Climate change
a regional perspective

Unity Summit of Latin America and the Caribbean

Riviera Maya, Mexico
22 and 23 February 2010

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FOREWORD

The purpose of this document is to contribute to the ongoing discussion on climate change in light of the available evidence on the possible channels of transmission of the econnomic impact of this phenomenon and the results of the latest session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 15), held in Copenhagen from 7 to 18 December 2009.

More effective multilateral modalities must be found for halting global warming, starting with an agreement that recognizes the interdependence of nations, of public, private and social actors, and of generations and that takes account of the different role played by each one in the creation of the problem.

Institutional and financial proposals for addressing the issue must be grounded in the principle of common but differentiated responsibilities and give due consideration to development priorities within a fairer system of global governance.

The region now faces an opportunity to participate actively in the international negotiations and the preparation of the ensuing agreements (including the financial ones), to consider production alternatives that enhance competitiveness within the pursuit of low-carbon economic development, to adjust or take advantage of the economic incentives offered under the current climate regime, and at the same time become part of a collective solution to a global problem.

The Conference of the Parties will next meet in Mexico, from 29 November to 10 December 2010. That session will be a unique occasion for the countries of the region to increase their presence on the international stage, to show the world the progress made, for all their diversity, as well as the directions being taken and the novel approaches being adopted to tackle climate change.

The region is in a position to embark on a novel preparatory process for COP 16 and COP 17 and to foster a positive approach by focusing on building trust and ensuring the inclusiveness of the process leading up to the adoption of a binding agreement.

This document has been prepared, at the request of the Government of Mexico, by the Economic Commission for Latin America and the Caribbean and the Inter-American Development Bank on the basis of the work carried out jointly with a number of countries of the region to further the analysis of the economic costs of climate change and with support from the European Union and the Governments of Denmark, Germany, Spain and the United Kingdom.[1]

[1] The countries involved are: Argentina, Chile, Colombia, Ecuador, Paraguay, Peru, Plurinational State of Bolivia and Uruguay. Central America and the Caribbean participated as subregions. Brazil and Mexico conducted independent studies. The studies on Chile, Central America and Mexico have been published by the Governments in question.

It is our hope that the reflections presented here for the consideration of the Member States help contribute to the ongoing debate.

Luis Alberto Moreno
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I. THE FIFTEENTH SESSION OF THE CONFERENCE OF THE PARTIES TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (COP 15)

The expectations surrounding COP 15 raised hopes that a new global agreement would be reached on the reduction of greenhouse gas emissions for the five-year period after 2012 as a follow-up to the commitments assumed under the Kyoto Protocol. The event consequently received unprecedented worldwide attention, and with over 40,000 representatives of Governments, international organizations, non-government and private-sector organizations, including 119 heads of State and Government in attendance, it was one of the largest meetings the United Nations has ever held.

COP 15 marked a vital step in the negotiation process initiated under the Bali Roadmap that was launched at COP 13 in December 2007. The Bali Roadmap marks out the route that needs to be taken to reach an agreement on mitigation measures, adaptation, financing, technology transfers and the reduction of emissions from deforestation and degradation in developing countries (REDD), as well as action for capacity-building, for achieving ambitious emissions reduction commitments and for establishing clear funding targets.

In the run-up to COP 15, it seemed that a legally binding treaty was becoming an increasingly less feasible outcome, but that a broad consensus could be reached on the key elements of a new framework agreement and on the bases for the provision of new and additional financing (of around US$10 billion per year) for the period 2010-2012. The goal now is thus to achieve, at COP 16, to be held in Mexico or, at the latest, at COP 17, to be held in Johannesburg, a new and legally binding agreement that provides continuity with the first commitment period referred to in the Kyoto Protocol. Also, in order to avoid delaying or slowing the actions already planned, some of which are well under way in many developing countries, there was growing recognition of the need for COP 15 to make progress with the development of specific financing mechanisms and other economic incentives. Despite achieving some convergence on several topics, including the basic outline of the financial architecture, large divisions remained regarding major issues, notably:

- The emissions reductions that the developed countries will collectively agree to, given that the Intergovernmental Panel on Climate Change (IPCC) recommends a 25%-40% reduction in emissions by 2020, which is the reduction widely held to be necessary to keep the increase in global temperature below 2 degrees Celsius.

- The amount of international public financing needed to help developing countries implement mitigation and adaptation measures (and to a lesser extent the architecture for delivering this funding).

- The level of commitment and the measurement, reporting and verification (MRV) mechanisms of medium-sized developing countries and developed economies that have yet to specify their mitigation commitments.

- The legal structure of the final agreement.

The negotiations were fraught with much procedural wrangling and a lack of transparency as several position papers were not presented until the session had already begun, and the process lacked the balance needed for a consensus to be reached. As a result, valuable negotiating time was lost in both the

first and second week, and it became impossible to have a negotiated text ready in time for when the Heads of State and Government joined the session.

II. OUTCOMES AND IMPLICATIONS OF COP 15

1. The Copenhagen Accord

In the last days of COP 15, the Heads of State or Government of 28 countries focused on the preparation of a text to reflect what is now referred to as the "Copenhagen Accord." The Accord has no legal standing, but it enables the countries that sign up to it to demonstrate their willingness to use it as a point of departure and to specify their commitments and quantitative action to tackle climate change on the basis of their classification as Annex I or Annex II parties.[2] All countries were invited to sign up to the Accord by 31 January 2010, but the process remains open today. Developed countries were urged to submit their mitigation targets and deadlines so that they could be included in one of the two annexes, and by 9 February 2010, 39 developed countries had responded to this call and submitted their mitigation plans.

As noted earlier, developing countries may also sign up to the Accord and submit their Nationally Appropriate Mitigation Actions (NAMAs) for inclusion in the corresponding annex. By 9 February 2010, 29 developing countries had done so. They include Bahamas, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Panama, Peru, Trinidad and Tobago and Uruguay from Latin America and the Caribbean.

The Accord states that developing countries that require international financial support for mitigation must agree to subject their NAMAs for international MRV. Distinctions can be made within NAMAs between measures that require financing and those that do not. If countries choose not to apply for international financing, they must report every two years on their NAMAs through the national communications already established under the Convention.

The secretariat of the Convention has estimated that the countries that have signed up to the Accord and established mitigation targets and deadlines account for over 78% of global GHG emissions.

The Accord contains several elements that are relevant to the region, particularly the commitments assumed by developed countries to provide new financing for mitigation and adaptation in the form of:

- **Short-term funding of US$ 10 billion a year**, with balanced allocation between adaptation and mitigation, available for the period 2010-2012.

- **Long-term funding of up to US$ 100 billion a year** by 2020, and a high-level panel to study the contribution of the potential sources of revenue.

- A new **Copenhagen Green Climate Fund**, which is the new operating entity of the financial mechanism of the UNFCCC and thereby support projects, programmes, policies and other activities related to mitigation (including REDD), adaptation, capacity building and technology development and transfer.

[2] See note on this matter issued by the secretariat of the UNFCCC in January 2009.

- A new **Technology Mechanism** guided by a country-driven approach and based on national circumstances and priorities.

- A mechanism to provide incentives immediately for **reducing emissions from deforestation and forest degradation**.

There was greater acknowledgement of **carbon markets** as a cost-effective way to promote mitigation in developing countries. **Progress has been made in developing the carbon market** thanks to regional and subregional capacity-building, including in the less represented sectors. The important role played by international agencies in this area is worthy of note. The need for adaptation measures was also stressed, but the concern is that, now more than ever, this issue will be linked to compensation for fossil fuel producers.

One of the outcomes of COP 15 was the decision to renew mandates in order to continue the formal negotiations along the two tracks of the Bali Roadmap: (a) quantifiable emissions reduction commitments for developed countries using the Kyoto Protocol format; and (b) long-term cooperation under the Convention to reach an agreement on stabilization. As several Member States have pointed out in various international forums and official communiqués since COP 15, it is now up to the parties at COP 16, in Mexico, and COP 17, in Johannesburg, to draw from the lessons learned in Copenhagen and ensure that the negotiation process is imbued with the necessary transparency and inclusiveness. The main challenge will lie in designing a legal format for a binding agreement that has sufficient substance to accomplish long-term goals.

2. Implications of the Accord

The possible provision in the short term of up to US$ 30 billion in new financing means that the criteria for channeling that financing need to be defined soon. The role to be played by the new Copenhagen Green Climate Fund, created under the Accord, and by existing mechanisms (the Global Environment Facility, multilateral financial institutions, the Climate Investment Funds, official development assistance, the adaptation fund, etc.) also needs to be specified.

The countries of the region must make preparations to access all the financing that is now available for mitigation and adaptation. This may mean improving capacity to execute projects and to generate the additional information and data required to channel the funds properly. Adaptation calls for major funding, and now it is becoming available. Institutions must therefore be strengthened and the knowledge needed to guide action in this area must be generated through investment in research and development.

The countries of the region could benefit by shifting from project-based to programme- and sector-based approaches in their low-carbon investments and by making these a core component of their development strategies.

Being able to mobilize the various sources of financing will play a key role in ensuring progress in mitigation and adaptation. The Governments of Latin America and the Caribbean will have to work with public and private banks and especially with the private sector and civil society to optimize the impact of the international funds obtained for their main initiatives.

III. THE TECHNICAL BASES FOR AN INTERNATIONAL AGREEMENT ON CLIMATE CHANGE

The global climate has been evolving since the formation of the Earth itself, basically for natural causes. From the nineteenth century onwards, however, the generation of GHGs by human activity has raised the average temperature to such an extent that it is now at its highest in 1,000 years, having increased by 0.7 degrees Celsius between 1850-1899 and 2001-2005.[3] The world's precipitation patterns have already been observably modified, the intensity of the hydrological cycle and extreme weather events is increasing, sea levels are rising and the ice caps are receding (IPCC, 2007).

These changes will have a significant impact on economic activities and ecosystems.

The analysis of climate change and the framing of suitable policy responses need to take the following into account:

1. Climate change is a long-term phenomenon. The causes and consequences of climate change are only fully observable over long periods of time and are highly uncertain. Given the huge variety of factors involved, it is impossible to project, for example, exactly what will happen in 100 years' time. Projections are therefore only scenarios based on various suppositions and with a certain degree of probability; they do not represent accurate prognoses.

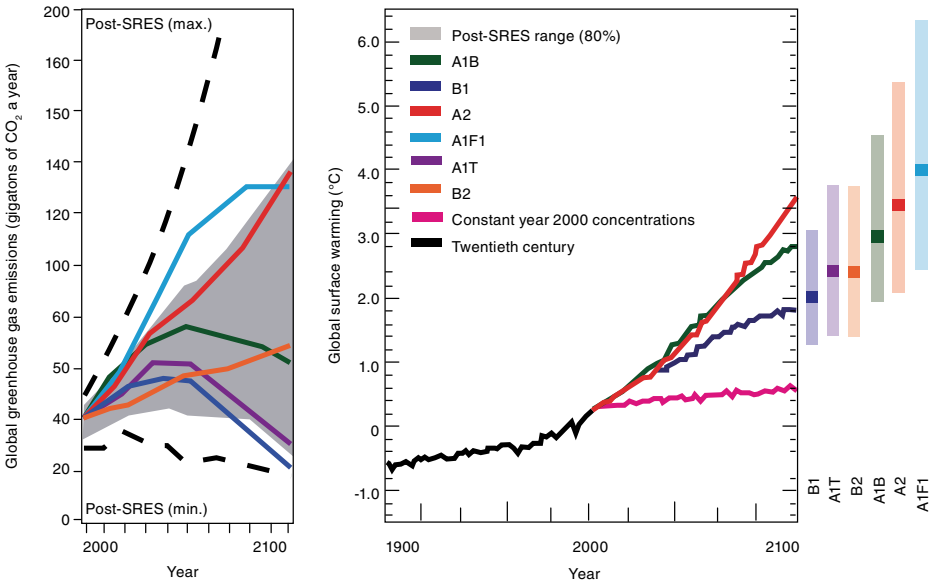
2. The causes and effects of climate change are asymmetrical inasmuch as usually the countries, sectors and social groups that have contributed most to GHG emissions do not suffer the largest consequences and have greater capacity to adapt to the phenomenon. If current trends persist throughout the twenty-first century, however, the composition of the main GHG producers will change drastically, with developing countries playing an increasingly larger role as emitters of GHGs.

3. There is an intergenerational aspect to the efforts to tackle climate change stemming from the importance of preserving ecosystems for future generations and ensuring that the planet remains inhabitable.

The projected trends for GHG emissions translate into different climate scenarios (see figure 1). In Copenhagen, an agreement was reached, in principle, to not exceed an increase of two degrees Celsius, although there is not yet a consensus on a precise target. Available scientific data indicate that this would make it possible, with reasonable certainty, to stabilize emissions concentrations at around 450 parts per million (ppm) (see table 1). Such a goal can be achieved by following various paths, but estimates show that it would require a reduction of approximately 50% in current emissions by 2050. Worldwide emissions presently stand at between 40 and 45 gigatons of GHGs (TCO_2e). With a world population of six billion, this implies an average of approximately seven tons of CO_2 per capita (Hepburn and Stern, 2008). In round numbers, to achieve the 50% reduction and lower emissions to about 20 gigatons of GHGs in 2050, with an estimated population of nine billion, emissions would have to be reduced to between two and three tons per capita worldwide.

[3] Greenhouse gases are gases that retain heat and raise the Earth's temperature in the same way that a greenhouse heats air close to the ground. The four main greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and Sulphur hexafluoride (SF_6). Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs) make up another important group of greenhouse gases.

Figure 1
SCENARIOS OF GREENHOUSE GAS EMISSIONS (IN THE ABSENCE OF ADDITIONAL CLIMATE POLICIES) AND PROJECTIONS OF TEMPERATURE ON THE EARTH'S SURFACE FROM 2000 TO 2100



Source: Intergovenrmental Panel on Climate Change (IPCC), Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC, Cambridge University Press, 2007.

Note: SRES = Special Report on Emission Scenarios.

Table 1
PROBABILITY OF TEMPERATURE RISES, BY STABILIZATION LEVEL
(Percentages)

Stabilization level of CO_2 equivalent (ppm)	**2°C**	**3°C**	**4°C**	**5°C**	**6°C**	**7°C**
450	78	18	3	1	0	0
500	96	44	11	3	1	0
550	99	69	24	7	2	1
650	100	94	58	24	9	4
750	100	99	82	47	22	9

Source: J.M. Murphy and others (2004), "Quantification of modelling uncertainties in a large ensemble of climate change simulations", *Nature*, No. 430, 2004.

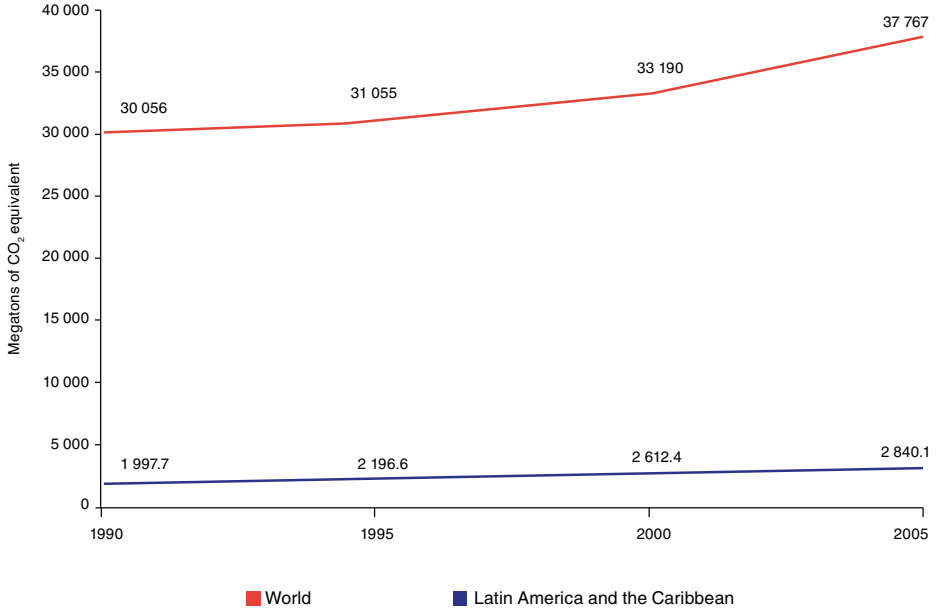
IV. EMISSIONS IN LATIN AMERICA AND THE CARIBBEAN

Climate change threatens the progress made in recent decades in development and in the achievement of the Millennium Development Goals.

The region of Latin America and the Caribbean is highly vulnerable to the adverse effects of climate change. Investment in adapting to climate change must be a priority for economic and social development. The immediate problem is to determine how, and how much, to invest and the manner in which multilateral institutions such as the IDB or the ECLAC should support these efforts.

The region is a relatively minor contributor to the global GHG emissions that accelerate climate change. Still, vast forest areas in the region are lost every year and the remaining forest areas will continue to be threatened, which makes efforts to address changes in land use and emissions from deforestation a priority for the region as well as for the world. In 2008, Latin America and the Caribbean accounted for 8.6% of the world's population, 8.2% of global GDP and 12% of global GHG emissions.

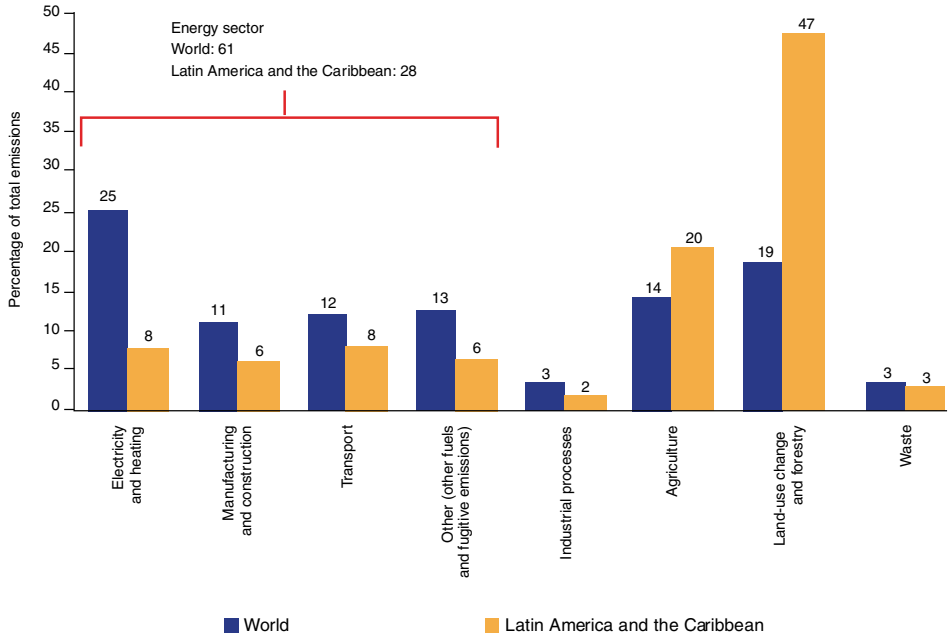
Figure 2
LATIN AMERICA AND THE CARIBBEAN: GREENHOUSE GAS EMISSIONS AS A SHARE OF THE WORLD TOTAL, 1990-2005
(Megatons of CO_2 equivalent)



Source: World Resource Institute (WRI), "Climate Analysis Indicators Tool (CAIT) Version 6.0" [online] www.cait.wri.org, 2009.
Note: Emissions include CO_2, CH_4, SF_6, N_2O, PFCs and HFCs, but exclude those from land-use changes.

The fact that in absolute terms the region accounts for a small amount of emissions does not relieve it of its global responsibilities. On a per capita basis and in proportion to the size of its economies, the region contributes more GHG emissions than do other developing countries, including China and India.

Figure 3
LATIN AMERICA AND THE CARIBBEAN: GREENHOUSE GAS EMISSIONS, BY SECTOR, AS A SHARE OF THE WORLD TOTAL
(Percentages)



Source: World Resources Institute (WRI), "Climate Analysis Indicators Tool (CAIT) Version 6.0" [online] www.cait.wri.org, 2009.

As climate change intensifies, the consequences are likely to be more serious and to threaten the social, economic, and environmental development of Latin America and the Caribbean. The possible consequences include:

- Significant decreases in agricultural productivity in some areas, with adverse consequences for food security and export revenues.

- A significant deterioration in the quality, quantity, and availability of water used for human consumption and in agriculture and a decline in the amount available to generate electricity.

- Damage to coastal areas owing to a rise of between one metre and five metres in sea levels, with an economic cost of between 0.54% and 1.30% of the region's GDP, respectively (Dasgupta and others, 2007).

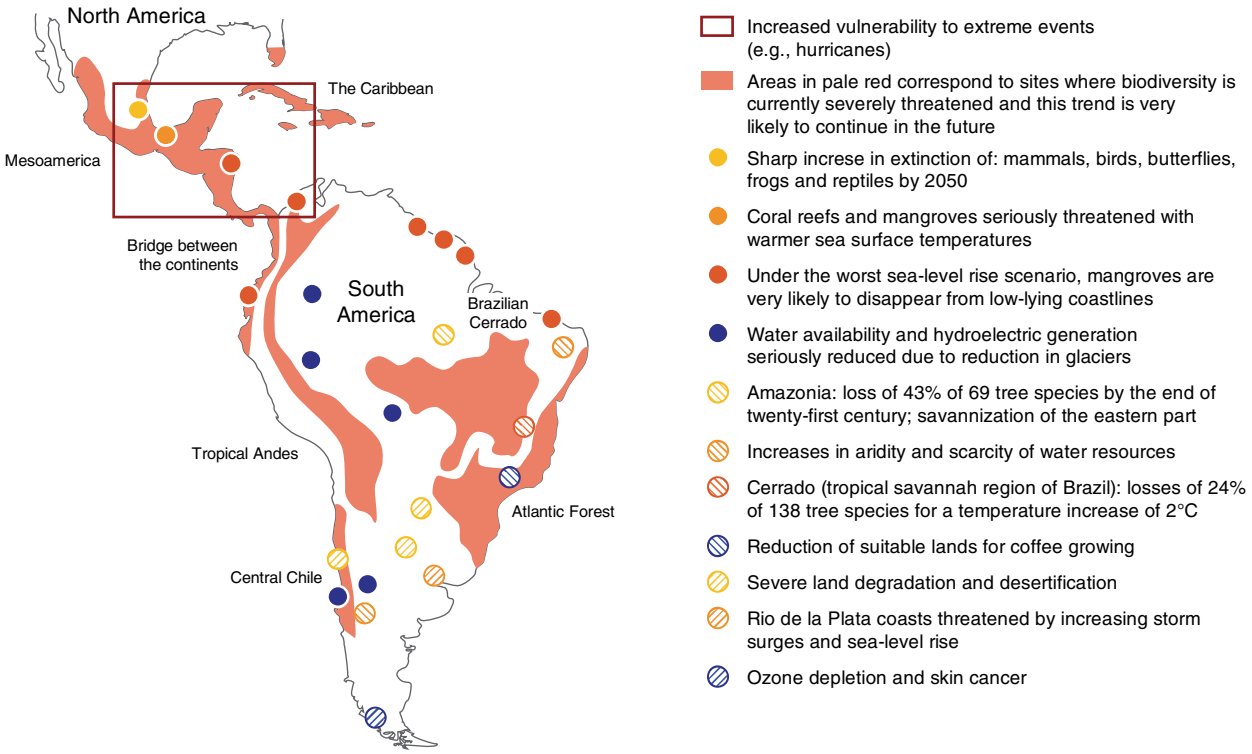
- More widespread bleaching of coral and death of coral reefs, as well as damage to associated ecosystem services, with high economic costs, particularly in the Caribbean.

- Increased economic damage from the greater intensity and frequency of hurricanes and tropical storms as a result of higher ocean surface and air temperatures.

- Significant biodiversity loss because of species extinction in most tropical areas and loss of ecosystem services.

- In the Amazon, the gradual replacement of tropical forests with savannahs.

Map 1
LATIN AMERICA AND THE CARIBBEAN: HOT SPOTS



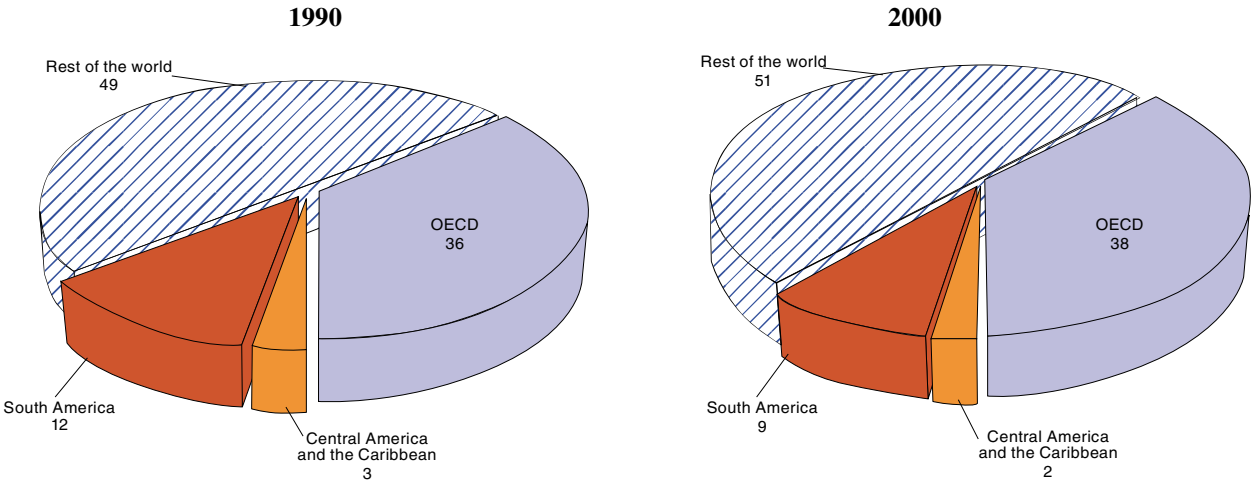
Source: Intergovernmental Panel on Climate Change (IPCC).

Note: As shown on the map, Central America and the Caribbean are at particularly high risk. The use of the boundaries and names given on the map does not imply that the United Nations endorses or accepts them.

Although in comparison with other regions, Latin America and the Caribbean may not be a major GHG emitter, climate change is clearly taking a toll, and if GHG emissions continue to rise, the impact on the region is likely to intensify and to generate even higher economic costs. According to a recent ECLAC study, between 1970 and 2008, climate-change-related phenomena (storms, floods, drought, landslides, extreme temperatures and forest fires) cost the region approximately US$ 80 billion (Samaniego, 2009). If the region fails to take action to mitigate the impact of extreme events in coming decades, the cost could rise to as high as US$ 250 billion in 2100 (ECLAC/IDB, 2009).

The region's share of global GHG emissions has declined in recent decades, although in absolute terms, total emissions have continued to rise (see figure 4).

Figure 4
LATIN AMERICA AND THE CARIBBEAN: SHARE OF ALL GREENHOUSE EMISSIONS
(Percentages)



Source: Based on data from World Resources Institute (WRI), "Climate Analysis Indicators Tool (CAIT) Version 6.0" [online] www.cait.wri.org.

Note: OECD emissions exclude Chile and Mexico, whose emissions are included with those of Latin America and the Caribbean. Also excluded are Belgium, Iceland, Luxembourg and Slovakia, whose data are incomplete. GHG emissions include those generated in energy and cement production and by changes in land use.

The main characteristics of these emissions are outlined below:

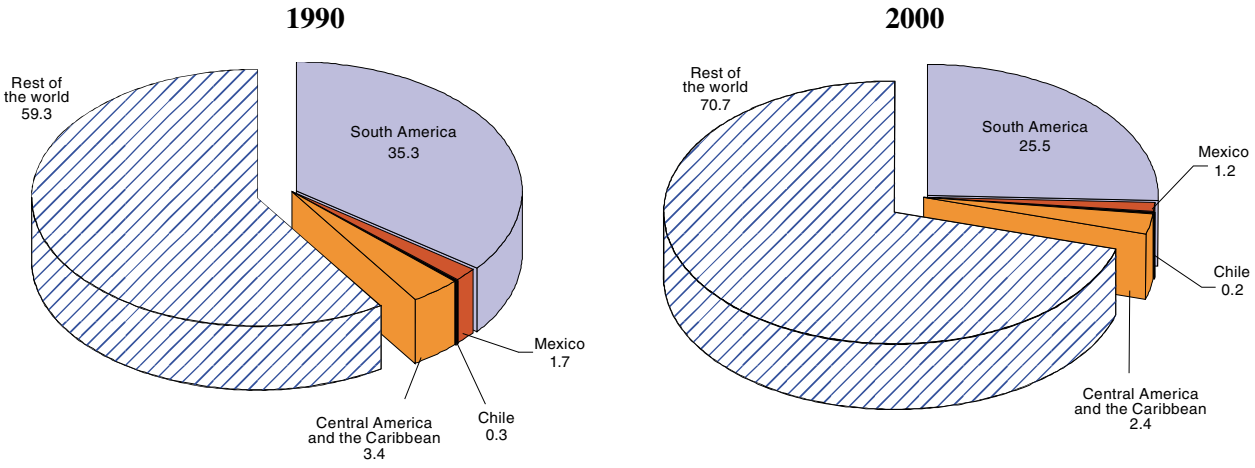
1. In Latin America and the Caribbean, a lower proportion of emissions comes from energy consumption, and a higher proportion comes from changes in land use, than in the rest of the world.

2. Average GHG emissions in Latin America and the Caribbean were seven metric tons per person in 2000, although there were significant differences among the countries.[4] A worldwide target of between two and three tons of GHG emissions per person would thus be below the current average for the region.

3. Total emissions in Latin America and the Caribbean reveal slightly contradictory trends. Emissions from changes in land use, including deforestation, in the region still represent a significant proportion of the world total, but have declined significantly in recent years. Nevertheless, deforestation continues to pose a challenge for the region (see figure 5). Emissions associated with energy consumption in the region, meanwhile, rose steadily from 1990 and 2004, although they continued to account for a small proportion of the world total (see figure 6).

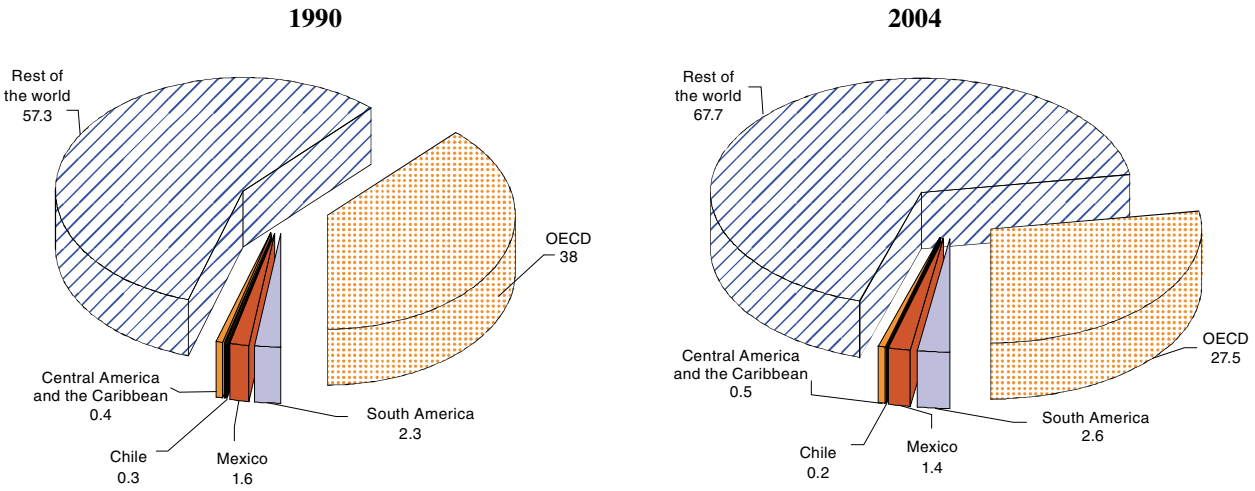
[4] On the basis of data from the World Resources Institute (WRI).

Figure 5
LATIN AMERICA AND THE CARIBBEAN: SHARE OF ALL GREENHOUSE GAS EMISSIONS FROM CHANGES IN LAND USE
(Percentages)



Source: Prepared by the author, on the basis of information from the Economic Commission for Latin America and the Caribbean (ECLAC) and the World Resources Institute (WRI), "Climate Analysis Indicators Tool (CAIT) Version 6.0" [online] www.cait.wri.org, 2009.

Figure 6
LATIN AMERICA AND THE CARIBBEAN: SHARE OF ALL GREENHOUSE GAS EMISSIONS FROM ENERGY CONSUMPTION
(Percentages)

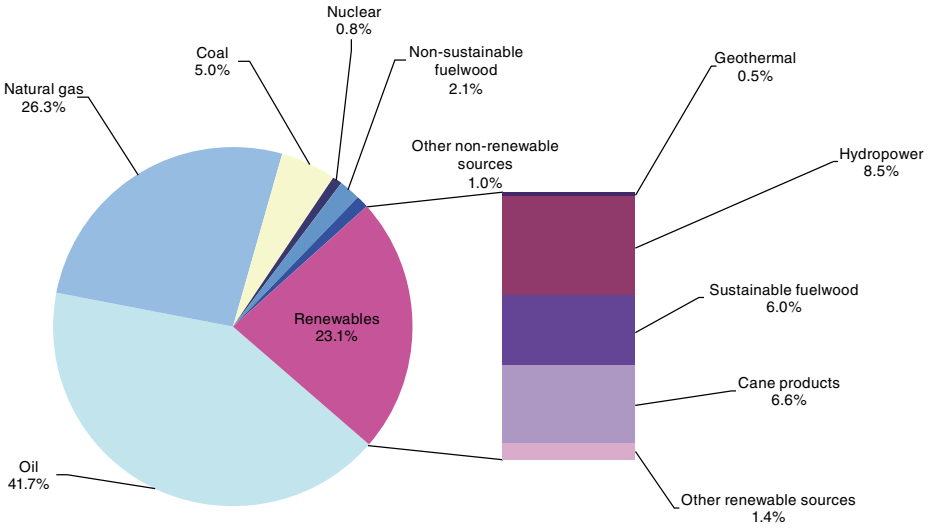


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Resources Institute (WRI), "Climate Analysis Indicators Tool (CAIT) Version 6.0" [online] www.cait.wri.org, 2009.

Note: OECD emissions do not include those of Chile and Mexico.

4. The energy matrix of Latin America and the Caribbean means that the region emits a lower amount of CO_2 than other regions do, owing in part to the importance of hydroelectric power. Moreover, the share of renewable energy in Latin America and the Caribbean has decreased slightly over the last decade, at about 23% of the total energy supply (see figure 7) (ECLAC, 2004 and 2010).

Figure 7
LATIN AMERICA AND THE CARIBBEAN: ENERGY SUPPLY, 2007



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the Latin American Energy Organization (OLADE), Energy-Economic Information System (SIEE) [online] http://www.olade.org.ec/siee.html.

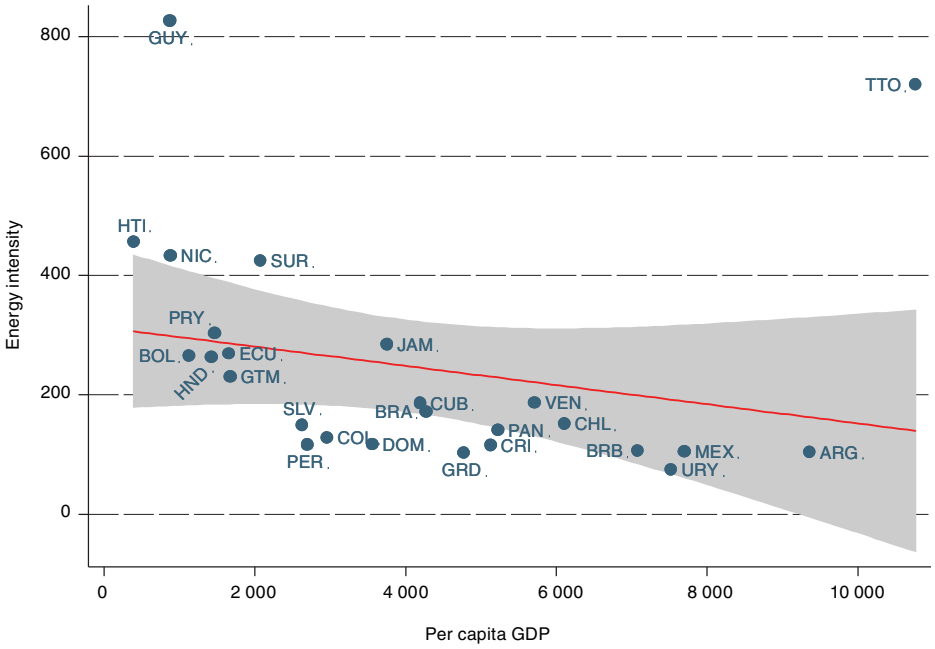
Available evidence indicates that in most countries there is a positive correlation between per capita energy consumption, per capita income and per capita emissions. This correlation points to a close interconnection between economic growth, energy use and GHG emissions and shows that the imposition of specific energy consumption limits would, in the short term, translate into an economic contraction in the region.

Energy consumption grew at an annual average rate of approximately 2.6% between 1990 and 2005.[5] CO_2 emissions from energy increased at a rate of less than 1.8% per year from 1990 to 2004.[6] By comparison, GDP rose by 3% per year from 1990 to 2005. That is, emissions from energy consumption increased more slowly than energy consumption, which, in turn, increased more slowly than GDP. In addition, energy intensity decreased as per capita GDP increased (see figure 8) (ECLAC/IDB, 2009). Although these relative changes appear to indicate that the region is headed in the right direction, albeit

[5] According to CEPALSTAT on the basis of information from the Latin American Energy Organization (OLADE).
[6] Based on information from the World Resources Institute (WRI), 2010. The figure for up to 2005 includes emissions from energy and cement production, which together increased at a rate of 2.6% per year.

slowly, they are, in and of themselves, insufficient for the region to meet the climate goals that it might be required to meet in a scenario of active cooperation on mitigation.[7]

Figure 8
LATIN AMERICA AND THE CARIBBEAN: PER CAPITA GDP AND ENERGY INTENSITY, 2007
(Barrels of oil equivalent and 2000 constant dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Latin American Energy Organization (OLADE), Energy-Economic Information System (SIEE) for total energy consumption, and Economic Indicators and Statistics Database (BADECON) for per capita GDP at constant 2000 prices.

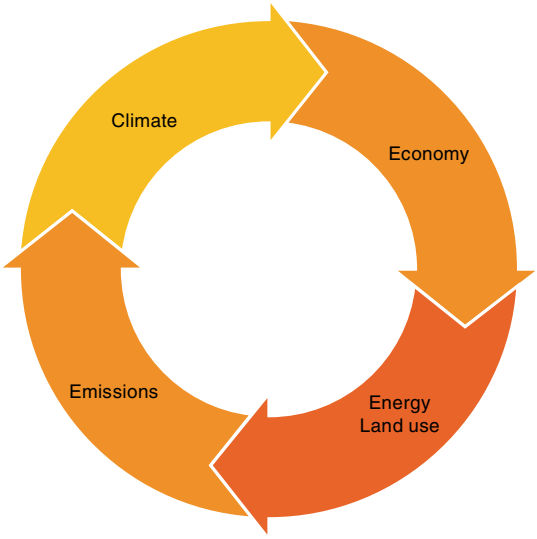
Note: The shaded area represents the standard deviation.

V. THE ECONOMIC COSTS OF THE IMPACT OF CLIMATE CHANGE

Climate change has a circular, non-linear relationship with the economy (see diagram 1). Estimates of what impact climate change will have on economic activity vary widely and depend crucially on the discount rate applied, the sectors considered, the methodology and the assumptions used in developing potential climate scenarios. So there is an ongoing and intense economic debate on how to estimate these costs. Preliminary estimates based on information available to December 2009 suggest that the economic costs for Central America, to 2100, under various climate scenarios and using current GDP as the benchmark, will vary between 70% with a 0.5% discount rate and 10% with a 4% discount rate. Chile and Uruguay are expected to lose about one percentage point of GDP per year up to 2100 (ECLAC/IDB/Government of Chile, 2009; ECLAC/IDB, 2009 and ECLAC/IDB, 2010).

[7] In other words, efficiency in energy use is gradually increasing while emissions per unit of energy consumed are gradually falling.

Diagram 1
CLIMATE-ECONOMY FEEDBACK CYCLE



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

The main characteristics of these economic costs are:

- **Significant and heterogeneous**: Costs are significant but will differ greatly by sector, economic agent, region or climate.

- **Short-term winners and losers**: Costs will rise in tandem with increasing weather phenomena. However, there are regions in Latin America and the Caribbean which will experience growth over the short term, with temperature increases remaining generally below 2 degrees Celsius. An example of this is the temperate areas, where rising temperatures will expand the area of farmland. In contrast, in areas of lower per-capita income, which are less capable of adapting and preventing, economic losses could be significant, as a consequence of extreme climatic events, even over the short term.

- **Non-linear and irreversible**: Costs increase unevenly and have specific boundaries which, once exceeded, will cause irreparable losses, such as would be the case with biodiversity.

- **Dependent on climate scenarios**: Economic costs are crucially dependent on climate change projections. In particular, the impacts of climate scenario A2 (the worst climate scenario) are substantially more significant. Available evidence indicates that, in the absence of mitigation, the economic costs brought on by climate change are usually higher than the costs of an internationally-coordinated mitigation process (Stern, 2006). This does not necessarily hold true for all regions.

VI. THE ECONOMIC COSTS OF MITIGATION

In aggregate terms, simulations conducted for Latin America and the Caribbean show that, for the rest of the century, total CO_2 emissions could grow at an approximate average annual rate of 1% to 2% (a 1.5% annual average), although there are significant differences between countries and sectors (ECLAC/IDB, 2009). For example, it is important to consider that, in the region, emissions associated with transport-sector fuel consumption are expected to grow rapidly, while emissions associated with changes in land use or deforestation are expected to decline gradually.

The economic costs of mitigation are difficult to estimate precisely, given that they rely on a set of factors that are difficult to predict, such as the availability and cost of specific technologies, the per-ton price of coal and the specific mitigation measures and mechanisms available. The evidence on hand shows that the region has a substantial array of mitigation options for sectors such as energy generation, transport, or for controlling changes to land use. Some of these options are already being implemented although, in aggregate terms, their costs are still quite high. Various exercises performed in studying the economic impact of climate change provide an approximate idea of the size of the effort involved.

For example, a very flexible mitigation strategy that would reduce by 30% all CO_2 emissions from the use of energy, when applying a trend or business-as-usual scenario (BAU) for Latin America in 2100, involves costs of approximately 1% to 3% of current GDP, assuming a price of US$ 10 to US$ 30 per ton of coal, and applying a discount rate of 0.5% (ECLAC/IDB, 2009).

There are various mechanisms and instruments that could support mitigation actions, such as the application of direct regulations or economic instruments, such as taxes or emissions trading schemes. Available evidence for Latin America (ECLAC/IDB, 2009) shows that current sensitivity of demand for various forms of energy to energy prices is relatively low. Energy consumption, on the other hand, is quite sensitive to, and closely tracks, the pace of economic growth.

The economic costs of climate change, both those associated with the impacts and those associated with mitigation, may impose another restraint on economic growth. Moreover, the general consensus is that those costs will be higher for the developing countries than for the developed ones.

VII. OPENINGS FOR REGIONAL INTEGRATION AND COORDINATION IN THE PURSUIT OF LOW-CARBON ECONOMIES[8]

The globalization of the world economy means that national economies are more interdependent than ever before, and the new challenges facing the global economy therefore need to be addressed by coordinating various actions and public policies at the regional and global levels. The challenge of climate change has revealed the importance of achieving a multilateral agreement that both minimizes the risks and allows the costs to be distributed more fairly. The countries of Latin America and the Caribbean will thus have to strive to coordinate actions that both further their development and respond to the additional pressures imposed by climate change.

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[8] The Natural Resources and Infrastructure Division provided valuable support in preparing this section (see ECLAC, 2009a, 2009b and 2009c).

This could mean changing the orientation of some of the region's long-term physical integration initiatives, especially those that encourage carbon-intensive activities and, in the advent of increasingly tighter restrictions on GHG emissions, therefore run the risk of generating significant costs in the future. Transportation projects in the region, for example, tend to focus on developing infrastructure for road rather than other less carbon-intensive modes of transport such as rail, maritime and river transportation (see map 2).

Map 2
INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA (IIRSA): MUTUALLY CONSENTED IMPLEMENTATION AGENDA, 2005-2010

Source: Strategic Management Information System (SIGE), *Quinto informe de avance de la Agenda de Implementación Consensuada 2005-2010*, Executive Secretariat of IIRSA [online] www.iirsa.org/BancoMedios/Documentos%20PDF/aic_informe_2009.pdf.

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