

# Global Environment Outlook

## Policy options for Latin America and the Caribbean



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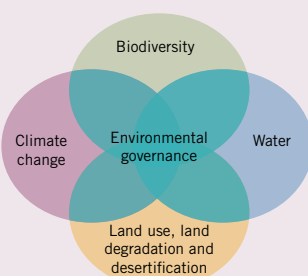
Although Latin America and the Caribbean accounts for a relatively modest 12% of the world's greenhouse gas (GHG) emissions, the region is already experiencing the adverse consequences of climate change and variability. Global climate change exacerbates many of LAC's existing environmental problems in addition to threatening development gains, poverty reduction and economic growth.

The policy cluster described in this policy brief, enables progress towards the internationally agreed UNFCC goal (UNFCCC 1992, Article 3, paragraph 1-3), selected to address climate change. More particularly, it emphasizes the specific needs of those that would have to bear a disproportionate or abnormal burden.

### POINTS TO REMEMBER

- As vulnerability to climate impacts in LAC increases, addressing the underlying drivers of risk becomes a top priority;
- Encompassing economic, social, environmental and political characteristics within adaptation measures are essential for any country in LAC willing to adapt to climate change;
- Increasing resilience and decreasing vulnerability offer many entry points for integrated intervention;
- Decision makers should work toward providing policies and institutional infrastructure that support climate change adaptation in human and natural systems.

### GEO5 processes reflect priority areas for environmental action in LAC



### SELECTED GOAL

GEO5 provides a scientific analysis of selected environmental challenges and the solutions available to address them, including their environmental and social costs and benefits.

A global intergovernmental and multi-stakeholder consultation undertaken as part of the GEO5 process established a High-Level Intergovernmental Advisory Panel to identify and concur on internationally agreed goals to be analyzed as part of the GEO5 process, to identify gaps in their achievement, and to frame the regional policy assessment. The Panel also provided high-level strategic advice to guide chapter authors when evaluating the gaps in achieving these goals and identifying the policy options for speeding up their achievement. The Latin America and the Caribbean Regional Consultation was held in Panama City, Panama, from 6 to 7 September 2010. Participants at the consultation selected a set of regional environmental challenges, together with a set of internationally agreed goals which were considered to be the most effective in addressing these challenges.

For climate change, the selected goal, the United Nations Framework Convention on Climate Change, Article 3, paragraph 1-3, reads as follows:

"The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof";

"The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration";

"The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects".

The number of LAC inhabitants affected by extreme climate-related events grew from five million in the 1970s to more than 40 million in the last decade<sup>1</sup>. Beyond climate related events, poverty, marginalization, exclusion from decision processes, inadequate education and poor basic infrastructure, are amongst the factors that continue to exacerbate vulnerability within the region. As vulnerability to climate impacts increases, addressing the underlying drivers of risk becomes a top priority.

## POLICY OPTIONS

The potential of a system to be affected by climate change varies greatly between countries, regions, economic sectors and social groups. While this variability lies in part on the type, intensity and frequency of weather events, it is also related to underlying socio-economical, institutional and environmental conditions<sup>1</sup>. There is therefore a close relationship between the vulnerability of people to climate risks and their ability to protect themselves and their families<sup>2-3</sup>.

In this context, one of the biggest issues facing any country in LAC willing to adapt to climate change<sup>ii</sup> is to determine how to implement adaptation measures considering economic, social, environmental and political characteristics. A major task toward this objective will be to provide policies and institutional infrastructure that support the climate change adaptation of human and natural systems<sup>4</sup>.

The following four policies present a more detailed analysis of the issues related to “reducing vulnerability of populations through efficient adaptation” in LAC.

### 1. Strengthening ecosystem management for improving resilience

Ecosystem management policies aim at preserving ecosystem services in the face of climate change impacts. Some countries have made significant efforts to provide a more solid methodological and analytical evidence base to understanding the relationship between ecosystem health, resilience and vulnerability. They have also developed economic cost-benefit analysis of ecosystem policy options and their potential in reducing the vulnerability of societies. Examples from the region provide a combination of economic, environmental and social policy options (see Case study 1).

### 2. Resilient infrastructure

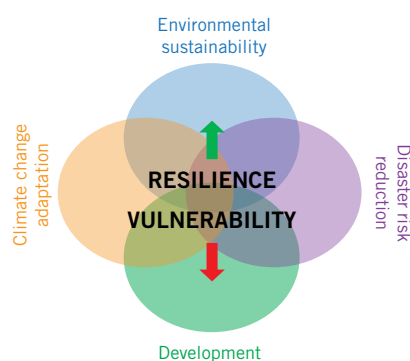
In light of the risks posed by extreme weather events, reducing the vulnerability of infrastructure systems need to be a central objective of climate change adaptation policy. The region has a wide range of potential policy instruments addressing these concerns, the most cost-effective and efficient of which rely on enforcing sustainable building standards and relocating vulnerable populations.

### Box 1: Vulnerability and resilience

*Vulnerability* refers to the potential of a system to be harmed by an external stress. It is defined as a function of exposure (to hazard or to underlying socio-economic, institutional and environmental conditions), sensitivity to impacts and the ability or lack of ability to cope or adapt<sup>16</sup>.

*Resilience* is defined as the ‘ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization and the capacity to adapt to stress and change’<sup>16</sup>.

*Increasing resilience and decreasing vulnerability* are universal goals and elemental functions which lie at the heart of - and are common to - development, environmental sustainability, climate change, and disaster risk reduction. This common ground offers many entry points for integrated intervention.



### 3. Strengthening weather monitoring and forecasting tools

Early warning systems, one of the main branches of disaster risk reduction, include the monitoring and forecasting of impending events<sup>7</sup>. The implementation of monitoring and forecast predictions of hydro-meteorological events, volcanoes, tsunamis and droughts enable the protection of population from casualties and morbidity (see Case study 3)<sup>3-8</sup>.

### 4. Adaptation policies for social resilience

Climate change adaptation policies based on social inclusion embrace challenges and opportunities associated with addressing the needs of all segments of the region's population. They are particularly sensitive to the most vulnerable, such as the rural and urban poor and indigenous peoples who live traditional lifestyles (see Case study 1).

## BENEFITS

Policies related to Adaptation to climate change (ACC) are critical for strengthening natural capital management. This is especially the case for managing changing water flows and improving ecosystem resilience; strengthening direct protection against climate-related threats; and strengthening technology transfer and knowledge flows<sup>4</sup>.

In addition, these policies are considered to have positive socio-economic and political impacts. In that regard, ACC can be beneficial for regional and national poverty reduction policies (See Case studies 1 and 2), especially in countries where there is a close relation between poverty and economic dependence on weather-sensitive resources (e.g. agriculture)<sup>9</sup>.

Large-scale projects to build or replace infrastructure in the coming years present

a tremendous opportunity to ensure that physical infrastructure and land-use systems are resilient in a changing climate. There is also significant opportunity to improve the cost effectiveness and sustainability of climate-resilient infrastructure investments by more systematically considering ecosystem-based approaches as a component of comprehensive infrastructure adaptation strategies<sup>10</sup>.

There are strong links between resilience to climate change, poverty reduction, ecological sustainability and sound environmental governance. and, reduce vulnerability through efficient adaptation brings multiple co-benefits to a range of sectors (see Table 2). Policy makers may find that understanding cross-linkages and benefits is useful in determining how to maximize the efficiency of existing policies or measures, and in prioritizing the development/implementation of new ones.

### Case Study 1: Strengthening social protection using payments for ecosystem services (Brazil)

The *Bolsa Floresta* Programme (BFP) was implemented in 2007 by Amazonas state government (Brazil). It focuses on reducing emissions from deforestation and forest degradation by providing incentives to the population. Incentives include: (1) direct payment of grants to smallholder farmers; (2) investments in social improvements in communities; (3) payments to the local associations in order to strengthen local organization and control of BFP; and (4) payments to communities employing sustainable production (see Table 1)<sup>17</sup>. It is based on both public and private funding, including resources from the recently created Brazilian Amazon Fund which links funding to verifiable emissions reductions<sup>18</sup>.

**Table 1: Payment plan – Bolsa Floresta  
Distribution of funding in the Juma reserve<sup>19</sup>**

Individual families	US\$25/month – transferred through a debit card issued to the wife
Families' associations	US\$500/month/association– Cash grant plus in-kind grant of equipment
Social programmes	Approximately US\$70,000/year/reserve – in the form of small investments (e.g. in education or health) complementing state and local government programmes
Sustainable income generation	Equivalent to US\$70,000/year/reserve – to support income-generation activities based on sustainable land and resource use

By providing direct benefits as a safety net tool to communities involved in the BFP - which are among Brazil's most marginalized groups - the project contributes to decrease local vulnerability<sup>19</sup>.

BFP is estimated to have reached about 7,300 families or 32,000 people<sup>20</sup>. Nonetheless it is difficult to ascertain to what degree the project has actually managed to reduce deforestation pressures, given that BFP is not the only strategy for forest protection or recovery in the Brazilian Amazon.

Local participation in project formulation and implementation, as well as local cooperation and coordination is still underway and has presented to be somewhat challenging, as - many projects are inefficient, and monitoring tools seem to be lacking. A need for more robust local collaboration and land tenure questions must also be addressed. To be effective in the long-run, programmes will have to consider the needs and priorities of forest dwellers that may lie beyond sole market-incentives<sup>17-18-21-22</sup>. Although research is still limited, it seems apparent that the BFP approach has co-benefits with biodiversity conservation and adaptation. Positive results may also be achieved from the transfer of this experience to other regions where deforestation and degradation are problematic<sup>23-24</sup>.



## ENABLING CONDITIONS

The best opportunities to adapt to climate change are linked with actions that address the underlying causes of vulnerability and respond to more

than one problem at a time<sup>11</sup>. In that context, environmental policy-making need to evolve to transcend traditional, compartmentalized approaches by becoming more integrated and cross-sectoral in nature<sup>12-13</sup>.

Strong governance frameworks to support environmental decision-making, is essential to ensure greater environmental sustainability. The following factors were identified as fundamental for strengthening governance

**Table 2:**  
Cross-linkages and cross-benefits between reducing Vulnerability of Populations through Efficient Adaptation and other regional environmental priorities

	Water	Biodiversity	Land use, land degradation and desertification	Climate change	Environmental governance	Oceans and seas
Reducing vulnerability of populations through efficient adaptation	<ul style="list-style-type: none"> <li>Improves the management of changing water flows;</li> <li>Promotes integration of risk management as a design criteria in water related policies and projects;</li> <li>Reduces vulnerability of potable water sources to impacts of climate change.</li> </ul>	<ul style="list-style-type: none"> <li>Protects resilience of ecosystems;</li> <li>Promotes integration of climate change considerations into regional biodiversity conservation;</li> <li>Improves management of biodiversity assets conservation.</li> </ul>	<ul style="list-style-type: none"> <li>Promotes integration of climate change considerations into land use planning and regulation;</li> <li>Incorporates climate related considerations into the design of long-term infrastructure investments.</li> </ul>	<ul style="list-style-type: none"> <li>Increases resilience and decreases vulnerability of ecosystems, people and their livelihoods to climate change impact;</li> <li>Improves the Region's resource management systems, incorporating climate related concerns and considerations into the design of long-term investments.</li> </ul>	<ul style="list-style-type: none"> <li>It is synergetic with regional poverty reduction policies;</li> <li>Fosters improvements in infrastructure and housing design that protect the environment while providing social and economic benefits</li> </ul>	<ul style="list-style-type: none"> <li>Promotes coastal recreation and tourism, as well as climate resilient coastal development;</li> <li>Promotes resilience in ocean and coastal ecosystems;</li> <li>Reduces coastal zone ecosystems and watershed vulnerability.</li> </ul>

### Case study 2: Using the Maya Nut tree to increase tropical agro-ecosystem resilience to climate change in Central America and Mexico<sup>25</sup>

The increasing impacts of climate change and demographic pressures will greatly affect the ecosystems and population of Mesoamerica in the next 15 years, with consequences on social, and economical sectors, and on ecological well being. Therefore, local actors need to work toward conserving and sustaining local ecosystems so as to reduce local vulnerability and to increase resilience.

The community-based Maya Nut tree conservation programme, implemented by the Maya Nut Institute (MNI) in Guatemala, El Salvador, México and Nicaragua, is a valuable example of strengthening ecosystem management for improving resilience to climate change. In addition to producing highly nutritive nuts, the Maya Nut tree plays an important role in retaining soil during natural erosion or extreme event, stabilizing riverbanks, maintaining flows and ensuring food security during periods of drought or after extreme climatic events. Based on those attributes, the MNI has begun developing participatory sustainable harvest guidelines for the Maya Nut as an adaptation strategy to increase ecosystem resilience to improve food security for children and livelihood opportunities for women. By promoting the economic and food value of the Maya Nut through workshops, the MNI also helps to reduce deforestation and therefore contributes to decrease the volume of carbon emissions.

The results since 2001 are:

- More than 150 stakeholders were involved in the project (government, social and economic sector);
- 317 rural indigenous women have form 22 microenterprises selling by-products of the nut;
- 3,000 community members now earn an income from harvesting Maya Nuts; and
- The programme is currently in the process of expanding to Cuba, Colombia, Bolivia, Peru, Ecuador and Brazil.

The programme's main limitations are related to land tenure, the Maya Nut's threatened status, and the presence of the Maya Nut on the list of Rainforest Alliance and Forest Stewardship Council of permitted timber species. In effort to overcome those limitations, governments could regularize land tenure system and promote programmes aiming to the conservation and reforestation of the Maya tree.



frameworks: adequate financial resources, access to scientific research and information, environmental education and environmental culture, as well as the standard governance principles and values of transparency, accountability, equitability, sustainability and inclusive participation of all stakeholders<sup>14</sup>.

For instance, achieving adequate early warning systems is only possible when stakeholders (e.g. national and local authorities, citizens and enterprises) are willing to make a sustained commitment in establishing measures to educate, organize and protect people.

### CHALLENGES AND WAYS FORWARD

Too often, policies tend to focus on the direct pressures affecting ecosystems and their services. Until policies begin to address some of the deeper, underlying causes of environmental degradation (or drivers as defined in the Driver-Pressures-State-Impact-Response framework), countries are unlikely to meet the goals and targets set out in international, regional and national commitments. There is thus a need to invest more in understanding these drivers and the ways they work together.

Similarly, the links between environmental degradation, long term economic decline and poverty reduction are not fully appreciated by policy makers, and environmental issues, including climate change remain still largely marginalized. More integration of environmental considerations into broader development process is therefore needed.

It has also been difficult to promote adaptation at the local level without the necessary support from national levels of government, international community contribution (e.g. financial and technology), the commitment of local authorities and the involvement of local communities. This has left a gap in the support and funding of locally determined, locally driven and necessary adaptation efforts that serve and work with those most at risk. Cooperation between LAC countries should facilitate the sharing of information, expertise, and technology transfer, the lack of which may currently limit countries in moving to more sustainable paths of development.

While an increasing number of social protection programmes in the LAC region have been aimed at increasing resilience to climate-related disasters. At the same time, insufficient attention has been paid to the medium and long-term risks associated with the array of social, economic and ecological aspects affected by climate change impact<sup>9</sup>. Areas in need of strengthening include generating a rigorous and more forward-looking evidence base, and a rights-based approach to social protection policy in the context of long term climate change and disaster risks<sup>15</sup>.



#### Case study 3: Overview of early warning system and the role of the Cuban national meteorological service<sup>8-16-26-27</sup>

Hurricanes are one of the more deadly natural disasters. While little can be done to prevent them from happening, the implementation of monitoring and forecast predictions can enable the protection of population from related casualties and morbidity.

Cuba is highly exposed to hurricanes. However, the important protective measures taken by the Cuban government have resulted in a very small number of casualties. As an example, the 2008 hurricane season - the most devastating in Cuban history, amounting to \$ 9,422 million USD in material losses - only caused seven casualties. In that same season, the rest of the Caribbean reported the loss of 800 lives. There are numerous reasons behind these impressive results, including (1) the public's awareness of hazard risk; (2) public policy commitment; and (3) applied scientific knowledge.

Cuba shows a solid historical background of hurricane risk awareness and technical capability in hurricane warning. The Cuban Institute of Meteorology possesses the leadership in hurricane predictions and monitoring as a function of the Cuban State. Its monitoring facilities are based on a network of more than 120 stations, 5 radars and operational access to satellite pictures. Over these bases, the meteorological service has developed its own advisory system, releasing one advisory every 12, 6, or 3 hours (depending on the level of threat). The system is structured in "defense zones" spread throughout the country. It allows the system to send up-to-date information to the appropriate level of decision while also using the media to play a role in disseminating warning and instructions for the public. Finally, it should be noted that Cuban disaster management organization is not only focused on emergency response but also in risk reduction activities. Preparedness plans are designed to build capacities in local and rural areas under risk.



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<sup>i</sup> For instance, determinants of human health are forecast to worsen under climate change affecting mainly poor populations and within the lower income percentiles, in particular women and children<sup>5</sup>.

<sup>ii</sup> Adaptation to Climate Change (ACC) is the process through which societies take measures to reduce the negative effects of climate change by making the appropriate adjustments and changes<sup>6</sup>.

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This policy brief is based on the GEO5 report, chapter 12 "Options for Latin America and the Caribbean", published by UNEP.