometimes fosters a short-term perspective toward problem-solving. This is counter-productive in the search for robust and long-term solutions to climate change. Many civil society and political actors find themselves in a constant crisis mode. When too many issues are critical and urgent and resources are scarce, the result can be too many band-aid solutions. It may be difficult to slow down, carry out systematic and thorough reform work, and allow enough time to build consensus among diverse stakeholders. And even if long-term plans are in place, changing circumstances make it hard to stick to any plan, agreement, or timeline. Climate initiatives must balance attending to urgent issues while ensuring stakeholders remain engaged long enough to build consensus and establish solid agreements. Designing interventions that last several years

"Climate initiatives must balance attending to urgent issues while ensuring stakeholders remain engaged long enough to build consensus and establish solid agreements."

instead of short ones also contributes to developing a long-term mindset and stabilizes the partners involved amidst a changing environment.

8. **Can Remittances be Part of the Solution?** Honduras consistently ranks among Latin America's top recipients of remittances. Testimonials from individuals with friends or family abroad underscore the vital role remittances play in the local economy. They contribute to improvements in housing, farms, and local businesses, reflecting migrants' strong sense of connection to and rootedness in their home communities. It is worth exploring how remittances in rural areas can contribute to more climate-smart solutions and community-driven sustainability efforts.

NOTES

1 Ilona Auer Frege, *World Risk Report*, 54. (Rank 1 is the country at greatest risk.)
2 University of Notre Dame, "Country Rankings." (Rank 1 is the least vulnerable country as well as country with the highest readiness. The overall readiness is measured considering three components – economic readiness, governance readiness and social readiness.)
3 The organization Fundación Para El Desarrollo Empresarial Rural (FUNDER) in Olancho and the organization Asociación de Organismos No Gubernamentales de Honduras (ASONOG) in Lempira.
4 David Eckstein, Vera Künzel, and Laura Schäfer, *Global Climate Risk Index 2021*, 46.
5 World Food Programme, "El Niño Response."
6 OECD, "Public Governance Reviews: Honduras," 3, 23. Note that this OECD review is based on an assessment carried out in 2021 during the former government, not the current one.
7 Banco Interamericano de Desarrollo (BID), Comisión Económica para América Latina y el Caribe (CEPAL), Evaluación de los efectos, 21, 22, 50.
8 David Alexander, "A Framework," Minute 11 and onwards.
9 David Alexander, "Corruption," 2, 5.
10 Elisabeth Malkin, "How graft and incompetence."
11 Francisca Stuardo, "Remembering Berta Cáceres."
12 Lucía Vijil y Bladimir López, "Coyuntura."
13 Banco Central de Honduras, "Honduras en cifras."
14 Equipo de Reflexión, Investigación y Comunicación (ERIC), "Sondeo de Opinión Publica," 11.
15 OECD, "Public Governance Reviews," 23.
16 "Country Dashboard," Fragile States Index. The maximum score is 120. The higher the score, the greater the fragility.
17 In 2023, Honduras ranked as the 56th most fragile country. In 2009 it ranked 90th.
18 Economist Intelligence Unit, "Democracy Index 2023," 19.
19 World Bank, "The World Bank Governance Indicators."
20 Freedom House, "Freedom in the World 2023;" and Arch Puddington et al., *Freedom in the World*.
21 Sarah Chayes, "When Corruption Is the Operating System."
22 Mike LaSusa, "US Trial of Honduras Ex-President Spotlights Thorny Security Ties."
23 Latinobarómetro, "Informe 2023," 39.
24 In 2022, the number was 44 percent; in 2018, 41 percent; and in 2015, 45 percent. ERIC, Boletines, Sondeo de Opinión Pública.
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Clouds cloak the hills surrounding Volcán Acatenango in Guatemala's Chimaltenango Department. Photo Credit: Theodore Moore/Unsplash

5 BETWEEN FOREST INCENTIVES AND ANCESTRAL FOREST GOVERNANCE: RESILIENCE TO CLIMATE CHANGE IN GUATEMALA'S WESTERN HIGHLANDS

MÓNICA E. SALAZAR VIDES

Guatemala's peace accords, signed in 1996, brought 36 years of bloody internal armed conflict to an end. In addition to their many provisions, the accords also marked an important milestone for the protection and restoration of forests.[1] The Forest Law, passed in 1996 and still in force, created the National Forest Institute (INAB) as a decentralized and semi-autonomous institution within the Ministry of Agriculture and Livestock (MAGA). In line with then-prevailing global trends, INAB sought to reduce the size of the state and give municipalities a more active role in forest management.[2] The INAB Board of Directors consisted of representatives of the government, private sector, environmental organizations, municipalities, and academia and reflected an effort to increase the participation of organized civil society in public affairs.

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During an almost twenty-year period (1997-2016), INAB's main policy instrument was the Forestry Incentives Program (PINFOR). The design of the program was based on Guatemala's Fiscal Incentives Program (PIF), first established in 1974 and superseded by the 1996 Forest Law,[3] as well as on the 1990s Chilean forestry incentives model.[4] For the first time in its history and through PINFOR, Guatemala implemented a system of payments for ecosystem services such as carbon sequestration, biodiversity protection, landscape improvement, and protection of water catchment basins.[5] These payments came from public funds and aimed to incentivize the sustainable management and protection of forests, above all the planting and/or replanting of forests in order to develop the national forestry industry.[6] This latter purpose gave rise to tensions in several areas.

Without a doubt, PINFOR helped to reclaim and protect the country's forest cover. However, 75.7 percent of the incentives made available between 1998-2016 were granted to a variety of large landowners—individuals, companies, municipalities, organized communities, or legally constituted groups—notwithstanding that by law, 50 percent of beneficiaries were to be small landholders. [7] These inequalities are related to underlying historical inequalities in land tenure and the requirements for accessing land. PINFOR

beneficiaries had only to prove to the General Property Registry that they owned at least 2 hectares of land and had submitted a management plan.[8] However, in a country where less than 20 percent of the population owns 90 percent of the land[9] and in which most indigenous communities lack formal property titles,[10] these requirements were exclusive. The few communities that accessed PINFOR entered into agreements with municipalities, but such agreements frequently were not honored. This led to frustration on the part of communities—who were not represented on the INAB Board of Directors—but it also spurred them to organize.[11]

Critics of forestry incentive programs and the discourse surrounding ecosystem services point out that they emerged from the neoliberal structural adjustments of the 1990s.[12] But in the Guatemalan case, communities—in alliance with international agencies and NGOs—have used such programs to ensure that the state recognizes their work in forest protection as essential to the mitigation of local, national, and even global climate change.[13] Community demands have been reflected in the design of two new forestry incentive programs that are currently in force and that seek to remedy shortcomings in the PINFOR approach. However, not all indigenous communities are interested in these initiatives, as their communal governance structures frequently diverge from the perspective of local public authorities. At issue is the notion of forests as social as well as natural phenomena.[14]

Two questions thus arise: What are the opportunities and constraints faced by communities in attempting to influence decision-making on forest management and climate change at the local level? And what strategies are communities implementing on their lands with respect to forests and resilience to climate change? This chapter explores the experiences of two *K'iche'* territories located in Guatemala's Western Highlands: The Palajunoj Valley in Quetzaltenango, and Santa María Chiquimula in Totonicapán.

Focus of the Study

This chapter undertakes a qualitative, comparative analysis of the socio-ecological dynamics in the Palajunoj Valley and Santa María Chiquimula. Both are located in the Western Highlands and are part of the Resilient Altiplano Program (PAR) implemented by the International Union for Conservation of Nature (IUCN), with the support of INAB and the Instituto de Agricultura, Recursos Naturales y Medio Ambiente (IARNA) of the Universidad Rafael Landívar (IARNA-URL), among others.

Santa María Chiquimula is located in the department of Totonicapán, with a population that is almost entirely Maya *K'iche'* and rural. The community is characterized by its ancestral governance structure for communal forest care, the cornerstone of climate resilience in the Western Highlands. By contrast, the Palajunoj Valley is the only rural and Maya *K'iche'* area in the metropolitan area of Quetzaltenango, whose population mostly self-identifies as Ladino or non-Indigenous and urban. A large part of the valley is a protected area owned by the local government, which has placed restrictions on collective forest care. The communities have had to carry out reforestation activities on the private lands of local residents.

A key actor in the Palajunoj Valley is an organization of young community tourist guides who manage reforestation projects and community nurseries. In Santa María Chiquimula the families of the *Parcialidad* León preserve the forests and their water sources based on ancestral forms of governance. *Parcialidades* are civic associations that serve as points of reference in the conservation of natural assets. They can be understood as ancestral collectives based on kinship, communal land tenure, and self-government.

Photos 1 and 2. Participatory territorial mapping. The first map was made by 12 young community guides in the Palajunoj Valley; the second, by six women from the lowlands and six from the highlands of Santa María Chiquimula.

Photo Credit: Unless otherwise indicated, all photos in this chapter are those of the author.

DYNAMICS OF THE WESTERN HIGHLANDS: TWO CASE STUDIES

The Western Highlands are located in the northwestern part of the country. In addition to Quetzaltenango and Totonicapán, they include some of the municipalities of San Marcos, Quiché, Sololá, and Chimaltenango.[15] This region is inhabited mainly by *Mam, K'iche'* and *Kaqchiquel* indigenous populations, who maintain a vibrant local economy that combines subsistence agriculture and trade.[16] The proximity of the territory to Mexico has stimulated commerce and human mobility has been a long-standing aspect of people's livelihoods.[17] In recent years, however, the growth of migration, together with an increase in extreme poverty, malnutrition, and deficits in food production caused by climate vulnerability,[18] have earned the area a reputation for being a 'migrant-expelling territory.'[19] As far back as 2016, the International Organization for Migration (IOM) identified San Marcos, Huehuetenango, and Quetzaltenango as the places of origin of the largest number of Guatemalan migrants in the United States.[20]

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The advance of the agricultural frontier in the Western Highlands is rooted in demographic growth, the *minifundio* practices of its rural population,[21] and the expansion of urbanization due to remittances and urban sprawl. Notwithstanding these dynamics, more than a third of the Western Highlands is still covered by pine and/or oak forests.[22] The preservation of these forest stands is strategic: important rivers such as the Motagua originate there; and Santa María Chiquimula and the Palajunoj Valley form the upper parts of the Chixoy and Salamá river basins.[23] These biophysical characteristics make the highland forests important water recharge zones that supply water not only to surrounding communities but also to cities and other parts of the country.[24] According to the Forest Cover Dynamics Maps (1991-2016),[25] biodiversity and forest cover in the upper parts of the highlands have undergone few changes and losses, to the benefit of the country's hydrological balance.[26] This cannot be explained without taking into account the ancestral governance structures of indigenous communities

and their historical role in the collective care of the highland forests.

Santa María Chiquimula: "Here We Care for the Forest All the Time."

Santa María Chiquimula is an ancestral territory of pre-Hispanic origin, known in the sacred book of the Mayas, the *Popol Vuh*, as Tz'olojche'.[27] The town was founded at the beginning of the colonial period.[28] Today, the municipality is part of the department of Totonicapán. It has a territorial extension of 237.45 square kilometers[29] and 55,013 inhabitants, of which 52.10 percent are women and 99.67 percent Maya-*K'iche'*.[30]

The municipality of Santa María is fairly egalitarian in spite of the overall poverty of its habitants. Inequality in the town as measured by the Gini coefficient is 0.28, while the national figure is 0.65.[31] In 2002, 87.48 percent of the population lived in poverty, with extreme poverty at 35 percent.[32] A decade later, in 2011, the figures were 83.09 percent and 30.01 percent, respectively.[33] Still, it is only very recently that residents of the area have begun to migrate, spurred on by the economic crisis triggered by the global COVID-19 pandemic. In 2017, the average number of years of schooling was a mere 3.21; and 71.06 percent of the inhabitants Santa María Chiquimula live in rural areas.[34] For these rural dwellers, the social, political, and ecological interplay make sense as seen from the Mayan *K'iche'* worldview.

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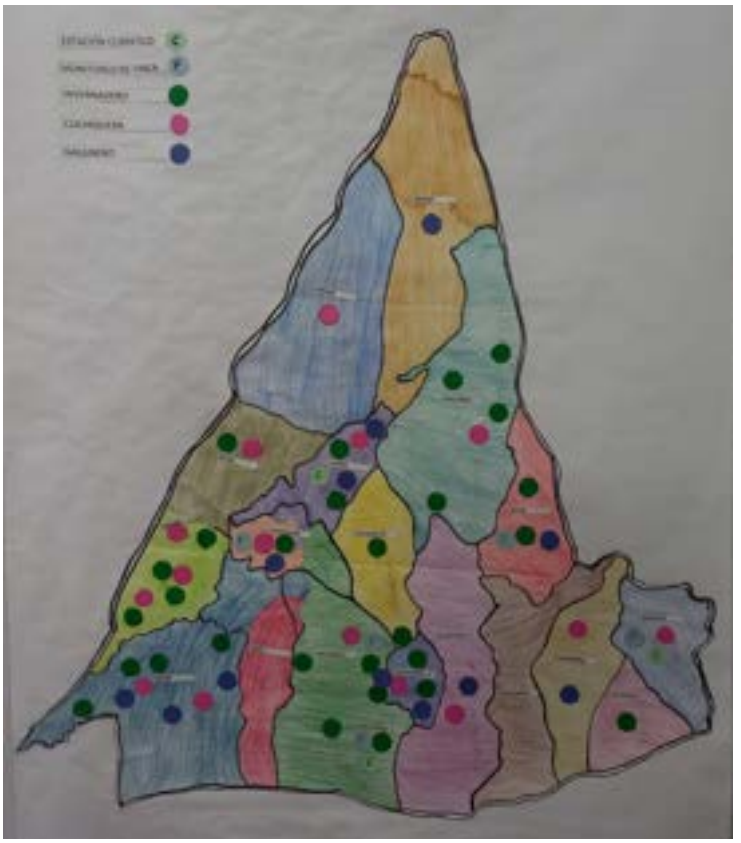
With respect to biophysical conditions, most of the area is located in the upper part of the Chixoy river basin, which is a sub-basin of the Pacaranat river.[35] A number of other rivers—the Xequijel and Siguan and the Pachac and the Chirrián—crisscross the territory and emerge from its mountains.[36] The territory has three distinct zones, each with its own climate: the upper or southern part that rises 2,500-3,000 meters above sea level is cold; the central zone, at 2,130 meters above sea level, has a temperate climate; and the northern or lower part, with altitudes ranging between 1,800 and 2,500 meters above sea level, is somewhat warmer.[37] The

highlands are covered by dense coniferous and broadleaf forests, which constitute a humid subtropical montane zone and serve as an important local and national water recharge area.[38] Governmental institutions are located in the municipal seat in the central zone.

Photo 3: Map of municipality of Santa María Chiquimula



To the north is the lower montane humid forest zone, characterized by drier and more fragmented, open forests of pine and oak.[39] These geographic differences impact the ways the population experiences the effects of climate change.

Climate Change and Socio-Ecological Differences Between Highlands and Lowlands

Santa María Chiquimula is exposed to environmental threats such as landslides, floods, and droughts, as well as to socio-environmental hazards such as pollution, deforestation, and forest

Photo 4: Town of Santa María Chiquimula

fires.[40] Interviewees, however, stated that their main concerns had to do with forests, water, and drought. Currently, forested areas represent 35.26 percent of the municipality and protected areas 0.05 percent.[41] The forested area in 1993 covered 13,935 hectares but by 2010 it had decreased to 9,207 hectares. The causes noted by the General Planning Secretariat (SEGEPLAN) are the advance of the agricultural frontier and the expansion in housing.[42] However, for those interviewed, the causes and effects of forest loss are more complex and have more to do with the differences between highlands and lowlands.

"Santa María Chiquimula is exposed to environmental threats such as landslides, floods, and droughts, as well as to socio-environmental hazards such as pollution, deforestation, and forest fires."

Women who live in the lowlands report that, although their territory is naturally drier than the highlands, the cutting of trees has meant there is even less water and the dry periods feel more intense.[43] This affects the harvests of those communities that grow corn and beans in May, when rain is expected; in the dry season they consume the food they've stored. According to the IUCN field technician, poverty in the municipality is higher in the lowlands, in part because they are further away from town. Communities have begun to view the sale of firewood as a way to earn a living and have ceded or sold parts of the communal forests to private owners. These owners treat timber strictly as a business, with no vision of

collective forest care.[44] In the words of one resident, "When [I] was little there were many trees, but not anymore; they were all cut down or sold." Because the climate of the area is dry, the forest takes longer to grow back. These socio-ecological conditions have reinforced the cycle of poverty.

In the highlands, the situation is different. Threats have to do with population pressures and forest fires. The vast cloud forests are managed by the communities and one of the collective rules is to allocate a tree to each family for the supply of firewood and timber.[45] However, population growth has put more pressure on the forests, as 96.17 percent of the homes in Santa María Chiquimula use firewood for cooking as well as heat.[46] In 2002, the population of the municipality was 35,148 inhabitants; by 2017 it had grown to 55,013. Projections are that by 2032 the population will reach 92,511.[47]

Photos 5 and 6. Livelihoods and forests in the highlands of Santa María Chiquimula

Fires are another cause for concern. According to the IUCN technician, most communities use traditional slash-and-burn farming methods. But the proximity of the plots to the forests has meant the outbreak of unintentional fires during intense heat waves. Yet another factor is the extraction of resin, a traditional activity that from a technical point of view exposes trees to fire risks.[48] Despite these threats, in places such as the highlands of Santa María where communal forest governance is more consolidated, deforestation rates are lower.[49]

Socio-Ecological Resilience and Communal Forests in Santa María Chiquimula

For the indigenous peoples who inhabit the highland plateau, especially the highlands of Santa María Chiquimula, the forests represent natural spaces that provide families with firewood, timber, water, and mulch for their crops. The forests are also social spaces that strengthen the sense of community, serving not only as biophysical areas but also as reference points for territory and identity.[50] Among the trees and the mountains are sacred sites used for Mayan ceremonies.[51]

The close relationship between communities and forests is linked to forms of governance of pre-Hispanic origin. These persist

despite the ways that colonization, the establishment of the nation-state in the 19th century, and displacement during the internal armed conflict (1960-96) led to evictions and a reordering of ancestral territories.[52] Ancestral governance can be defined as a set of rules, responsibilities, and collective sanctions, together with mechanisms of oversight and conflict resolution, that are based on ancestral knowledge which shapes productive practices, conservation, and reforestation.[53] One of its main characteristics is collective decision making regarding the use, protection, and control of common or public goods in the territory.[54] According to the IUCN field technician, a native of the Santa María Chiquimula highlands, "The forest here is being cared for all the time. These practices have been passed down from generation to generation."

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One of the most significant experiences in Santa María Chiquimula is that of the *Parcialidad* León; the area is adjacent to the communal forests of the departmental capital. It encompasses around 400 hectares of land at its highest point, 400 hectares in a slightly lower area, and about 800 hectares of forest.[55] The area is home to a variety of animals, including deer, monkeys, snakes, and jaguarundis. Spring-fed plants include fruit trees, alder, pine, and more than twenty different kinds of fungi.[56] Approximately one hundred families comprise the *parcialidad* and each family has been allotted a one-hectare individual plot for the growing of subsistence crops.[57] Communal forests thus alternate with small-scale, individual agricultural plots. Collective forest care bears relation to the concept of *K'ax k'ol*, which translates as 'pain.' *K'ax k'ol* refers to the services that people provide to the forest as well as to the community—a 'sacrifice' but also a political choice.[58] Services include patrolling and guarding the forests, attending to the community nursery, reforesting, collecting rainwater, and maintaining the water tank and the mini-irrigation system installed by the community to provide water to families, plots, and forests in the dry season.[59] Those who cannot perform their service must pay a substitute to do it for them.

Photos 6, 7, and 8. Communal forests in Parcialidad León, Santa María Chiquimula highlands.

Indigenous governance of the forests and their natural assets is the principal source of resilience to climate change throughout the Western Highlands.[60] At times the dialogue between ancestral and state-sponsored approaches to preservation is difficult, but it is possible to build bridges.

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Governing the Forest: The Case of Incentives

Forestry incentives are at the core of the state's forestry policy. In fact, the Resilient Altiplano Program (PAR) strategy implemented by the IUCN seeks to foster ecosystem-based resilience in several western highland basins by means of landscape restoration and the granting of forest incentives.[61] Two such initiatives are the Incentive Program for Owners of Small Extensions of Land for Forestry or Agroforestry (PINPEP) and the Incentive Program for the Establishment, Recovery, Restoration, Management, Production, and Protection of Forests in Guatemala (PROBOSQUE). The latter program was created to fill gaps in PINFOR. A close analysis will show whether or not these programs successfully mesh with community-based forestry management strategies.

PINPEP seeks to benefit small landholders of plots from 0.1 to15 hectares, through reforestation and forest protection projects, including agroforestry.[62] The minimum land requirement to

participate in PROBOSQUE is 0.5 hectares, down from the PINFOR minimum of 2 hectares. The incentives are aimed at the establishment and maintenance of agroforestry systems, the protection of forests as sources of water, ecotourism, and sacred sites.[63] These guidelines are designed to include indigenous communities previously left out by the dominant logic guiding PINFOR. In addition, the program does not require participants to have a formal land title from the National Property Registry; certificates given out by municipalities or letters from indigenous or community leaders confirming possession of the land are also accepted.[64] Both PINPEP and PROBOSQUE are financed by the government, although PROBOSQUE, an extension of PINFOR, has more funding.[65] Both programs require the submission of a forest management plan.

In Santa María Chiquimula, the *Parcialidad* León received assistance from the IUCN in devising a forest management plan that would be eligible for support from PROBOSQUE. The plan to protect the forests as a source of water was, in fact, accepted, with the first payments to be made in 2024. However, there are communities such as Xejuyú that are not interested in incentives, as the way they manage their forested areas differs from INAB's. In the case of Xejuyú, the IUCN helped prepare a management plan not aimed at incentives but at integrating technical expertise with sociocultural norms. According to an IUCN technician, the communities' distrust of state institutions, including the municipalities, was an obstacle: "The incentives are there, but they won't apply for them." Other technicians and researchers believe the problem resides in the strong pressure exerted by INAB and environmental organizations to have the incentive programs become part of the protection strategy; from the perspective of the communities, this means they cannot use the forest in a manner they consider sustainable.[66]

In the *Parcialidad* León, most of the women grow vegetables and fruit, extract resin from the trees to produce pom, a sacred material used in Mayan ceremonies, and collect mushrooms and various kinds of leaves to make tamales.[67] These products are usually

eaten at home but are also sold in town on Thursdays, the weekly market day. During the rainy season, men cultivate corn, beans, and different types of squash, pumpkins, and gourds. In the dry months they migrate to other municipalities of Totonicapán, such as San Francisco El Alto, where they engage in various kinds of commercial activities, or to the South Coast to work in the coffee and sugar cane harvests.[68] Because residents have individual plots

Photos 9 and 10. Women from the *Parcialidad* León selling their products in Santa María on market day.

to grow food as well as large areas of forest to care for, it has been possible to work within the logic of INAB incentives. As the IUCN field technician explained: "Our approach is not simply to improve environmental services. We have to link these with the social and economic issues that are important to the communities. Otherwise, the work isn't possible."

The Palajunoj Valley: "How Do We Ensure that People Don't Forget How to Tend a Garden?"

The municipality of Quetzaltenango has an area of 122 square kilometers and is the second most important city in Guatemala.[69] According to the World Economic Forum, it has the best attributes for competitiveness of any place in the Western Highlands.[70] Historically, the city has had a strong commercial relationship with cities in southeastern Mexico such as Tapachula. The construction of shopping centers, universities, housing developments, overpasses, and highways is ongoing.[71] Quetzaltenango's economic growth has brought with it a disorderly process of urbanization and sprawl,[72] resulting in pressure on natural assets such as land, forests, and water.[73]

According to the XII National Population and VII Housing Census, 100 percent of Quetzaltenango city's 180,706 inhabitants live in the urban area; of these, 52.57 percent self-identify as Ladinos and 46.66 percent as Mayas.[74] However, the census has overlooked the rural Palajunoj Valley, which is also a part of the metropolitan area. As one leader puts it: "We consider that we live in a rural area because we don't have all the services that the city does."

Ninety-five percent of the 14,481 inhabitants of the Palajunoj Valley self-identify as *Maya-K'iche'*.[75] They lack running water, paved streets, education, and representation in local government.[76] Although in the city of Quetzaltenango the poverty rate is 25.92 percent[77] and the average number of years of schooling is 9.36,[78] in the valley it is estimated that 80 percent of its population live in poverty and the years of schooling drop to 6.39.[79] Inequality in

the Palajunoj Vally is even worse than in Santa María Chiquimula, Totonicapán, whose population is almost all rural and Maya-*K'iche'*.[80]

The Palajunoj Valley is located to the south of the city of Quetzaltenango and is made up of ten cantons that were founded between the years 1800 and 1810.[81] As its name indicates, it was settled in a valley (as was the city); but the name in *K'iche'*–*Palajunoj*—means "among the ten wisdoms."[82] The size of the valley is 15 square kilometers, at 2,400 meters above sea level. But if the many mountains, volcanoes, and hills that surround the valley are included, the size of the area grows to 42 square kilometers.[83] The area is strategic for climate change mitigation. It forms part of

Photos 11 and 12. Peri-urban living conditions in the Palajunoj Valley. Photo 11 shows a traditional adobe house; photo 12 shows a structure made of concrete blocks. Both have space for the growing of crops.

the Samalá River micro-basin, bordered to the south by the Santa María Volcano (3,772 meters above sea level), to the east by the inactive Siete Orejas Volcano (3,370 meters above sea level), to the north by Puerta del Llano, and to the west by Cerro Candelaria (3,200 meters above sea level).[84] The biophysical characteristics of the valley and the imprecise boundaries between rural and urban areas shape the dynamics of climate change in the territory.

Climate Change and its Impact on Peri-Urban Relations

The volcanic chain that surrounds the Palajunoj Valley represents an important area of forest cover for the municipality. Its cloud forest mountainous vegetation of pine, oak, and alder, the mesophilic ecosystems of organisms that grow in moderate temperatures and the transitional areas of vegetation known as ecotones regulate the climate and rain cycles. The entire ecosystem directs the currents of air, clouds, and mist that come from the Pacific Ocean.[85] The slopes and elevations that shape part of the Samalá River micro-basin influence the hydrological dynamics of the metropolitan area of Quetzaltenango and provide a medium to very high level of water recharge.[86] The maintenance of forests in the highest areas is related to the processes of water infiltration and percolation (the movement and filtering of fluids), meaning that forest protection is essential to addressing climate change.[87]

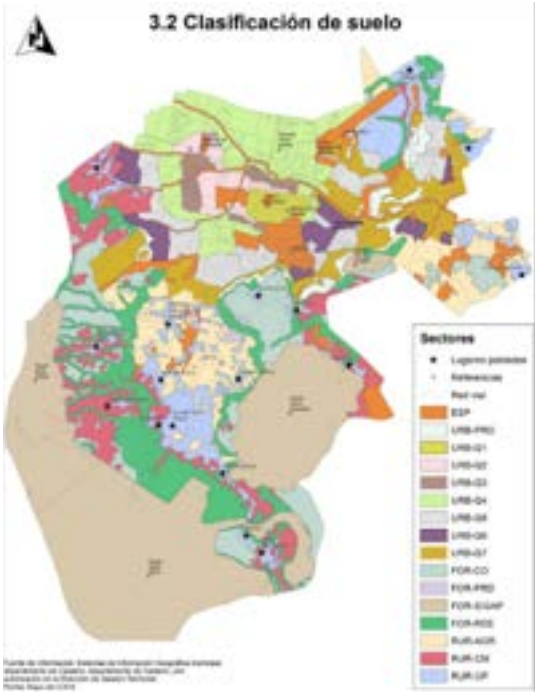
Although the area is meant to be 75 percent protected forest, as of 2016 only 40 percent met the criteria.[88] In the last ten years forested areas have been declining due to small-scale agriculture and the disorderly construction of houses, along with the activities of companies that mine aggregates for construction materials. An additional factor has been the use of the slopes of the Siete Orejas Volcano as the city's open-air garbage dump.[89] These interactions between the city and the valley—that is, between the city of Quetzaltenango and the Palajunoj Valley—are rooted in inequality, resulting in deforestation, pollution, and the erosion of the hills that put the valley's population at risk.

Most of the families in the valley grow corn, vegetables, and flowers, and some also raise livestock on a small-scale.[90] They supply the city with food, including vegetables and grains and, to a lesser degree, meat from cattle and sheep. In the city market, vegetables sourced from the valley are known as "vegetables of the plain."[91] These crops are generally grown in the lower part of the valley on plots of 300-500 square meters. But due to the expansion of the cantons and the rise of subdivisions, farmers have been pushed up the slopes, with crops now being planted as high as 2,900 meters above sea level.[92] A woman who runs a nursery observed: "They had many young trees on their land, but they were dug up due to construction." The urbanization of the valley is bound up with international migration, as remittances are often used to build houses.[93]

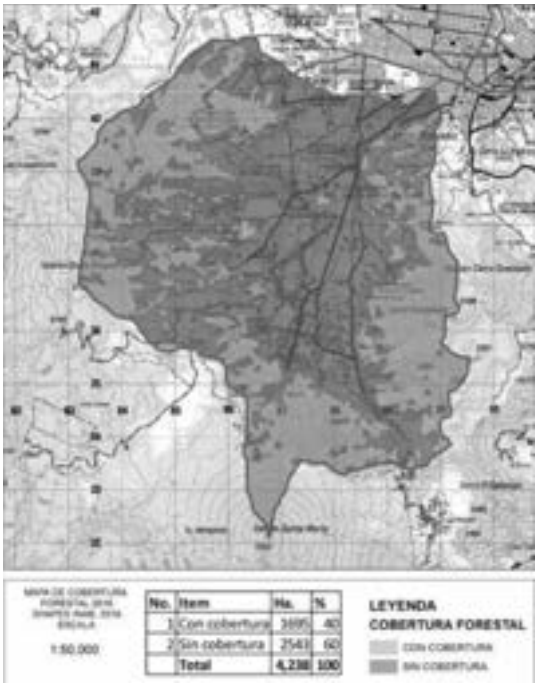
Mining and the municipal garbage dump have a tremendous socio-ecological impact. The dump is located between the Siete Orejas and Santa María Volcanoes, at an altitude of over 3,000 meters above sea level.[94] Numerous trucks from Quetzaltenango cross the valley daily; and the waste they transport has been accumulating for years in an open space the size of forty city blocks.[95]

The local government has obtained an environmental license to convert the municipal dump into a sanitary landfill and tests are underway to transform organic material into compost and to

Map 1. Soil use map of Quetzaltenango. Source: Quetzaltenango Mayor's Office, 2021: 77.



Map 2. Palajunoj Valley forest cover, 2016. Méndez and Coy, 2019: 94.



engage in small-scale recycling. But these efforts are insufficient to deal with the large volume of unsorted garbage that arrives daily.[96] During the half hour that we spent in the area, some ten garbage trucks arrived. The neighboring communities complain about the smell and the smoke from the burned garbage, which are only a few meters from their vegetable and flower plots.[97] Fostering more research on the relationship between the dump, the underlying groundwater, and human health is an urgent task.

Similarly, since the late 1990s, mining activity has intensified. Due

Photos 13 and 14. Municipal dump and quarrying on the slopes of the Siete Orejas Volcano.

to its geological composition, the valley floor is rich in non-metallic minerals used in construction, such as sand, gravel, pumice, and cement.[98] Historically, the population has engaged in small-scale artisanal mining. But currently, the Ministry of Energy and Mines (MEM) has issued at least five licenses for the extraction of rocky materials in the valley, most of which are on the slopes of the Siete Orejas Volcano.[99] The population complains about the aggressive nature of the extraction, which begins with the deforestation of extensive areas and the dynamiting of part of the mountain. The rocks are then placed in crushing hoppers and the smaller pieces are transported in trucks that crisscross the valley all day long, heading to the processing plants.[100] This causes noise pollution, respiratory diseases associated with the dust, and the risk of natural disasters due to cavities on the hillsides.[101]

Socio-Ecological Resilience: Community Organization and the Recovery of Ancestral Knowledge

The resilience strategies in the territory cannot be separated from the resistance capacity of the ten communities. In 2012, while several mines were operating, a storm caused rocks on the side of the mountain to spring loose. A powerful stream of water rushed down the slopes, flooding houses and inundating crops. Outraged, the communities organized to halt the mining.[102] Thus began a long struggle. It included filing complaints with the Attorney General's office but also led to confrontations with riot police and threats of eviction, while the companies promised to build schools and playing fields. In the words of a woman leader, "we as neighbors didn't want that, because those things won't protect us when there's a landslide…We lie awake at night, afraid, because we know the water is coming." In February 2019, a member of Congress filed a lawsuit against several of the mines operating in the valley;[103] in April the Attorney General's office confirmed that 11 mining sites were operating without a license.[104] In October the floods returned.[105] The office of the Attorney General ordered the closure of some operations, but other companies continued working or relocated.[106]

"These young people have several ongoing projects: community reforestation campaigns, the provision of fuel-efficient stoves so that families don't depend on firewood, the installation of combines to capture and store water for growing vegetables during the summer months, the fostering of agroforestry systems to bolster the local economy, the establishment of an apiary to rescue bee species needed for the crop pollination, and the artisanal manufacture of hygiene products using medicinal plants."

Although this represented only a partial triumph for the communities, the crisis inspired a group of young community tourist guides to create their own NGO that same year. Their first initiative was to create a nursery to grow trees, as they knew that unregulated deforestation in the mountains was causing the landslides and floods.[107] These young people have several ongoing projects: community reforestation campaigns, the provision of fuel-efficient stoves so that families don't depend on firewood, the installation

Photo 15: Nursery self-managed by the NGO founded by the young community tourist guides.

Photo 16: Reforestation zones self-managed by young people on private land

of combines to capture and store water for growing vegetables during the summer months, the fostering of agroforestry systems to bolster the local economy, the establishment of an apiary to rescue bee species needed for the crop pollination, and the artisanal manufacture of hygiene products using medicinal plants.[108] The group has the support of international donors and its ultimate goal is the recovery of ancestral knowledge.

The young people have fostered formal and informal intergenerational dialogues to learn about native plants such as the canaque ("tree of the little hands") and palo de maíz (part of a corn stalk), the various types and uses of medicinal plants, how to plant in relation to moon cycles, and agroforestry methods.[109]

Governance: Municipal Protected Areas and Self-Directed Reforestation Processes

Unlike Santa María Chiquimula, no community or organization in the Palajunoj Valley receives forestry incentives from INAB.[110] The IUCN technicians also note the absence of a forest management plan. The main problem is forest tenancy and the way in which municipal officials turn a blind eye to the needs of the communities living in the valley.

In Guatemala, there are four different kinds of forest ownership: national forests owned by the state and managed by INAB; municipal forests that are the responsibility of local governments; collectively managed communal forests; and privately owned forests.[111] Protected areas are located in all four of these categories and respective owners must abide by regulations of the National Council of Protected Areas (CONAP).[112] The case of the Palajunoj Valley is significant in that the adjacent chain of volcanos has been declared a protected area owned by the local government. It is known as the Quetzaltenango Municipal Regional Park–Saqbe' and comprises four biogeographical regions—the volcanos known as Siete Orejas, Santa María, Santiaguito and Cerro Quemado.[113] It makes utterly no sense that mining companies and the municipal

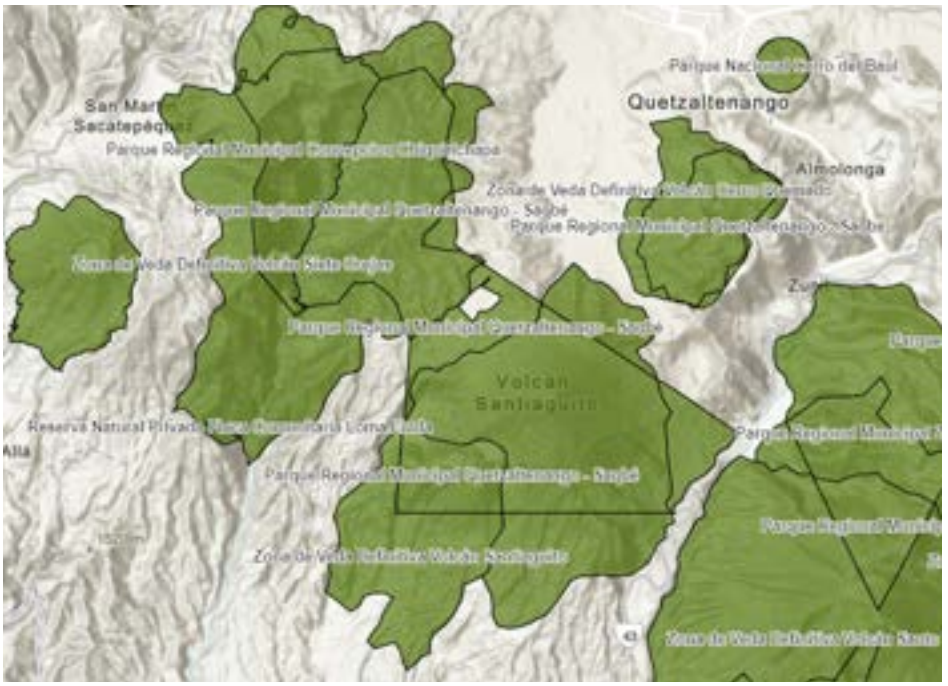
dump should be operating in this area.

The communities believe that these lands constitute ancestral K'iche' territory and therefore belong to them. The young guides point to several sacred sites located among the hills and volcanoes. In addition, as in other parts of the Western Highlands, indigenous forms of self-government regulated the care of the forests.[114] As in the case of Santa María Chiquimula, community members took care of the part of the mountain assigned to them, setting yearly goals for cutting brush, making firebreaks, and planting trees. However, as a young leader explained: "Since the land began to be managed by the local authorities, you no longer see constant forest protection." Many families do not understand why they are now barred from collecting firewood from dead trees or allowing their animals to graze in the forest.[115] The local authorities' view of protection conflicts with K'iche' cultural, spiritual, and economic traditions.

Added to these tensions is the Land Management Plan (LMP) being implemented by the municipal government. Although urban planning is necessary to manage the city's growth and address climate change, the LMP was formulated without consulting authorities in the valley communities and fails to take into account peri-urban areas. For example, it includes an undifferentiated, across-the-board real estate tax for all residents of the municipality and does not address the problem of the garbage dump.[116] To pressure for dialogue with the mayor's office, the communities blocked the roads used by the city's garbage trucks for several weeks, leaving waste to accumulate in city streets.[117]

Against this complex backdrop, young people tried to carry out reforestation campaigns through the metropolitan government, but the bureaucracy has been burdensome and support scarce.[118] They decided to ask individual landowners in the communities to voluntarily offer space for reforestation.[119] Entire families, teachers, primary school students, and teenagers organized to plant trees grown in their nursery on these private lands. In the absence of

Map 3. Regional Municipal Park of Quetzaltenango-Saqbe', and its biogeographical zones. Source: Sistema Guatemalteco de Áreas Protegidas (SIGAP)



help from the local government, self-governance has opened a pathway to climate resilience. As one local NGO leader exclaimed, "What can we do so that people [living in cities] don't forget to have a garden and fruit tree, to have right at hand, no? There is still time!"

POWER INEQUALITIES, ANCESTRAL GOVERNANCE, AND RESILIENCE

The conservation of biodiversity and forest cover in the upper regions of the Western Highlands are essential for Guatemala's hydrological equilibrium. Ancestral governance structures have provided one of the main mechanisms for the protection of these areas and constitute a central pillar of climate resilience.

"The conservation of biodiversity and forest cover in the upper regions of the Western Highlands are essential for Guatemala's hydrological equilibrium. Ancestral governance structures have provided one of the main mechanisms for the protection of these areas and constitute a central pillar of climate resilience."

In Guatemala, land and forest ownership are linked unless landowners negotiate and cede forest management to others.[120]

In the highlands, the majority of forested areas are on either local government or communal lands. At times, the local governments cede the rights to use and manage the forests in their jurisdiction to the communities.[121] Whether this happens or not depends on specific power relations within each territory. In the case of the Palajunoj Valley, for example, the local government does not recognize communal forest management. This has led to a breakdown of the ancestral care system and limits forest use by the communities. This, in turn, affects the entire municipal area's resilience to climate change. Where the communal governance of forests is more consolidated—as in Sololá, Totonicapán and Quetzaltenango—there is less deforestation.[122]

"Communal systems have proven to be more efficient and sustainable than those of the state or the private sector; this is because governance is based on rules, culture, and traditional knowledge that establish benefits and collective responsibilities as well as sanctions when responsibilities are not met."

When the indigenous peoples of the highlands administer communal and municipal forests, they do so according to their own ancestral government structures. These do not necessarily reflect Western norms of representative government. The communal governance of forests is a central feature of community organization and a source of territorial political power for many indigenous communities of the altiplano. The system of governance reinforces their connection to territories they have occupied, farmed, and controlled since pre-Hispanic times. It also strengthens their relationship—symbolic, spiritual, and material—to common goods.[123] These communal systems have proven to be more efficient and sustainable than those of the state or the private sector; this is because governance is based on rules, culture, and traditional knowledge that establish benefits and collective responsibilities as well as sanctions when responsibilities are not met.[124]

Over the last two decades, the traditional relationship between the Western Highland communities and the forests has been changing. The reasons for this include pressure from environmentalists to transform communal forests into protected areas; the logic of the extractive economy; and the continued expansion of urban areas. All these dynamics fail to account for the dependency and socio-ecological connection between communities and the forest: that is, the ways that the forest is not only a biophysical space for

ecosystem services but also a social space that binds the life of the community with the territory.[125]

New government cooperation projects and mechanisms to regulate the forestry sector (such as forestry incentive programs) have triggered power struggles between ancestral and local government structures of governance and authority. The struggle is rooted in different conceptions of the territory and its forests.[126] The objective of the PAR, for example, is for communities to benefit from incentives as a way of legitimizing their care of the forests. The challenge, however, is not only to analyze the unequal power dynamics in each territory, but also to bring together technical and ancestral approaches. That way, communities can take advantage of incentives without fear of losing access to the forests, something which limits their livelihoods and fractures a central part of their identity, history, and political power.[127]

NOTES

1 The regulation and protection of forests enhances the regulation and availability of water, helps capture and sequester carbon in the soil, and provides timber and other inputs low in energy intensity.
2 INAB, *Forest Law Decree 101-96*.
3 Sandoval García and Le Coq, *Dinámicas de la política forestal*, 3-48.
4 Von Hedemann, *Transitions in Payments*, 117-43.
5 Duncan, ed. *Payment for Environmental Services*, 51.
6 Sandoval and Le Coq, *Dinámicas*.
7 Von Hedemann, *Transitions*, 125-26.
8 Ibid.
9 Navarro, Bonilla and Esquivel, *Fortalecimiento de la gobernanza*, 9-15.
10 Sandoval and Le Coq, *Dinámicas*, 3-48.
11 Aguilar-Stoen, *Social Forestry*, 20-26.
12 Ibid.
13 Von Hedemann and Osborne, *Incentivos forestales*, 83-110.
14 Elías, Larson, and Mendoza, *Tenencia de la tierra*, 2-38.
15 Geotecnología, Ingeniería Territorial, *Producto*, 5, 1-52.
16 Elías, Larson and Mendoza, *Tenencia*, 2-38.
17 García, Cartagena, Morán-Ramírez and Monterroso, *Mapeo de actores*, 4-27.
18 Geotecnología, Ingeniería Territorial, *Producto*, 5, 1-52.
19 García, et al., *Mapeo*, 4-27.
20 Ibid.
21 Ferroukhi and Echeverría, *Las políticas de gestión forestal*, 89-112.
22 Elías, Larson, and Mendoza, *Tenencia*, 2-38.
23 Geotecnología, Ingeniería Territorial, *Producto*, 5, 1-52.
24 Ibid.
25 See: http://www.sifgua.org.gt/SIFGUAData/Home.aspx.
26 Elías, Estudio de caso 1, 8-17.
27 Carmack, *Evolución del Reyno K'iche'*, 60-100.
28 COMUDE and SEGEPLAN, *Plan de desarrollo municipal*, 1-61.
29 IARNA, *Índice socioecológico del municipio de Santa María Chiquimula*, 1-2.
30 INE, *Censo Nacional*. Portal de Resultados del Censo 2018. censopoblacion.gt.
31 The Gini coefficient is a measure of inequality in which 1 represents maximum inequality and 0 perfect equality. Statistics are from IARNA, *Índice socioecológico*.
32 Ibid.
33 COMUDE and SEGEPLAN, *Plan*.
34 INE, *Censo Nacional*.
35 Elías, Estudio de caso 2.
36 COMUDE and SEGEPLAN, *Plan*.
37 Elías, Estudio de caso 2.

38 Ibid.
39 Ibid.
40 COMUDE and SEGEPLAN, *Plan*.
41 IARNA, *Índice Socioecológico*.
42 COMUDE and SEGEPLAN, *Plan*.
43 Focus group with six women from the lowlands and six women from the highlands of Santa María Chiquimula.
44 Author interview with an IUCN-PAR field technician and focus group with 12 women from Santa María Chiquimula.
45 Elías, Estudio de caso 2.
46 IARNA, *Índice socioecológico*.
47 COMUDE and SEGEPLAN, *Plan*.
48 Elías, Estudio de caso 2.
49 Elías, Estudio de caso 1.
50 Ibid.
51 Elías, Larson, and Mendoza, *Tenencia*.
52 Elías, Estudio de caso 1.
53 Ibid.
54 Ibid.
55 Author interview with an IUCN-PR field technician and Forestry Office, Santa María Chiquimula.
56 Focus group with six women from the *Parcialidad* León and IUCN-PAR field technician interview.
57 Ibid.
58 Elías, Estudio de caso 1; Focus group with women from the *Parcialidad* León and IUCN-PAR field technician.
59 Focus group, *Parcialidad* León.
60 Elías, Estudio de caso 1, 8-17; and autor interview, IUCN-PAR field technician.
61 IUCN, *Resilient Highlands Project*.
62 INAB, *Ley de incentivos forestales*.
63 INAB, *Ley de fomento*.
64 INAB, PINPEP and PROBOSQUE, application requirements.
65 Von Hedemann, *Transitions*.
66 Elías, Estudio de caso 1; Author interview, IUCN-PAR field technician.
67 Elías, Estudio de caso 2; Focus group with women from the *parcialidad* and author interview, IUCN-PAR field technician.
68 COMUDE and SEGEPLAN, *Plan*.
69 Alonzo, *Dinámicas e interacciones*, 13-16.
70 Córdova, *Diagnóstico* (resumen), 2-3.
71 Alonzo, Introduction.
72 IARNA, *Índice socioecológico del municipio de Quetzaltenango*, 1-2.
73 Skarleth and Rodríguez, *Medidas de adaptación*, 55-84.
74 INE, *Censo Nacional*.
75 INE, *Encuesta Nacional*.
76 Ordóñez, Mazariegos, and Chávez, *Actividades económicas emergentes*, 17-54; and author interviews with women leaders.
77 IARNA, *Índice socioecológico Quetzaltenango*.

78 INE, *Censo Nacional*.
79 INE, *Encuesta Nacional*.
80 The Gini coefficient measuring income inequality is 0.42 in the Palajunoj Valley and 0.28 in Santa María Chiquimula. IARNA, *Índice socioecológico Quetzaltenango*.
81 Méndez and Coy, *Dinámica forestal*, 85-112.
82 Ordóñez, Mazariegos, and Chávez, *Actividades*, 17-54; and focus group with young guides.
83 Méndez and Coy, *Dinámica forestal*.
84 Ibid.
85 Ordóñez, Mazariegos, and Chávez, *Actividades*.
86 Méndez and Coy, *Dinámica forestal*.
87 Ibid.
88 Ibid.
89 Ibid.
90 Ordóñez, Mazariegos, and Chávez, *Actividades*; and author interviews with women leaders.
91 Méndez and Coy, *Dinámica forestal*.
92 Ibid.
93 Ordóñez, Mazariegos, and Chávez, *Actividades*; and author interviews with women leaders.
94 Ibid.
95 Ibid.
96 Ibid.
97 Author interviews with women leaders, ancestral authorities, and tourist guides.
98 Méndez and Coy, *Dinámica forestal*.
99 Ibid.
100 Ibid.; and author interviews with women leaders, ancestral authorities, and tourist guides.
101 Author interviews with women leaders, ancestral authorities, and tourist guides.
102 Author interviews with women leaders and ancestral authorities.
103 *Prensa Libre*, "Diputado denuncia a empresas mineras del Valle de Palajunoj en Quetzaltenango."
104 *Prensa Libre*, "MP confirma que 11 lugares de explotación de recursos naturales en el Valle de Palajunoj carecen de licencia."
105 *Prensa Libre*, "La carretera que se convierte en 'una laguna.'"
106 Ordóñez, Mazariegos, and Chávez, *Actividades*.
107 Author interviews with women leaders and focus group with young community guides.
108 Ibid.
109 Ibid.
110 Author interview with IUCN-PAR governance technician and interviews with women leaders.
111 Ferroukhi and Ronald Echeverría, "Las políticas de gestión," 89-112.
112 Ibid.
113 Sistema Guatemalteco de Áreas Protegidas (SIGAP), https://sig-inab.maps.arcgis.com/apps/webappviewer/index.html?id=fa496ada6c624f29badc8a79085c8cb8.
114 Author interviews with women leaders, ancestral authorities, and a focus group with young community guides.
115 Ibid.
116 Skarleth and Rodríguez, *Medidas*, 55-84.

117 Shirlie Rodríguez, *Valle de Palajunoj*.

118 Author interviews with women leaders.

119 Ibid.

120 Ferroukhi and Echeverría, *La Gestión Forestal*.

121 Elías, Larson and Mendoza, *Tenencia*.

122 Ibid., 13-14.

123 Elías, Estudio de caso 1.

124 Von Hedemann, *Transitions*.

125 Elías, Larson and Mendoza, *Tenencia*; Elías, Estudio de caso 1.

126 Von Hedemann, *Transitions*.

127 Author interview with an IUCN-PAR technician, Santa María Chiquimula.

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An aerial view of the mountainous terrain of Los Naranjos coffee-growing region in El Salvador. Photo Credit: 2020157501/Shutterstock.com

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