



FINAL REPORT

Climate Change Adaptation and Population Dynamics in Latin America and the Caribbean



PERSPECTIVES FROM THE REGION

Abstract

Latin America and the Caribbean face multiple risks from a changing climate, from sea level rise to glacial melt to extreme weather and disease. Recent population trends—particularly population growth and urbanization—will continue to be an important factor in influencing the region’s vulnerability and adaptive capacity. This policy brief shares highlights, key findings and lessons from a series of seminars on climate change adaptation organized by the Wilson Center and U.S. Agency for International Development missions across Latin America and the Caribbean. Adaptive capacity in the region is growing, and the process of consultation drew attention to projects that demonstrate innovative approaches in participatory planning, private sector engagement, payment for ecosystem services, urban planning, and mainstreaming climate change into broader development objectives. As the impacts of climate change become more severe, however, the need for effective climate change adaptation action and resources will grow. Creating shared learning networks through convening climate change practitioners and policymakers will be an important part of the strengthening the region’s capacity to adapt.

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Global climate trends indicate that our planet will continue warming into the next century, leading to more extreme climate conditions. The Latin America and Caribbean region is vulnerable to some of the most challenging aspects of climate change—sea level rise, changes in precipitation, glacial melting, spreading of disease, and extreme weather events. Population trends—including population growth, urbanization, migration, fertility and reproductive health—are highly dynamic in the region and influence society’s

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vulnerability and adaptive capacity. Building resilience to climate change through adaptation efforts is critical to continued economic development across the region in climate-uncertain times.

From 2013 through 2015, the Wilson Center worked closely with USAID Missions in Latin America and the Caribbean to explore climate change challenges and potential solutions through a series of seminars in Colombia, the Dominican Republic, El Salvador, Jamaica, Peru, and Barbados. At the end of the series,

several participants from these seminars gathered at the Wilson Center in Washington, DC, to share perspectives and discuss the implications of their work and participation in the series for broader policy dialogues and adaptation practices in the region. This policy brief shares key findings and lessons from discussions throughout the series, highlighting several innovative approaches and projects and outlining future directions for effective and durable adaptation efforts.

Regional Climate Change Impacts and Vulnerabilities

The Latin America and Caribbean region has experienced significant changes in the last decade: economic growth, rapid urbanization, and declines in poverty and inequality. At the same time, rising global temperatures and the impacts of climate change have also made their mark across the region. On the whole, the capacity among the peoples of the region to adapt to climate change has grown, though such growth is uneven and the need to increase adaptive capacity and resilience remains high.

Extreme Weather

Extreme weather presents one of the most pressing challenges for the region. More frequent and intense rainfall has resulted in an increase in flash floods and landslides, which themselves are intensified by deforestation in the region. Coastal areas are increasingly vulnerable to sea-level rise, which when combined with an increase in the intensity of cyclones, has contributed to flooding, damage to infrastructure and agricultural resources, and threats to human health and well-being.¹

Among the small islands of the Caribbean, current and future climate-related risks include sea-level rise, cyclones, increasing air and sea surface temperatures, and changing rainfall



Nicaraguan farm that collects excess rainwater during the rainy season to use for irrigation during the dry season
Photo credit: Neil Palmer, CIAT

patterns. Sea-level rise, in particular, presents severe flood and erosion risks for low-lying coastal areas. Saltwater intrusion is expected to compromise fresh groundwater resources, and an increase in ocean temperature will result in increased coral bleaching and reef degradation. For island communities that are dependent on coral reef ecosystems for coastal protection, subsistence fishing, and tourism, such impacts on reef ecosystems are likely to negatively impact economic growth and livelihoods.²

Water Resources

Changes in streamflow and water availability are expected to continue throughout the region. Glacial retreat in the Andes affects seasonal distribution of water, and the risk of water supply shortages will grow due to reduction in precipitation and increases in evapotranspiration in semi-arid regions. Such changes in water supply will continue to affect cities, hydropower generation, and agriculture.³ Drought and glacial melt cause shifts seasonal water supply, resulting in challenges of reliable water access for many populations. In addition, flooding and extreme weather events can overwhelm safe sanitation systems, leading to decreases in water quality, particularly in urban and coastal areas.

Agriculture and Food Security

With increasing temperatures and shifting rainfall patterns, agricultural productivity in the region faces serious threats—though the magnitude of those impacts is expected to continue to vary throughout the region. The hardest-hit areas are likely to be Central America, northeast Brazil, and parts of the Andean region, where decreases in rainfall and increases in temperature could limit agricultural productivity and contribute to food insecurity, particularly among the poorest populations.⁴

Human Health

A changing climate is associated with shifts in the incidence of diseases, including cardiovascular disease and insect- and water-borne diseases like malaria, yellow fever, cholera, and diarrheal disease. Vulnerability to the health impacts of climate change varies across regions, ages, gender, and socioeconomic status, and is increasing in large cities. Given the region's population growth rates and urbanization trends, and existing vulnerabilities in health, water, sanitation, nutrition, and pollution, the impacts of climate change are expected to exacerbate these challenges.⁵ Barbados, for example, currently has the highest rate of dengue in the Americas. While efforts have been made to improve the reliability of water supply through rainwater storage, the risk of dengue has increased due to improperly stored water, highlighting the need for comprehensive, cross-sectoral strategies to adapt to the multiple impacts of climate change.

Population Growth and Urbanization

The Latin America and the Caribbean region has experienced significant population growth and urbanization over the past several decades, and these are trends that are likely to continue into the future. The total population of the region is expected to grow from 618 million today to 773 million by 2050;⁶ the region is already highly urbanized with 80 percent of the population living in cities, and that proportion is expected to grow to 87 percent by 2050.

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These trends have significant implications for vulnerability and adaptive capacity. Rapid population growth exacerbates climate change vulnerability and exposes greater numbers of people to climate risk. Greater numbers and concentrations of people will require reliable access to resources such as water, sanitation, infrastructure, and energy—resources that are already over-taxed and/or vulnerable to the impacts of climate change. Understanding such demographic trends is critical for forecasting climate risks and responses, and for designing strategies to adapt.⁷

Understanding the social and economic trends underlying population dynamics can also be an important part of crafting effective adaptation strategies. Rural to urban migration, for example, can be an adaptive response to climate risks and vulnerabilities in rural areas, and understanding such drivers can help to strengthen long-term planning for adaptation. Likewise, rapid population growth in many areas is driven by high fertility that results from women's lack of access to adequate reproductive health and family planning services in the context of poor overall health service delivery. Adaptation plans that address needs for such services can have the added benefit of contributing to women's empowerment and the health of women and children, thereby also strengthening household adaptive capacity.

Marginalized Groups

While the region has experienced sustained economic growth over the last decade, poverty rates in many countries remain high. The Human Development Index varies greatly between countries, from Chile with the highest value (41st in the world) to Haiti with the lowest value in 2013 (168th).⁸ Economic inequality, both among and within countries, relates to inequality in access to water, sanitation, and adequate housing, particularly for vulnerable and marginalized groups, including indigenous people, Afro-descendants, children, and women living in poverty. Furthermore, such marginalization can mean reduced access to consultative and decision-making processes, limiting adaptive capacity and increasing exposure to climate risk.

Featured Projects

Across Latin America and the Caribbean, governments, civil society, and the private sector are responding to climate change risks and vulnerabilities and building the capacity to adapt. The following projects highlight effective and innovative approaches that respond to specific climate change challenges within the region. These approaches are tailored to the local context and utilize local resources and capacities, and yet as participants in the seminars discovered, sharing such individual and unique experiences can be useful in strengthening and inspiring broader action, through the replication of ideas, establishment of new partnerships, and scaling up effective action.

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Building Community Capacity: A Social Reforestation Program in the Dominican Republic

Throughout the Dominican Republic, issues of low forest cover, erosion, landslides, drought, and water stress present challenges to sustainable development. In areas with high rates of poverty and a large proportion of the rural population dependent on subsistence agriculture, the impacts of climate change exacerbate these challenges.

In 2003, the Center of Urban and Regional Studies (CEUR) based at the Pontificia Universidad Católica Madre y Maestra, launched a Social Reforestation Program, a comprehensive effort to improve the natural environment through expanding forest cover and preserving hydrologic resources. The program also seeks to improve the quality of life for farmers by diversifying income sources through the development of forest products.

Using an innovative public-private partnership approach that links community organizations with government (the Ministry of Environment), the private sector (Cervecería Nacional Dominicana, the primary brewery in the country), and academia (CEUR), the program



Villagers in Pessuapa, Colombia making use of their dwindling watering hole.

Photo credit: Gill Fickling, UN Photo

has grown from its initial pilot phase to encompass over 600 forestry micro-projects. In addition to planting more than 2 million trees, the forestry projects have created thousands of jobs, reduced erosion, helped to protect local water resources, and contributed to national efforts to sequester carbon dioxide. According to project organizers, community education, engagement, and capacity building have been central to the project's success.

Strengthening Water and Sanitation: Payment for Ecosystem Services in Peru

Ensuring adequate water and sanitation services for Peru's population is a growing challenge. Seasonal and regional variation in precipitation, glacial melt, and uneven distribution of population across Peru's landscape contribute to this challenge. Layered on top of these factors is historic rapid population growth and urbanization: over the past 65 years, Peru's population has grown more than four-fold, to approximately 31 million today,⁹ with nearly one-third of the population concentrated in the coastal capital of Lima. While the population growth rate has slowed, the population continues to grow: by 2050, Peru's population is projected to be over 40 million.¹⁰

Providing better access to water services for both urban and rural Peruvians requires strengthened relations between water users at all points of a water source, and a greater sense of connection between the city and the watershed that brings it water. Small fees assessed to downstream users can be used to invest in better conservation upstream, protecting watersheds in ways that can help regulate water supply and reduce problems like sedimentation.

In 2013, the Peruvian government passed new laws promoting the modernization of water and sanitation services and put into place the structure for a system of "payment

for ecosystem services” to support practices to protect watersheds upstream, such as reforestation, forest protection, rotational grazing, and the revival of ancient practices that can help to slow the path of water during heavy downpours. While challenges remain in putting into place the financial mechanisms to enable funds to flow from users to support conservation practices, progress has been made in assessing the fees and identifying the highest priority projects that will yield the greatest return in terms of effective water resource conservation.

Preparing for Climate-Related Disasters: Restoring Micro-watersheds in the Sierra Madre of Chiapas, Mexico

The combination of intense precipitation from cyclones and other extreme weather events, steep slopes, and degraded landscapes has created significant risk to communities in the Sierra Madre of Chiapas, Mexico. Significant erosion, floods, and landslides destroy agricultural land and threaten human settlements.

To address these concerns, the National Commission of Water (CONAGUA) established a project for the hydrological and environmental restoration of the basins of the region, and to build adaptive capacity and resilience of local communities. CONAGUA employed a project planning and management tool called CRiSTAL (Community-based Risk Screening Tool – Adaptation & Livelihoods), which helps project managers integrate risk reduction and climate change adaptation into community-level projects.

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The tool employs a highly participative approach, engaging community members in assessing many forms of capital—natural, physical, financial, human, and social—to determine vulnerability and capacity to adapt to climate change risks. As a result the project helped to strengthen and support micro-watershed committees to engage in local decision-making on water resources, initiated responsive agroforestry programs, and supported a variety of community-led erosion control techniques. The lessons learned through this project in effective community engagement helped to inform strategies and action for the current National Water Program.

Addressing Urbanization Challenges: Emerging and Sustainable Cities Program

Urbanization is one of the dominant social trends of the Latin American and Caribbean region: it is the second-most urbanized region of the world, with 80 percent of its population living in urban areas in 2015.¹¹ And with ongoing population growth and rural to urban migration, cities are continuing to grow: by 2050, 87 percent of the region’s population could be living in cities.

With rapid urbanization comes a need to assess and plan for climate change risk. Planning



Hilltop slum in Brazil

for natural disasters such as floods, cyclones, and sea level rise is growing in importance with increasing population density in coastal areas; and growing cities need to plan for sustainable expansion of public services that may be vulnerable to climate change, including infrastructure and water and sanitation. Identifying patterns of inequality and poverty are also critical for strategies to build the resilience of the most vulnerable segments of the population.

The Emerging and Sustainable Cities Program, a program of the Inter-American Development Bank, provides technical assistance to fifty-five intermediate cities (those with populations of 100,000 to 2 million) in Latin America and the Caribbean in identifying, prioritizing and structuring projects to improve their environmental, urban, and fiscal sustainability. The program engages a wide range of stakeholders in analyzing challenges, assessing priorities, developing and implementing an action plan, and monitoring for results.

The plans result in concrete and localized initiatives: in the city of Baranquilla, Colombia, for example, the project has supported an initiative in a city park that integrates sustainable rain water management and “auto-irrigation,” which saves water and energy, reduces maintenance needs, and moderates vulnerability to precipitation changes. Such work in urban areas aims to situate climate risk in a larger sustainable development context, integrating an understanding of hazards, growth trends, provision of services, costs, and the identification of sectors contributing to, and at risk from, climate change.

Mainstreaming Climate Change Across Sectors: The Experience of Jamaica

Like many countries in the region and around the world, Jamaica has designated a specific

ministry to address climate change issues (the Ministry of Water, Land, Environment, and Climate Change). While the ministry had worked to develop several sectoral climate change strategies, incorporating climate change considerations into the work of other ministries remained a challenge.

Rather than developing standalone climate strategies to be implemented by a single ministry, the government was interested in thinking through how to integrate climate change considerations across the work of government. The government enlisted the support of the U.S. Agency for International Development to support efforts to mainstream climate change into Vision 2030, Jamaica's overall development strategy.

Through a series of workshops and meetings, representatives from across multiple ministries worked together in small, cross-sectoral groups to examine Vision 2030's economic objectives—objectives such as a stable macro-economy, and internationally competitive industry structures. For each objective, they identified key inputs and enabling conditions, as well as risks and impediments, categorizing the risks and impediments as climate-related or not climate-related. They then worked together to identify potential actions to reduce such risks.

As a result of this work, the government established climate change “focal points” in 26 ministries and departments who focus on science, information for decision-making, and multidisciplinary approaches. They have worked to develop a national policy framework for mainstreaming climate change adaptation into the strategies of multiple ministries, thereby successfully weaving climate into sector policies that are owned by ministries themselves.

This group of focal points continues to receive training and support for working with their ministry colleagues as well as networking with one another. In conjunction with the Wilson Center, for example, the focal points explored new tools and approaches for mainstreaming gender considerations into climate change work. Such training and networking has enabled the development of 12 sectoral work plans that are linked and sensitized to each other. For example, climate risk reduction strategies in the transport and tourism sectors—two sectors that are tightly linked—have incorporated goals and activities that account for one another's plans.

Key Findings and Lessons

Climate change is a risk factor for all societal and economic activity, and the need to integrate climate change considerations in future development planning is growing in importance.

In each of the seminars, it was clear that participants viewed climate change as something much broader than an “environmental problem.” While many initially believed acting on climate change was solely a matter of reducing greenhouse gases through shifts in energy

use, there is growing awareness and recognition that adapting to the impacts of climate change is critical, and that the urgency to adapt is growing. And just as the impacts of climate change touch multiple sectors—agriculture, transport, infrastructure, health, tourism—so do the solutions require the engagement of stakeholders across sectors to

With increasing temperatures and shifting rainfall patterns, agricultural productivity in the region faces serious threats

ensure that responses optimize outcomes and that different stakeholders do not work at cross-purposes.

This becomes increasingly important as population grows and urban centers continue to expand; preparing for climate risk and providing reliable services to residents requires coordination of multiple government agencies, stakeholders, and decision-makers. As the plan for urban expansion for Valledupar, Colombia, illustrated, master plans for transport, public space, and water and sanitation cannot be developed in isolation from one another, but are best launched in a coordinated and synergistic fashion. The experience of Jamaica’s Vision 2030 is a useful example of effective mainstreaming of adaptation issues into national development plans, as is their experience in creating a Focal Points group amongst ministries and agencies that appoints individuals to represent their office on issues pertaining to climate change.

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In addition to cross-sectoral integration, vertical integration is also needed. Local adaptation measures are most effective and durable when nested within regional and national plans, and when experiences and lessons from such efforts are shared in both directions. International processes, too, such as ongoing global negotiations within the United Nations Framework Convention on Climate Change and international climate finance discussions, will be stronger when informed by local, regional, and national experiences.

Stakeholder engagement is critical, including engagement of the private sector

Participants continually pointed toward the importance of engaging multiple stakeholders in all aspects of adaptation efforts, from analyzing challenges, to developing and implementing plans, to monitoring and evaluating results, to advocacy in the policy arena. The participation of civil society organizations and local communities is central to these efforts, as evidenced in the Quito Climate Action Plan.¹²

Participants also highlighted the growing importance of engaging the private sector as adaptation efforts. Plan 4C in Cartagena, Colombia, for example, intentionally engaged the private sector and other civil society organizations together with government agencies in identifying and working to achieve its goals in climate-compatible development for the city.¹³

Capacity-building is one of the region's greatest needs

While capacity for adaptation planning and implementation in the region has grown remarkably in recent years through the development of research institutions, innovative public sector initiatives, and the strengthening of civil society, participants continue to highlight the need for capacity-building. Participants noted the absence of reliable, localized climate data, the weakness of monitoring and forecasting systems in the region, and the limitations of detailed projections and scenario development as particular difficulties.

Greater support is needed to develop better systems for gathering, managing, and sharing data. Such needs could be met in part by strengthened observation networks and regional data clearinghouses. There are also ongoing needs to translate data for non-technical decision-makers and planners in order to better inform adaptation strategies, policies, and programs.

Coordination among donors is growing in importance

As the challenge of climate change has grown, the donor landscape for adaptation has become more complex and varied. Multilateral, bilateral, and private funds have multiplied, though the overall need for financial resources for adaptation remains great.

While coordination among donors is improving in some areas, participants highlighted an ongoing need for greater coordination. Funds from multiple institutions are often targeted in the same regions, duplicating or confounding efforts, while other regions remain without sufficient support. Reporting to donors in different formats and on different schedules can also consume precious human resources at a time when project managers and planners are already over-burdened and over-extended.

Need to understand nexus of population-environmental change-gender

Finally, participants expressed a need to better understand and plan for the complex linkages between population dynamics, environmental change, and gender. Recognizing that acting on such linkages in the context of climate change requires cross-sectoral learning and coordination that is beyond the scope typically incorporated in climate change efforts, participants nonetheless appreciated the significant influence of population dynamics in the region in coming decades. For many participants, focusing on the ways in which women's empowerment links to adaptive capacity, as well as the importance of reproductive health and rights in shaping future population trends added a valuable perspective to climate adaptation strategizing. The interest in exploring how such linkages can inform adaptation policy and programming appears to be growing.

The Value of Shared Learning Networks

Participants in the seminars spoke highly of the value of dialogue to share experiences, debate strategies and outcomes, and learn from one another. International experts valued the opportunity to think more deeply about specific local contexts, and local practitioners appreciated the opportunity to widen their vision by hearing about approaches to similar problems in different locations or on different scales.

This seminar series has demonstrated the value of personal contact in helping to establish more durable networks, leading at times to valuable partnerships and ongoing, sustained interactions. While written reports and guides on best practices for adaptation play an important role in building capacity and enhancing adaptation learning in the years to come, the power of convening experts and practitioners for face-to-face dialogue cannot be underestimated. As the challenges of advancing sustainable development in the context of climate change become more complex, the value of fostering shared learning networks will continue to grow.

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Endnotes

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