Sustainable Development: Environment, Climate Change and Energy

Opportunities for Dialogue and Cooperation between the European Union and Latin America and the Caribbean

Inter-American Development Bank

A preliminary version of this paper was distributed to the participants in the First Meeting of Environment Ministers from EU and Latin American and Caribbean countries, held in Brussels on March 4, 2008.

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Foreword

Sustainability lies at the heart of economic growth, whose objective is to generate lasting benefits to society. The region of Latin America and the Caribbean is well endowed with natural resources and environmental assets, which, if properly managed, constitute the basis for productive activity, poverty reduction, and improved quality of life.

Challenges for the region include the conservation and sustainable use of biodiversity, forests, soils, watersheds, and other natural capital assets, as countries come to terms with increasing demand for infrastructure development, energy supply and commodity exports, and the impacts of climate change. Therefore it is imperative that the region achieve an unprecedented level of policy coherence, technological innovation and financing in order to successfully respond to climate change as well as meet sustainable development objectives.

The Fifth Summit of Heads of State and Government of the European Union and Latin America and the Caribbean (EU-LAC), to be held in Lima in May 2008, provides an excellent opportunity to make the environmental dimension of sustainable development a strategic priority for cooperation between both regions, especially as it relates to energy and climate change.

The decision to make these issues the focus of the discussions reflects their great importance for the participating governments. The Summit's high-level dialogue on these topics can serve as the basis for agreements to enhance cooperation between the regions and lead to improved environmental governance and performance in Latin American and Caribbean countries. Such discourse can also promote sustainability in their energy production and consumption and enhance joint efforts in the face of climate change. This document was an input to the dialogue of the Environment Ministers of Europe, Latin America, and the Caribbean at their meeting held in Brussels in March 2008 under the coordination of the Slovenian Presidency and the Government of Peru, the host of the EU-LAC Summit. This paper describes the opportunities that countries have to shape public policies, finance public goods, and strengthen institutional capacities to address the challenges of sustainable development, energy and climate change.

The IDB is committed to collaborating with the countries of the EU and LAC to enhance dialogue and cooperation to tackle the challenges of climate change and realize potential shared benefits, such as energy efficiency, access and security, rural development, and improved quality of life. Our Bank is prepared to extend its support to the countries in their efforts to achieve their sustainability objectives.

Luis Alberto Moreno
IDB President

Introduction

Countries in Europe, Latin America, and the Caribbean face many challenges in ensuring the environmental sustainability of economic growth and properly addressing the economic, environmental, and social aspects of the global threat of climate change.

The Fifth Summit of Heads of State and Government of the European Union and Latin America and the Caribbean (EU-LAC), to be held in Lima in May 2008, provides a unique opportunity to frame the environmental dimension of sustainable development, especially in relation to energy and climate change, as a strategic priority in cooperation between the two regions.

The decision to make these issues the focus of the discussions reflects their great importance for the participating governments. The Summit's high-level dialogue around these topics can serve as the basis for enhanced cooperation to improve environmental governance and performance in Latin American and Caribbean countries, promote sustainability in their energy production and consumption, and increase joint action in the face of climate change.

This document provides an overview of issues related to sustainable development, energy, and climate change from the perspective of Latin America and the Caribbean. It was prepared as a contribution from the Inter-American Development Bank (IDB) to the process of dialogue between the regions.

The discussion that follows reviews the main challenges faced by the countries of the region in their quest for sustainable development, with a focus on emerging trends related to increasing demands for infrastructure development, energy supply, and commodity exports, as well as opportunities offered by the global response to climate change. In all cases, the document highlights areas where a greater cooperation between the LAC and the EU is possible.

The common thread among the different sections of the paper is the need for an integrated and coherent approach to policy-making, which is a key requirement to put the region on track towards sustainable development, as has been the experience with the EU Sustainable Development Strategy. Addressing basic environment, energy, and climate change challenges will require an unprecedented level of policy coherence in each of the LAC countries and at the regional level.

The shift from the conventional "silo" approach to policy-making to an integrated approach that enables mutually supportive objectives will require enhanced dialogue and cooperation with the international community, especially considering advances made by the EU and its member countries in the integration of environmental and social aspects of sustainable development into all areas of government action.

Challenges for Sustainable Development in Latin America and the Caribbean

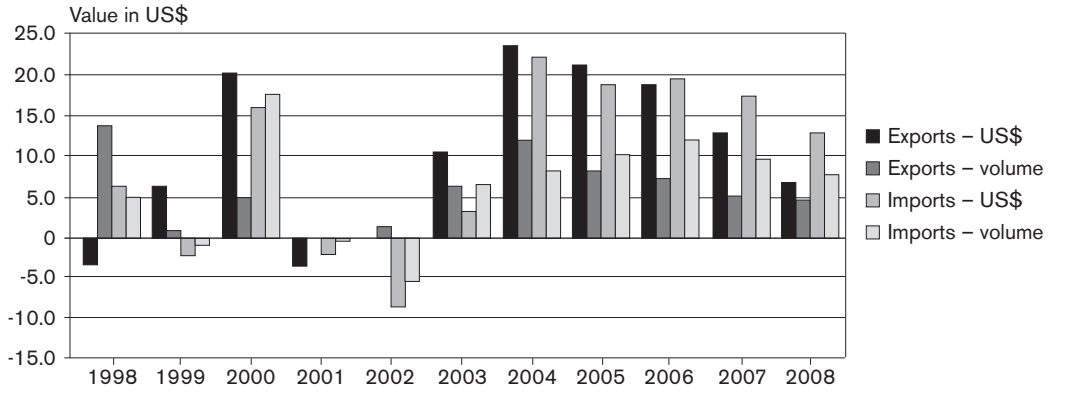
Economic Growth and Environment

Latin American and Caribbean countries[1] are striving to take advantage of opportunities presented by globalization to achieve sufficient economic growth to alleviate poverty, while at the same time struggling to respond to increasing pressures on their natural resource base and their institutional capacities to take action.

The region has undergone rapid trade liberalization in the past decade. Most countries currently belong to one or two trading blocs, and important political agreements provide the basis for economic and physical integration, such as the Plan Puebla Panama (PPP), and the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA).

A greater inward and outward flow of goods and services is being realized in the region through intra-regional agreements as well as participation in multilateral and bilateral negotiation forums, such as the World Trade Organization; the free trade agreements of several of the region's countries and blocs with the United States, Taiwan, Japan; and the ongoing negotiation of an Economic Association Agreement between Central America and the European Union. The increasing integration of LAC economies into international markets is evident from the significant rise in exports and imports over the past five years (Figure 1).

Figure 1: Latin America and the Caribbean: Changes in Value and Volume of Exports and Imports (Annual Growth Rate)



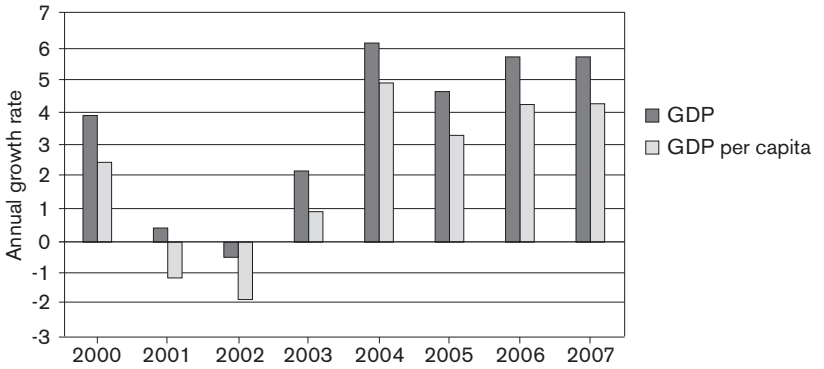
Source: United Nations, World Economic Situation and Prospects 2008, New York, UN 2008. Annex Tables.
Note: The figures for 2008 are projections.

[1] Of which 26 are IDB members

Growing global demand for commodities is reflected in sharp price increases in the global markets. According to data from the United Nations (UN, 2008), during the third quarter of 2007 the prices of vegetable oilseeds and oils had increased 163% compared to the year 2000; those of agricultural raw materials 64%; minerals and metals 222%; and crude petroleum 159%. Such increases are especially important for countries whose economies depend on exports of primary products.

This upsurge in external demand and international prices of the region's commodities, and the associated revenue increases, in turn stimulate internal demand growth. As a result, LAC as a whole has experienced high economic growth rates for the past 5 years (Figure 2).

Figure 2: LAC Gross Domestic Product Growth 2000-2007



Source: Economic Commission for Latin America and the Caribbean, ECLAC Notes No. 56. January 2008.

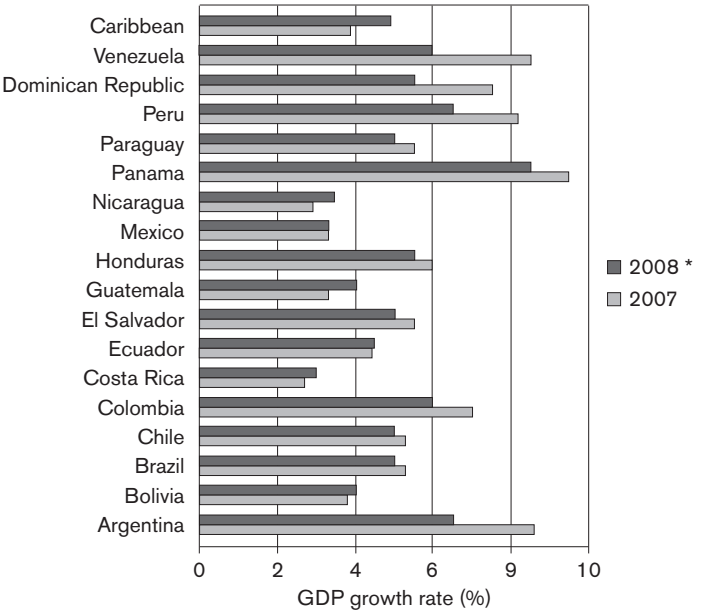
Projections from the UN's Economic Commission for Latin America and the Caribbean (ECLAC) indicate that the growth trend is expected to continue in 2008 for all countries in the region (Figure 3).

Such growth rates are contributing to poverty reduction, which is still a main concern for LAC countries.[2] Nevertheless, some experts question the sustainability of these growth rates from an environmental point of view, as increased commodity exports may translate into an expansion of the agricultural frontier and/or intensification of extractive activities. This could lead to environmental degradation in the absence of appropriate regulations and sustainable management practices.

Complementing national efforts to facilitate trade and tourism, regional initiatives such as the Plan Puebla Panama and IIRSA include the development of large infrastructure projects, such as highways, ports, energy production, and transmission facilities, which are intended to promote greater commercial and cultural exchange among participating countries. Despite

[2] According to ECLAC, poverty decreased by 3.3% and extreme poverty by 2.1% from 2005 to 2006, meaning that 14 million people escaped from poverty and 10 million were no longer classified as indigents. That still leaves 195 million people in poverty (36.5% of the population) and 71 million in extreme poverty (13.4%).

Figure 3: LAC GDP Growth Rate by Country, 2007 and 2008



*Estimated
Source: ECLAC. ECLAC Notes No. 56. January 2008.

their potential benefits, these projects can increase pressure on some of the most important ecosystems in the region, such as the Amazon and Mesoamerican Biological Corridor, and displace vulnerable groups, if they are not designed and implemented within a "sustainable development framework that promotes economic growth and poverty reduction while simultaneously promoting the conservation of natural resources and the long-term economic health of the region."[3]

Pressures on regional natural resources that arise from trade and production expansion are further aggravated by rapid urban growth. According to the GEO4 report, the LAC region is the most urbanized in the developing world, with 77% of the total population living in cities (UNEP, 2007a). In Argentina, the Bahamas, Brazil, Chile, Mexico, Uruguay and Venezuela, more than 75% of the people live in urban areas, and populations in countries such as Panama, Dominica, Colombia, Suriname and Peru are expected to reach that level by 2015.

Other countries that still have larger rural populations are rapidly becoming urbanized. For example, from 1975 to 2005, the urban population in Haiti rose from 22% to 39%; in Saint Vincent and the Grenadines, from 27% to 46%; in Paraguay from 39% to 59%; and in Costa Rica from 41% to 62%.

This rapid urban expansion, combined with weak land-use regulations and deficient planning, has stretched the cities' capacities to provide adequate housing, transportation, and

[3] As suggested by Gustavo Fonseca in the introduction to Killen (2007)

services to all their inhabitants, while exacerbating urban environmental problems. There have been some successful experiences such as those of Bogotá (Colombia) and Curitiba (Brazil) in the improvement of their urban transport systems; of certain major cities in Mexico in the management of urban air quality; and of Chile in water law reforms. Nevertheless, air pollution is high and increasing in smaller cities, while untreated domestic and industrial waste contributes to water pollution. Such problems demand greater efforts to develop and implement effective urban environmental policies (UNEP, 2007b).

Institutional Response Capacities: Governance and Policy Coherence

Governments and civil society organizations in the LAC region have embraced sustainable development as a conceptual framework in their efforts to achieve a better quality of life for present and future generations. However, in practice, reaching sustainable development goals requires an integrated approach to policy-making, which represents a significant shift from the traditional sectoral policy approach.

In the past two decades, the majority of LAC countries have passed environmental legislation and created environmental institutions at the ministerial level. During the late 1990s there was significant legislative progress in areas of environmental impact assessment; territorial planning; new offense and penalty definitions; assignment of responsibility and legal actions related to environmental damage and protection; mechanisms for citizen participation; and limitations of property rights for environmental reasons. There were also reforms in sectoral laws regulating the exploitation, use, and conservation of renewable and non-renewable natural resources (Majano and Rivera, 2003).

Additionally, the region has been active in adopting multilateral environmental agreements. All 32 countries have signed the major environmental conventions: Climate Change, Biodiversity, Ozone and Desertification, and the Montreal Protocol. All but one have signed the Kyoto Protocol, 30 out of 32 have signed the Cartagena Protocol, and a similar number have signed the Stockholm Convention.

In addition to the creation of environmental institutions at the national level, there have been promising developments at the sub-regional level. These include the creation of the Central American Commission on Environment and Development (CCAD) led by the Ministers of Environment from the Central American Integration System member countries, as well as the establishment of permanent high level fora, such as the Latin American and Caribbean Environment Ministers Forum, which meets every two years and has an interagency technical support group integrated by the World Bank, the IDB, ECLAC, UNDP, and UNEP.

Despite such advancements, environment ministries in many LAC countries are still politically and financially weak. The roles of such ministries are not entirely understood by other government authorities, the private sector, or the population in general, and they are expected to solve all environmental problems while everyone else continues "business as usual."

The enforcement of environmental regulations is relatively weak. In the 2007-2008 Global Competitiveness Report, which ranks 131 countries according to the stringency of such regulations, the top five are in Europe: Germany, Denmark, Sweden, Finland and the Netherlands. The highest ranked LAC countries are Costa Rica, Chile, Brazil, and Uruguay, which rank 37, 40, 46 and 47, respectively. The majority of LAC countries rank between 50 and 100, while five are within the lowest 30 (WEF, 2006).

Most of the environmental legislation and policy instruments in the region have favored traditional command and control approaches. However, financial and technical resources needed for effective enforcement are not always available to the authorities. Moreover, in many private sector segments, and even among economic policy-makers, there is a prevailing perception that environmental management is a "non-productive" expense that hinders competitiveness.

Considering the shortcomings of the direct regulatory approach, some countries in the region have opted to develop and apply instruments that allow for the consideration of environmental costs and benefits in economic decision-making, thereby discouraging certain negative practices and providing incentives for positive ones. Important achievements have been made in the application of such instruments in the region, such as the payment for ecosystem services to protect biodiversity and water sources in Costa Rica, Brazil, Ecuador and Mexico; and effluent charges to control water pollution in Colombia (Majano and Rivera, 2003).

The successessful use of economic instruments highlights the need to consider all aspects of sustainable development when administering measures to address environmental problems. Likewise, economic policies must consider all social and environmental aspects related to their area of influence. As such, the main challenge for policy-makers in Latin America and the Caribbean is to find ways to mainstream environmental concerns into all areas of sectoral policy-making and private economic decision-making.

The Millennium Development Goals

The difficulties LAC countries encounter in dissociating economic growth from environmental degradation are reflected in recent assessments of the region's likelihood of achieving the Millennium Development Goals (MDGs). An evaluation of the probability of reaching eight MDGs, based on available country reports, shows that the majority of countries are likely —or at least have the potential—to achieve the goals of reducing extreme poverty by 50% and providing universal primary education. But very few are considered on track regarding the goal of achieving environmental sustainability (http://www.un.org/milleniumgoals/).

The Millennium Development Goal of environmental sustainability has three targets. The first one (Target 9) calls for the integration of the principles of sustainable development into country policies and programs and the reversal of environmental resource losses. A United Nation's inter-agency study of the MDGs in the LAC region notes that the progress indicators for this goal lack an actual measure of such integration. Nevertheless, an analysis of those indicators that are actually included provides an opportunity to examine the most pressing issues for the region.

The first two progress indicators for this target are the proportion of land area covered by forest and the ratio of protected area to total surface area. These indicators are very relevant, since forests cover almost 46% of the LAC region (more than nine million square kilometers), which is equivalent to 23% of the world's forest area.

Despite this great forest coverage, the agricultural frontier expansion, intensification of extractive activities, and disorderly urban expansion have contributed to the decrease of forest area at an average rate of 0.5% annually since 1990, amounting to more than 683,000 square kilometers of forest loss in the 15 years up to 2005. Almost 62% of that loss has occurred in Brazil and 22% has occurred in four of the other largest countries in the region (see Table 1).

Table 1: LAC Forest Loss, 1990-2005

Country	Decrease in Forest Area 1990-2005 (Thousand sq km)	Accumulated Percentage	Annual Loss Rate 1990-2005
Brazil	423.3	62%	0.5%
Mexico	47.8	69%	0.5%
Venezuela	43.1	75%	0.6%
Bolivia	40.6	81%	0.4%
Ecuador	29.6	85%	1.4%
Honduras	27.4	89%	2.5%
Argentina	22.4	92%	0.4%
Peru	14.1	94%	0.1%
Nicaragua	13.5	96%	1.4%
Guatemala	8.1	98%	1.1%
Colombia	7.1	99%	0.1%

Source: GEO4 Database.

Although in absolute figures the largest losses are in South America, in relative terms forests are disappearing more rapidly in Central America, where the largest annual decrease rates are in Honduras (2.5%), Nicaragua, Guatemala, and El Salvador (1.4% each). The general trend of decreasing forest coverage does not hold, however, for Uruguay, Saint Vincent and the Grenadines, and Chile, which have increased forest area at annual rates of 4.2, 1.5 and 0.4%, respectively.

Besides the loss of habitats, as well as indigenous culture and knowledge, deforestation and unsustainable agricultural practices have resulted in the degradation of soil and water, which are already under considerable stress in certain areas. As a response to this situation, some countries have developed programs to help reduce annual deforestation rates and have declared more protected areas. Such areas now cover 10.5% of the LAC land base, twice the area of two decades ago (UNEP, 2007a). These programs, which combine traditional command and control measures with innovative economic instruments, show the way to more integrated efforts at the national and regional levels.

The third indicator for Target 9 refers to energy intensity; in this regard, LAC countries have made modest advances. Compared with a sharp increase in the late 1980s and early 1990s,

energy use per U.S. dollar of output has stabilized in recent years. A UN study points out that the region still must make significant progress in this area, considering that OECD countries have succeeded in reducing their energy intensity "by 20% over the past 20 years, through energy policies geared to diversify the energy supply and enhancing energy efficiency" (UN, 2005). These topics are discussed more thoroughly in Section 2.

Diversifying energy sources and increasing production to meet growing demand must take place simultaneously with providing access to modern energy to a significant percentage of the population. According to estimates, 45 million people in the region, mostly living in rural areas, lack electricity connections and more than 60 million people rely on traditional biomass for cooking. The latter figure relates to the fourth indicator for Target 9 of the MDGs. The use of biomass in itself is not necessarily a problem, but the combination of inefficient technology and unsustainable harvest practices pose serious threats to human health, the environment, and economic development through deforestation, land degradation, indoor air pollution, and the opportunity cost of the time dedicated to fuel collection (IEA, 2006).

The fifth indicator for Target 9 of the MDGs refers to per capita emissions of carbon dioxide and consumption of ozone-depleting chlorofluorocarbons (CFCs). In this regard, the region's performance is positive; in accordance with their commitments under the Montreal Protocol, countries have undertaken measures to eliminate ozone-depleting substance use. Although carbon dioxide emissions have increased in the region, they still represent a small percentage of global emissions and have grown more slowly than some major emitters worldwide.

The region's contribution to greenhouse gas (GHG) emissions, which have been identified as the cause of global warming, is relatively small but not insignificant. It is estimated that the region accounts for only 6% of total GHG emissions, but it contributes to approximately 25% of all carbon sink losses (Vergara et al., 2007), mainly from deforestation. This means that for the region to contribute to the mitigation of GHG emissions "the sustainable use and conservation of forests are quantitatively more important … than energy efficiency measures, although such measures yield more short-term results" (UN, 2005).

The Millennium Development Goal of environmental sustainability is also reflected by Target 10, which aims to reduce the proportion of people without sustainable access to safe drinking water and basic sanitation by 50% by 2015. The LAC region's indicators for progress towards this target have improved in recent decades and are above the average for developing countries as a whole. Nonetheless, 23% of the region's population lack access to improved sanitation and 9% lack improved water sources. These averages hide significant differences between countries, as can be observed in Table 2.

Access to improved water sources has gone from an average of 83% to 91% for the LAC region, which is above the overall 79% average for developing countries. Paraguay shows the greatest improvement, from 62% to 86%, followed by Ecuador (73% to 94%), El Salvador (67% to 84%), and Guatemala (79% to 95%). Two countries in the region had 100% access to both improved sanitation and water sources in 2004: Barbados and Uruguay.

Table 2: Percentage of LAC Population Without Access to Improved Water and Sanitation

Country	Percentage of Population Without Access to	
	Improved Sanitation (2004)	Improved Water Source (2004)
Belize	53	9
Bolivia	54	15
Brazil	25	10
Colombia	14	7
Dominica	16	3
Dominican Republic	22	5
Ecuador	11	6
El Salvador	38	16
Guatemala	14	5
Guyana	30	17
Haiti	70	46
Honduras	31	13
Jamaica	29	7
Mexico	21	3
Nicaragua	53	21
Panama	27	10
Paraguay	20	14
Peru	37	17
Saint Lucia	11	2
Venezuela	32	17

Source: Based on data from the Human Development Report 2007/2008 (UNDP, 2007).
Note: Countries not shown have both improved water and sanitation access for over 90% of their populations, with the exceptions of Saint Vincent and the Grenadines, for which no data is available.

On average, the percentage of the population with access to improved sanitation in the LAC region increased from 67% in 1990 to 77% in 2004, which is also above the average of 49% for all developing countries. The greatest improvements were seen in the Dominican Republic, increasing from 52% in 1990 to 78% in 2004; Bolivia, from 33% to 46%; Mexico, from 58% to 79%; and Paraguay, from 58% to 80%.

The majority of the countries have met the drinking water component of the MDGs. However, the sanitation situation is not as promising, since more than 20% of the total population still have inadequate sanitation, a percentage that rises to more than 50% in rural areas, according to Table 3. This implies that untreated wastewater from more than 100 million people is dumped into the region's rivers, lakes, and oceans, contributing to water pollution and water-quality related diseases.

Table 3: Percentage of LAC Population Without Access to Improved Sanitation

Subregion	Percentage of Population Without Access to Improved Sanitation 2004		
	Rural	Urban	Total
Caribbean	42.1	14.2	25.9
Mesoamerica	49.9	11.0	22.7
South America	53.0	15.4	22.6
Latin America and the Caribbean	53.4	14.3	22.8

Source: GEO Data Portal http://geodataa.grid.unep.ch/.

The lack of improved water and sanitation highlights the fact that, although they are confronting challenges brought about by globalization and economic growth, LAC countries must still solve basic environmental problems that greatly affect the quality of life of their population. This is especially true for people living in rural areas and slums, whose life quality improvement is also a target of the MDGs related to environmental sustainability.

According to the aforementioned UN study (UN, 2005), the degradation of the natural and built environments, which has adverse effects on the poor population in both urban and rural areas, is serious and worsening, and the transition to environmentally sustainable development is fraught with difficulties. The fragmentation of laws and institutional mandates, the low level of compliance with environmental standards, the lack of coordination between social and environmental policies, and considerable financial constraints impede progress towards the fulfillment of Target 9.

Areas for LAC-EU Dialogue and Cooperation

Putting the region on track towards sustainable development requires immediate and coherent action from different areas of government, civil society, and the private sector to address growing and increasingly complex environmental problems. Although Latin American and Caribbean governments are making efforts to find solutions, in many cases the analysis and policy responses are developed using the traditional sectoral approach instead of an integrated approach, which is needed to incorporate all elements of sustainable development in all areas of policy-making.

Despite the great diversity of its member states, the European Union has successfully developed action plans, institutions, and legal and economic instruments to address local and global environmental problems and promote sustainable development. As such, greater political dialogue and cooperation in this area between the LAC and EU countries could be beneficial to both regions.

LAC countries could benefit greatly from a wider implementation of the methodological approaches adopted by the EU and the OECD to ensure the convergence of the "overarching long-term objective of sustainable development, and the medium-term goal of growth, competitiveness, and jobs, such as through Impact Assessments (IA) to evaluate the social, environmental, and economic impacts of all major policy decisions and programs" (European Commission, 2007). A specific EU directive requires use of the Strategic Environmental Assessment (SEA) to identify and assess environmental consequences of certain plans and programs during their preparation and before their adoption.

As a means to "ensure that significant environmental effects arising from policies, plans, and programs are identified, assessed, mitigated, communicated to decision-makers, and monitored" (UNEP, 2002), the SEA has become an important instrument to help achieve sustainable development in planning and policy-making. It is a complement to the project-level Environmental Impact Assessment (EIA) not a substitute for it. The SEA is now common

practice in Latin America and the Caribbean, where it "extends the objectives and principles of EIA in the first phases of the decision-making process, while major alternatives are still open" (UNEP, 2002).

Such tools have already been applied in practice in some international agencies, academic institutions, and NGOs to assess the potential impact of specific policies and programs, especially those related to international trade and infrastructure. In some cases, such as in El Salvador, these tools are required by some of the most recently approved environmental legislation. Their use is also being encouraged by multilateral and bilateral cooperation agencies, yet they are not widely used in general development planning and sectoral policies.

Policy dialogue and cooperation between the EU and LAC can contribute to strengthening capacities and building political will for the implementation of a more integrated approach to sustainable development planning. Similarly, it can promote the use of tools such as the SEA, both at the national level and within regional integration projects, especially those related to trade and infrastructure. The negotiation of economic association agreements, such as the one signed with Chile and the one recently initiated with Central American countries, which require the integration of SEAs, creates an opportunity to transfer methodologies and build relevant capacities in the region.

An important issue in this interregional dialogue, which is also the subject of monitoring and debate for governments, NGOs, and citizen groups within the EU, is the coherence of the Union's internal policies regarding cooperation with developing countries. The term "Policy Coherence for Development" promoted by the OECD, of which most EU countries are members, directly refers to "the needs and interests of developing countries in the evolution of the global economy" (OECD, 2003).

The EU has recently published its first report on PCD, which highlights the relationship between the Union's development policy and twelve other internal and external policies that impact developing countries. It concludes that the coherence between EU policies and the development objectives has improved, but more can be done (EU, 2007). Possible areas for improvement, suggested by the report as well as civil society organizations, include trade, agriculture, fisheries, and energy, among others (www.eucoherence.org).

As a result of this first assessment, the European Commissioner for Development and Humanitarian Aid called for more dialogue with developing countries at the national, regional, and global levels, on the effects of EU policies, other than those of aid, and the relevance of the PCD approach for those countries. This request was made because "in most policy areas the impact of EU policies depends on parallel efforts being undertaken by partner countries" (Europe-Rapid, 2007).

The Lima Summit is an excellent opportunity for the EU to begin this dialogue with Latin America and the Caribbean, and for LAC countries to express their opinions on the impact of EU policies on their sustainable development objectives. In turn, this can open the door for

continued communication and cooperation, at the bilateral and interregional levels on greater policy coherence both within the countries and in their cooperation relations with others. In addition, it can help strengthen capacities for improving environmental governance and incorporating environmental concerns in all areas of policy-making in the LAC region.

The decision to focus the Lima Summit discussions on the relationship between environment, energy, and climate change within the framework of sustainable development creates the opportunity for a high-level political dialogue and increased cooperation. These can help the countries attain stronger environmental governance and develop coherent policies and instruments that improve the quality of life, particularly for their poor population. Additionally, they can contribute to satisfy the energy needs arising from economic development while making sustainable use of their natural resources and contributing to the mitigation of global problems.

The Challenge of Energy Sustainability

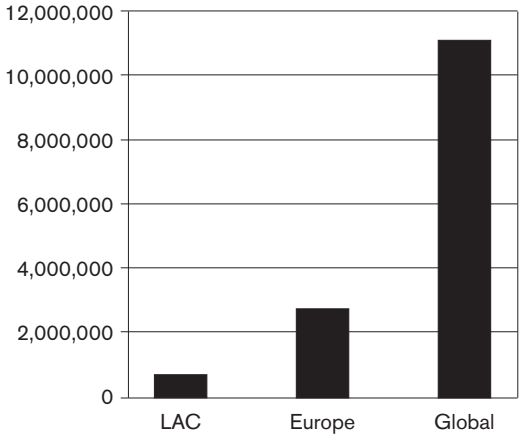
Energy Demand and Supply

With roughly 9% of the world's population, Latin America and the Caribbean account for approximately 6% of global energy use. Within the region, the size of the energy sector is proportional to the sub-region's populations and the sizes of their economies: South America's Total Primary Energy Supply (TPES) in 2004 was more than twice that of Mesoamerica, and more than nine times the Caribbean TPES (GEO Data Portal, http://geodata.grid.unep.ch/).

Figure 4: LAC Total Primary Energy Supply

(Thousand tons of oil equivalent)

2004

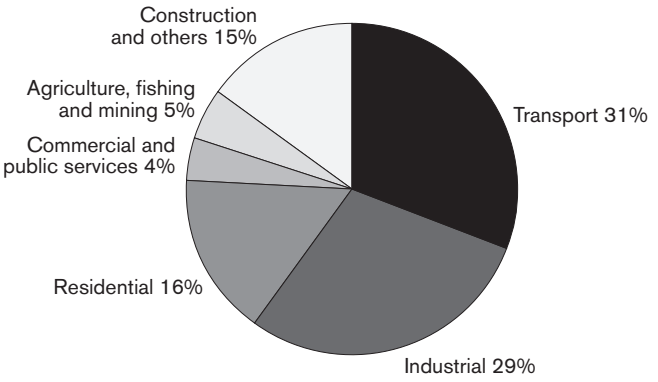


Source: GEO Database.

Despite certain variations between the countries and sectors, energy demand has consistently increased over the past decade, influenced by the growth of the population and economic activities. Between 1996 and 2005, energy consumption grew at an average annual rate of 3.22% in the commercial and public services sector, 2.35% in the transport sector, 1.78% in the industrial sector, and 1.10% in the residential sector (OLADE, 2005). This trend resulted in the increase of energy usage in the region by over 25% between 1990 and 2005.

The needs of the transport and industrial sectors each account for nearly one-third of the region's energy use, as illustrated in Figure 5:

Figure 5: LAC Energy Consumption by Sectors - 2004



Source: Based on data from OLADE. Energy Statistics Report, 2005

According to data from the Latin American Energy Organization (OLADE), nearly all of the transport sector needs are satisfied by petroleum derivates. Moreover, such derivates widely cover industrial needs and are used increasingly in electricity generation, accounting for 40% of the region's total energy supply (TES). Natural gas is second in importance, accounting for almost one-quarter of the total energy supply, although its use varies across countries given that some sub-regions like Central America and parts of the Caribbean are just starting to build the infrastructure for its transport.

Renewable energies, especially hydroenergy and biomass, constitute another quarter of total energy supply (not including unsustainable fuel wood, which is considered in a different category). Table 4 contains a breakdown of the renewable sources in the region.

Table 4: LAC Participation of Renewable Sources in Total Energy Supply

Energy Source	Percentage of Total Energy Supply (2004)
Hydroelectric Energy	11.3
Geothermal	0.5
Sugar Cane Products	5.7
Sustainable Wood/Residential	3.6
Sustainable Wood/Industrial	0.7
Sustainable Wood/Agricultural	0.3
Sustainable Charcoal	1.5
Renewable Thermal Power Plants	0.1
Other Renewables	1.2

Source: ECLAC. "Renewable Energy Sources in LAC: Two Years After Bonn."

Data from a recent study by the United Nation's Economic Commission for Latin America and the Caribbean (ECLAC, 2007), which analyzes the Evolution of TES from 2002 to 2004, helps describe the sub-regional situation. In Mexico and Central America, petroleum makes up half of the TES, although there is a difference in the consumption of natural gas, which accounts for 24% of Mexico's TES but is not used in Central America. Renewables contribute

to only 9.5% of Mexico's energy supply, while they constitute 35.4% of Central America's TES. In the latter, the study points out environmental concerns related to increases in coal use, which rose from 1.7% in 2002 to 2.4% in 2004.

In the Caribbean countries, including Barbados, Grenada, Guyana, Jamaica, Trinidad and Tobago, and Suriname, hydrocarbons make up 94% of TES (32% petroleum and 61.7% natural gas). Of the small renewable portion, the contribution of hydroenergy is less than 1%. In the Greater Antilles petroleum constitutes 68% of total energy supply, natural gas only 2.8%, and renewables, particularly wood and sugarcane products, make up 23%.

In the Andean region, considered rich in terms of energy resources, the supply of fossil fuels represents 70.9% of TES (37.9% petroleum and 31% natural gas), while hydroenergy represents a notable 21.8%. Concerning trends, the ECLAC study found a significant rise in natural gas supply in Colombia, Peru and Bolivia. But in Venezuela gas use diminished, which caused a decrease in the total use of this fuel for the sub-region.

In the Southern Cone, there is a strong dependence on fossil fuels (40.5% petroleum, 17% natural gas), but almost a third of TES is provided by renewable sources, especially hydroenergy (14.2%). Between 2002 and 2004, the participation of petroleum was reduced, compensated by an increase in that of natural gas. Although a slight proportion of TES, nuclear energy use more than doubled due to the construction of a new plant in Brazil.

The LAC region has a good endowment of fossil energy resources, although the distribution is uneven. Today, natural gas is extracted only in Argentina, Bolivia, Trinidad and Tobago, Venezuela, Barbados, Brazil, Chile, Colombia, Ecuador, Peru, and Mexico. Of these countries, only the first three reported significant exports in 2005. Mexico is the largest producer, but also a net importer. Petroleum is produced in the same countries, along with Guatemala, yet the majority of countries are net importers (OLADE, 2005). This situation makes the region vulnerable to price variations and availability of such fuels.

Currently, the energy sector is a source of concern for governments around the world. There is an awareness of the need not only to find effective responses to continued oil price increases caused by growing global demand and diminishing reserves, but also to mitigate greenhouse gas emissions that are aggravating climate change and threatening the sustainability of human life in the planet. Governments in Latin America and the Caribbean must deal with these global concerns, as well as the need to provide access to modern energy sources to a significant proportion of their population.

According to the most recent Human Development Report (UNDP, 2007), although the region's electrification index has reached 90%, well above the developing world's average, 45 million people still lack electricity connections, and there are vast differences in electrification indices among countries and regions, as well as urban and rural areas. For example, Haiti, Honduras and Bolivia are below the average for developing countries, with 36%, 62%, and 64% electrification indices, respectively.

Even with access to other energy sources, as previously indicated, an estimated 60 million people continue to use firewood for cooking, mainly for economic and cultural reasons. The persistence of unsustainable firewood harvesting practices, combined with inefficient combustion technologies, result in deforestation, habitat loss, soil degradation, indoor and outdoor pollution, as well as a high opportunity cost in terms of time dedicated to such work, mainly by women and children.

Realizing the Potential for Clean Energy Production and Consumption

The current oil price crisis is having a major impact on the countries' balance of payments, their industries' competitiveness, and their citizens' domestic finances in the majority of the countries of the region. Faced with this situation, and with growing energy needs, governments have expressed their commitment to promote the efficient use of energy and the development of largely untapped renewable energy sources to diversify their countries' energy supply.

The above-mentioned ECLAC study (ECLAC, 2006) reports on the existence of several national programs to promote a greater use of renewable energy sources in their energy mix. An example is Argentina's national plan to promote the development of wind power plants and proposed new legislation to promote renewable sources in electricity generation. Similarly, Brazil's government has designed a program of incentives for alternative energy sources, while Chile has made a commitment to increase renewable sources in electricity generation to 15% by 2010. Mexico, Costa Rica, Ecuador, El Salvador, Peru, the Dominican Republic, and Uruguay have implemented similar initiatives at the legislative and executive levels, which are supported by regional organizations and international cooperation agencies.

Nevertheless, the study mentioned above points out that actual participation of renewable energy sources remained fairly constant in most countries between 2004 and 2006, with the notable exception of Brazil. Brazil has made significant strides in the production and use of biofuels, especially ethanol, which has made that country the world's main producer, as well as in the introduction of other renewable energy sources. However, despite "interesting advances" (ECLAC, 2006) in terms of legislation, policies, and projects the regions has not seen significant increases in the participation of renewable energies in the energy mix.

On the demand side, Mexico has been successful in the implementation of energy efficiency programs in several sectors. Nonetheless, many other countries have initiated, and in many cases abandoned, such programs, either for lack of financial support or because of limited results. In Curitiba, Brazil and Bogotá, Colombia, successful initiatives for improvement of urban transportation have resulted in better energy use in this sector; however, other major cities continue to struggle with the chaos of vehicular traffic. Energy efficiency efforts are sometimes undermined by subsidies and other market-distorting measures, which lead consumers in the opposite direction.

A study commissioned by the Inter-American Development Bank, as part of its Sustainable Energy and Climate Change Initiative (SECCI), identifies the following barriers to financing clean energy investments in the region (David Gardiner & Associates, 2006):

- At present, few LAC countries have established a policy framework that promotes a level playing field where clean energy can compete with traditional energy options. Even fewer countries have taken additional steps to create policies that favor the selection of clean energy options over traditional ones.
- Few developed countries have enacted policies and/or incentives to encourage clean energy companies to invest in developing counties, including those in LAC.
- Carbon trading and Clean Development Mechanism projects lag substantially with respect to both the need and potential for clean energy projects in LAC.
- For smaller LAC countries, limited energy market size makes it difficult to absorb the higher transaction costs for clean energy projects. Similarly, the market size of energy-consuming products is too small to create a critical mass of clean energy products that could result from the adoption of national efficiency standards.
- Pension funds for public employees, which have been used to promote investment in other socially desirable areas, have been practically absent from clean energy investments. The same is true for venture capital, either from developed countries or from LAC.
- Access to debt and equity for clean energy has been difficult, especially for small and medium enterprises (SMEs). Their access to external funds for project feasibility and business development assessments is also limited.
- Traditional banks and credit institutions are generally reluctant to offer attractive loans for the purchase of clean energy products. Microcredit options to help finance clean energy products for certain classes of consumers are practically non-existent.
- Some well-intentioned clean energy development projects have proven economically unsustainable because they lack the necessary support and engagement of the local community and have failed to link with other potentially complementary development activities.

National governments and international cooperation agencies have implemented a variety of programs aimed at overcoming such barriers. Nonetheless, better results from current renewable energy and energy efficiency policies require more time as well as increased efforts from those responsible for developing energy policies and support from other relevant policy areas.

In the energy sector, policy coherence is fundamental to achieve sustainability. This is true especially in LAC countries which seek to simultaneously incorporate the unserved population into modern energy distribution systems, satisfy the growing demand of the different sectors, reduce the region's dependence on oil, protect its natural resources, and avoid increasing its contribution to the climate change problem. This can only be accomplished through a new and integrated approach to energy policy-making based on ex-ante analysis and ex-post evaluation of all economic, social, and environmental aspects of specific measures, and the consideration of all possible trade-offs between sometimes competing objectives.

Without such an integrated approach, a seemingly effective measure can produce results contrary to its original purpose. For example, it is possible that the well-intentioned subsidies to fossil fuel consumers—intended to alleviate the burden of the price crisis—will result in

wasteful consumption and increase energy demand while discouraging renewable energy producers by altering relative costs. Another example is the much-discussed impact of biofuels production on the availability and prices of certain food products, on the quantity and quality of water resources, and on the integrity of valuable ecosystems when carried out without the incorporation of social and environmental considerations in the productive decision-making processes. This topic will be analyzed in the following section.

The Opportunities and Challenges of Biofuels

Faced with record-high oil prices, developed and developing countries have turned to liquid biofuels, mainly ethanol and biodiesel, as an alternative to satisfy their energy transportation needs, while at the same time mitigating global climate change. In October of 2007, with the support of the IDB, OLADE and the Inter-American Institute for Agricultural Cooperation (IICA), representatives of 20 Latin American and Caribbean countries expressed their commitment to promote biofuel consumption and production.

An Issue Paper on biofuels commissioned by the IDB identifies 17 countries in the region[4] as "natural candidates for biofuels" [(S&T)^2 Consultants, Inc., 2006], because they import petroleum and export feedstock that could be used to produce biofuels to substitute for oil imports. This study point outs that even fossil fuel-rich countries like Colombia, Venezuela, and Argentina have biofuel programs underway or in the process of being established.

Regardless of the interest of the region in this area, Brazil is the only LAC country among the current worldwide biofuel production leaders, due to an aggressive ethanol production and usage policy dating back to the 1980s. The study commissioned by the IDB identifies a series of market barriers to biofuel development, which include uncompetitive market prices, inefficient market organization, buyers or business risk, financing, price distortions, excessive or inefficient regulation, capital stock turnover rates, and technology barriers. These barriers must be addressed in order to achieve better results.

The potential benefits of biofuels are clearly acknowledged by LAC governments. As renewable sources of energy, biofuels have the potential to reduce the transport sector's dependence on fossil fuels and reduce GHG emissions. They could also generate new opportunities for agricultural producers, both in the domestic and the international markets, and contribute to increased income and job creation in that sector. However, critics point out that, in the absence of a coherent policy framework for their development (World Bank, 2007a), not all biofuels have a positive energy balance and the negative social and environmental impacts of their production could offset their economic benefits.

The environmental impacts of biofuels depend on many factors, which include the type of crop used as the feedstock, land-use changes, and the production process. Their economic feasibility

[4] Barbados, Belize, Bolivia, Brazil, Costa Rica, Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru and Uruguay.

without subsidies and/or protection depends on such factors as the price of petroleum and the cost of the raw materials necessary for their production (World Bank, 2007a).

No general answer exists to the question of whether all biofuels are good or bad for the environment and the economy. The specific answer depends on numerous factors, many of them resulting from public policies. Therefore, a sustainable biofuel policy (UN Energy, 2007) must consider the implication of these energy sources in the following areas:

- The ability to provide the poor with energy services
- Agro-industrial development and job creation
- Health and gender equality issues
- Agriculture structure
- Food security
- Government budget
- Trade, foreign exchange balances, and energy security
- Biodiversity and natural resource management
- Climate change

Considering these elements and with support from the regional and international cooperation agencies, LAC countries can develop policies and improve current promotion efforts to overcome barriers to biofuel production and consumption while maximizing their benefits and minimizing potential negative impacts. Accordingly, biofuels can provide a sustainable answer to the needs of the energy and agricultural sectors and make a significant contribution to the stabilization of global GHG emissions.

Areas for Dialogue and Cooperation with the EU

Promoting clean energy and sustainable transport are two of the key challenges of the European Union's Sustainable Development Strategy. The first assessment report (Commission of the European Communities, 2007a) recognizes important progress that has been made with regard to energy policies and climate change. Such progress includes the definition of ambitious goals for renewable energy and biofuels, as well as the development of an Energy Efficiency Action Plan.

Owing to an increased awareness and the implementation of EU and national policies, consumption of renewable energy grew at an average annual rate of 4.1% between 2000 and 2005. Nonetheless, more has to be done, since the share of renewable energy in total energy consumption was only 8.5% in 2005, and a higher growth rate is required to reach the target of 12% by 2010. The assessment (Commission of the European Communities, 2007a) also concludes that Europe is not on a sustainable transport path, since energy consumption and GHG emissions are growing at nearly the same rate as gross domestic product, showing no signs of decoupling that sector's growth from its environmental impact.

Countries in Latin America and the Caribbean and Europe can share important lessons from successes and difficulties in promoting sustainability in the energy sector. As a result of monitoring

and assessment of energy policy measures on the part of government and stakeholder groups, the EU has been able to adjust its policy to correct negative effects and improve coherence with other policy areas. One example is its recent decision to develop new guidelines to ensure that goals to increase biofuel consumption do not harm the poor in developing countries by increasing food prices nor promote the destruction of biodiversity.

The EU experience shows that achieving results in the promotion of renewable energy sources and energy efficiency requires clear development objectives and coherent policy frameworks, including coherent price regulations, fiscal incentives, consistent and transparent subsidy mechanisms, and investment protection. It also shows that the use of renewable sources of energy is not necessarily cheaper than imported fossil fuels, and that advances in Europe have required government interventions (subsidies and tax incentives) and investments in research and development to complement those of the private sector. This situation creates a special challenge for LAC governments, which face a distinct situation from their European counterparts: significantly lower tax revenues, a population with lower purchasing power, and the existence of many people without access to modern energy services.

Sharing experiences and lessons, as well as enhancing technical cooperation, can help countries develop a coherent set of policies to promote the sustainability of their energy sectors. Areas in need of coordinated efforts include the development of sensible guidelines to assist in the expansion of the countries' potential for biofuels production, considering all relevant environmental and social issues, and obtaining access to European markets. Other important areas include the formulation of specific incentives for the promotion of investments by EU companies that can initiate the transfer and appropriation of new technologies for renewable energies and energy efficiencies to Latin America and the Caribbean.

The sustainability of the energy sector in both regions is fundamental for the achievement of short- and long-term growth and development goals, and especially for the common objective of reducing greenhouse gas emissions. This leads to the mitigation of global climate change, which is considered the biggest threat to human welfare and ecosystems in the planet.

Addressing Climate Change: Threats and Opportunities

The Impact of Climate Change in Latin America and the Caribbean

Governments and citizens worldwide increasingly acknowledge the scientific evidence that the Earth's climate system is warming as a result of a human-induced increase in the emission of greenhouse gases (GHG).[5] They also recognize that "even with current climate change mitigation policies and related sustainable development practices, global GHG emissions will continue to grow over the next few decades" (IPCC, 2007).

The global warming phenomenon is causing air and ocean temperatures to increase. Additionally it is producing widespread melting of snow and ice, causing global average sea levels to rise. Recent studies project serious impacts on LAC, which will have profound implications for the economic and social development of the region. The latest report of the Intergovernmental Panel on Climate Change (IPCC) gives some examples of the projected impacts for Latin America and some small islands, which include the majority of Caribbean states (see Table 5).

Table 5: Projected Impacts of Climate Change in LAC and Small Islands

Latin America	Small Islands
• Increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savanna in eastern Amazonia. Semi-arid vegetation will tend to be replaced by arid-land vegetation. • Risk of significant biodiversity loss through species extinction in tropical areas. • Decrease in crop and livestock productivity, with adverse consequences for food security. Soybean yields are expected to increase in temperate zones. Overall, more people are expected to suffer from hunger. • Adverse consequences are expected to affect the availability of water for human consumption, based on changes in precipitation patterns and disappearance of glaciers.	• Sea level rise is expected to exacerbate flooding, storm surge, erosion, and other coastal hazards, thus threatening vital infrastructure, human settlements and facilities that support the livelihood of island communities. • By mid-century, reduction of water resources in many small islands, such as in the Caribbean and the Pacific, to the point where they become insufficient to meet demand during low rainfall periods. • Increased invasion by non-native species due to higher temperatures, particularly on mid- and high-latitude islands.

Source: Intergovernmental Panel on Climate Change. Fourth Assessment Report. Summary for Policymakers.

[5] Carbon dioxide (CO_2), methane (CH4), nitrous oxide (NO_2), perfluorocarbons (PFCs), hydroflourocarbons (HFCs), and sulphur hexafluoride (SF_6)

A detailed study developed by experts from the World Bank, the Japan Agency for Marine-Earth Science and Technology and national institutions from Mexico, Colombia, Peru and Ecuador (Vergara et al., 2007) identifies the following impacts for the LAC region, some of which are already taking place:

- Destruction of the coral ecosystems in the Caribbean Basin
- Hurricane intensification
- Rapid tropical glacier retreat in the Andean region
- Dieback of the Amazonian ecosystem
- Increased exposure to tropical vector diseases

The Stern Review on the Economics of Climate Change estimated that the overall cost of not acting to address global climate change could equal 5% of global GDP each year, while the costs of reducing greenhouse gas emissions to avoid the worst impact of climate change can be limited to around 1% of global GDP per year. The report also points out that "the investment that takes place in the next 10-20 years will have a profound effect on the climate in the second half of this century and in the next," and that "costs of stabilizing the climate are significant, but manageable; in contrast, delaying these efforts would be dangerous and much more costly" (Stern, 2006).

For LAC countries the economic impact of climate change will not only be related to costs in preparing for and recovering from more intense and frequent extreme weather phenomena, but also to the impact on natural resources that are the basis for some of their main economic activities: agriculture, fishing and tourism. In the last 20 years, the cost of destruction caused by hurricanes in the Caribbean Basin has increased by two orders of magnitude. According to some projections, in the next 50 years, the combined impact of the rise in the sea level and losses in the fishing and tourism sectors are estimated to equal from 5% to 30% of GDP in the Caribbean region. These projections also indicate a rise in health care costs resulting from increased exposure to tropical diseases, as well as higher power generation costs as hydroelectric potential is reduced, and higher water provision costs (Vergara, 2006).

The total contribution of LAC to global GHG emissions is very modest, and concentrated mainly in a few countries (Vergara et al., 2007). Most Latin American economies are less CO_2 intensive than the United States and many are less intensive than the EU or Japan. Nonetheless, the region contributes to almost one-quarter of the emissions caused by loss of carbon sinks as a result of deforestation and land-use changes.

Regardless of their small contribution to the problem, all Latin American and Caribbean countries have joined the world's agreement to address climate change by signing the UNFCCC and the Kyoto Protocol. Most countries have participated in the negotiations, although generally with limited technical and financial resources, and have prepared the National Communications required by the Convention. Only one country in the region, Argentina, has voluntarily accepted a target for GHG emission reductions.

The governments and citizens in the LAC region are more concerned each day about the causes as well as the repercussions of climate change and they are ready to take action. For example, Mexico has recently launched a comprehensive climate change strategy and the Presidents of the Central American Integration System (SICA) plan to meet in May 2008 to establish guidelines for a regional strategy on climate change.

The efforts of the LAC region regarding climate change must take into account both its threats to their economies and livelihoods, and the opportunities to obtain resources to promote a more sustainable development path than the one followed by industrialized nations in the past. Taking advantage of those opportunities and preparing to face the impacts of global warming requires an integrated view of the problem and its consequences, as well as coordinated action on the part of government, the private sector, and civil society in different sectors of the economy.

LAC and the Clean Development Mechanism

The adoption of the Kyoto Protocol gave the region a great opportunity to reduce GHG emissions, while promoting sustainable investments in the energy and forestry sectors through the Clean Development Mechanism. With the help of international cooperation, the countries established national offices to promote the elaboration of projects within the framework of this mechanism.

Although an early pioneer in the CDM, with 318 registered projects under the Kyoto Protocol (35% of the total number of projects), in 2004 the region accounted for only 10% of the CDM global market, with 4% represented by Brazil (World Bank, 2007b). Asia dominated the market, both in number of projects and volume of emission reductions (Table 6).

Table 6: LAC Registered CDM Projects and Projected Emission Reductions

Country	Number of Projects	Average Annual Emission Reduction
Argentina	10	3,851,143
Bolivia	2	224,371
Brazil	115	17,496,393
Chile	22	3,973,232
Colombia	9	836,116
Costa Rica	5	251,600
Dominican Republic	1	123,916
Ecuador	10	465,451
El Salvador	5	475,444
Guatemala	5	279,694
Honduras	12	229,032
Jamaica	1	52,540
Mexico	101	7,006,185
Nicaragua	3	456,570
Panama	5	118,702
Peru	9	887,221
Uruguay	2	221,577
For Comparison Purposes		
China	154	91,802,932
India	309	28,693,288

Source: CDM Web page http://cdm.unfccc.int/Statistics/index.html, February 28, 2008.

The fact that LAC has been quickly surpassed by Asia, despite early enthusiasm and efforts to participate in the CDM, is partially a result of the small size of the LAC projects and the many difficulties faced in their implementation. These obstacles include access to financing, lack of management capacities of the proposed developers, high transaction costs, and an initial misunderstanding of what the CDM entails.

According to a recent study sponsored by OLADE and the Canadian International Development Agency (CIDA), participation of smaller projects in the CDM would require the following (PEMBINA Institute, 2004):

- Capacity building and assistance in the development of projects.
- Reduction of costs associated with registration and verification for micro-projects and the possibility for small-scale projects to pay such costs with certified emission reductions (CERs).
- Special funds established by Annex 1 Countries, specifically to purchase CERs from small-scale projects.
- Innovative methods to group or aggregate various small projects.

Another explanation for the limited participation of LAC in the CDM is the initial exclusion of many conservation and forestry activities in which some countries of the region had placed hope, as well as obstacles faced by eligible forestry projects. Based on current records, 50% of CDM projects are related to energy and industry, and only one forestry project has been registered.

Latin America and the Caribbean would notably benefit from widening opportunities for forestry projects in the CDM, in light of estimates that the region would provide more than half the carbon credits in the forestry-related CDM market (Neef et al., 2007). Concerns over the permanence of emission reductions, accounting, and other issues have limited the approval of forestry and land-use change projects in the CDM, while buyers in alternative "voluntary" carbon markets have proven increasingly prepared to acquire credits from this type of projects.

The Imperative of Adaptation

Environmental and economic policy-makers throughout Latin America and the Caribbean are aware of possibilities to benefit from emission reduction projects, with varying degrees of detail and accuracy. In addition, there is a general consensus that taking advantage of that opportunity is a worthy objective. However, there is less awareness that the economic and social benefits of CDM participation can be easily offset and surpassed by the effects of climate change impact on their production and infrastructure systems, the livelihood of their citizens, and biodiversity.

Greenhouse gas reduction commitments are not intended to stop climate change; rather they are aimed at allowing societies and ecosystems to adapt to such changes. Given that some sub-regions of Latin America and the Caribbean are among those most likely to suffer negative impacts from climate change, adaptation should be a top priority for their governments and societies.

With support from international agencies, several governments and regional organizations have initiated adaptation programs, which are mainly focused on addressing the immediate effects of climate change. These include an integrated national adaptation project in Colombia; a regional Andean project to reduce vulnerability to rapid glacier retreat; as well as initiatives focused on adapting to impacts on coastal zones in the West Indies, hurricane intensification in Central America, sea level rise in Guyana, and the climate shift in Mexico's Gulf Coast. However, apart from these types of projects, policy-makers in sectors that are most vulnerable to climate change such as health, agriculture, energy, and public works, to a great extent continue to formulate plans and projects without considering such impacts (Vergara et al., 2007).

The last World Development Report (World Bank, 2007a) highlights the need for measures that reduce the adverse impacts of climate change on agriculture "facilitated by concerted international action and strategic country planning" (World Bank, 2007a). These measures include:

- Crop and livestock insurance
- Safety nets
- Research into and dissemination of flood-, heat-, and drought-resistant crops
- New irrigation schemes in dryland farming areas, especially in combination with complementary reforms and better market access for high value products
- Improved climate information

It is necessary to undertake similar efforts in the health sector, which must prepare to face greater incidence of infectious diseases; infrastructure, which should be designed and implemented considering the expected impacts at specific sites; and energy, a sector which must contemplate the possibility of reductions in hydropower potential, among others.

Both developing and developed parties have responsibilities under the UNFCC to prepare for climate change impacts on coastal zones, water resources, and agriculture, as well as to develop plans to diminish their adverse effects on the economy, public health, and environmental quality.

The above-mentioned Convention and several of the decisions by the Conference of the Parties require developed countries to provide support and funding to assist developing nations in impact, vulnerability and adaptation assessment; capacity-building; training; education and public awareness; implementation of concrete adaptation activities; and the exchange of technology and experiences (UNFCCC, 2007a). However, the funds currently available for such adaptation, which amount to $150 to $300 million a year, fall far short of the tens of billions of dollars that developing countries require (World Bank, 2007b).

Accordingly, LAC countries must take drastic action to accelerate their adaptation to climate change impacts in two important areas: the development of comprehensive and coherent adaptation strategies for the most vulnerable sectors, and negotiations and partnerships with developed countries to ensure a greater financial contribution to the region's adaptation efforts.

The Road Ahead

The urgency for further measures to mitigate GHG emissions and undertake effective actions for adaptation to the effects of climate change is clear. The Kyoto Protocol is considered "a first step towards a truly global emission reduction regime."

In 2007, parties to the UNFCCC adopted the Bali Action Plan (UNFCCC, 2007b), which calls for an intense negotiation process to arrive at a decision by the 15th Conference of the Parties (in 2011). This agreement should establish "a long term vision for long term cooperative action, including a global goal for emission reductions," as well as "measurable, reportable, and verifiable nationally appropriate mitigation commitment or actions, including quantified emission limitation and reduction objectives, by all developed country Parties," and "nationally appropriate mitigation actions by all developing country Parties in the context of sustainable development" (UNFCCC, 2007b).

As usual, the negotiations to achieve such an agreement will be difficult, requiring a strong political commitment and significant work with each country's private sector. This is due to the economic burden of GHG mitigation, which until now has been placed on a few countries (Annex 1 Parties) under the principles of common but differentiated responsibilities and so as not to impede the development aspirations of the developing world. However, the wording of the Bali Action Plan creates the opportunity to require mitigation actions on the part of developing countries, which they have not had in the past (UNFCCC, 2007b).

An important issue for LAC in the new negotiation process will be the relationship of interdependency between forests and climate change. This relationship is multidimensional; while forest loss as a source of GHG emissions is not as significant as fossil fuel usage, one of the main expected impacts of climate change is the disappearance of large portions of the region's forests and their rich biodiversity. In turn, the carbon dioxide liberated from these losses would exacerbate climate change. Decreased hydroelectric potential, arising from a combination of severe droughts and forest loss, could hinder efforts to decrease fossil fuels use. As such, increased financing, both from the carbon markets and other mechanisms, is necessary to avoid the loss of the ecosystem services provided by forests and the increase in GHG emissions that would result from further forest disappearance.

As pointed out previously, one of the main priorities for LAC countries in these negotiations is the search for agreements that create a greater flow of resources for adaptation strategies and measures. Building alliances between developing and developed nations to support this demand is crucial for the achievement of such objectives.

Climate action requires a greater understanding and cooperation among nations worldwide. The high-level political dialogue in the context of the Lima Summit can initiate a permanent dialogue between the two blocs, which could lead towards agreements on the main issues of the UNFCCC negotiations, especially within the framework of the Bali Action Plan.

Areas for EU-LAC Dialogue and Cooperation

Even before the UNFCCC was adopted, by 1990 EU ministers of environment had committed to undertake actions to stabilize their emissions of CO_2 and other GHG at 1990 levels by 2000. Under the Kyoto Protocol, the 15 member countries at that time accepted an overall target to reduce emissions 8% below their 1990 level in 2008-2012. Recent evaluations indicate that the Community is on track to meet that target, even while its economy continues growing.

In January 2007, the European Commission set forth proposals and options to reduce global emissions after 2012 to limit global warming to 2° Celsius. The EU has committed to reduce its overall emissions to at least 20% below 1990 levels by 2020, and has expressed willingness to "scale up this reduction to as much as 30% under a new global climate change agreement if other developed countries make comparable efforts" (European Commission, http://ec.europa.eu/environment/climat/climate_action.htm).

In January 2008, the Commission presented a package of proposals for the European Parliament, including efforts to increase renewable energy usage and the expansion of the EU Emissions Trading System (EU-ETS), which is expected to help the European Community deliver on its ambitious commitments (see Box 1).

Box 1. The EU-ETS and the Global Carbon Market

The EU-ETS was launched in 2005 to help EU Member States achieve their commitments to limit or reduce GHG emissions in a cost-effective way. It is the first international trading system for GHG emissions and beginning in 2008 applies not only to the 27 EU Member States, but also to the other three members of the European Economic Area – Norway, Iceland, and Liechtenstein.

In 2006, the EU-ETS accounted for 62% of the volume and 80% of the value of the global carbon markets, worth a total of 22 billion euros, and covered transactions for 1.6 billion tons of CO_2 equivalent. Of that total, transactions of Clean Development Mechanism credits amounted to 522 metric tons of CO_2 equivalents in the primary market, and an additional 40 tons in an emerging secondary market, amounting to a total of 3.9 million euros (less than 0.02% of the total) (Point Carbon, 2007). The CDM market in 2006 was dominated by European buyers, with 86% of volume transacted, and Asian sellers, with 61% of the volume (World Bank, 2007b).

The recent declarations of the European Union's finance ministers concerning the need to make EU climate change policy effective both in terms of meeting their emission reduction goals and in terms of costs could open the door for a greater participation of carbon credits from developing countries in the EU-ETS, which holds great interest for Latin American and Caribbean countries.

In addition to their aggressive mitigation actions, the EU is also working on measures for adapting to climate change. The recent Green Paper on that matter (Commission of the European Communities, 2007b) calls for actions within the EU, increased climate research, and the initiation of dialogue and partnerships with other developed countries and the developing

world. The paper acknowledges the historic responsibility of industrialized countries for the accumulation of GHGs and their need to support adaptation efforts in developing nations.

The European Commission is currently examining how to promote such cooperation through the building of a Global Climate Change Alliance, and has earmarked a total of 50 million euros for the period 2007-2010 for dialogue activities and to support developing countries through targeted mitigation and adaptation measures (Commission of the European Communities, 2007b). In the context of the Lima Summit, conversations with LAC heads of state can be an important step in the construction of such an alliance.

Mitigation and adaptation to climate change constitute another important area for policy coherence, since it requires an integrated view of the problem and its consequences, and coordinated action on behalf of the government, private sector, and civil society in different sectors of the economy. Dialogue and cooperation between the EU and LAC can contribute to a greater coherence in climate change policies of both regions, especially in Latin America, where until recently this issue has been a concern mostly for environmental and meteorological authorities.

More cooperation with the EU could also provide financial and technical resources to strengthen the capacity of LAC countries to design and implement comprehensive adaptation policies. Such policies will help them increase their potential in GHG emission reductions and sell their emission reductions in the European markets, which would contribute to a reduction of mitigation costs and an increase in financing for the sustainable management of their energy and forest resources.

Both regions can also work together towards agreements under the UNFCC to improve the mechanisms that provide for greater and more timely availability of resources to finance adaptation measures in developing countries, especially those more vulnerable to climate change. Such agreements would also promote forest conservation and better agricultural practices, both as mitigation and adaptation measures.

Conclusions: Opportunities for Dialogue and Cooperation

The decision to focus conversations of the Lima Summit on sustainable development, especially its environmental dimension, as it relates to energy and climate change, reflects the growing importance of these issues for the people and the governments of the European Union, Latin America and the Caribbean.

The discussion in the previous sections shows that problems inhibiting the LAC region's quest for sustainable development are complex and clearly interrelated, and their solutions require a significant shift in policy-making and economic decision-making. The region needs to integrate efforts among different spheres of government, the private sector, and civil society to be able to fully meet the growing and still unfulfilled need for energy, water, sanitation, and other basic services, and at the same time help to mitigate global climate change and adapt to its effects.

Current priorities for EU dialogue and cooperation with Latin America and the Caribbean have been defined in the previous EU-LAC Summits:

- The fight against poverty and social inequality
- The consolidation of good governance and the promotion of peace
- Economic cooperation, trade development and support for regional integration

It can be expected, therefore, that parties can come to an agreement on a new priority area related to the environment, energy, and climate change. These issues are already the subject of some cooperation programs of the EU and its member countries with LAC, at the regional and bilateral levels. For example, in 2007, 30% of the EU's cooperation funds in Brazil were directed to the environmental aspects of sustainable development. A regional program called Euro-Solar, launched in 2007, aims to promote the sustainable development of isolated communities through the use of renewable energies.

An agreement to include sustainable development, energy sustainability, and climate changes among EU priorities for the region would promote greater dialogue and cooperation activities in specific areas for the three issues. Current EU and LAC situations and concerns described in this paper suggest the following areas for action:

- Focused financial and technical assistance for the provision of basic environmental services to the unserved population and conservation of biodiversity.
- Building capacities to improve the effectiveness of environmental authorities through the application of new policy instruments.
- Exchange of experiences and training in the use of methodological tools, such as impact assessments and strategic environmental assessments, to ensure the consideration of all aspects of sustainable development and coherence in policy-making.

- Dialogue on the effectiveness and orientation of development cooperation, as well as how EU domestic policies impact the development objectives of their cooperation programs in the LAC region.
- Exchange of experiences and capacity building for the development of policy programs and instruments for the promotion of renewable energy and energy efficiency.
- Dialogue on conditions that biofuels production must meet to contribute to the reduction of GHG emissions without adverse effects on the region's poor and its ecosystems, and the opportunities for LAC's biofuel producers in the EU market.
- Development of policies and incentives for the promotion of the EU's private and government investment in the development of new and renewable sources of energy in Latin America.
- A permanent dialogue to reach agreements on the main issues of the UNFCC negotiations.
- Evaluation of the experiences of CDM projects and creation of programs to help project developers overcome existing deficiencies and constraints.
- Development of mechanisms to finance forest conservation in the LAC region, in order to mitigate and adapt to climate change.
- Identification and development of mechanisms for the future participation of GHG emission-reduction project developers and traders from the LAC region in the EU ETS.
- Technical and financial cooperation for the development of adaptation policies and programs for sectors expected to suffer a greater impact from climate change, such as health, agriculture, and transportation infrastructure.

Prioritizing these issues not only would result in government-to-government programs, but also open the door for greater interaction between civil society organizations, academic institutions, and private companies from both regions. These interactions will be crucial in achieving the objectives and goals of cooperation and in promoting the changes necessary to move LAC societies towards sustainable development.

Future cooperation activities would gain in effectiveness and coherence from greater coordination, both in planning and execution, with the relevant regional multilateral institutions. The coordination efforts should focus on analyzing work already advanced by these institutions in the development of regional-level analysis and strategies to find synergies with their programs.

A strong partnership between the EU and LAC to promote the sustainable use of energy and forest resources would constitute an important advance in the development of a global alliance to take on the challenges of climate change. It would also help prepare these societies for the expected effects of this global phenomenon while continuing to generate sufficient economic growth to improve the quality of life of current and future generations.[6]

[6] For example, the IDB's Sustainable Economic Growth strategy and the Environment strategy, both approved in 2003, include several of the topics identified here as priorities for cooperation.

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