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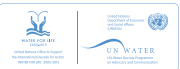
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SUSTAINABLE DEVELOPMENT 20 YEARS ON FROM THE EARTH SUMMIT

Progress,
gaps and
strategic
guidelines for
Latin America
and the
Caribbean



United Nations



RIO+20

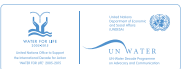
United Nations Conference
on Sustainable Development



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Progress, gaps and strategic guidelines
for Latin America and the Caribbean



United Nations



RIO+20

United Nations Conference
on Sustainable Development

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Notes

The following symbols have been used in the tables shown in this publication:
Three dots (...) indicate that data are not available or are not separately reported.
A dash (-) indicates that the amount is nil or negligible.
A full stop (.) is used to indicate decimals.
The word "dollars" refers to United States dollars unless otherwise specified.

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FOREWORD

In December 2009 the General Assembly adopted resolution 64/236 and agreed to convene the United Nations Conference on Sustainable Development in Brazil in June 2012. This Conference, which will be held in Rio de Janeiro 20 years after the United Nations Conference on Environment and Development, or the Earth Summit, represents a historic opportunity to take stock of developments over the past two decades, assess the progress made and the difficulties encountered and explore new forms of cooperation capable of expediting the transition towards sustainable development. The Member States have also agreed to analyse two main themes at the Conference: (a) a green economy in the context of sustainable development and poverty eradication, and (b) the institutional framework for sustainable development.

The present document is divided into two parts: an analysis of progress made and difficulties encountered in Latin America and the Caribbean in implementing global commitments on sustainable development since 1992, and proposed guidelines for moving towards sustainable development in the region.

One of the milestone achievements of the Earth Summit in 1992 was the international community's acceptance of the concept of sustainable development, which was broadly disseminated in the Rio Declaration on Environment and Development. Yet, twenty years later—and despite significant advances—the development model is still unable to bring about simultaneous and synergic progress on the social, economic and environmental fronts.

The world now faces an imperative for change: to move towards a new model of development with the value of equality at the core of its actions, one which is capable of carrying forward simultaneous social development, economic growth and environmental sustainability. Development cannot continue to perpetuate poverty and inequality and to deplete natural resources and ecosystems. Undeniable evidence now exists that protecting ecosystems and ecosystem services improves health, physical integrity, food security and other basic aspects of human security and of individual and community well-being.

A recurrent, cross-cutting problem is resistance to fully considering all the costs of economic activity in investment policies, standards and decisions—or, indeed, the inability to do so. Hence the multiple negative environmental and health externalities which lie at the root of almost the entire array of environmental issues. And, by exacerbating these externalities, the high discount rates employed in investments lay a disproportionate share of the costs of economic activity on the present generation's most disadvantaged members and on future generations.

The proposal by the United Nations to reflect upon a “green economy in the context of sustainable development and poverty eradication” aspires to catalyse the changes needed in the region. Under the principle of shared but differentiated responsibilities, the green economy is understood in opposition to a brown economy, which compartmentalizes, pollutes, excludes and destroys. A green economy is one which augments and affords priority to human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

This proposal advocates the redesign of specific public policies that promote a low-carbon development pattern resistant to disasters and climate change, create green jobs and factor into decision-making the economic costs and benefits associated with the use of ecosystem services and materials. An economy for sustainable development reduces negative environmental impacts, such as carbon emissions and pollution, promotes efficient use of energy and resources and avoids the loss of biological diversity and ecosystem services, thus improving well-being now and in the future.

International agreements, at both the global and regional levels, can and must contribute to these objectives, by fostering an environment and incentives to guarantee greater social inclusion, access to fair and sustainable exchanges of ecosystem goods and services and sound stewardship of global environmental public goods.

The preparation of this report was coordinated by the Economic Commission for Latin America and the Caribbean (ECLAC), in its capacity as Coordinator of the Regional Coordination Mechanism, in close collaboration with the regional offices of other bodies in the United Nations system, in particular the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), Food and Agriculture Organization of the United Nations (FAO), United Nations Human Settlements Programme (UN-Habitat), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), United Nations Children's Fund (UNICEF), Office of the United Nations High Commissioner for Human Rights (ONCHR), Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Centre for Regional Development (UNCRD), World Food Programme (WFP), Pan American Health Organization (PAHO), United Nations Office for Project Services (UNOPS), International Labour Organization (ILO), World Tourism Organization (UNWTO), United Nations Conference on Trade and Development (UNCTAD), Global Mechanism of the United Nations Convention to Combat Desertification, UN-Water Decade Programme on Advocacy and Communication and International Strategy for Disaster Reduction (ISDR).

We hope that this document will stimulate and inform discussions on development in Latin America and the Caribbean and play a part in garnering renewed political commitment to sustainable development and to the establishment of equitable and sustainable development goals towards which the region can progress as a whole.

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INTRODUCTION

The United Nations Conference on Environment and Development of 1992, also referred to as the Earth Summit or the Rio Summit, marked a turning point in awareness of environmental issues and laid the foundations for the global advance towards sustainable development. The countries of Latin America and the Caribbean —represented by their Governments, civil society and the private sector— eagerly adopted the agreements reached at the Conference and implemented various measures in pursuit of the various goals. The United Nations Conference on Sustainable Development, to be held in 2012 (labelled Rio+20 in reference to the time elapsed since the Earth Summit) will seek to secure a reaffirmation by countries of their political commitment to sustainable development, following an assessment of progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development (see box 1), and consideration of the new and emerging challenges.

As a contribution to this assessment, this report, written from the Latin American and Caribbean perspective, describes the progress made and the gaps that remain in implementing global commitments on sustainable development since 1992. Bearing in mind these gaps and the challenges that continue to arise, it proposes guidelines for advancing sustainable development. The preparation of the report was a multidisciplinary effort involving various organizations of the United Nations system that operate in Latin America and the Caribbean¹ under the umbrella of the Regional Coordination Mechanism. This Mechanism was established pursuant to Economic and Social Council resolution 1998/46, “Further measures for the restructuring and revitalization of the United Nations in the economic, social and related fields”, with a view to enhancing coherence between the programmes, funds and specialized agencies of the United Nations Secretariat and reports at the global level through the Economic and Social Council.

A. FRAME OF REFERENCE

The frame of reference for this assessment is the set of principles defined in the Rio Declaration on Environment and Development (1992). Other reference documents, which have guided implementation of the principles of the Declaration, include Agenda 21 (1992), the Johannesburg Plan of Implementation (2002), the Rio de Janeiro Platform of Action on the Road to Johannesburg (2001); the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (1994) and the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (2005); the Climate Change and Biological Diversity

¹ Economic Commission for Latin America and the Caribbean (ECLAC), International Strategy for Disaster Reduction (ISDR), United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), Food and Agriculture Organization of the United Nations (FAO), United Nations Human Settlements Programme (UN-Habitat), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), United Nations Children's Fund (UNICEF), Office of the United Nations High Commissioner for Human Rights (OHCHR), Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Centre for Regional Development (UNCRD), World Food Programme (WFP), Pan American Health Organization (PAHO), United Nations Office for Project Services (UNOPS), International Labour Organization (ILO), World Tourism Organization (UNWTO), United Nations Conference on Trade and Development (UNCTAD), Global Mechanism of the United Nations Convention to Combat Desertification, UN-Water Decade Programme on Advocacy and Communication.

Convention signed in 1992, together with the multilateral environmental agreements and the international cooperation commitments reflected in Goal 8 of the Millennium Development Goals (2000).²

Box 1

WORLD SUMMITS ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT^a

United Nations Conference on the Human Environment (Stockholm, 1972)

The Stockholm conference was the first world summit to deal with the global environment (previous summits had addressed specific issues). The outcome was a Declaration of principles and an Action Plan for the Human Environment and the agreement to create the United Nations Environment Programme (UNEP).

United Nations Conference on Environment and Development (Rio de Janeiro, 1992)

Also known as the Rio Summit, or Earth Summit, this conference marked a turning point in consolidating the sustainable development concept, which had been coined in the late 1980s by the World Commission on Environment and Development and defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). Its main outcomes were the Rio Declaration on Environment and Development, Agenda 21, the signing of the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change, and the creation of the Commission on Sustainable Development. In addition, a statement of principles to guide forestry development was signed. The United Nations Conference on Environment and Development was also the launch pad for negotiations on the United Nations Convention to Combat Desertification, which was signed in 1994; and for the Global Conference on the Sustainable Development of Small Island Developing States (Barbados, 1994), which gave rise to the Programme of Action for the Sustainable Development of Small Island Developing States (the Barbados Programme of Action).

World Summit on Sustainable Development (Johannesburg, 2002)

The Johannesburg Summit focused on the implementation and financing of sustainable development; and it restated the importance of integrating the three pillars of sustainable development: environmental, economic and social. Above all, however, the Johannesburg Summit highlighted the importance of eradicating poverty and promoting human development (United Nations, 2010b). A plan for implementation of the World Summit on Sustainable Development was created and reaffirmed many of the objectives and actions agreed upon 10 years earlier under Agenda 21. It also reaffirmed States’ commitment to the Barbados Programme of Action. During the preparatory process, a regional instrument, the Rio de Janeiro Platform for Action on the Road to Johannesburg, was adopted. Also adopted during the Summit of 2002 was the Latin American and Caribbean Initiative for Sustainable Development, which was subsequently ratified by the Forum of Ministers of the Environment of Latin America and the Caribbean.

Given the importance it attached to poverty and human development issues, the Johannesburg Summit was closely linked to the Millennium Summit, held in 2000, which had produced the Millennium Declaration and defined a set of objectives that laid the foundations for the Millennium Development Goals. The inclusion of environmental sustainability as Goal 7 was recognition not only of the intrinsic value of the environment, but also of its importance for poverty reduction, health, gender equality and other components of well-being (United Nations, 2010b). The Johannesburg Summit also stressed the means of implementation of sustainable development and particularly its financing, by linking it to the International Conference on Financing for Development (Monterrey, 2002), where the international community agreed upon new measures related to this theme, in fulfilment of the principle of common but differentiated responsibilities.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, Millennium Development Goals: Advances in environmentally sustainable development in Latin America and the Caribbean, Santiago, Chile, United Nations, 2010; and Gro Harlem Brundtland, Our Common Future, Oxford, World Commission on Environment and Development, Oxford University Press, 1987.

^a The documents referred to in this box are available at www.eclac.cl/Rio20.

² Goal 8 of the Millennium Development Goals establishes the general conditions for forging a global partnership for development. On the one hand, it sets forth, a series of commitments by developed countries to support the efforts of developing countries and, on the other, it identifies ways of correcting asymmetries in international trade, with emphasis on the full and sustainable integration of least developed countries in trade and financial circuits (United Nations, 2010a).

The Rio Declaration contains 27 principles, which are reproduced in full in box 2 and, for the purposes of this assessment, can be grouped under broad headings (see table 1). The first group refers to the central nature of the human being in sustainable development, the link between the three pillars of sustainable development (social, economic and environmental), the fight against poverty and intergenerational equity. These topics are addressed in chapter I, which reviews development in the region in the past 20 years and identifies relations between the trends in each of the three pillars. The second group refers to strengthening of the environmental pillar, considered in chapter II. The third refers to participation by civil society and specific groups in the transition towards sustainable development, a subject that is discussed in chapter III. Principle 6, considered in chapter IV, refers to the special situation of the least developed countries and small island developing States (SIDS). Lastly, the fifth group of principles concerns the means of implementation of sustainable development, which involve both international cooperation and trade, and also local scientific and technological capacities. This last group is addressed in chapter V. Guidelines for advancing towards sustainable development in the region, based on the assessment presented in the preceding chapters, are set forth in chapter VI.

Box 2

THE PRINCIPLES OF THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT (1992)

- 1 Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
- 2 States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.
- 3 The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.
- 4 In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.
- 5 All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.
- 6 The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.
- 7 States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.
- 8 To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.
- 9 States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Box 2 (continued)

- 10 Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.
- 11 States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.
- 12 States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.
- 13 States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.
- 14 States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.
- 15 In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- 16 National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.
- 17 Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.
- 18 States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.
- 19 States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.
- 20 Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.
- 21 The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.
- 22 Indigenous people and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.
- 23 The environment and natural resources of people under oppression, domination and occupation shall be protected.

Box 2 (concluded)

- 24 Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.
- 25 Peace, development and environmental protection are interdependent and indivisible.
- 26 States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.
- 27 States and people shall cooperate in good faith and in a spirit of partnership in the fulfilment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

Source: Rio Declaration on Environment and Development.

Table 1
**PRINCIPLES OF THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT:
 GROUPING OF TOPICS FOR ASSESSMENT PURPOSES**

Principles ^a	Issue	Chapters
1, 3, 4, 5, 8	Anthropocentric nature of sustainable development, the link between the environment and economic and social development and poverty; the environmental needs of present and future generations.	I. The development of Latin America and the Caribbean since 1992 from a sustainability perspective
2, 11, 13, 15, 16, 17	Environmental legislation, economic instruments, responsibility for environmental damage, environmental impact assessment, the polluter-pays principle, the precautionary principle.	II. Strengthening the environmental pillar
10, 20, 21, 22	Social participation, access to information and justice, key stakeholders (women, youth, indigenous peoples and local communities)	III. Information for decision-making and participation by civil society, the private sector and local governments in matters relating to sustainable development
6	Special situation of small island developing States	IV. The sustainable development of the small island States of the Caribbean
7, 9, 12	Means of implementation and capacities: common but differentiated responsibilities, trade, scientific-technological capacities, cooperation between developed and developing countries	V. International cooperation, trade, and science and technology

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

^a Principles 14, 18, 19 and 23 to 27 are not explicitly addressed in this report inasmuch as they refer to relations between States and obligations in relation to phenomena that have transboundary impacts, environmental protection, promotion of sustainable development in situations of conflict and occupation, and the obligation to cooperate in good faith.

The sustainable development commitments made by States are closely related to human rights, in that they reinforce each other mutually and pursue a common objective: human well-being and the dignity of individuals. The rights approach in human development provides a conceptual framework, based on international human rights standards, which is used to evaluate the inequalities that underlie development problems and to rectify unfair discriminatory and distributive practices. In this regard, the

rights approach identifies, firstly, rights holders and the object of those rights; and secondly, the corresponding duty bearers and the obligations pertaining to them. Likewise, the approach aims to strengthen the capacity of rights holders to uphold their rights and help duty bearers fulfil their obligations. It provides tools to enable people to participate in formulating policy and in demanding action from the State (OHCHR, 2006). The approach emphasizes the need to improve accountability systems and ensure access to information on environmental issues. It also defines the obligation to implement specific policies targeting groups of people that are in situations of disadvantage as a result of discrimination, poverty, health (for example, people living with HIV) and socioeconomic inequality (see chapters II and IV).³

The human rights principles set out below are directly related to sustainable development and reaffirm the importance of considering all social groups in sustainable development policies. They are also consistent with principle 1 of the Rio Declaration, which places the human being at the centre of sustainable development concerns and with principle 10, which affirms the importance of citizen participation:

- (i) The principles of equality and non-discrimination ensure that the poorest and excluded are not left behind in the drive to eradicate poverty and achieve sustainable development.
- (ii) The accountability principle ensures greater commitment and transparency in national and international efforts to clarify the duties and responsibilities of developing countries, donor States and non-State actors.
- (iii) The participation principle ensures that people, particularly the poorest and excluded, are active participants rather than passive recipients in terms of poverty eradication and sustainable development.

Under the rights approach, assuring human rights—including those relating to participation by various social groups in transition to sustainable development—is not an option for governments, but an obligation under internationally assumed commitments. This needs to be reflected in the priority accorded to those topics in public programmes and budgets. An essential step in ensuring social participation and the representativeness of groups identified by the Rio Declaration is the ratification and implementation of the Convention on the Elimination of All Forms of Discrimination against Women, the Convention on the Rights of the Child and the United Nations Declaration on the Rights of Indigenous Peoples (OHCHR, 2008).

The Rio principles should also be interpreted in light of the evolution of the concepts and approaches adopted by the international community, under the Platform for Action of the Fourth World Conference on Women, held in Beijing in 1995, at subsequent conferences on women and at the International Conference on Population and Development, held in Cairo in 1994. In accordance with principle 8 of the Rio Declaration, it was recognized that, to achieve sustainable development and a better quality of life for people, States should reduce and ultimately eliminate unsustainable patterns of production and consumption, and promote appropriate policies, including population policies, so as to equitably meet the population, development and environment needs of present and future generations. In

³ This report refers to “disadvantaged groups”, which include women, indigenous peoples, Afro-descendants, older persons, children and the disabled, in situations of “vulnerability” arising from conditions of discrimination, poverty, health and socioeconomic inequality. These situations prevent them from gaining access to services, resources, education and basic information, which weakens their capacity to overcome impacts and puts them at greater risk.

this regard, the International Conference on Population and Development affirmed that the rights and empowerment approach to reproductive health was fundamental for eradicating poverty, achieving a better quality of life, and attaining sustainable development.

Reflecting the wide diversity of countries, peoples and cultures that make up the region, different visions of development exist and must be recognized. Of particular note are the visions and values of indigenous peoples that have been enshrined in legislation in recent years in some countries. In Ecuador, for example, the new Constitution of 2008 recognizes “the right of the population to live in a healthy and ecologically balanced environment that guarantees sustainability and the good way of living “sumak kawsay”. Article 71 of this instrument adds that “nature or Pacha Mama, where life is reproduced and occurs, has the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes”. Similarly, in the preparatory process for Rio+20, the Plurinational State of Bolivia has stated that nature as well as human beings must be at the centre of concerns for sustainable development and that the existence, integrity, interrelationship, interaction and regeneration of all the components of the overall Earth system must be restored and guaranteed in order to achieve a level of sustainable development capable of withstanding the multiple crises afflicting humanity and the planet.⁴

Bearing in mind the diverse visions of development in the region, the guidelines proposed in chapter VI do not seek to provide a single solution but rather to present to countries a set of recommendations based on characteristics observed across the region for their consideration as they move towards a more sustainable pattern of development. How these guidelines are applied should be defined in the light of the agreements adopted at the Rio+20 Conference, among other factors.

B. SUMMARY OF THE MAIN CONCLUSIONS

Efforts to promote sustainable development in Latin America and the Caribbean over the past two decades have yielded advances as well as setbacks. Table 2 shows (in darker shading) some positive changes such as the decrease in the percentage of people living in poverty, the reduction of the Gini coefficient used to measure inequality in income distribution, the rise in the Human Development Index (HDI) (see chapter I), the increase in coverage of protected areas and success in eliminating the consumption of substances that deplete the ozone layer (see chapter II). Nonetheless, many of the improvements are tentative or merely relative. For example, the total number of people living in conditions of poverty or indigence in 2010 (177 million people) was higher than in 1980 (see figure I.1). The region’s HDI in 2010 was below that recorded by countries in the Organization for Economic Cooperation and Development (OECD) in 1990 (see chapter I). Furthermore, economic losses caused by disasters between 2000 and 2010 were almost three times as high as in the 1990s.

⁴ See the proposal of the Plurinational State of Bolivia for the United Nations Conference on Sustainable Development (Rio+20) (ECLAC 2011).

Table 2
LATIN AMERICA AND THE CARIBBEAN: SELECTED INDICATORS
1990, 2000, 2005 AND 2010 (OR NEAREST YEAR)

Indicator	1990	2000	2005	2010
Population (thousands, at mid-year)	443 032	521 429	557 038	590 082
Urban population (thousands, at mid-year) ^a	311 042	393 420	432 646	468 757
Poverty ^b				
Proportion of total (percentages)	48.4	43.8 (1999)	33.2 (2008)	31.4
Number of people (millions)	204	215 (1999)	183 (2008)	177
Human Development Index ^c	0.624	0.68	0.703	0.728
Income distribution ^d (Gini coefficient x 100)	53.8 (1989/1992)	55 (2002)		52 (2006/2009)
Population living in slum dwellings ^e				
Proportion of total (percentages)	33.7	29.2	25.5	23.5
Number of people (millions)	105.7	115.2	110.1	110.8
Population without access to energy				
Proportion of total (percentages)	17.8	13.4	7.8	6.4 (2009)
Number of people (millions)	76	41	43	39 (2009)
Population with access to improved drinking water sources				
Proportion of total (percentages)	85	90	92	93 (2008)
Number of people (thousands)	376 605	468 992	513 000	538 089 (2008)
Population with access to sanitation services				
Proportion of total (percentages)	69	75	78	79 (2008)
Number of people (thousands)	304 219	392 289	435 969	458 593 (2008)
Surface area with forest cover ^f (percentages)	51.9	49.4	48.2	47.2
Proportion of protected land areas ^g (percentages)	9.7	15.3	19.5	20.3
Supply of renewable energy ^h (percentages)	25	21.5	22.2	23.2 (2009)
Energy intensity of GDP ⁱ (total energy consumption — in thousands of barrels of oil equivalent— per million dollars of GDP at constant 2000 prices)	1.6	1.53	1.5	1.45 (2009)
Intensity of CO ₂ emissions ^j (tons per 1,000 dollars of GDP at constant 2000 prices)	0.65	0.62	0.60	0.58 (2008)
CO ₂ emissions per inhabitant ^k (tons of CO ₂ per inhabitant, from the burning of fossil fuels and cement production)	2.3	2.6	2.6	2.9 (2008)
Intensity of fertilizer use ^l (tons per 1,000 hectares of farmland)	11.6	17.3	21.3	23.3 (2008)
Consumption of ozone-layer-depleting substances ^m (thousands of tons of ozone-depletion potential)	74.6	31.1	14.5	5.4 (2009)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the CEPALSTAT database [online] <http://www.cepal.org/estadisticas/>; population databases: United Nations Population Division, information revised 8 July 2011 and World Urbanization Prospects: The 2009 Revision. Population Database; ECLAC (2011), Social Panorama of Latin America 2011: Summary; United Nations Development Programme (UNDP) [online] <http://hdr.undp.org/en/statistics/hdi/>; United Nations Human Settlements Programme (UN-Habitat), *State of the World's Cities 2010/2011. Cities for All: Bridging the Urban Divide*, 2011; Latin American Energy Organization (OLADE), Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC databases; WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation [on line database] <http://www.wssinfo.org/>; Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment*, Rome, 2010; United Nations Environment Programme (UNEP), World Database on Protected Areas; (WDPA); Energy-Economic Information System (SIEE); United Nations, Millennium Development Goals indicators database; FAO, Corporate Database for Substantive Statistical Data (FAOSTAT); United Nations Environment Programme (UNEP), UNEP Ozone Secretariat [online database] http://ozone.unep.org/Data_Reporting/Data_Access/.

^a The term “urban” is defined by each country. Information revised 8 July 2011.

^b Refers to the percentage of total population whose average per capita income is below the poverty and indigence (extreme poverty) line.

^c The Human Development Index (HDI) combines measures of life expectancy, education and per capita gross national income. The HDI is obtained by calculating the geometric mean of these three factors. United Nations Development Programme (<http://hdr.undp.org/en/statistics/hdi/>). Information revised in December 2011.

^d The Gini coefficient is used to measure income distribution. It takes values in the range [0,1], where zero corresponds to absolute equality and one corresponds to absolute inequality (CEPALSTAT).

^e Slum dwellings, or homes in marginal neighbourhoods, are defined as a person or group of persons living under the same roof lacking one or more of the following conditions: a durable dwelling (permanent structure providing protection against extreme weather conditions); sufficient space (not more than three people per room); access to improved water supply sources (sufficient, compatible with available financial resources and accessible without extreme effort); access to improved sanitation facilities (private toilet, or shared with a reasonable number of people); and secure tenure (de facto or de jure, with protection against eviction). As the data on secure tenure are incomplete, only the first four indicators are used to estimate the size of urban slum populations.

^f Proportion of forest area in relation to the total land area of a country.

^g World Database on Protected Areas and CEPALSTAT. Measures the extent of protected land areas, compared with the total area of a country. A protected area is defined as a land or marine area that is specially assigned to the protection and maintenance of biological diversity and the associated natural and cultural resources, managed in accordance with legal criteria or other effective measure.

^h Proportion of energy supply obtained from renewable sources, compared with the total energy supply in each country.

ⁱ Total energy consumption (in thousands of barrels of oil equivalent) per million dollars of GDP (at constant 2000 prices).

^j Carbon dioxide (CO₂) emissions per unit of gross domestic product and annual rates of change, generated by the burning of fossil fuels and cement production.

^k Carbon dioxide (CO₂) emissions per inhabitant generated by the burning of fossil fuels and cement production.

^l ECLAC calculations on the basis of data on the consumption of fertilizers and agricultural land area, both obtained from FAOSTAT. Corresponds to the quantity of chemical fertilizers used in relation to the agricultural land area of the country.

^m Consumption of substances controlled by the Montreal Protocol.

The dynamic on which these data are based is complex. The Earth Summit gave a strong boost to the environmental pillar—which in the early 1990s was less developed than the other two pillars of sustainable development (economic and social). Since then, the region’s environmental legislation and institutions have been strengthened and the concept of sustainable development has been mainstreamed into many public policies and business activity (see chapter II).

Nonetheless, no notable change has occurred in the development model to support simultaneous advances in the social, economic and environmental dimensions. Thus, despite some achievements, the region has not managed to reduce inequalities in any significant way, to eradicate poverty or to decouple environmental pressures from economic growth. There are still many people living in poverty without access to basic utilities—including those defined as human rights, such as access to environmental health, water and sanitation, and housing—with serious implications for the security of the region’s inhabitants. Lack of access to these services, compounded by wide disparities in access to education, and hence to the labour market, mean that the characteristic inequality of Latin America and the Caribbean also renders disadvantaged groups more vulnerable to the effects of local and global environmental deterioration. Gender gaps and discrimination based on race, ethnicity, age and geographical location accentuate the disadvantages faced by large segments of the region’s population. This situation increases the vulnerability of these groups to climate-related and other disasters. During the period 1970-2010, floods and storms accounted for almost 70% of disasters recorded in the region leaving a toll of more than 467,000 deaths, an average of 4.5 million persons affected each year and estimated losses in the order of US\$ 160 billion.⁵ Disadvantaged groups are also vulnerable to diseases caused by exposure to toxic products, garbage, polluted water and air, among other things; and the deterioration or scarcity of natural resources and water on which their survival depends.

Urban development in the region in the past few decades has brought about improvements in income, health care, education, access to basic services, life expectancy and access to consumer goods (see chapter I). This has occurred, however, against a backdrop of asymmetries and inadequate planning which expose human security and the quality of life of the inhabitants of large urban centres in the region to disaster risks (80% of disasters are reported in urban areas) (ISDR, 2011), levels of air pollutions that exceed even national standards, situations of grave insecurity in the face of violence, and inefficient transport systems that lead to commutes lasting several hours. The marked inequalities observed in urban areas in terms of access to, and the quality of, basic services such as water supply, sanitation, housing, health, electricity and waste collection and disposal are magnified in large metropolitan areas (see chapter I).

The region has not succeeded in narrowing the productivity gaps that exist in relation to developed countries; and it has been unable to adapt its productive structure, which still relies heavily on natural-resource-intensive sectors (ECLAC, 2010). Given the lack of effective environmental management mechanisms and a regulatory framework making it possible to reflect the value of the environment in economic decisions, it will be difficult to establish a trend in which growth can occur without environmental degradation.

The way in which wealth and public and private investments are measured for accounting purposes has frequently resulted in the overuse of environmental assets and natural resources, in conjunction with solutions that prioritize the short term and deplete assets that are essential for the development of future generations in the region, such as water resources, biological diversity, soil

⁵ Figures based on records maintained by the international Emergency Disasters Database (EM-DAT) for the countries of the region and on the impacts of geological and hydro-meteorological threats. Biological and technological threats were not taken into account.

productivity and the integrity of fishery or forestry reserves, to mention just a few. Government coordination failings result in policy inconsistencies, such as investing in environmental protection, while at the same time supporting activities with high and sometimes irreversible environmental costs (externalities).⁶

The key sustainable development challenges facing the region remain the same as before, but are situated in a new and more demanding context of climate change and a rearrangement of global economic power. The challenges are to eradicate poverty and eliminate inequalities; reverse the destruction of ecosystems that provide habitat for the region's rich biological diversity and a source of income for local populations; achieve local development (both rural and urban) that guarantees human security and satisfies the economic needs of the citizens of the region's countries; and consolidate institutions that ensure continuous improvement in integrating the three spheres of development and prevent backsliding in adverse situations, by promoting full participation by key actors such as women, young people and indigenous peoples, among others.

Poverty, hunger, soil degradation and overexploitation of natural resources are part of a vicious cycle that generates deep crises in food security, human development and sustenance, since most people with high rates of vulnerability, marginality and food insecurity live on land and in ecosystems that are fragile and degraded.

Furthermore, the region also faces new challenges, many of which seemed less urgent at the time of the Earth Summit. Hence the importance of making progress on climate change adaptation, which requires action in different domains practically throughout the region.

The good news is that the situation in Latin America and the Caribbean today is very different from what it was in 1972, when the environment appeared only very marginally on the public agenda; or in 1992, when the region was emerging from a "lost decade" of low growth, high inflation and external debt constraints; or in 2002, when it was emerging from a decade of reforms that had weakened government structures and was facing new economic crises. Despite the recent world economic upheaval, the region has enjoyed nearly a decade of relatively high growth; inflation is under control in nearly all countries and, in general, stable economic conditions prevail. The economic situation, combined with a new wave of social policies, has made it possible to reduce poverty indices. States are more robust, and the region is playing an increasingly important role in the world economy. Some countries have started to reinforce their policies on productive development, innovation, science and technology, and have returned to development planning. In much of the region there is still an opportunity to take advantage of the demographic dividend by investing in universal access to basic services and quality education (see chapter I). Latin America and the Caribbean is thus better placed than ever to lay the foundations for change towards sustainability.

⁶ Externalities are external impacts of a given economic activity on the environment and social well-being which are not measured through the pricing system. In other words, the social cost of the impact or the environmental damage caused by the economic activity is not reflected in its cost structure or in the price of the product resulting from the activity. In fact, society is implicitly subsidizing the product to the extent of the cost of the social loss or externality incurred as a result of its production (Acquatella and Bárcena, 2005, page 30). The challenge that arises in this regard is to effectively internalize this external cost in the pricing system.

Bibliography

- Acquatella, J. and A. Bárcena (eds.) (2005), “Política fiscal y medio ambiente: bases para una agenda común”, *Libros de la CEPAL*, No. 85 (LC/G.2274-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/German Agency for Technical Cooperation (GTZ). United Nations publication, Sales No. S.05.II.G.140.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011), Report of the Latin American and Caribbean Regional Meeting Preparatory to the United Nations Conference on Sustainable Development. Santiago, 7-9 september 2011 (LC/L.3432), Santiago.
- _____ (2010), *Time for equality: closing gaps, opening trails* (LC/G.2432 (SES.33/3)), Santiago, Chile.
- ISDR (International Strategy for Disaster Reduction) (2011), *2011 Global Assessment Report on Disaster Risk Reduction*, Oxford, Information Press.
- OHCHR (Office of the United Nations High Commissioner for Human Rights) (2008), *Claiming the Millennium Development Goals: A Human Rights Approach* New York. United Nations publication, Sales No. 08.XIV.6.
- _____ (2006), Frequently asked questions on a human rights-based approach to development cooperation (HR/PUB/06/8), Geneva.
- United Nations (2010a), *Achieving the Millennium Development Goals with equality in Latin America and the Caribbean: Progress and challenges* (LC/G.2460), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- _____ (2010b) *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).

Chapter I

**DEVELOPMENT IN LATIN AMERICA AND THE CARIBBEAN SINCE 1992
FROM THE PERSPECTIVE OF SUSTAINABILITY**

Principle 1 of the Rio Declaration on Environment and Development places human beings at the heart of sustainable development concerns. Principle 3 affirms the need to ensure equity between and within generations and principle 4 to consider the three pillars of sustainable development —economic, social and environmental— together. Principle 5 cites poverty eradication as a condition for sustainable development. Principle 8 identifies two fronts for policy action: demographics and unsustainable production and consumption patterns, the first a matter of scale and the second of behaviour. This array of principles forms the basis for a model of lasting, equitable and sustainable development in which social and environmental policies dovetail and support each other to generate a society in which quality of life—for all, not just for a minority— is compatible with the concept of human security¹ and the human rights enshrined in the relevant international conventions. In this model, moreover, today’s economic activity must safeguard, not impinge upon, the well-being of future generations and must therefore attribute economic value to environmental assets. This chapter discusses some of the main traits of development in Latin America and the Caribbean in the past 20 years, particularly those which touch upon economic, social and environmental aspects.

PRINCIPLES OF THE RIO DECLARATION

- 1 Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
- 3 The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.
- 4 In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.
- 5 All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.
- 8 To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

A. HUMAN BEINGS AT THE CENTRE

This section describes changes since the 1990s and the current state of factors that are critical for human well-being, which is at the centre of sustainable development concerns. These factors are poverty and

¹ In 2003, the United Nations Commission on Human Security (CHS) defined human security as the protection of “the vital core of all human lives in ways that enhance human freedoms and human fulfilment (...). Human security means protecting fundamental freedoms —freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people’s strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity” (CHS, 2003).

inequality, access to basic services, health, and food security. The analysis conducted here starts from the premise that a society with high levels of poverty and inequality is not sustainable, no matter how well protected the environment. Conversely, the existence of poverty does not exempt States from the responsibility to take whatever measures and make whatever investments are needed to ensure proper environmental stewardship, because the poor are disproportionately disadvantaged, both directly and indirectly, by environmental degradation. Damage to the environment also limits the resources available to future generations for staying out of poverty. Many of the measures needed to ensure environmental sustainability are, in fact, the very actions needed to protect the economic, social and cultural rights enshrined in international conventions, such as those that refer to housing, water and sanitation, which Millennium Development Goal 7 cites as targets for environmental sustainability.

1. Poverty and inequality

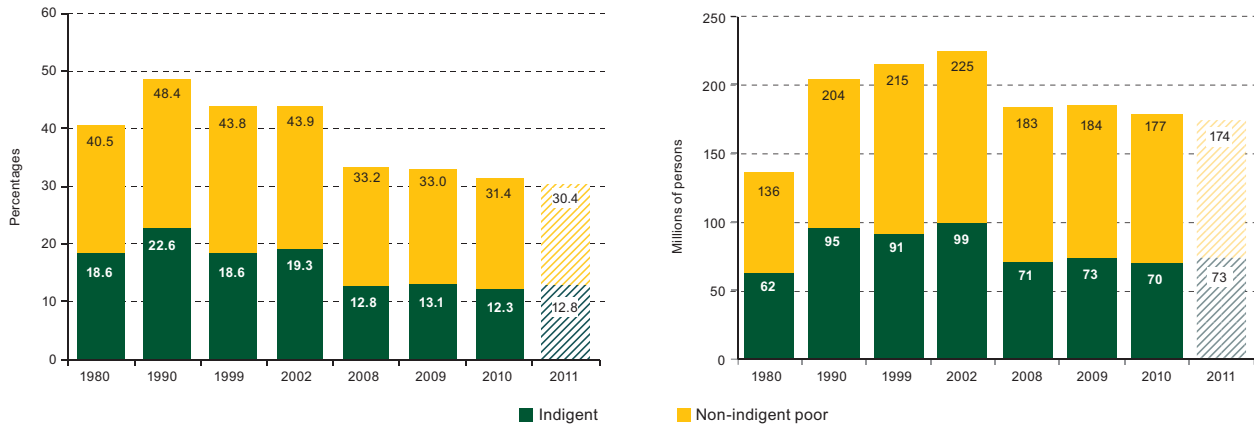
In the past 20 years, the Latin American and Caribbean region as a whole has made headway in reducing poverty (see figure I.1) and, albeit to a smaller extent, in narrowing inequality and improving employment indicators (see figure I.2), notwithstanding the crisis of 2008-2009 (ECLAC, 2010a). The region's HDI² showed substantial gains between 1990 and 2010 (see figure I.3). The Gini coefficient, which measures income distribution inequality, also improved between the early 1990s and around 2009, moving down from 0.538 to 0.520. This may be a small change, but it is highly significant in a region where inequity has always been particularly recalcitrant (ECLAC, 2010a). Since 2002, the reduction in both poverty and inequality has been attributable to real gains in labour income —associated in most cases with simultaneously rising income per employed person with respect to the unemployed or dependent population— and to narrowing labour income gaps between highly skilled and less skilled earners and an increase in income transfers to the poorest population (ECLAC, 2011a).

The progress is relative, however, since the Latin American and Caribbean region is still the most unequal in the world (see figure I.4 and UNDP, 2010a). Despite the improvements, the region's poverty and indigence levels remain high and the gap with respect to the developed countries has not narrowed. The poor and indigent population in 2010 —177 million— was larger in absolute terms than in 1980 (see figure I.1). The region's HDI for 2010 was still behind the 1990 figure for the countries of the Organization for Economic Cooperation and Development (OECD) (see figure I.3).

Aside from economic resources, the concept of poverty may encompass aspects of psychological well-being or non-market assets such as literacy or access to natural resources or ecosystem services. Poverty can, then, be defined as the lack of certain basic capabilities (ECLAC, 2011a). From a human rights perspective, the Committee on Economic, Social and Cultural Rights defines poverty as “a human condition characterized by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights” (CESCR, 2001).

² The Human Development Index (HDI) is calculated by the United Nations Development Programme (UNDP) on the basis of the geometrical average of measurements of life expectancy, education and per capita gross national income.

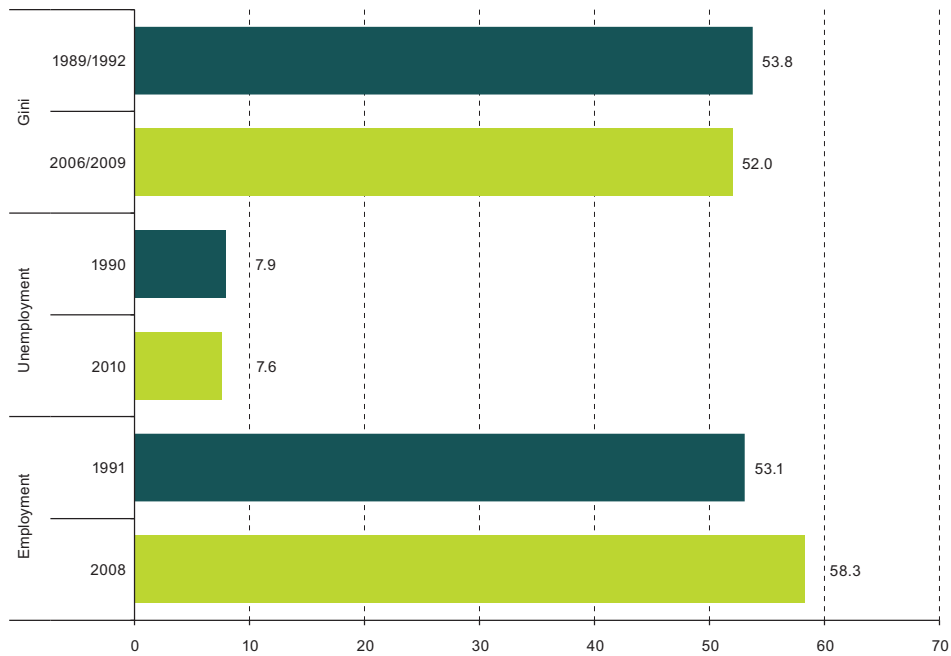
Figure I.1
LATIN AMERICA AND THE CARIBBEAN (19 COUNTRIES): POVERTY AND INDIGENCE, 1980-2011^a
(Percentages and millions of persons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of data from household surveys conducted in the respective countries.

^a Estimate for 18 countries of the region plus Haiti. The figures above the bars represent the percentage and total number of poor persons (indigent plus non-indigent poor), respectively. The figures for 2011 are projections.

Figure I.2
LATIN AMERICA AND THE CARIBBEAN: EMPLOYMENT, UNEMPLOYMENT AND GINI COEFFICIENT, AROUND 1990 AND MOST RECENT YEAR
(Gini coefficient x 100 and percentages)



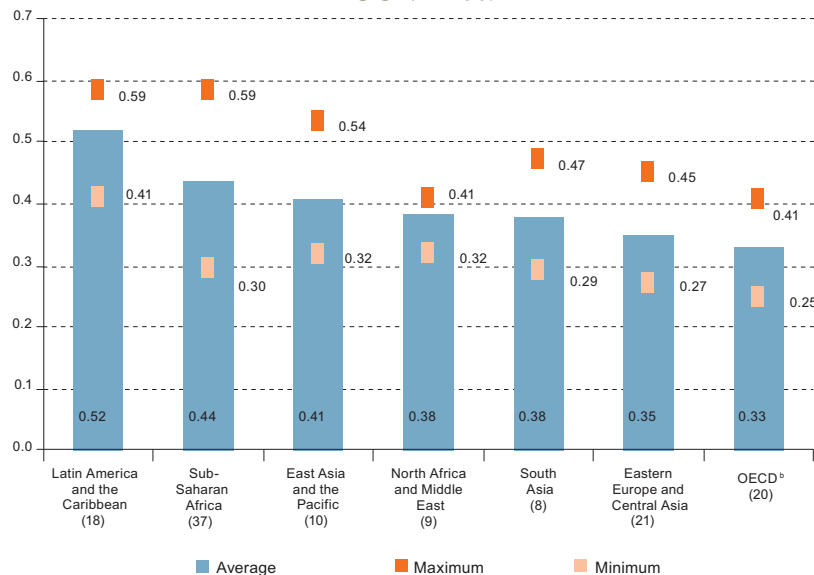
Source: Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT database.

Figure I.3
**LATIN AMERICA AND THE CARIBBEAN AND OECD: HUMAN DEVELOPMENT INDEX
 1990, 2000, 2005 AND 2010**



Source: United Nations Development Programme (UNDP), “Human Development Index. International Human Development Indicators” [online] <http://hdrstats.undp.org/en/tables/default.html> [date of reference: 21 December 2011].

Figure I.4
**LATIN AMERICA AND OTHER REGIONS OF THE WORLD: GINI COEFFICIENT,
 AROUND 2009^a**



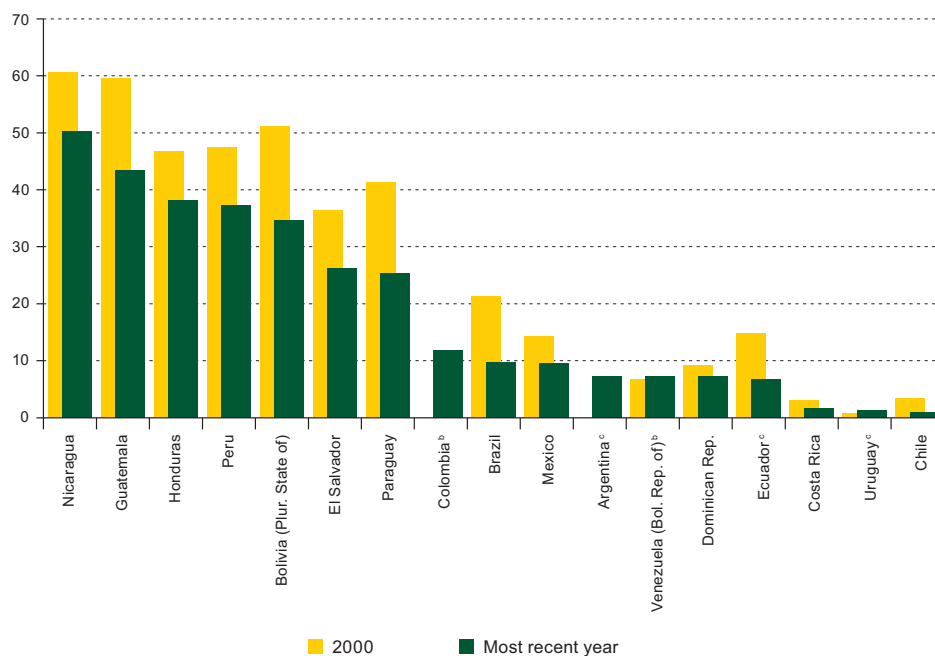
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of data from household surveys conducted in the respective countries; World Bank, World Development Indicators [online] <http://databank.worldbank.org/ddp/home.do>.

^a The regional data are expressed as simple averages, calculated using the latest observation available in each country for the 2000-2009 period.

^b Organization for Economic Cooperation and Development.

A number of methods exist for calculating a multidimensional measurement of poverty. Figure I.5 shows outcomes based on the unmet basic needs method. The countries with the highest multidimensional poverty rates are also those with the highest rates of monetary poverty. Multidimensional poverty rates came down in practically all of the countries of the region in the past decade (ECLAC, 2011a).

Figure I.5
LATIN AMERICA (17 COUNTRIES): MULTIDIMENSIONAL POVERTY RATES, 2000-2009^a
 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America 2010* (LC/G.2481-P), Santiago, Chile, 2010. United Nations publication, Sales No. E.11.II.G.6.

^a The survey year used differs between countries. The period 2000 corresponds to the latest survey available in 2000, and the period 2009 represents the latest surveys available between 2006 and 2009.

^b The surveys available around the year 2000 do not support a comparable estimate of multidimensional poverty.

^c The data relate to urban areas only.

The multidimensional analysis of human security reveals the interrelationships and complementarities between the different dimensions of personal security (economic, environmental, health, community, food and political) and provides insight into vulnerability and the critical events that have a bearing on people's lives, their survival and their dignity as persons. If one dimension is affected, another or all of the others may be as well. For example, lack of environmental security can also generate low food security, undermining health security. Precarious health can also have repercussions on economic security and so forth. The links between poverty, on the one hand, and vulnerability to environmental degradation and natural disasters, on the other, have become increasingly stark. The most disadvantaged sectors of the population are also the most likely to suffer loss of income and assets in the event of economic and environmental events that encroach upon the various aspects of human security. They suffer most from diseases associated with exposure to toxic products, waste, and polluted water and

air (see the section on health), and from the deterioration or shortage of the natural resources or water on which they depend for their survival. The poor are also more vulnerable to extreme weather events, which tend to worsen with climate change.

Not enough has been invested in the past few decades in managing the risks associated with natural events, and post-disaster recovery or reconstruction has often been postponed or left incomplete (ECLAC, 2010b). The need to adapt to the consequences of climate change makes the role of environment protection and ecosystem services even more important. Where potential conflicts of access and control exist in relation to environmental resources, States must make additional efforts to ensure that the rights of disadvantaged groups are properly protected (UNCRD, 2011).³

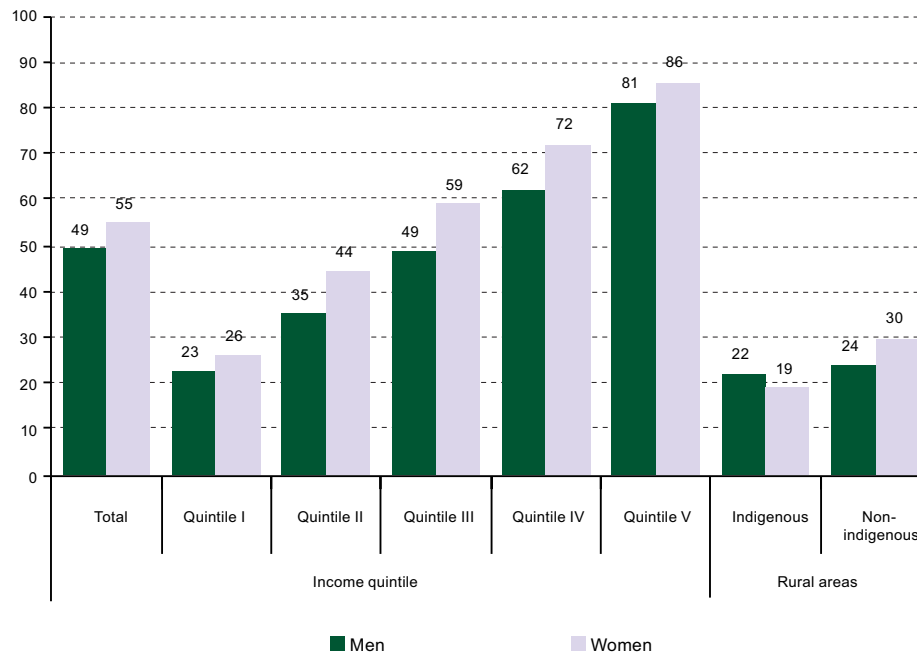
Inequality, too, has many dimensions (UNDP, 2010a). One of them is gender. Women have made a major contribution to poverty reduction through paid and unpaid work and migrant remittances (ECLAC, 2010b). Poverty is worse, however, in female-headed households and in most of the countries of the region a higher proportion of female-headed households than male-headed households are poor. Women outnumber men in the region's informal labour markets and consequently earn lower incomes and have more limited social security access (UNDP, 2010a). The countries with the greatest inequalities in general also show the largest gaps between men and women. What is more, given the double work burden (paid and unpaid) borne by women and the higher barriers they face to working outside the home, they have narrower options for overcoming poverty and entering paid employment (UNDP, 2010a, 2010b). Inequality also has a strongly territorial component: Latin America as a region shows highly uneven patterns of land use (see section D).

The sustainability perspective must necessarily consider the intergenerational transmission of inequality (UNDP, 2010a and ECLAC, 2010a). Two critical factors in this respect are unequal capacities and high rates of early fertility among the poorest population groups (for a discussion of the latter, see section 5).

With regard to capacity-building, the quality of education remains highly uneven between different socioeconomic levels and between the rural and urban populations in the countries of Latin America and the Caribbean (see figure I.6). Five criteria are used to assess the quality of education: importance of learning, relevance, equity, effectiveness and efficiency. Even though the region has made significant strides in education compared with the international context, inequalities persist between and above all within the countries of the region. At the end of the first decade of the twenty-first century, 91% of Latin Americans and Caribbean nationals were literate and 94% of school-age girls and boys were enrolled in a school programme (UNESCO, 2011). Generally speaking, reading skills and above all skills in mathematics and the sciences are below the average for the OECD countries. According to the second Regional Comparative and Explanatory Study of the United Nations Educational, Scientific and Cultural Organization (UNESCO), Cuba is the country in the region with the best performance in all areas (UNESCO, 2011).

³ In August 2011, the intermediate Governments of Latin America, led by the Latin American Organization of Intermediate Governments (OLAGI) and with support from the United Nations Centre for Regional Development (UNCRD), signed the Valparaíso Manifesto on Human Security in the Latin America Integration Agenda, with emphasis on climate change and risk management. This Agenda will be submitted at the United Nations Conference on Sustainable Development (Rio+20). There are also significant initiatives under way in Chile, Colombia, Haiti and Honduras, which point up the outcomes of synergies between human security, biological diversity and territorial (rural and urban) management in a context of integrated land management.

Figure I.6
**LATIN AMERICA (18 COUNTRIES):^a POPULATION AGED 20-24 WITH COMPLETE SECONDARY
 EDUCATION BY PER CAPITA INCOME AND SEX, AROUND 2008**
 (Percentages)

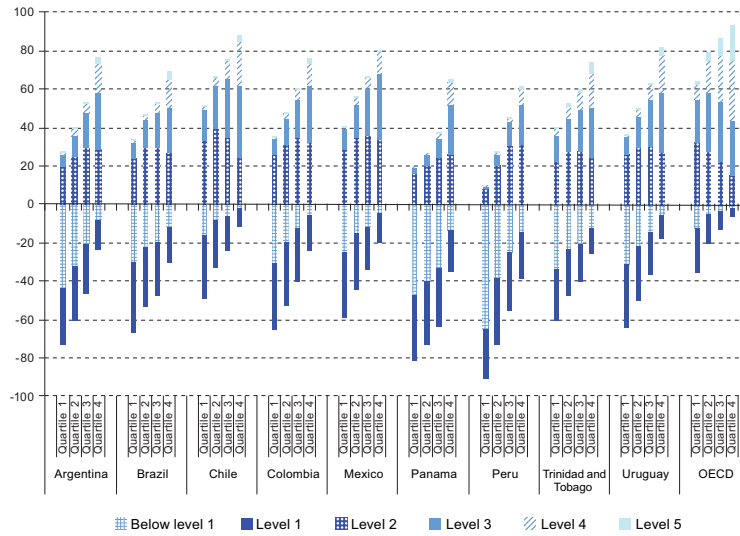


Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America 2010* (LC/G.2481-P), Santiago, Chile, 2010. United Nations publication, Sales No.E.11.II.G.6.

^a The data for indigenous and non-indigenous youth refer to eight countries and correspond to 2007.

In each country, the worst results are observed among the lower socioeconomic strata, while the gaps between the high and low strata are much wider than in the OECD countries (see figure I.7). Access and quality failings in education constrain access to higher-income segments of the labour market thereafter (see figure I.8). Across the region, 30% of school-age children are still excluded from secondary education and half of the young people in the 20-24 age group (which includes recent graduates) did not complete their secondary schooling. Suffice it to say that on average four out of every five young people between the ages of 20 and 24, from the 20% highest-income households have completed their secondary education, while, at the other extreme, only one out of every five young people of this same age group and belonging to the 20% lowest-income households have done so (UNESCO, 2011).

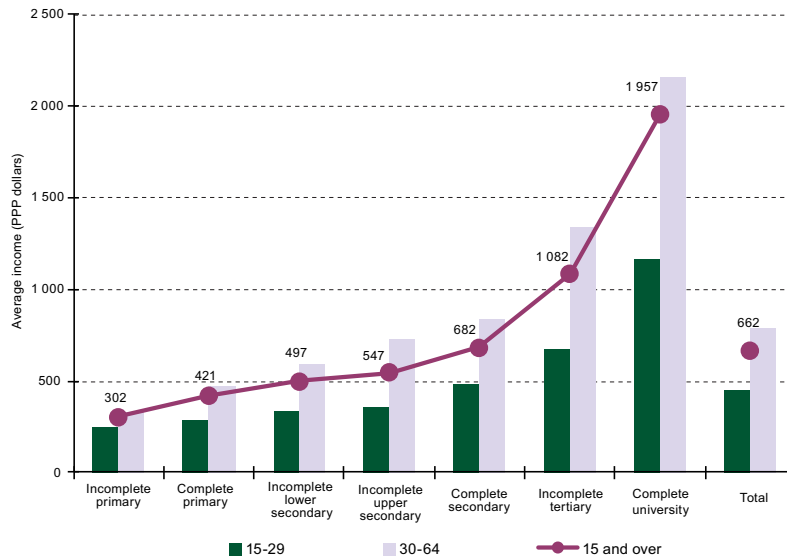
Figure I.7
LATIN AMERICA AND THE CARIBBEAN (9 COUNTRIES): DISTRIBUTION OF PISA READING ACHIEVEMENT LEVELS AMONG STUDENTS AGED 15 BY INDEX OF SOCIOECONOMIC AND CULTURAL STATUS (ISEC) OF THEIR FAMILIES, 2009
(Percentage of students)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special processing of microdata from the Programme for International Student Assessment (PISA), 2009.

Note: The Programme for International Student Assessment (PISA) was developed by the Organization for Economic Cooperation and Development (OECD) to assess the abilities of 15-year-old students (regardless of the grade in which they are enrolled). Further information is available [online] at <http://www.pisa.oecd.org>

Figure I.8
LATIN AMERICA (18 COUNTRIES): AVERAGE MONTHLY LABOUR INCOME OF EMPLOYED POPULATION AGED 15-29, 30-64 AND 15 AND OVER, BY LEVEL OF EDUCATION^a
(Percentages and dollars at constant 2000 prices, expressed in purchasing power parity)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America 2010* (LC/G.2481-P), Santiago, Chile, 2010. United Nations publication, Sales No.E.11.II.G.6.

^a The length of education cycles was defined in accordance with the 1997 International Standard Classification of Education (ISCED).

2. Access to basic services

Basic services of water, sanitation, housing, public transport (addressed in the section on urban development) and energy are crucial in determining people's quality of life and the sustainability of their environment. Considerable progress has been made in the past few decades in expanding the coverage of these services. The challenge now is to extend them to the poorest and most isolated areas, and to make sure that the services delivered are reliable and of good quality.

(a) Drinking water and sanitation

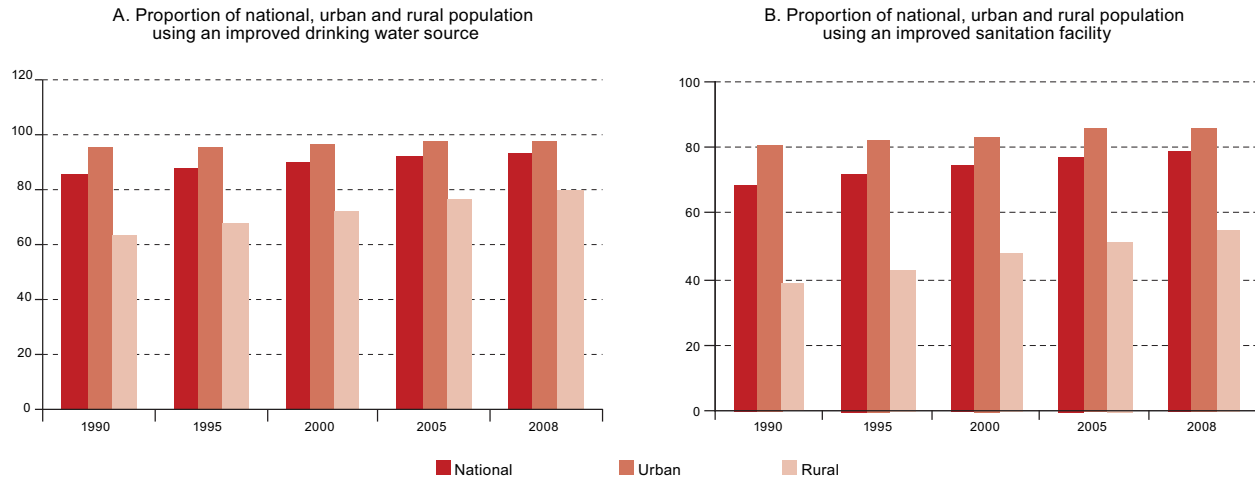
In 2010, the United Nations General Assembly adopted resolution 64/292 on the human right to water and sanitation, which recognizes access to safe and clean drinking water as a human rights that is essential for the full enjoyment of life and all human rights. Even before this resolution was adopted, the Committee on Economic, Social and Cultural Rights viewed the right to water as forming part of the broader right to a decent standard of living. The right to water is also recognized as a component of other entitlements such as the right to health and proper nourishment. The Committee on Economic, Social and Cultural Rights defines the human right to water as the right of everyone “to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses” (CESCR, 2003). The right to water is also enshrined in the Millennium Development Goals.

Although the picture remains fairly mixed in the region, significant progress has been made in expanding drinking water and sanitation services. The proportion of population using an improved source of drinking water has risen slightly (from 95% in 1990 to 97% in 2008) in urban areas and considerably (from 63% to 80%) in rural areas (see figure I.9A). However, 22% of the Latin American and Caribbean population does not have water piped into the household but relies on public taps or other forms of water capture. With regard to sanitation, the proportion of the population using improved sanitation facilities has risen systematically since the early 1990s in both rural and urban areas. Yet in 2008 (the most recent year for which data are available), 45% of the rural population and 14% of the urban population—that is, 115 million people altogether— still lacked improved sanitation facilities (see figure I.9B) (WHO/UNICEF, 2010).

Behind the overall figures lie significant variations in access within countries, and a broad range of definitions for “improved” drinking water and sanitation facilities. Improved drinking water sources include water piped into a dwelling, plot or yard, for example. For many, the water supply is irregular and not actually drinkable. Much remains to be done in terms of properly disinfecting drinking water and reducing problems of leakage and intermittent service, as well as in treating urban sewage and ensuring the sustainability of services amid growing competition for water, destruction of catchment basins, contamination and climate change (United Nations, 2010a) (see chapter II).

Most Latin American and Caribbean countries have introduced charges for drinking water supply and sanitation services, as with other public services. But few suppliers are able to fully cover the cost of investment, overheads and maintenance (Fernández and others, 2009), which makes it difficult to guarantee sustainable access to good quality services (with stable financing), particularly for the poor. Only in cases where drinking water and sanitation systems were already relatively mature, such as in Chile, has it been possible to achieve satisfactory, sustainable and large-scale service delivery by the private sector. Public investment continues to play a very important role in water and sanitation in Latin America and the Caribbean, especially in the poorest regions, because private sector involvement has proved to be intermittent or unsustainable (Ducci, 2007; Jouravlev, 2010). These services cannot be made universal unless they are subsidized for the poor.

Figure I.9
LATIN AMERICA AND THE CARIBBEAN: PROPORTION OF NATIONAL, URBAN AND RURAL POPULATION USING AN IMPROVED DRINKING WATER SOURCE AND AN IMPROVED SANITATION FACILITY, 1990-2008



Source: United Nations, Millennium Development Goals indicators database [online] <http://unstats.un.org/unsd/mdg/Default.aspx>, on the basis of information from the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF). Date of reference: December 2011.

From a human rights perspective, General Comment No. 15 of the Committee on Economic, Social and Cultural Rights states in paragraph 27 that, “Any payment for water services has to be based on the principle of equity, ensuring that these services, whether privately or publicly provided, are affordable for all, including socially disadvantaged groups. Equity demands that poorer households should not be disproportionately burdened with water expenses as compared to richer households” (CSECR, 2003).

(b) Energy services

Generally speaking, the region has broad electric power coverage. Of the countries with the lowest rates of coverage, Haiti is a special case with only 34% of its population connected to electrical energy in 2008, followed by Nicaragua (63%), Plurinational State of Bolivia (69%), and Honduras (73%) and Peru (78%). The poor are the worst affected. Of the total population without access to electricity in Latin America and the Caribbean, 73% are poor (see table I.1). The rest of the countries in the region have achieved electric power coverage rates of over 80% and, in some cases, close to 100%, as is the case for Chile, Cuba, Brazil, Uruguay, Paraguay and Bolivarian Republic of Venezuela (OLADE, several years). Between 35 million and 40 million people in Latin America and the Caribbean, particularly in isolated rural areas and informal settlements on the outskirts of major cities, still do not have access to the basic energy services (electric power and modern fuels) considered necessary to overcome poverty and improve human development indices. Table I.1 offers an estimate of the number of persons living without electric power in selected countries (ECLAC/UNDP/Club de Madrid/GTZ, 2009). Box I.1 presents the experience of the *Luz para todos* programme (electricity for all) in Brazil.

Table I.1
**LATIN AMERICA (SELECTED COUNTRIES): ESTIMATE OF POPULATION
 WITHOUT ELECTRIC POWER**
(Thousands of persons and percentages)

Country	Poor without electric power (thousands of persons)	Non-poor without electric power (thousands of persons)	Total without electric power (thousands of persons)	Percentages of poor without electric power
Argentina	57	91	148	38
Bolivia (Plurinational State of)	2 904	708	3 611	80
Brazil	5 123	2 753	7 875	65
Chile	62	168	231	27
Colombia	420	956	1 376	31
Costa Rica	34	18	52	66
Ecuador	51	15	66	77
El Salvador	751	191	942	80
Guatemala	2 569	687	3 256	79
Honduras	2 272	210	2 482	92
Nicaragua	1 377	219	1 596	86
Paraguay	510	75	585	87
Peru	5 264	1 982	7 245	73
Venezuela (Bolivarian Republic of)	16	19	35	46
Total	21 410	8 092	29 501	73

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Development Programme (UNDP)/Club de Madrid/German Agency for Technical Cooperation (GTZ), “Contribución de los servicios energéticos a los Objetivos de Desarrollo del Milenio y a la mitigación de la pobreza en América Latina y el Caribe. Síntesis ejecutiva”, *Project documents*, No. 281 (LC/W.281), Santiago, Chile, October 2009.

Note: The estimate is calculated on the basis of the latest poverty records for Latin America and the Caribbean, and is applied to the total population of each country for which information is available. The estimate of the number of households lacking electric power is then applied to this figure.

Box I.1

THE LUZ PARA TODOS PROGRAMME IN BRAZIL

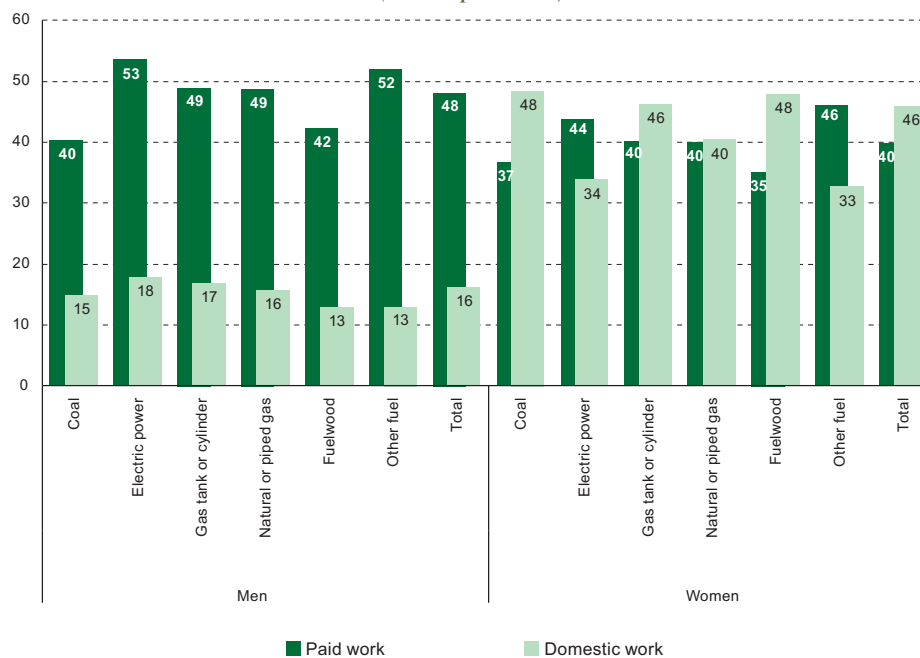
Taking up the challenge of providing millions of Brazilian citizens in the rural areas with access to electricity, the Federal Government of Brazil launched the programme *Luz para todos* in 2003. The objective was to provide electric power to 10 million rural inhabitants by 2010 at no installation cost for the beneficiaries. By May 2009, two million hook-ups, benefiting 10 million people, had already been made. Thanks to this programme, 40.7% of the beneficiary families enjoy better opportunities for study, 34.2% have better working opportunities, 35.6% earn a better income and 22.1% have access to better health care.

Source: Ministry of Mines and Energy of Brazil, “Luz para todos: Un marco histórico. 10 millones de brasileños salieron de la oscuridad. Programa luz para todos” [online] <http://luzparatodos.mme.gov.br/luzparatodos/Asp/publicacoes.asp>, 2010.

The problem of unreliable services, especially electricity supply, tends to be most serious in countries with a lower HDI. Where services for the non-poor population fall short, the coverage difficulties are usually due to spatial distribution issues rather than lack of income.

Access to energy services and to cleaner energy sources varies a great deal by income quintile and between urban and rural areas. In the absence of energy services, the only substitute for heat and cooking purposes is the burning of fuelwood, which is associated with health problems and gender inequalities among the poor, since fetching firewood for daily consumption is often the responsibility of girls and women in rural areas. Figure I.10 shows that facilitating access to energy services in Mexico is vital for reducing the hours of paid and unpaid domestic work required to access these services. .. Apart from the environmental advantages it would bring, investment in expanding access to clean and economical energy sources would free up time for women and girls to devote to other activities (such as education, paid productive activities or leisure).

Figure I.10
**MEXICO: WORK TIME IN POPULATION AGED 15 YEARS AND OVER
 BY SEX AND FUEL MOST USED FOR COOKING, 2009**
(Hours per week)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of the National Time Use Survey, 2009 of Mexico. on the basis of information provided by National Institute of Statistics, Geography and Informatics (INEGI) and National Women's Institute (INMUJERES).

The poor consume less energy than other social strata (see table I.2), but spend a higher proportion of their income on energy and often pay more per heat equivalent unit, basically because of difficulties in accessing services through electricity or natural gas distribution networks. Where they pay less, it is usually because they use firewood as a basic fuel. In some areas clandestine connections play a significant role.

Table I.2
LATIN AMERICA (6 COUNTRIES): ESTIMATE OF AVERAGE INCOME AND ENERGY SPENDING RATIOS BETWEEN INCOME QUINTILES I AND V

Country/Area	Average income ratio QV: QI			Energy spending ratio QV: QI		
	National	Urban	Rural	National	Urban	Rural
Costa Rica	12.1	14.2	13.5	-	-	-
Dominican Republic	17.2	17.8	12.0	-	-	-
El Salvador	13.5	10.3	13.1	2.7	6.87	2.21
Guatemala	17.7	13.5	15.0	5.72	21.0	1.5
Honduras	29.6	15.3	38.0	2.53	2.96	1.64
Nicaragua	19.6	16.6	24.1	-	-	-

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Development Programme (UNDP)/Club de Madrid/German Agency for Technical Cooperation (GTZ), “Contribución de los servicios energéticos a los Objetivos de Desarrollo del Milenio y a la mitigación de la pobreza en América Latina y el Caribe”, *Project documents*, No. 281 (LC/W.281), Santiago, Chile, October 2009.

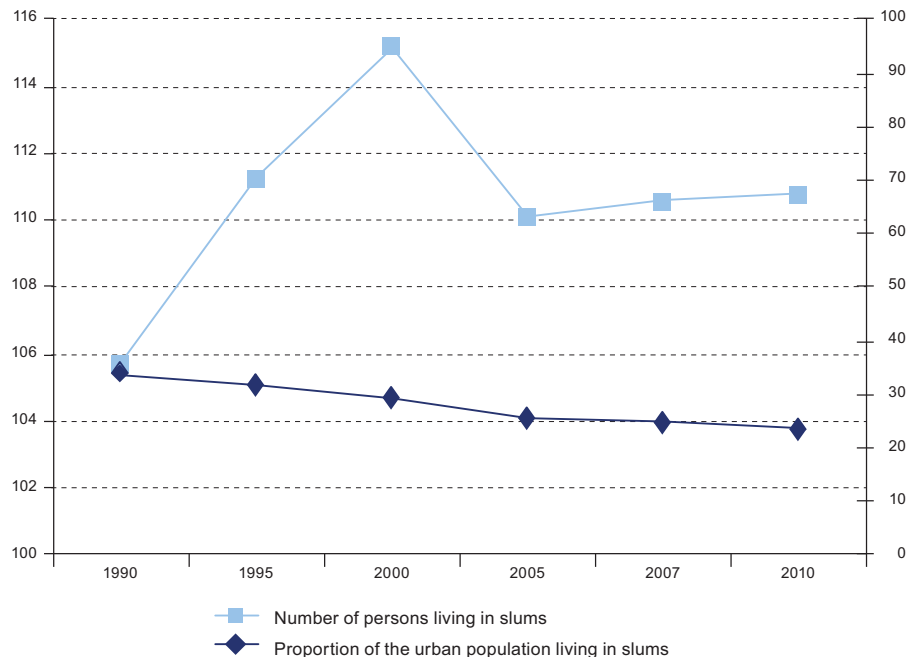
A number of countries have implemented cross-subsidy systems in order to narrow the energy access gap. In Colombia, for example, law 142 on public services adopted in 1994 established a block tariff system scheme for tackling inequality through both energy policy and access to non-energy public services. This combined approach classifies social strata (from 1 to 6) by type of housing and establishes criteria for cross-subsidies, so that strata 1 and 2 (the lowest incomes) are subsidized by strata 5 and 6, by other sectors of consumption and by the public budget.

(c) Housing

From a human rights perspective, the right to housing means the right to live somewhere in safety, peace and dignity. As such, it must be guaranteed to all, regardless of income, and take account of the suitability of dwellings. According to the Committee on Economic, Social and Cultural Rights, the concept of adequate housing means “adequate privacy, adequate space, adequate security, adequate lighting and ventilation, adequate basic infrastructure and adequate location with regard to work and basic facilities—all at a reasonable cost” (CSECR, 1991).

The combination of poverty, high levels of urbanization and strong socio-spatial segregation in the region has led to large numbers of people living in slums (and therefore deprived of the right to adequate housing). In the past 20 years, the proportion of the population living in slums fell significantly, from 34% in 1990 to 24% in 2010. Yet in this same period, the absolute number living in slums has risen from 105 million to 110 million (see figure I.11) (UN-Habitat, 2010). Owing to the respective countries’ demographic weight, close to 60% of slum-dwellers in Latin America and the Caribbean are found in Brazil, Mexico and Argentina.

Figure I.11
LATIN AMERICA AND THE CARIBBEAN: URBAN POPULATION LIVING IN SLUMS, 1990-2010
 (Millions of persons and percentages of the urban population)^a



Source: United Nations Human Settlements Programme (UN-Habitat), *State of the World's Cities 2010/2011. Cities for All: Bridging the Urban Divide*, Earthscan, 2010.

^a Figures are based on estimates, since not all the countries have data on informal settlements and the interpretation of the indicators may vary from one country to another.

Estimates for the past 20 years show considerable achievements in Colombia, Nicaragua and Peru, where both the proportion of the urban population living in slums and the absolute number of slum-dwellers have fallen, the latter by 25%. The numbers of slum-dwellers in Mexico fell by 15%. Both Argentina and the Dominican Republic were able to reduce the absolute numbers despite strong population growth in the period. In Brazil, the combined effect of infrastructure investments and social housing policies reduced the proportion of slum-dwellers from 37% of the population in 1990 to 28% in 2007, though this effort was insufficient to reduce the numbers in absolute terms (see table I.3). The greatest contrast between achievements in terms of the percentage of the urban population living in slums and the absolute figures are seen in the data for Haiti, where the number of slum-dwellers has more than doubled since 1990.

Table I.3
LATIN AMERICA AND THE CARIBBEAN: URBAN POPULATION LIVING IN SLUMS, 1990-2007
(Thousands of persons and percentages of the urban population)^a

	Proportion of urban population living in slums					Number of persons living in slums				
	1990	1995	2000	2005	2007	1990	1995	2000	2005	2007
Argentina	30.5	31.7	32.9	26.2	23.5	8 644	9 790	10 940	9 278	8 530
Belize				47.3					65	
Bolivia (Plurinational State of)	62.2	58.2	54.3	50.4	48.8	2 304	2 589	2 794	2 972	3 030
Brazil	36.7	34.1	31.5	29.0	28.0	40 998	42 856	44 601	45 613	45 708
Chile				9.0					1 285	
Colombia	31.2	26.8	22.3	17.9	16.1	7 433	7 224	6 711	5 920	5 520
Costa Rica				10.9					291	
Dominican Republic	27.9	24.4	21.0	17.6	16.2	1 123	1 131	1 146	1 110	1 079
Ecuador				21.5					1 786	
El Salvador				28.9					1 152	
Grenada				6.0					2	
Guatemala	58.6	53.3	48.1	42.9	40.8	2 145	2 300	2 438	2 572	2 619
Guyana				33.7					70	
Haiti	93.4	93.4	93.4	70.1	70.1	1 893	2 385	2 851	2 786	3 065
Honduras				34.9					1 109	
Jamaica				60.5					855	
Mexico	23.1	21.5	19.9	14.4	14.4	13 859	14 484	14 830	11 457	11 801
Nicaragua	89.1	74.5	60.0	45.5	45.5	1 931	1 861	1 678	1 390	1 439
Panama				23.0					526	
Paraguay				17.6					608	
Peru	66.4	56.3	46.2	36.1	36.1	9 958	9 439	8 382	7 001	7 180
Saint Lucia				11.9					5	
Suriname				3.9					13	
Trinidad and Tobago				24.7					40	
Venezuela (Bolivarian Republic of)				32.0					7 896	

Source: United Nations Human Settlements Programme (UN-Habitat), *State of the World's Cities 2010/2011. Cities for All: Bridging the Urban Divide*, Earthscan, 2010.

^a Figures are based on estimates, since not all the countries have data on informal settlements and the interpretation of the indicators may vary from one country to another.

Improving living standards for slum-dwellers requires an integrated approach to their needs in terms of housing, employment and income, basic services and infrastructure, public spaces and secure tenure. The approach to housing in the region in the past two decades has often been based on policies and programmes centred on housing endowment, without considering broader qualitative urban development issues. Most housing finance systems are based on subsidies and on saving and borrowing schemes that benefit only one population group and indirectly deepen pockets of poverty and precarious conditions. This has sharpened the patterns of growing residential segregation typical of the large cities and has excluded those who lack the capacity to pay for certain services and types of infrastructure (Jordán and Martínez, 2009).

Concerning tenure, certain structures persist in the region that bar the poor from the formal or legal property market, such as requirements related to minimum plot size and price. The poor thus face major difficulties in buying a piece of land on which to build a dwelling, unless financing mechanisms exist for that purpose. For decades, this has resulted in urban settlers being forced to squat on the land (United Nations, 2010a). Among other challenges in relation to housing is the shortage of urban land, which pushes prices up disproportionately in relation to the ability to pay of the poorest groups; and insufficient capacity on the part of local authorities to offer adequate services that could help to reduce poverty in a multidimensional manner. In the absence of sufficient data, information and research capacity, development plans do not reflect the reality of the cities. To these traditional challenges are added those of environmentally-friendly construction (see box I.2).

Box I.2
SUSTAINABLE CONSTRUCTION

Most of the countries in Latin America and the Caribbean have yet to adopt a legal framework to govern the use of non-polluting construction materials. What is more, technical standards often represent barriers to the use of eco-friendly materials. There are a number of schemes in place in the region, however. Mexico has a residential building code (CEV) which sets forth requirements for planning, developing and building different types of construction, and urban development and architectural parameters; it also assigns responsibility to the agents involved in the process in a model which can be standardized nationwide, yet takes into account local characteristics (Nuñez de León, 2011). In Argentina minimum quality standards for social housing were legally established in 2002 and environmental impact assessments for proposed new housing schemes were made compulsory in 2006. On the technical design side, the quality standards also specified rules for space and water heating in social housing (Government of Argentina, 2010). The Argentine Institute for Standardization and Certification (IRAM) introduced a building energy efficiency labelling system known as IRAM 11900, which became law in 2010. In Chile, legislation introduced in 2009 provides tax breaks for building companies that use solar heating systems. Subsidies are also offered for energy efficiency innovation and for residential heating replacement (Ministry of Housing and Urban Planning of Chile, 2010). At the international level, the United Nations Environment Programme (UNEP) created the Sustainable Building and Construction Initiative, which helps decision makers in industry, enterprise and policy to make use of existing opportunities in the sector by: providing a global platform for dialogue and consensus-building among stakeholders; developing tools and strategies for sustainable building practices; establishing baselines for measuring and reporting building performance; and piloting demonstrations locally, nationally and globally.

In addition, an approach being developed in the framework of the Sustainable Social Housing Initiative (SUSHI), also brokered by UNEP, aims to ensure that social housing programmes incorporate sustainability criteria and practices. The preliminary lessons drawn from the pilot components of SUSHI include the following:

- (i) There are serious gaps in understanding and practice in relation to the costs and benefits of sustainable construction and its importance for society (they are seen as too expensive);
- (ii) Building companies and workers often lack the technical capacities required;
- (iii) There is a crucial need to identify financing opportunities to cover the initial investment and redistribute the capital over the project life cycle, and to quantify the cost savings and other associated benefits;
- (iv) There are few specific examples of this type of construction; and
- (v) It is essential to compile previous experiences and to measure and monitor projects to enhance understanding and replicability.

As well as these considerations, there is resistance among users to complex and costly maintenance operations, which underscores the need for clear accounting of costs and benefits (UN-Habitat, forthcoming).

Source: J.P. Nuñez de León, "México y Reino Unido estrenan códigos para la construcción sostenible", Construdata.com, 9 February 2011; Government of Argentina, Office of the Under-Secretary for Urban Development and Housing, Buenos Aires, 2010 [online] <http://www.vivienda.gov.ar/>; Government of Chile, Ministry of Housing and Urban Development, Santiago, 2010 [online] http://www.minvu.cl/opensite_20101129092614.aspx; United Nations Human Settlements Programme (UN-Habitat), *Affordable Land and Housing in Latin America and the Caribbean*, forthcoming.

The great challenges in the region today lie in addressing the lag in housing access and quality, eliminating precarious settlements and preventing more from springing up in the future, and helping to generate opportunities for access to housing through the market. Governments and institutions in the region have begun to take up these challenges in light of growing recognition of the role played by residential land use in shaping Latin American and Caribbean cities. Today they will have to find ways to craft a roadmap for expanding access to affordable land and promoting the use of land for accessible housing. Successful strategies in this direction include regularizing land tenure, forming municipal land banks, recouping land value and making land registry data more reliable and accessible. Existing initiatives include an overhaul of the subsidy system in Chile, while Brazil and Mexico, together with other countries, are pursuing efforts to narrow existing gaps and cater to demand from lower-income sectors. In particular, Brazil is promoting direct financing to communities, which can broaden opportunities for targeted intervention and strengthen participation by communities, non-governmental organizations (NGOs) and local governments, among other stakeholders. Chile, Colombia and Costa Rica have developed financing schemes based on a combination of subsidies, prior saving and mortgage loans (Jordán and Martínez 2009).

Mechanisms adopted to this end must also ensure equal access by men and women to permits or property titles (United Nations, 2010a). They should also incorporate disaster-reduction strategies into the road map for sustainable development.

3. Protection and promotion of human health⁴

The right to lead a healthy and productive life in harmony with nature is enshrined in the first principle of the Rio Declaration and should be understood within the broader right to enjoy the highest attainable standards of physical and mental health, which is set forth in various international instruments (OHCHR/WHO, 2008). Chapter 6 of Agenda 21, “Protecting and promoting human health”, emphasizes the close relations between health and the environment in the context of sustainable development, particularly in relation to five pillars: (a) meeting primary health care needs, (b) control of communicable diseases (c) protecting disadvantaged groups, (d) urban health, and (e) reducing health risks from environmental pollution and hazards. Other intersectoral health-related issues are covered in other chapters of Agenda 21.

(a) Meeting primary health care needs

All the Latin American countries have made considerable efforts to reform and restructure their health-care systems. However, millions still lack access to health care and other basic conditions needed to live a healthy life. Health systems throughout the region remain fragmented and ill-prepared to adapt to epidemiological or demographical shifts (PAHO, 2009a). If health care is to be equitable, public policies must be designed in a cross-sectoral manner in order to expedite progress towards universal, non-discriminatory and comprehensive health-care that affords priority to vulnerable groups. These efforts should be based on the values and principles of the Primary Health Care Strategy formulated to guide the policies, structure and functions of health systems at all levels for all.⁵

⁴ Reproductive health is discussed in section 5.

⁵ Buenos Aires Declaration, “Towards a health strategy for equity, based on primary health care”, 17 August 2007 [online] <http://www.paho.org/Spanish/D/declaracion-final-BuenosAires30-15.pdf>

Thanks to the improvements in water supply and sanitation services noted earlier, the level of mortality from intestinal infectious diseases has fallen considerably among the population in general. Proportionally speaking, this cause of death fell from number 24 in 1997 (0.99% of all deaths) to number 33 in 2007 (0.62% of all deaths). Among children aged 1 to 4 years, however, it was the second largest cause of death in 1997 and the third largest in 2007, accounting for 8.8% of deaths in that age group in both years (PAHO, 2011a). Overall, risk of death from intestinal infectious diseases in the region came down from 6.8 per 100,000 inhabitants in 1997 to 3.4 per 100,000 in 2007, but with major variations—from 1.17 to 29.4 per 100,000 between countries (PAHO, 2011b).

(b) Control of communicable diseases

The incidence of malaria fell by 53% in the region between 1992 and 2009 (PAHO, 2008a). Some examples of what are known as neglected tropical diseases have also been successfully reduced. Of the 13 original foci of onchocerciasis (river blindness) in six countries (WHO, 2010a), eight have been eradicated. Endemic transmission of lymphatic filariasis has been reduced from seven to four countries (WHO, 2010b). The transmission of schistosomiasis, too, has been reduced (Amaral and others, 2006) and the transmission of Chagas' disease in the household environment was also eradicated in several countries in the region during this period (PAHO, 2010a).

More efficient and timely early warning systems are needed, as demonstrated by the emergence of rapid-spread communicable diseases such as influenza A (H1N1), the recurrence of outbreaks of leptospirosis, yellow fever and other viral haemorrhagic fevers and the resurgence of cholera in Haiti. Dengue is an unresolved challenge: the number of cases has risen constantly. What is needed is a thoroughgoing revision of preventive and control measures based on better-integrated ecosystemic and public health strategies.⁶ As the efficiency of intervention measures and strategies becomes better understood, a greater effort is needed to broaden and strengthen prevention and control of neglected tropical diseases. Efforts need to be focused on eradicating the last remaining pockets of trachoma, onchocerciasis, leprosy and other diseases (PAHO, 2009b).

The prevalence of HIV/AIDS has remained relatively stable in Latin America and the Caribbean in the past two decades, at between 0.4% and 0.5% of the general population. This is undoubtedly an achievement, although the epidemic continues to seriously affect certain key groups which have long suffered institutional discrimination and neglect. Rates of HIV infection as high as 34% have been reported among the transsexual population, for example. Among men who have sexual relations with men, HIV prevalence is over 5% in all the countries of the region and as much as 20.3% in some. The highest HIV infection rate reported among sex workers in the Latin American countries is 4.9% in Brazil. But among male sex workers HIV prevalence in the countries with data available is as high as 22.8%. Among intravenous drug users, the rate is over 5% (UNAIDS, 2011a). The proportion of men infected in relation to women has dropped drastically since the 1980s, yet the number of infections among men has not fallen. Instead, a higher number of infections has been reported among women. In Latin America, more than one third of adults (36%) living with HIV in 2010 were women (UNAIDS, 2011b).

In the Caribbean, the epidemic has slowed considerably since the mid-1990s. Since 2001, new HIV infections slowed by close to 25% in the Dominican Republic and Jamaica and by close to 12% in Haiti. AIDS-related deaths were reduced by 50% between 2001 and 2010. Greater access to HIV-

⁶ Pan American Health Organization/World Health Organization (PAHO/WHO), "Dengue Regional Information: Number of cases", [online] http://new.paho.org/hq/index.php?option=com_content&task=view&id=264&Itemid=363&lang=en.

prevention services for pregnant women led to a significant reduction in the number of children contracting HIV and in AIDS-related child deaths. Notwithstanding the progress achieved, the Caribbean is second only to Sub-Saharan Africa in terms of HIV prevalence (0.9%). Indeed, it is the only region, apart from Sub-Saharan Africa where there are more women than men infected with HIV. In 2010, approximately 53% of adults living with HIV were women (a percentage that has remained stable since the late 1990s). This reflects the pattern of infection in Haiti (which has the worst epidemic in the region), Bahamas, Belize and the Dominican Republic. In most of the other countries of the region, more men than women are HIV-positive (WHO, UNAIDS, UNICEF, 2011).

In order to halt and considerably reduce the epidemic by 2015, best practices in public health and disease control recommend targeting the HIV response on key groups and carefully compiling information and analyses to match policy action to the dynamics of the epidemic in affected communities, in partnership and based on a human rights approach (UNAIDS, 2011a, UNAIDS, 2011b).

Major advances have been achieved in Latin America and the Caribbean in terms of coverage (50% of the region) of antiretroviral treatments for those living with HIV, but this progress has been constantly undermined by poverty, food insecurity and undernourishment (WHO, UNAIDS, UNICEF, 2011). Undernourishment worsens the effects of HIV and hastens the onset and progress of AIDS-related conditions (WFP, 2010). Rising food prices, the economic crisis and the downturn in remittances have all added to food and nutrition insecurity for those living with HIV, who continue to be one of the region's most vulnerable groups (WHO, UNAIDS, UNICEF 2010).

(c) Protecting disadvantaged groups

Several countries in the region have implemented targeted health-care programmes for the extremely poor, children, women and pregnant women, older persons and victims of violence, among others. Schemes that have been successful in this regard include *Bolsa Familia* in Brazil (Lindert, 2005) and *Oportunidades* in Mexico (SEDESOL, 2008).

However, groups that are already disadvantaged are coming under new pressures from emerging challenges, such as increased drug consumption, changes in eating habits, climate change, the destruction of ecosystems, water shortages and land-use change.

(d) Urban health

Urbanization may have a positive impact on health owing to the greater ease of supplying basic services such as water and sanitation. It also entails many risks, however. For example, tuberculosis is closely associated with social determinants of health and occurs mainly in urban areas. Nevertheless, tuberculosis-related deaths in the region fell from 8 per 100,000 inhabitants in 1990 to 2.1 in 1990 (WHO, 2010c).

Major inequalities remain, however, between both countries and cities within countries (PAHO, 2007). A study conducted in Buenos Aires found that child mortality was 6.5 per 1,000 live births in one central district, but as high as 16 per 1,000 live births in another part of Greater Buenos Aires (Bernardini, 2009).

One of the greatest health risks in urban areas comes from atmospheric pollution. In some high-risk cities (such as Mexico City, São Paulo and Santiago) the emission of pollutants is managed to some extent. But the growth of many other cities has been accompanied by an increase in both stationary and mobile sources of pollutants and this has significantly affected health indicators in the respective populations. PAHO estimates that close to 100 million of the region's inhabitants are exposed in their daily lives to concentrations of ambient air pollutants in excess of the maximum permissible levels established in the air quality guidelines published by the World Health Organization. It is calculated that, annually, air pollution costs the lives of around 35,000 people and the loss of 276,000 life years (Romieu and others, 2010).

(e) Reducing health risks from environmental pollution and hazards

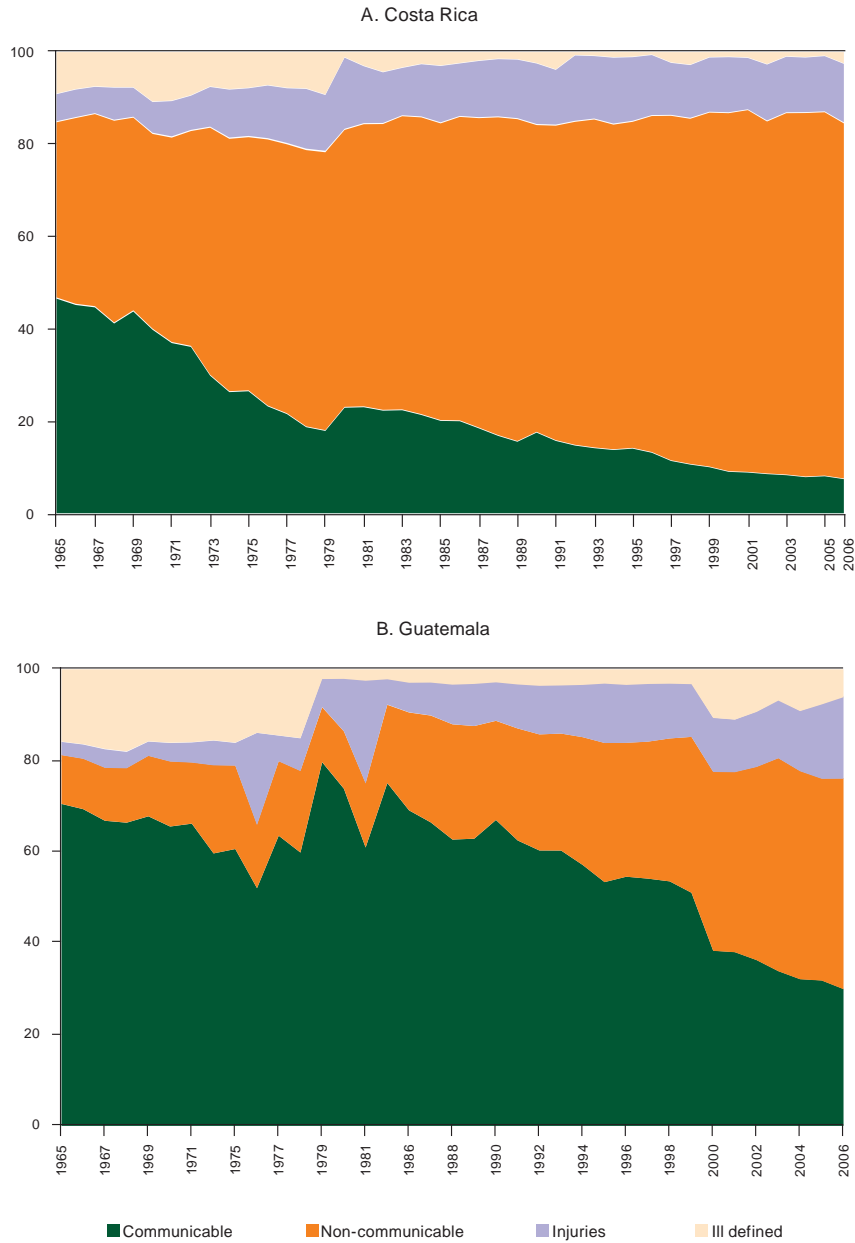
In addition to air pollution, chemical contamination is a serious problem in the region. Chapter II discusses progress made in managing chemical products. Some of the main health problems are caused by the use of dichlorodiphenyltrichloroethane (DDT) and by chemical and technological incidents. DDT has also commonly been used to control malaria. Between 2004 and 2007 an innovative scheme was carried out to combat malaria without the use of toxic insecticides—and eliminating DDT—in the countries of Central America and Mexico with support from PAHO, the National Public Health Institute of Mexico and the Global Environment Facility. This scheme reduced malaria transmission by 63% in the participating communities and eradicated the use of persistent organic pollutants—and therefore their effects on ecosystems (PAHO, 2008b). Even so, preventive measures and risk minimization efforts have been insufficient. As a subregion, Central America has historically been one of the world's greatest importers of insecticides (Bravo and others, 2011).

Chemical and technological incidents are not isolated events in Latin America and the Caribbean. Some have caused major human health impacts, such as the gasoline spill in the sewer system of Guadalajara (Mexico) in 1992 and the chemical spill in the port of La Guaira (Bolivarian Republic of Venezuela) in 1999 (Haddad, Aguilar and Nobre Gouveia, 2010).

(f) Emerging health issues

The region is undergoing an epidemiological transition (see figure I.12): on the one hand, long-standing risks have not been adequately reduced while, on the other, newer problems are on the rise, including tobacco addiction, alcoholism, physical inactivity and poor diet, uncoordinated public transport, unsustainable agriculture, uneven socioeconomic development and environments which discourage healthy behaviours. Another issue that has gained importance in recent years is the impact of climate change on health. This is discussed in chapter II. Other global environmental changes that raise health concerns for the region are loss or deterioration of ecosystems and the degradation of water sources caused by environmental exploitation and worsened by climate change. Land-use change, for example, may lead to malnutrition in local populations; biodiversity loss can result in changes in the natural regulation of some infectious diseases; and water shortage has direct health implications where people use polluted water and indirect effects where it is lacking for local agricultural use (WHO, 2005).

Figure I.12
COSTA RICA AND GUATEMALA: EPIDEMIOLOGICAL TRANSITION, 1965-2006
(Percentages)



Source: Pan American Health Organization (PAHO), *Health Situation in the Americas: Basic Indicators 2010*, Washington, D.C.

In Latin America and the Caribbean, information and communications technologies (ICTs), like some older technologies, have brought with them their own type of waste (such as persistent organic, electronic and nuclear waste, as well as radiation and residues from the automobile industry) (see chapter II, section B.10). Unless appropriate infrastructure is set up for its disposal, this waste will pose a further challenge for the health of Latin American and Caribbean populations.

(g) Non-communicable chronic diseases

Non-communicable chronic diseases not only reduce the productivity of individual sufferers, they also represent a recurring, lifelong cost which deepens people's vulnerability and makes it more difficult for them to overcome poverty—or increases their chances of slipping back into it. Chronic diseases are now the leading cause of mortality and represent 78% of all deaths in the Americas (PAHO, 2010b). Of these, 38% were caused by cardiovascular conditions, 25% by cancer, 8.3% by chronic respiratory disease and 6% by diabetes mellitus (PAHO, 2011a). The demand for related services places enormous pressure on sufferers of chronic diseases, on their families and certainly on health services, whose response capacity and sustainability become seriously strained.

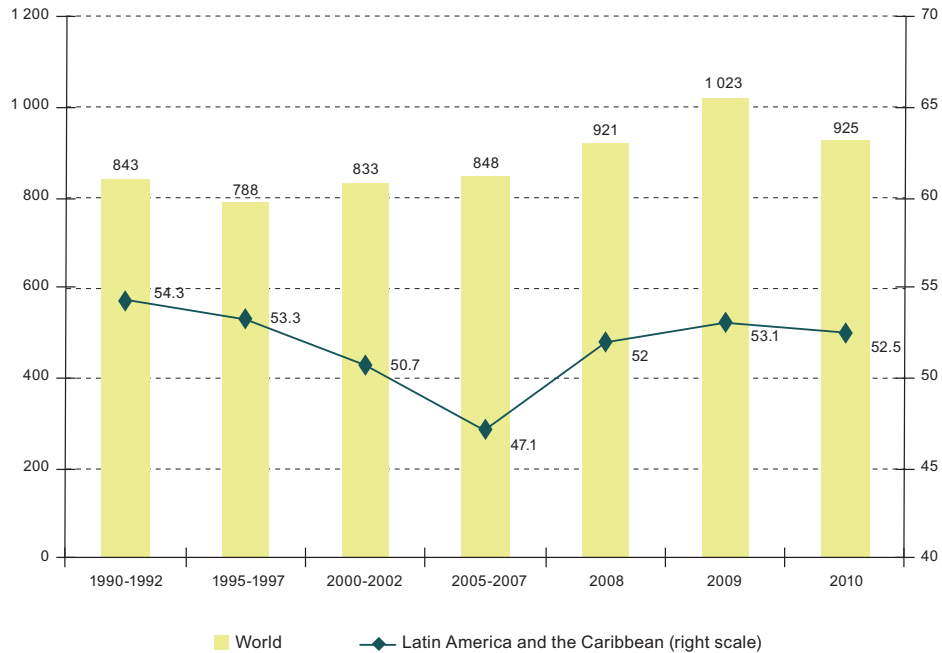
4. Food security

The right to food is recognized in the Universal Declaration of Human Rights of 1948 as part of the right to a decent standard of living and is enshrined as well in article 11 of the International Covenant on Economic, Social and Cultural Rights. The Committee on Economic, Social and Cultural Rights states in General Observation number 12 (paragraph 6): “The right to adequate food is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement” (CESCR, 1999). The right to food must therefore be understood in a broad sense to include physical and economic access to adequate food or to the means to obtain it, and not in the narrow sense of the endowment of energy, protein and other nutrients needed to survive. It has also been recognized that the right to adequate food must be achieved progressively. Nevertheless, States still have a basic obligation to adopt the measures needed to reduce and relieve hunger, including in the event of natural disasters or other contingencies.

Hunger and undernutrition are the most dramatic expressions of poverty. The number of people suffering from hunger decreased between 1990 and 2006 (see figure I.13), but this progress was thrown into reverse by the food crisis of 2007-2008 and the economic crisis of 2008-2009 and at the end of 2011 had yet to regain pre-crisis levels. In 2010, there were still over 52 million undernourished people in the region and the outlook is not particularly encouraging in view of food price developments—between 1992 and 2011, the FAO food price index rose by a full 100%.⁷

⁷ See [online] [http:// www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/](http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/) [date of reference: December 2011].

Figure I.13
**NUMBER OF UNDERNOURISHED PEOPLE IN THE WORLD AND IN
 LATIN AMERICA AND THE CARIBBEAN, 1990-1992 TO 2010**
(Millions of persons)

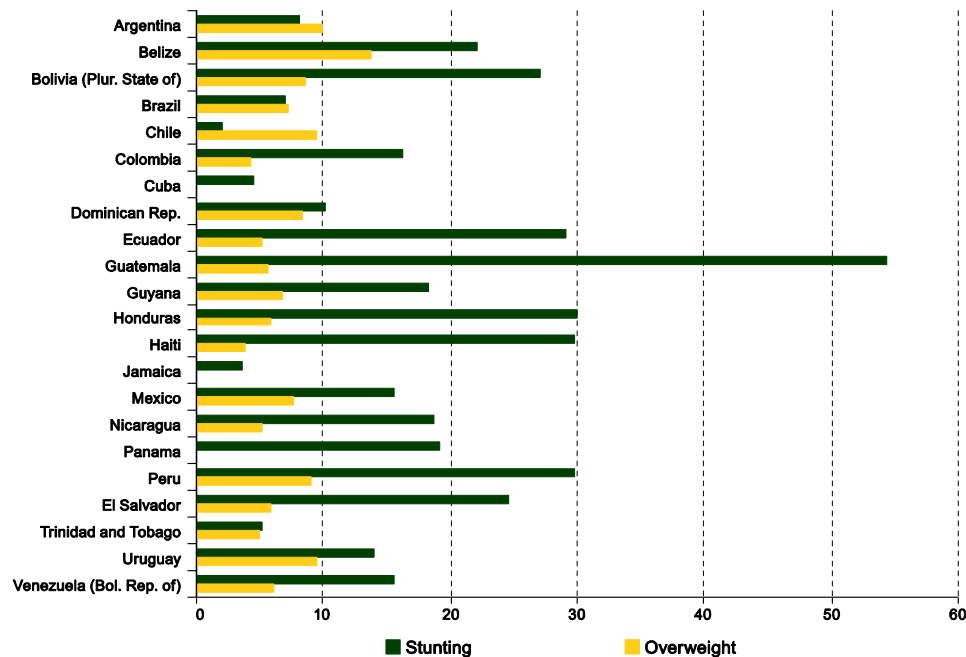


Source: Food and Agriculture Organization of the United Nations (FAO), *Panorama of Food and Nutrition Security in Latin America, 2010*, Santiago, Chile, 2010.

Central America (except Costa Rica), the Caribbean and some South American countries (Ecuador, Paraguay and Plurinational State of Bolivia) were making very little progress in reducing undernourishment even before the crisis, which left them even worse placed. Moreover, the rate of chronic child undernutrition in these countries remains high (see figure I.14). At the same time, the nutritional transition⁸ has led to alarming levels of obesity in some countries, causing a “double burden” of malnourishment.

⁸ This term refers to a change in food consumption patterns and nutritional status whereby undernourishment and obesity may coexist in the same country. The main factors underlying this process are demographic changes, food availability and cost as well as lifestyle changes, particularly with regard to physical activity (Caballero and Popkin, 2002, cited in FAO (2010b)).

Figure I.14
UNDERNUTRITION AND OVERWEIGHT IN CHILDREN UNDER 5 YEARS, 2000 TO 2009
 (Percentages)



Source: Food and Agriculture Organization of the United Nations (FAO), *Panorama of Food and Nutrition Security in Latin America, 2010*, Santiago, Chile, 2010.

Fortunately, notwithstanding the crisis, social spending held steady or even expanded and this helped to soften the impact on the nutrition situation in the region. Conditional cash transfer programmes have provided short-term assistance. Some Latin American countries have developed best practices in implementing public policies to combat hunger. Those countries could lead the way in the transition process in the region towards building stronger social protection networks and improving food and nutrition security through South-South cooperation mechanisms. However, policies of a more structural type are now needed in order to shift the burden from welfare to capacity-building within the population and States afflicted by these social calamities.

Nutritional transition and increasing child obesity form a key emerging issue that countries will have to address at the same time as redoubling their efforts to eradicate hunger. This effort will require institutional innovations based on the human right to food and aimed at guaranteeing proper, healthy nourishment and adequate information on industrialized foods. The crisis of 2007-2009, weather variability and climate change and the rise in international food prices in 2010-2011 have returned food security to the international agenda. Here the need arises, too, to reform governance of world food markets and their links with the financial and energy markets. It is also necessary to attribute due value to small-scale farming and enhance its role in food production, strengthen intraregional trade and, as noted in a recent report by FAO (2011), close the gender gap in agriculture in order to win the fight against hunger and extreme poverty once and for all.

Lastly, mounting global uncertainty underlines the need for strategies to manage the risk inherent in the traditional approach to food security, in order to mitigate the impacts of unforeseen shocks and adapt to more permanent changes.

Target 1C of the Millennium Development Goals —to halve, between 1990 and 2015, the proportion of people who suffer from hunger— remains a pending issue in the region. This is compounded by the challenge of reducing obesity and dealing better with the economic impacts of crises and natural disasters due to extreme weather events or natural phenomena (FAO, 2010a; 2010b; 2011).

5. Reproductive rights and sexual and reproductive health

According to the Programme of Action of the International Conference on Population and Development (ICPD), reproductive rights derive from the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. It also includes their right to make decisions concerning reproduction free of discrimination, coercion and violence, as expressed in human rights documents”. In this framework, among other matters the Programme of Action includes objectives referring to education (especially for girls) and to greater reduction of infant, child and maternal mortality, which requires measures to broaden and improve access to sexual and reproductive health care. These objectives were further reinforced with the adoption of the Millennium Development Goals. In 2007, target 5B —to achieve, by 2015, universal access to reproductive health— was included in Millennium Development Goal 5.

Latin America and the Caribbean is the region which has made the most headway in signing international accords on human rights, including those which refer to reproductive rights. A number of countries have adopted national legislation expressly recognizing sexual and reproductive rights and the great majority have adopted policies and programmes designed to promote the realization of reproductive rights, broaden access to sexual and reproductive health services and improve their quality.

Several indicators relating to this field have shown improvements since the 1990s and particularly since 2004. In the latter period, unmet family planning needs fell, the coverage of prenatal care and skilled birth attendance rose and infant mortality came down. Data from the Inter-Agency Group for Child Mortality Estimation show a drop in infant mortality from 41 per 1,000 live births to 19 (figures from CEPALSTAT).

Although maternal mortality declined in 1997-2005, the absolute number of maternal deaths virtually stood still and many of these appear to have been from avoidable causes.

A particularly important area of concern for the region is reproductive health during adolescence. As mentioned previously, early fertility is one of the factors involved in the intergenerational reproduction of poverty, since it obliges households to distribute scarce resources more thinly and makes it more difficult for mothers to participate in the labour market or continue with their education. Poor children develop at a disadvantage in terms of health and access to education systems. This erodes their human capital and contributes to the reproduction of poverty in the long run (ECLAC, 2011a). Adolescent fertility is high in Latin America and the Caribbean and, unlike in other regions, shows no sign of systematically decreasing. The adult fertility rate has not decreased either and most of these pregnancies are unplanned. The reduction in adolescent fertility since 1990 has been very slight and the high rates now observed in the region are exceeded only by Sub-Saharan Africa (United Nations, 2010b).

Generally speaking, national health systems do not properly recognize specific adolescent patterns of morbidity and mortality. Almost all the countries have implemented sexual and reproductive health programmes for adolescents and several have adopted legislation or nationwide programmes to provide formal and non-formal sex education in addition to other longer-standing schemes. The outcomes of these efforts have yet to be fully realized, however.

Information services, efforts to build preventive capacities and skills, and access to sexual and reproductive health services are still insufficient for the under-20 age group and show sharp differences by social sector. In particular, the use of contraception during first sexual intercourse is still very uncommon despite the fact that sexual intercourse with no reproductive intention has risen sharply among adolescents. In addition, girls who are already mothers are at high risk of a second pregnancy relatively quickly, sometimes within less than two years. This warrants the development of protective measures to avoid or postpone another pregnancy. Persistent and even growing inequalities in adolescent maternity rates by area of residence (urban or rural), level of education or ethnic or racial identity are illustrative of constraints on the exercise of rights and the lack of opportunities for adolescents in the most disadvantaged groups.

Most of the countries in the region do not yet have legislation precisely defining reproductive rights and universal access to sexual and reproductive health. Accordingly, explicit guarantees of those health services do not exist, nor mechanisms for realizing entitlement and ensuring specific standards of quality care. On the contrary, some legislations actually conspire against reproductive rights, showing that national legal systems are not aligned with the relevant international agreements.

Section 3 discussed the situation in relation to HIV in the region. With regard to ICPD commitments, progress has been made in access to antiretroviral therapy with exceptional achievements in some cases, such as Brazil, and high rates of treatment access in others, such as Argentina, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, Mexico Nicaragua, Paraguay and Uruguay (UNAIDS, 2011b). At the regional level, in August 2008 in Mexico City ministers of health and education from 30 Latin America and Caribbean countries adopted the ministerial declaration “Educating to prevent”, which seeks to reduce HIV transmission, sexually transmitted diseases and unwanted pregnancies through comprehensive sex education.⁹

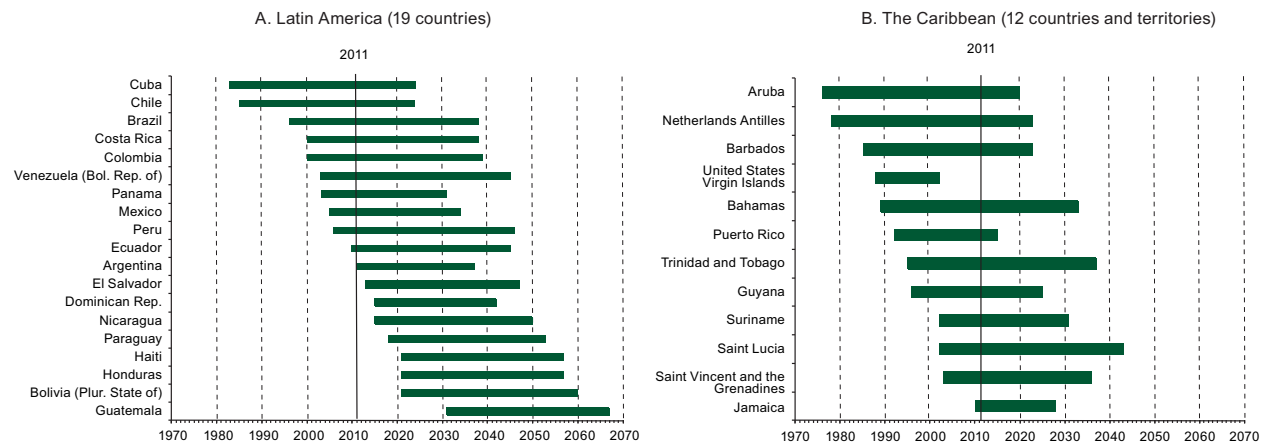
6. Population structure

Many of the Latin American and Caribbean countries are in the midst of a demographic transition: the process whereby a country moves from low population growth with high fertility and mortality levels to, again, low population growth but now combined with low fertility and mortality levels. There is a period during the demographic transition in which the proportion of the population at potentially productive ages rises steadily in relation to the proportion at inactive ages. This period offers particularly favourable conditions for development by boosting potential for saving and investment in economic growth while lessening the pressure on the education and health budget. This is what is known as the “demographic dividend” —a window of opportunity to accelerate development. Lower demographic dependency rates help to lower poverty levels (Ros, 2009) through their direct positive impact on well-being levels in societies and they also reduce the pressure on ecosystems and rural resources associated with poverty.

⁹ See [online] <http://www.censida.salud.gob.mx/descargas/pdfs/declaracion.pdf>. Date of reference: December 2011.

In much of the region, there is still time to take advantage of the demographic dividend and invest effectively in the universal provision of basic services and good-quality education (see figure I.15). A virtuous cycle between demographics and economic and social conditions began in the region as of 2002, thanks to the boom phase of the business cycle and greater economic growth (see section B). This has brought opportunities for social mobility by strengthening the middle classes and increasing household income in a context of fewer dependents per family.

Figure I.15
LATIN AMERICA AND THE CARIBBEAN: PERIOD FOR WHICH THE DEPENDENCY RATIO REMAINS BELOW TWO DEPENDENTS FOR EVERY THREE WORKING-AGE INDIVIDUALS



Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007 for Latin America; United Nations, “World Population Prospects: The 2006 Revision. Population Database” [online database] <http://esa.un.org/unpp/> for the Caribbean.

Benefiting from the demographic dividend however, depends on the adoption of macroeconomic policies that will encourage productive investment (Bloom, Canning and Sevilla, 2003; Adioetomo and others, 2005; Wong and Carvalho, 2006). It will also require heavy investments in human capital, especially in young people (see section 1 and chapter III). Suitable, comprehensive education and employment policies are needed to tap the benefits of the demographic dividend for education coverage and leverage its effect on poverty reduction and sustainable development. For some countries, many of them in the Caribbean, the demographic dividend is petering out. For many others in the region, it is just beginning or has yet to start (ECLAC/UNFPA, 2009).

As the transition progresses, older persons will come to represent a proportionally larger section of the population, making it essential to take action now to face the challenges posed by an older society. The opportunity offered by the demographic dividend must be leveraged to promote decent work, social protection and the savings capacities of today’s youth (ECLAC/UNFPA, 2009). An overview of the action being taken in the countries of Latin America shows that many have begun to prepare for population ageing. Capacity-building is under way to enable public agencies to respond to and channel the needs of older persons and to coordinate public policy in the sectors involved. Many countries have adopted special legal instruments for older persons. Non-contributory pension systems have formed one of the pillars of recent efforts to build social protection in several countries in the region, and this has enabled governments to offer greater economic security to large swathes of the adult population not

covered by existing retirement schemes. There are a number of examples of non-contributory pension schemes in the region, but they are still not the general rule (ECLAC/UNFPA, 2009) nor a solution in their own right.

7. Reducing exposure to disasters

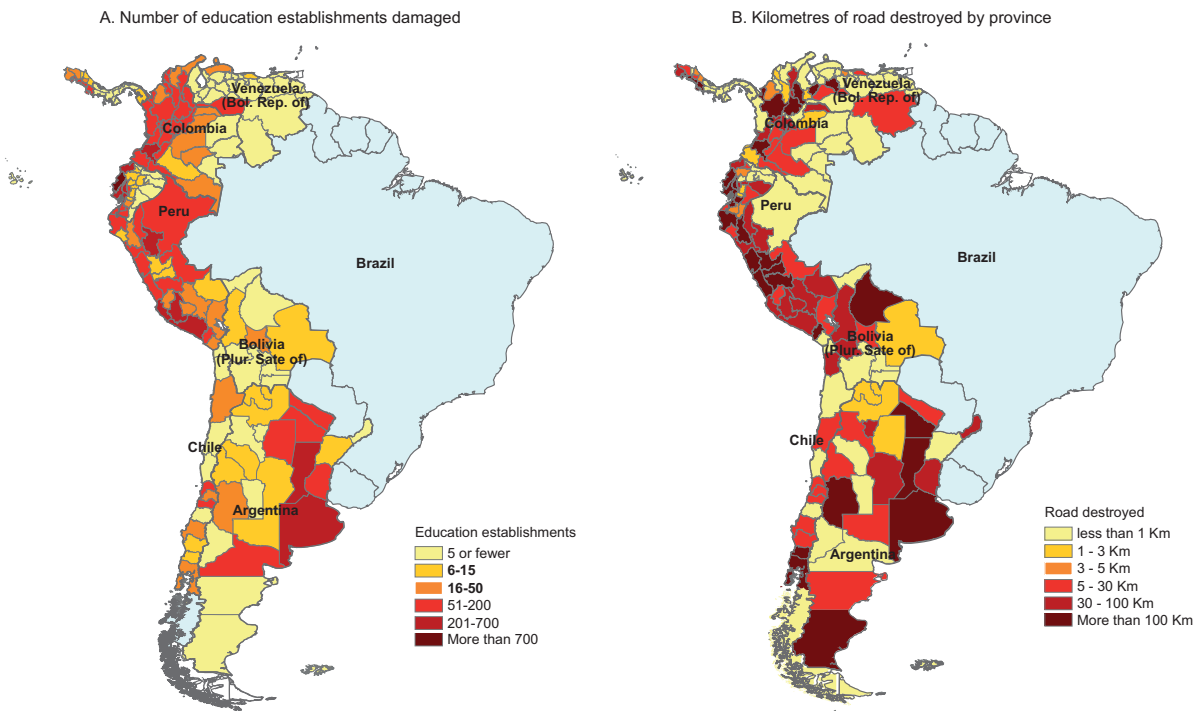
The disasters arising from extreme weather events and natural phenomena such as earthquakes have strongly impacted social well-being and the economy of a number of countries in the region. The most disadvantaged sectors of the population are the most vulnerable to the various natural threats including hydrometeorological hazards, which tend to worsen with climate change (see chapter II). In the past two decades, investments in natural disaster risk management have been insufficient; moreover, post-disaster recovery and reconstruction have been postponed or incomplete (ECLAC, 2010c). Table I.4 reveals the magnitude of the impacts of geological disasters or those associated with weather events in the region. Maps I.1A and I.1B show the damage done to regional infrastructure by these extreme events.

Table I.4
LATIN AMERICA (SELECTED COUNTRIES): DISASTER-RELATED LOSSES
(Number of persons and households)

	Dead	Injured	Disappeared	Homes destroyed	Homes damaged	Persons affected	Population in 2009	Period
Argentina	3 377	22 470	810	53 973	141 381	23 271 305	40 164 561	1970-2009
Bolivia (Plurinational State of)	1 190	1 133	254	6 249	8 200	832 980	10 187 067	1970-2009
Chile	3 184	6 811	640	101 877	278 087	8 052 836	19 983 720	1970-2009
Colombia	35 898	26 447	2 812	183 106	681 404	22 688 062	45 103 268	1970-2009
Costa Rica	516	51	62	8 796	50 800	32 405	4 509 290	1970-2009
Ecuador	3 019	2 535	1 228	12 074	58 785	1 293 799	14 032 233	1970-2009
El Salvador	4 541	15 087	535	180 277	202 701	343 817	7 124 374	1970-2009
Guatemala	1 953	2 789	1 113	20 941	105 985	3 339 301	14 009 133	1989-2009
Mexico	31 442	2 882 359	9 273	432 812	2 781 635	59 882 327	106 116 969	1970-2009
Panama	339	1 292	39	13 534	70 678	345 782	3 304 461	1989-2009
Peru	40 994	65 675	9 136	438 376	398 237	2 218 035	29 330 481	1988-2009
Venezuela (Bolivarian Republic of)	3 015	379	1 059	56 285	158 288	2 932 101	28 143 584	1970-2009

Source: International Strategy for Disaster Reduction (ISDR), *2011 Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/download.html>.

Map I.1
**LATIN AMERICA (SELECTED COUNTRIES): IMPACT OF EXTREME EVENTS ON REGIONAL
 INFRASTRUCTURE, 1970-2009**



Source: International Strategy for Disaster Reduction (ISDR), *2011 Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/download.html>.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

These impacts imply setbacks in the already complex process of development in the countries of the region. Small countries, in particular small island developing States (SIDS) are the most seriously affected by economic losses caused by disasters (ISDR, 2009).

The heightened vulnerability to disaster risks in the region is attributable to factors such as climate change, poverty, poor land-use planning, urban sprawl and environmental degradation with the subsequent loss of biodiversity. Climate change is giving rise to new patterns in the intensity and frequency of climate-related threats and other physical perils that threaten lives, property, employment and livelihoods.

The gravity of the impacts of future natural disasters will depend largely on the ability of countries in the region to reduce their vulnerability and boost their risk-management capabilities; this, in turn, will depend on how they manage their environmental and natural resources, economic and social development, urban and land-use planning and governance (ISRD, 2011b).

Reducing vulnerability will require instruments for prevention such as land-use planning, early-warning systems, maintaining plant cover, improved local institutions and construction of proper infrastructure. Integrated analytical and management approaches will also be needed; in particular, disaster risk reduction strategies must be incorporated into public investment systems in the region (see box I.3, below).

Box I.3

MAINSTREAMING DISASTER-RISK REDUCTION INTO PUBLIC INVESTMENT DECISIONS IN LATIN AMERICA AND THE CARIBBEAN

Since the turn of the century, disaster-risk reduction has been an essential component of public investment systems in the region. In addition to its primary function, it has served to ensure that public funds are used efficiently and in such a way as to promote sustainability and equity.

In 2000, Peru set up the National Public Investment System, which paved the way for incorporating disaster risk reduction in the public investment system. The success of this initiative is attributable to a number of factors including standardized concepts and appraisal methodologies, the participation of government stakeholders of different levels and from different departments, the training of 900 professionals, the implementation of new standards and instruments and the development of a long-term investment vision. By 2008, as many as 72,000 projects had been approved. Following the success of the Peruvian experience, Costa Rica adopted a similar initiative in 2007.

In Latin America, some 80% of disaster-related losses are reported to occur in urban areas. Integrating disaster risk reduction in public investment decisions and in urban development agendas is therefore key for reducing risk and preventing loss of life and assets when weather-related disasters strike. According to estimates carried out in Mexico and Colombia, it would cost four times as much to reconstruct and repair damaged infrastructure than to take the necessary risk-reduction measures in the area of land-use planning and better construction codes. Corrective measures such as retrofitting or relocating are more expensive but could result in 40% fewer deaths. Social protection is another innovative mechanism for preserving community and household assets during and following a disaster. Chile and Nicaragua have successfully adopted social protection measures, such as cash transfers, to reduce vulnerability of households in times of disaster. Over 114 million people in Latin America alone benefit from similar social protection programmes and these may be adapted at relatively low cost to effectively boost the resilience of communities and households, thereby reducing the need for humanitarian aid in the aftermath of a disaster.

The value of disaster risk management as a policy initiative is growing even at the local level. Currently, about 80 local government units are active members in the 2010-2011 campaign entitled “Making cities resilient: My city is getting ready”, launched by the United Nations International Strategy for Disaster Reduction (ISDR) (see [online] <http://www.unisdr.org/english/campaigns/campaign2010-2011/>). The campaign was implemented to unite cities in building better awareness and commitment in order to promote sustainable development practices with a view to reducing future disaster risks and boosting disaster preparedness. The members of the campaign have access to the ten-point check-list to help them monitor their progress in disaster risk management. These points are aligned with local indicators in order to highlight local progress.

Source: International Strategy for Disaster Reduction (ISDR), *2011 Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/download.html>; *Making Cities Resilient: My City is Getting Ready*. 2010-2011 World Disaster Reduction Campaign, Geneva.

The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities, endorsed by all the Governments of the region, is the first international agreement that outlines the work different actors and sectors will need to do in order to reduce disaster-related losses. It seeks to strengthen risk management and institutional and legal frameworks as well as the mechanisms that support them (ISDR, 2011a). Since the adoption of this framework, various regional platforms have been established, including the Regional Platform for Disaster Risk Reduction in the Americas for furthering implementation of the Hyogo Framework for Action. These platforms have served to underscore the need to strengthen coordination between the different levels of government (national, subnational and local) in implementing disaster risk reduction actions and in promoting adaptation to climate change. A holistic, sustainable-development approach is viewed as essential for boosting development management, biodiversity, fragile ecosystems and water resource management and for reducing vulnerability to different types of threat, in particular, environmental degradation.

8. Emerging social issues

Well-grounded doubts exist regarding the economy's capacity to sustainably create the formal employment necessary to increase social protection coverage. Employment informality is a growing phenomenon in some economies. Structural changes in the economy, such as the transition to a green economy, must be accompanied by adequate social protection notwithstanding modifications in the structure of employment.

In the coming years, States will need to rally all their resources to tackle organized crime, whether profit-seeking (human trafficking, drug smuggling, contraband, waste trafficking, tax evasion and so on) or filling gaps left by the breakdown in traditional social relations (gangsterism).

With conflicts breaking out across the globe, security is one of the foremost issues being discussed today. The human person must be placed at the centre of security concerns and the close link between development and security needs to be recognized. Human security emerges as a new concept that focuses on the lack of security affecting the daily lives of people and on their dignity from an integrating and multidimensional approach (as opposed to a defensive one). It calls for an intervention approach (or a combined policy) designed to safeguard human life and give people a sense of security in their homes, at work, in their communities and their territories, and also for enabling persons to develop their potential, participate fully in decision-making and ward off, resist and confront threats, making them less vulnerable. This is the most important qualitative leap of human security over traditional security. It enhances the dimension of human dignity, emphasizing a dimension that is rarely addressed or taken into account in policymaking and development planning: culture and people's emotions. The contours of security extend far beyond a person's survival to encompass matters such as emotions, love, culture and faith, and the tendency for people to identify with a place (territory) (UNCRD, 2011b).

B. ECONOMY AND SUSTAINABILITY

The direction of macroeconomic policy, production structure and sustainability are also strongly tied to one another. In the long term, growth with equity and sustainability depends upon productive diversification with a sustainable energy pattern, a broader array of export destination markets and a rise in total factor productivity (ECLAC, 2010a). In the past 20 years, the region has not succeeded in closing productivity gaps with developed countries or in transforming its production structure, which remains heavily based on natural-resource-intensive sectors—which generates heavy pressure on natural resources, soils and the atmosphere—and on manufacturing sectors with little value added, which limits potential for growth and for improving the poverty and inequality indicators described earlier (ECLAC, 2010a). The current conditions are, however, favourable for bringing the actions of the State towards sustainable and inclusive patterns of development.

1. Growth, investment and the exchange rate

When the Earth Summit was held in 1992, the Latin American and Caribbean region was emerging from a decade of economic adjustments, instability, external borrowing problems and low growth, all of which undermined the capacity of its governments to respond to rising poverty and social challenges. The pressure to generate hard currency led to a preference for activities capable of yielding visible results in the short term (Sunkel, 1985, 1990). The 1990s were years of profound changes in policies and growth

patterns in Latin America, with a far-reaching process of trade liberalization, deregulation of public services, opening of the domestic financial market and the capital account, rationalization of the State apparatus and abandonment of previous policies on industry and technology (Stallings and Peres, 2000).

By the mid-1990s inflation was under control: an achievement that should not be underestimated. Yet this success was not enough to bring about economic growth or improve social indicators. As discussed in section A, the number of poor rose between 1990 and 2002 (see figure I.1) as did the number of slum-dwellers (see figure I.11). With regard to economic growth, as shown in table I.5, the yearly rate averaged no more than 3.6% between 1990 and 1997.¹⁰ To this was added a deterioration in the current account balance, leaving the external sector extremely vulnerable to sudden stops in financing flows, especially financial capital.

The economic upturn in Latin America and the Caribbean took hold more firmly in the second semester of 2003.¹¹ This marked the onset of a strong growth period in the region which has lasted to the present, with a momentary interruption caused by the global crisis of 2009 before recovery in 2010. The external sector also gained a sounder position, with smaller deficits (and some surpluses) on the balance-of-payments current account in a number of economies in the region. Gross fixed capital formation expanded significantly through domestic saving.

The growth of the region in this period has been heavily tied to burgeoning demand for primary goods from China. The impacts of China's economic growth have been channelled not only through external trade but also through reserve accumulation. The build-up of reserves has been a strong factor in keeping international interest rates low, which has had benign financial effects for the economies of the region in the past decade.

In the second half of 2009, the region began to yield a stronger economic performance than the more developed countries, thanks to prudent management of fiscal and monetary policies and the positive trade and financial impacts of China's growth. The international financial crisis which broke out in the developed countries late in 2008 had an impact on Latin America and the Caribbean which, although temporary, dragged the region's growth rate into negative territory in 2009 (-2.0%), after which it rebounded rapidly (see table I.5).

The Latin American and Caribbean region is, as a result, on a better economic footing today than at the beginning of the 1990s and this is one of the factors that make this the most propitious period for adopting the policies needed to shift the pattern of development towards greater sustainability. There are major challenges, however, in relation to the constellation of structural factors prevailing before and during the boom period. These will require an articulated array of macroeconomic, development, innovation promotion, productive development and social policies (see ECLAC, 2010a and chapter V).

¹⁰ For purposes of comparison, in the 1960s the region expanded at an average annual rate of around 5.6% (ECLAC, 2010a).

¹¹ The stock market crisis and recession in the United States in 2001 caused a slowdown in the world economy, weakening the region's economies still further, especially those with closest ties to that country. Regional GDP grew by just 0.3% that year and contracted by 0.4% in 2002.

Table I.5
LATIN AMERICA AND THE CARIBBEAN (19 COUNTRIES): GDP GROWTH, 1971-2010
(Annual rates of variation)

	1971-1980	1981-1989	1990-1997	1998-2008	1990-2008	2009	2010	ENDP 2009 ^a
Antigua and Barbuda	0.3 ^b	6.8	3.2	4.9	4.2	-11.3	-5.2	
Argentina	2.8	-1.0	5.0	3.0	3.8	0.9	9.2	
Bahamas	1.3	2.2	1.8	-5.4	0.9	
Barbados	3.9 ^c	1.4	0.1	2.0	1.2	-4.7	0.3	
Belize	5.1 ^d	4.9	2.0	5.6	4.1	0.0	2.9	
Bolivia (Plurinational State of)	3.9	-0.3	4.3	3.5	3.9	3.4	4.1	
Brasil	8.6	2.3	2.0	2.9	2.5	-0.6	7.5	
Chile	2.5	2.8	7.0	3.6	5.0	-1.7	5.2	
Colombia	5.4	3.7	3.9	3.0	3.4	4.5	4.3	
Costa Rica	5.7	2.4	4.7	5.3	5.0	-1.3	4.2	
Cuba	-3.3	5.6	1.8	1.4	2.1	
Dominica	...	4.2	3.3	2.1	2.6	-0.4	0.1	
Dominican Republic	7.2	3.3	4.5	5.6	5.2	3.5	7.8	
Ecuador	9.1	2.1	2.8	3.5	3.2	0.4	3.6	
El Salvador	2.4	-0.9	5.2	2.9	3.9	-3.1	1.4	
Grenada	17.6 ^e	11.3	1.6	3.9	2.9	-8.3	-0.8	
Guatemala	5.7	0.7	4.0	3.9	4.0	0.5	2.8	
Guyana	2.2	-3.1	5.8	1.4	3.3	3.3	3.6	
Haiti	5.2	-1.0	-0.4	0.9	0.4	2.9	-5.1	
Honduras	5.5	2.7	3.3	4.3	3.9	-2.1	2.8	
Jamaica	-0.7	3.1	1.7	1.1	1.3	-3.0	-1.3	
Mexico	6.5	1.4	3.1	3.1	3.1	-6.1	5.4	-8.5
Nicaragua	1.0	-1.4	2.4	3.7	3.2	-1.5	4.5	
Panama	5.6	0.9	5.6	6.1	5.9	3.2	7.5	
Paraguay	8.8	3.1	3.2	2.3	2.7	-3.8	15.0	
Peru	3.9	-0.7	3.9	4.5	4.3	0.9	8.8	
Saint Kitts and Nevis	5.7 ^e	6.3	4.6	3.4	3.9	-6.3	-5.0	
Saint Lucia	4.4 ^e	7.4	2.9	2.5	2.7	-1.1	3.1	
Saint Vincent and the Grenadines	6.4 ^f	6.4	3.4	4.4	4.0	-1.2	-1.3	
Suriname	2.1 ^f	0.6	-0.5	3.5	1.8	2.2	4.4	
Trinidad and Tobago	5.3	-2.7	2.9	7.7	5.7	-3.5	2.5	
Uruguay	2.7	0.4	3.9	2.6	3.1	2.6	8.5	
Venezuela (Bolivarian Republic of)	1.8	-0.3	3.8	2.9	3.3	-3.3	-1.4	
Latin America and the Caribbean	1971-1980	1981-1989	1990-1997	1998-2008	1990-2008	2009	2010	
Total GDP (dollars at constant 2000 prices)	5.6	1.5	3.6	3.3	3.4	-2.0	6.0	
Per capita GDP	1971-1980	1981-1989	1990-1997	1998-2008	1990-2008	2009	2010	
Latin America and the Caribbean	3.1	-0.6	1.9	2.0	1.9	-3.0	4.8	
China	4.3	8.9	10.2	9.4	9.6	8.5	9.8	
India	0.8	3.3	3.4	5.4	4.6	7.7	-	
OECD ^g	2.6	2.8	1.7	1.7	1.7	-4.0	-	
United States	2.2	2.5	1.7	1.6	1.7	-3.5	-	
World	1.9	1.6	1.2	1.8	1.5	-3.0	-	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Time for equality: closing gaps, opening trails* (LC/G.2432(SES.33/3), Santiago, Chile, 2010; for 2010 data *Economic Survey of Latin America and the Caribbean, 2010-2011*, Briefing paper, June 2011; World Bank, World Development Indicators (WDI); National Institute of Statistics and Geography (INEGI), Sistema de cuentas nacionales de México. Cuentas económicas y ecológicas de México, 2005-2009 [online] http://www.inegi.gob.mx/prod_serv/contenidos/espanol/bvinegi/productos/derivada/economicas/medio%20ambiente/2009-09/SCEEM2005-2009.pdf.

^a ENDP = Ecological Net Domestic Product, in which GDP is adjusted for depletion and degradation of natural resources, on the basis of the methodology employed by the United Nations. Only Mexico publishes this data. For 2009, Mexico's ENDP corresponds to 81% of GDP, with the 19% loss being explained by the consumption of fixed capital (11% of GDP) and the total cost of environmental depletion and degradation (8% of GDP).

^b Refers to the average of the growth rates for the period 1974-1980.

^c Refers to the average of the growth rates for the period 1975-1980.

^d Refers to the average of the growth rates for the period 1977-1980.

^e Refers to the average of the growth rates for the period 1978-1980.

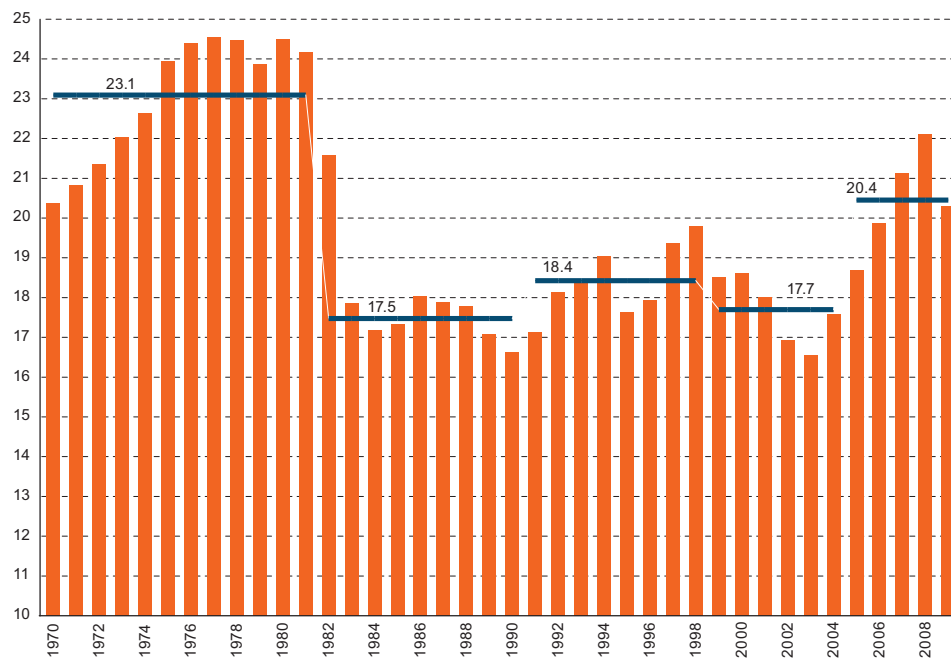
^f Refers to the average of the growth rates for the period 1976-1980.

^g Does not include Chile, Mexico or Turkey.

In fact, despite achievements made in the recent period and in 2004-2008, the region's growth averaged just 3.4% between 1990 and 2008. As shown in table I.5, yearly per capita GDP¹² growth over that period was 1.9%, far below the rate for China and India and similar to that of the United States (whose per capita income is, however, almost five times that of Latin America and the Caribbean).

The momentum of GDP growth depends on a number of factors, a key one being the investment rate. Capital formation has been notably poor in the region by comparison with other emerging economies and with the region's own rate for the 1970s (see figure I.16).

Figure I.16
LATIN AMERICA (19 COUNTRIES): GROSS FIXED CAPITAL FORMATION, 1970-2009^a
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Time for equality: closing gaps, opening trails* (LC/G.2432(SES.33/3)), Santiago, Chile, 2010.

^a Figures for 2009 are preliminary. The percentages shown on the horizontal lines represent the annual averages for the relevant sub-periods.

International experience suggests that maintaining a high, stable real exchange rate can provide significant support for growth in the long run and in the absence of other engines of international competitiveness. In the past two decades, real exchange rate trends have been heavily driven by liquidity cycles in capital markets and by rising income from the region's main export products. This, combined with the use of the exchange rate as a nominal anchor in anti-inflation policy, has led to periods of currency overvaluation in the region. Together with other processes, this has weakened exports and the production of domestic-market-oriented small and medium-sized enterprises (SMEs). The cyclical

¹² This does not truly reflect national wealth, however, since it omits degradation or depletion of natural capital and counts as wealth spending which is in fact defence against the unwanted side effects of economic activity.

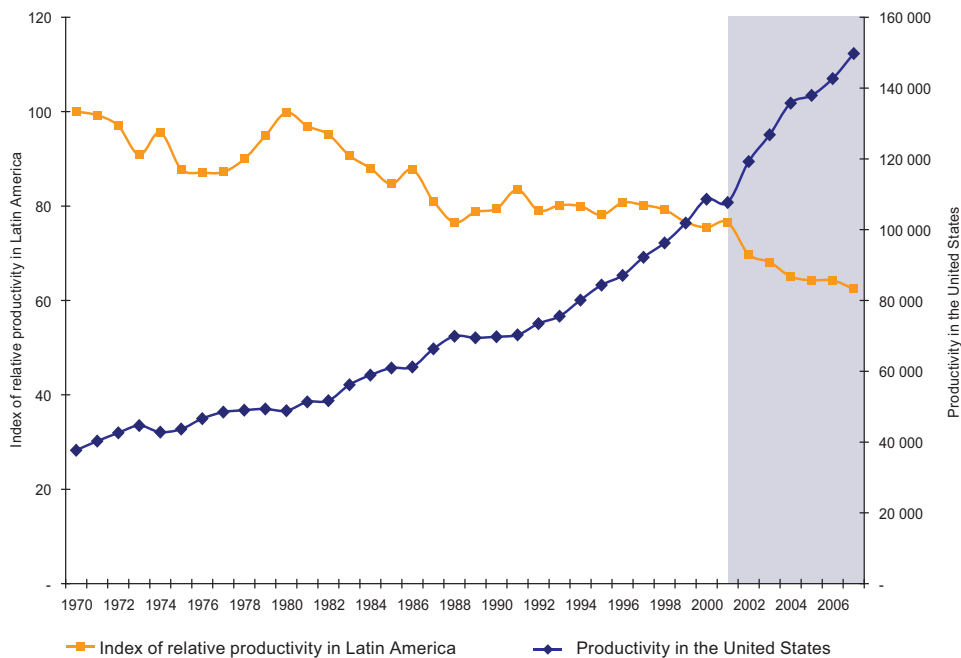
fluctuations of the exchange rate naturally constitute a disincentive to developing new comparative advantages and adding value to traditional natural resources exports (ECLAC, 2010a).

These factors —growth, investment and the exchange rate, among others— influence and are influenced by the particular production structure in each country.

2. Production structure and productivity

In terms of productivity, two traits distinguish the Latin American and Caribbean region from developed economies. The first is the external gap, which reflects asymmetries in the region's technological capabilities with respect to the international frontier: the developed economies innovate and spread technology through their productive fabric faster than the Latin American and Caribbean countries are capable of absorbing, imitating, adapting and innovating in turn on the basis of international best practices. A comparison between the productivity levels of the countries of the region and those of the United States illustrates the magnitude of the challenge of technological convergence (see figure I.17). The productivity gap has been widening since the 1980s and the region shows a particularly sharp fall in relative productivity as of 2001, whereas the United States was much quicker to incorporate changes based on increasing incorporation of ICTs (Oliner, Sichel and Stiroh, 2007).

Figure I.17
**RELATIVE PRODUCTIVITY INDEX OF LATIN AMERICA (SELECTED COUNTRIES)
 AND PRODUCTIVITY IN THE UNITED STATES**
(Index: 1970=100 and constant dollars at 1985 prices)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Time for equality: closing gaps, opening trails* (LC/G.2432(SES.33/3)), Santiago, Chile, 2010.

The second productivity feature distinguishing the Latin American and Caribbean from the developed economies is the internal gap, which refers to productivity differences between and within different sectors. Again, the experience in the United States serves as a comparison. The structural transformation of the past few decades increased productivity throughout the United States economy. Conversely, Latin America witnessed no structural shift towards knowledge-intensive manufacturing sectors between 1990 and 2007. In Latin America, both in 1990 and 2007 the highest-productivity sectors and those that added the most manufacturing value were natural-resource-intensive (ECLAC, 2010a).

The productive structure post-2003 is qualitatively different from that of earlier decades, with import coefficients rising faster than export coefficients in the manufacturing sector. Although in several countries of the region technology-intensive sectors have grown faster than other branches of industry, they have not recovered the relative weight they had in previous periods. In addition, spending on research and development and other public policy efforts essential for leveraging development had already weakened and the public sector's institutional capacities for developing manufacturing had atrophied before 2003. In some cases, industrial policy had been abandoned altogether (Katz and Stumpo, 2001).

The sharper increase in import than in export coefficients in manufacturing underscores the difficulty of the industrial productive apparatus in competing in most sectors. As a result of this weakness and given the sustained increase in domestic demand, industrial trade balances are either running higher deficits or posting waning surpluses. The trade balance deterioration has been offset in recent years by high prices for the region's agricultural and mining exports, heightening the economies' specialization in the export of primary goods and increasing pressure on natural resources and land-use changes which threaten forest cover and biodiversity (ECLAC, 2010a).

The expansion of natural-resource-intensive sectors has few positive effects on overall technological capabilities. These sectors undoubtedly adopt technology, but mainly imported technology, and their lack of an endogenous capacity to innovate minimizes the catalytic role of learning. These sectors are, moreover, characterized by continuous-production processes which, by definition, are more difficult to break down into discrete spatial and temporal phases. Hence, they offer far fewer opportunities for generating subcontracting linkages with other firms and therefore for transferring know-how and technology to other activities and enterprises (for example, to SMEs). Natural-resource-intensive sectors also have less capacity to generate backward and forward linkages, owing to the "technological strangeness" between existing activity and the new activities that are to be generated.

Patterns of research and development are a key factor in this scenario. But not even the most advanced countries of the region have reached the level of investment in relation to GDP of European countries, Japan or the United States (see chapter V).

It is clear that technological change in Latin American industries has been limited and inadequate in light of the challenges posed by a production structure that is more open and more integrated into international trade and by the objective of achieving sustainable and inclusive development. The situation may become even more difficult in an international context in which, for several years, technologies and production processes have been changing in response to increased ICT use in production processes. Yet the expansion of the global economy has opened up opportunities. Inasmuch as external conditions are more favourable than they were in previous decades, the countries of the region which export primary goods should be able to tap the revenues from higher international prices to boost policies on learning and investment in research and development.

A policy of promoting a structural shift towards more technology-intensive goods could help to decouple economic growth from environmental degradation. Energy intensity (see section C) is one area in which productive structure and sustainability (and particularly its environmental pillar) must be reconciled. But all the challenges mentioned earlier will have to be tackled together in order to advance towards a green economy in the context of sustainable development and poverty eradication, one of the themes set for Rio+20 in General Assembly resolution 64/236. This calls for more investment in research and development in the region as well as the transfer of funds, technologies and capacity-building.

3. Employment

As noted earlier, between the early 1990s and 2010, the employment rate was on the rise (see figure I.2). The trend in employment indicators has not been linear, however, but has instead followed the course plotted out by economic dynamics in the broad sense of the term and public policy, with employment levels moving closely in step with fluctuations in economic growth (Weller, 2000).¹³ The deterioration in the occupational structure that occurred during the 1990s was reflected in a downturn in job quality indicators (social security coverage, the right to paid time off, pay levels, etc.). These indicators showed an improvement during much of the 2000s, however, as job creation in sectors with middle-to-high levels of productivity strengthened. In some cases, contributing factors included efforts to expand the coverage of pension and health-care systems, ramp up workplace inspections, offer new incentives for entry into the formal sector of the economy and other policy measures (Weller and Roethlisberger, 2011). Employment levels also bounced back quickly following the 2008 economic crisis (ILO, 2010).

Job quality and the problem of unequal access for men and women and adults and young people to jobs that offer employment benefits now pose serious challenges for the region (ILO, 2010). Statistics compiled by the International Labour Organization (ILO) indicate that:

- (i) In 13 countries for which information is available, the unemployment rate for women is 1.4 times higher than the rate for men;
- (ii) The youth unemployment rate for 2010 was three times as high as the total unemployment rate;
- (iii) The labour-income gap between men and women has been gradually narrowing during the past decade, but this improvement is primarily attributable to the increase in the level of education of women in the workforce. Yet women who work the same number of hours and who have the same level of education still earn three quarters less than their male counterparts; and
- (iv) Nearly half of all employed persons are not covered by any pension system. On average, in the case of 36% of households, none of the household members are registered under the social security system, or receive public welfare transfers or any type of pension or benefit (ECLAC, 2011b).

The transition to “a green economy in the context of sustainable development and poverty eradication”, as defined in General Assembly resolution 64/236, has significant job creation potential and can help to bridge the social divide. The experiences of a number of countries, as well as various studies conducted, indicate that this transition can result in net employment gains and can be of particular benefit

¹³ The employment rate is calculated as the number of employed persons as a percentage of the working-age population.

for groups that are usually bypassed by the conventional model of economic growth (i.e., the poor, young people and women) (United Nations, 2010a).

Although the Latin American countries have been moving towards policies that will promote both sustainable development and the creation of jobs and other types of employment that provide workers with social benefits, the implementation of these policies is still in its initial stages. There are, however, some national programmes that are taking a “green jobs” approach. Examples include Brazil’s initiative in the area of biofuels and low-cost housing construction; ecotourism and sustainable farming projects in Costa Rica and Guatemala; and the promotion of infrastructure that can be adapted to cope with climate change in Haiti (ILO, 2009a).

As of 2008, there were nearly 2.6 million jobs (6.7% of employment in the formal sector) in Brazil that could be described as “green”. These jobs are in six sectors of economic activity that are classified as low polluters or as doing little harm to the environment (see table I.6). Most green jobs are in transport and renewable energy industries; others are in recycling, forestry exploration and telecommunications. The most promising sectors in terms of their potential for creating green jobs in Brazil are the recycling industry, biofuels and sustainable construction (ILO, 2009b).

Table I.6
BRAZIL: NUMBER OF GREEN JOBS IN EACH ECONOMIC ACTIVITY, 2008

Economic activity	Number of jobs
Forestry management and production	139 768
Renewable energy (generation and distribution)	547 569
Sanitation, waste and environmental risk management	303 210
Maintenance, repairs and restoration of products and materials	435 737
Public transit and alternative land-based and aeronautic means of transport	797 249
Telecommunications and telephony	429 526

Source: International Labour Organization (ILO), *Empregos verdes no Brasil: quantos são, onde estão e como evoluirão nos próximos anos*, Brasília, 2009.

In order to take advantage of the potential offered by green jobs, well-structured policies are needed to maximize the opportunities and minimize the social costs of the transition. The Green Jobs Initiative was launched in September 2008 by UNEP, ILO and the International Trade Union Confederation (ITUC) and the International Organization of Employers (IOE) (UNEP/ILO, 2008; Poschen, 2007). This programme supports policymaking initiatives through: (a) active participation in high-level international debates on climate change and sustainable development; (b) global and country-level analyses of the potential for green job creation; (c) direct technical assistance for governments and civil society stakeholders; and (d) training for civil servants and for civil society stakeholders.

4. Environmental performance at the sectoral level

As the region’s production patterns evolve, the various sectors of the economy must find ways of dealing with their environmental impacts. The challenges that they face in this respect are formidable, but each industry is making headway. The region’s experiences with sustainable production and consumption provide valuable cross-cutting lessons (see box I.4). Chapter II examines the implementation of economic instruments for environmental management and chapter III looks at private-sector initiatives for supporting sustainability.

Box I.4

SUSTAINABLE CONSUMPTION AND PRODUCTION IN THE REGION

In line with principle 8 of the Rio Declaration on Environment and Development, the Latin American and Caribbean region has joined the international community in its commitment to work towards the establishment of more sustainable production and consumption patterns. To that end, the region has embarked on a number of different initiatives.

By its Decision No. 12/2003, the Forum of Ministers of the Environment of Latin America and the Caribbean established the Council of Government Experts on Sustainable Consumption and Production and tasked it with promoting and facilitating the adoption of sustainable consumption and production patterns. The Council is composed of representatives of each country's focal point for sustainable consumption and production, which, in most cases, is located in the national agency or ministry responsible for environmental affairs.

The results of a survey of the focal points for sustainable consumption and production in 20 countries of the region indicate that a great deal of work is being done in this area. Most of the countries have launched initiatives to step up the pace of the transition to sustainable consumption and production patterns and, in nearly half of them, these initiatives have been incorporated into the countries' national development plans. A similar number of countries have opened the way for participation in design and implementation tasks by other public-sector agencies working in such areas as economics and transport. Little headway has been made in implementation, however.

Training, technical assistance, various forms of recognition and incentives are the most commonly used tools for promoting sustainable consumption and production patterns in the region. Laws, regulations and penalties relating to market creation and damages are being applied in very few cases. The types of incentives for sustainable consumption and production patterns that are being used, for the most part, are measures designed to provide financing for environmental investments, tax incentives and voluntary agreements. In most cases, special forms of support are provided for small and medium-sized enterprises (e.g., awards, quality certifications, technical assistance, tax breaks and other incentives).

A number of countries have launched sustainable government procurement initiatives. Most of these projects are still in their initial stages, however. All the countries that responded to the survey said that their advocacy of sustainable consumption and production patterns has been based on a participatory process and that they have set up information and training networks dealing with sustainability issues, including those relating to consumption and production.

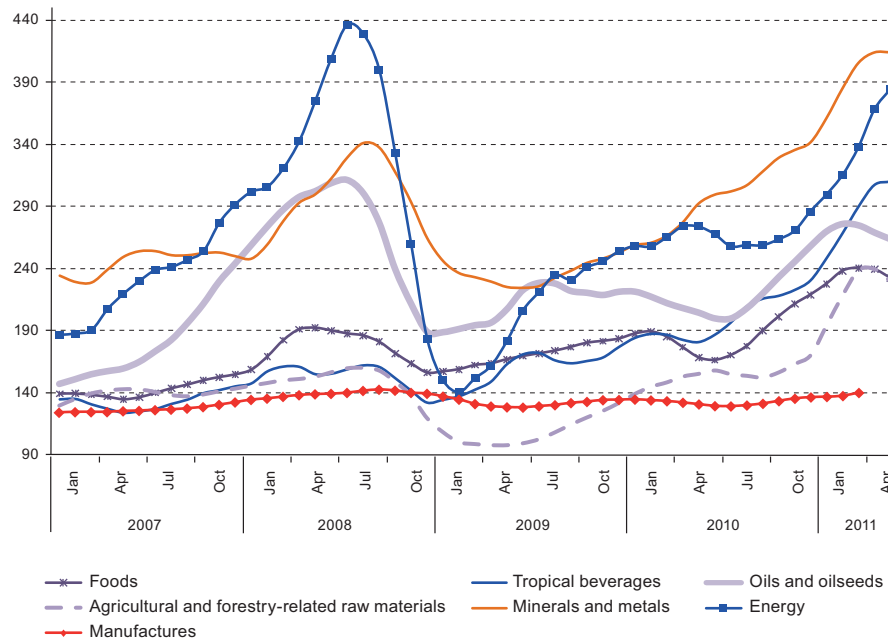
Source: United Nations Environment Programme (UNEP)/Technology Management Center of Costa Rica (CEGESTI), "Consumo y producción sustentable (CPS). Estado de avances en América Latina y el Caribe", 2009 [online] http://www.redpycs.net/MID_upload/redpycs_net/File/Reuniones_Regionales/Reunion%20Colombia/informe%20cps%20alc%202009-28%20agosto%202009.pdf.

(a) Mining and hydrocarbons

A number of countries in the region have a long tradition of mining and hydrocarbon production. In some of them, these industries are a major driver of economic activity, account for a large share of exports and are an important source of fiscal revenue (Altomonte, 2008; Campodónico, 2009). In fact, as noted earlier, the economic growth attained by the region in 2003-2008 was closely related to the upswing in demand for commodities, including mineral products and hydrocarbons, which figure prominently in the region's export matrix (see figures I.18 and I.19).

Since the 1990s, global hydrocarbons and mining industries have undergone major changes which have included their consolidation and transnationalization. In the region, regulatory reforms were introduced in these sectors in the 1990s as part of a policy package designed to bring about structural changes (opening up trade, liberalizing the financial sector, downsizing the public sector and offering incentives for foreign investment) in the region's economies (Sánchez and Lardé, 2006). The depth and nature of these reforms, particularly in terms of the role to be played by State enterprises, varied across countries and differed between the mining sector and the hydrocarbons industry. In some countries, State-run oil companies began to regain lost ground in the early 2000s.

Figure I.18
**LATIN AMERICA AND THE CARIBBEAN: PRICE INDEXES FOR COMMODITIES
 AND MANUFACTURES, 2007-2011^a**
(Index: 2000=100, three-month moving average)



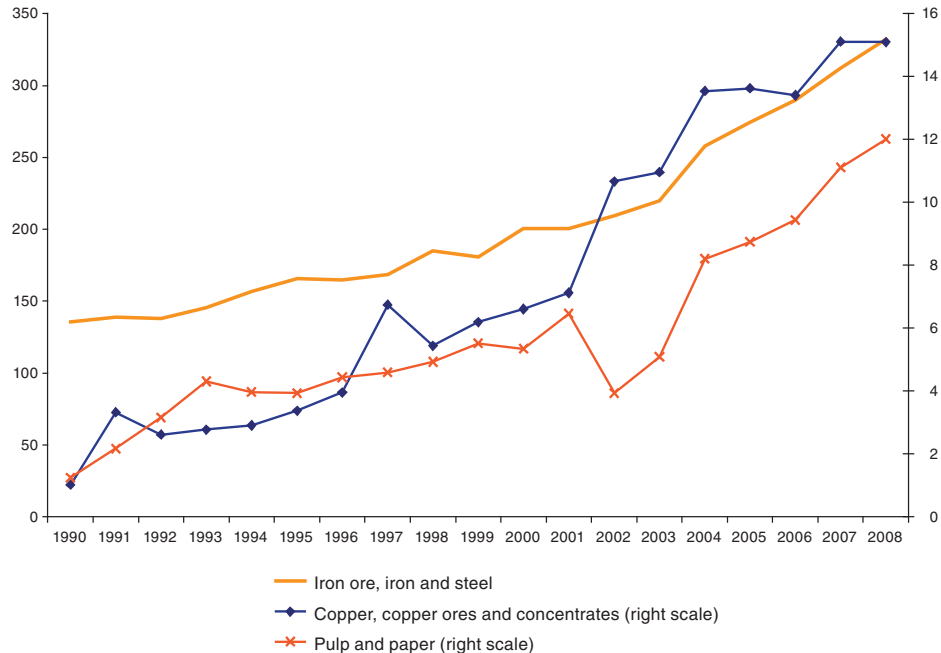
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures from the United Nations Conference on Trade and Development (UNCTAD) and the Netherlands Bureau for Economic Analysis (CPB).

^a The categories of commodities are weighted by their share in Latin America's exports.

Rising prices for mining products and hydrocarbons, together with technological innovations (e.g., deep sea drilling), have made it profitable to mine deposits that were once economically unattractive. The expansion of mining activity in some Central American countries, for example, is posing challenges in terms of environmental protection and local communities' way of life. The number of social and environmental conflicts or disputes associated with mining activities has been on the rise since 1990 (UNEP, 2010). Environmental problems posed by mining and drilling activities include the pollution of groundwater and surface water, deforestation and the consequent loss of plant cover, and soil erosion, along with the resulting destabilization of land areas and increased sedimentation of water courses, which disturb watersheds (UNEP, 2010). In addition, there is the risk of accidents, such as oil spills and the rupture of tailings reservoirs.¹⁴ Sensitive areas of the Amazon basin have been contaminated with mercury from gold mining operations, for example.

¹⁴ UNEP, for example, is currently conducting the Awareness and Preparedness for Emergencies at Local Level (APELL) Programme.

Figure I.19
LATIN AMERICA AND THE CARIBBEAN: EXPORT VOLUMES OF SELECTED PRODUCTS, 1990-2008^a
(Millions of tons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, Commodity Trade Database (COMTRADE) and Foreign Trade Data Bank for Latin America and the Caribbean (BADECEL).

^a The product groupings refer to the following codes in the Standard International Trade Classification (SITC), revision 1: Iron ore, iron and steel - 2813, 2814, 6711, 6712, 67131, 67132, 67133, 6714, 6715, 6721, 67231, 67232, 67233, 67251, 67252, 67253, 67271, 67272, 67273, 6729, 67311, 67312, 67313, 67321, 67322, 67323, 67341, 67342, 67343, 67351, 67352, 67353, 67411, 67412, 67413, 67414, 67421, 67422, 67423, 67431, 67432, 67433, 6747, 67481, 67482, 67501, 67502, 67503, 6761, 6762, 67701, 67702, 67703, 6781, 6782, 6783, 6784, 6785, 6791, 6792, 6793; Copper, copper ores and concentrates - 28311, 28312, 68211, 68212, 68213, 68221, 68222, 68223, 68224, 68225, 68226; Pulp and paper - 2511, 2512, 2515, 2516, 25171, 25172, 25181, 25182, 2519.

The countries of the region have toughened their environmental laws on mining exploration. Mining companies, for their part, have put management and certification systems into place and, in some cases, have bolstered them with occupational health and safety strategies, introduced cleaner production technologies and developed environmental education and training projects.¹⁵ Various legal loopholes and problems with enforcement remain, however. In addition, existing legislation and regulations on mine closures do not always specify who should shoulder responsibility for the associated environmental liabilities (ECLAC, 2009). Problems continue to exist in such areas as governments' capacity for the review of environmental impact assessments, oversight of mining operations and of mine closures and mine abandonment plans, arrangements for dealing with mining operations' environmental liabilities, the restoration of damaged sites, occupational safety and accidents, and mining companies' relations with indigenous communities and peoples. Small-scale mining poses a special type of challenge, since such operations are often informal and have little access to sophisticated technology or to financing (ECLAC,

¹⁵ See for example the experience of Petrobras in "Petrobrás Meio Ambiente e Sociedade", [online] <http://www.petrobras.com.br/pt/meio-ambiente-e-sociedade/preservando-meio-ambiente/>.

2009). In addition to environmental concerns, there is the fact that few countries have a scheme for the development of sustainable mining operations that would integrate this industry's potential into national and community development objectives by ensuring the effective participation of the surrounding communities, along with the State and mining companies, in decision-making.

Major inter-generational challenges for countries with large mining or drilling industries include the creation of production linkages and the introduction of fiscal mechanisms that will channel the wealth created by these industries (especially in the case of windfall profits) to society and use it to generate sources of economic growth for future generations. Countries that are reaping huge oil profits also have to devise policies for managing and distributing those profits efficiently if they are to avert inflationary shocks and unsustainable increases in the value of their currencies, which could hurt their export sectors (Altomonte, 2008). The boom in mining and oil profits should enable these countries to fully cover the environmental costs and contribute, via fiscal or other means, to national development.

In order to finance initiatives for expanding their capacity for innovation and technology, the countries of the region have established charges or royalties on metal and non-metal mining, such as the royalty charged in Chile since 2006 (see chapter V), or to finance infrastructure, as in the case of the new tax system promulgated in Peru in September 2011. These charges fuel additional tax inflows, which will be used to build facilities such as hospitals, schools and roads in the poorest areas of the country (Ministry of Mining and Energy of Peru, 2011).

Once the importance of preserving sound ecosystems is understood and the value of the services they fulfil is appreciated, these systems may start to compete with natural resource exploration.¹⁶ One interesting case relating to extractive industries (in this instance, oil) and climate change is that of the Yasuní National Park in Ecuador, where the Government has offered to refrain from tapping the oil fields located there in exchange for financial compensation from the international community.¹⁷

(b) Agriculture

Agriculture makes a considerable contribution to GDP, export earnings, employment and rural livelihoods throughout the region. The land area devoted to irrigated crop-farming, especially for export commodities, has expanded in the last two decades, and livestock and aquaculture industries have grown as well (ECLAC/FAO/ IICA, 2010). This expansion has had a considerable impact on changes in land use and on greenhouse gas emissions. The Latin American and Caribbean region is second only to East Asia in terms of emissions generated by the agricultural sector. As in other regions, nitrous oxide emissions are due mainly to the use of fertilizers in the soil and methane emissions are due mainly to enteric fermentation in livestock. With increasingly vast tracts of land being used for agriculture and livestock rearing, the use of nitrogen fertilizers has escalated and cattle herds have grown with an inevitable surge, as already mentioned, in nitrous oxide and methane gas emissions (Smith and others, 2007).

¹⁶ The Millennium Ecosystem Assessment (2005) defines ecosystem services as the benefits that human beings obtain from ecosystems: provisioning services such as food, water, timber, fibre and genetic resources; regulating services such as climate, floods, diseases and water quality; cultural services, such as recreational, aesthetic and spiritual benefits; supporting services, such as soil formation, pollination and nutrient cycling. These services are not developed in this section since, although they are vital for ensuring other types of services, they are not used directly by humans (see [online] <http://www.greenfacts.org/en/ecosystems/millennium-assessment-2/2-ecosystem-services.htm#1>).

¹⁷ See [online] <http://yasuni-itt.gob.ec/>.

This expansion is putting pressure on the environment in various ways. The environmental impacts of stock-raising activities include deforestation, soil degradation, loss of biodiversity and greenhouse gas emissions. Single-crop farming, in which transgenic seeds are used in some cases, has impacts on land use and biodiversity, while the growth of aquaculture has various implications, including a heightened demand for water resources (ECLAC/FAO/IICA, 2010). Pesticide use is one of the main sources of chemical contamination in the region (see box I.5).

Box I.5
PESTICIDE RISK REDUCTION

Since the early 1990s, a number of countries have passed laws to halt the production, importation and use of dangerous pesticides, destroy inventories of banned products and reduce the use of agrochemicals. The International Code of Conduct on the Distribution and Use of Pesticides developed by FAO, which has been signed by the vast majority of countries in the region, provides a frame of reference for pesticide control measures. It establishes rules, on a voluntary basis, for public and private organizations that are involved in the distribution and use of pesticides or that work in related areas. This code of conduct was originally adopted in 1985, but a revised version was issued in 2002 that takes into account the prior informed consent provisions of the Rotterdam Convention, developments in international laws and standards, and a number of problems relating to pesticide control that continue to be an issue. The revised version also uses the concept of the “life-cycle” of pesticide management, that is, consideration of the range of impacts caused from the production phase right up to final disposal of the product. The region has made headway in terms of compliance with the Code, and the laws and regulations on pesticides are more sophisticated than those governing other toxic chemicals. Nevertheless, as in other developing regions, a lack of resources and technical capacity hinders enforcement of national laws on pesticides.

Some of the issues relating to pesticide control that are particularly important for the region are:

- (i) The management of cross border impacts of pesticide-laden runoff into the ocean;
- (ii) The need to deal with hazardous stockpiles of obsolete pesticides. These stockpiles are often improperly stored, which exposes people to these toxins and allows them to seep into the soil and into watercourses;
- (iii) The related issue of pesticide containers (whether obsolete or otherwise). Empty containers that contain traces of these pesticides pose a risk to human health and the environment if not handled properly. In many countries, these articles are disposed of or used in ways that pose environmental and health hazards, as they are sometimes re-used, buried in the ground in rural areas, dumped in unsuitable landfills or incinerated without the use of necessary technologies or precautions;
- (iv) The presence of pesticides in groundwater, which then seep into drinking water and water used for irrigation (and, consequently, agricultural produce), as well as into surface water and drainage areas, with subsequent impacts on agriculture; and
- (v) Traces of pesticides in foodstuffs, which pose a danger for the people who eat them. The Codex Alimentarius sets caps on residues of specific types of pesticides in food, following the recommendations of the FAO Panel of Experts and a designated group at the World Health Organization (WHO).

The international treaties relating to pesticides are discussed in chapter II.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), Sustainable development in Latin America and the Caribbean: trends, progress, and challenges in sustainable consumption and production, mining, transport, chemicals and waste management (LC/R.2161), Santiago, Chile, 2009.

The livestock sector accounts for 45% of agricultural GDP in Latin America and the Caribbean and for 13% of global production. With an annual growth rate of 4%, it doubles the 2% global growth rate for this industry. The region also produces 28% of the world’s beef (ECLAC/FAO/IICA, 2010). Most of the environmental problems associated with stock-raising activities have to do with the traditional extensive grazing systems used in the region. The intensive production systems that are being brought into use as a means of boosting productivity can relieve some of the pressure on the environment by mitigating deforestation and the degradation of pasturelands in marginal areas. More intensive beef

production will, however, heighten competition with other sectors of the livestock industry, and the expansion of intensive production systems for poultry, pork, dairy products—and, now, to a lesser extent, beef—increases the potential for air and water quality problems due to excess nutrient accumulations in concentrated production systems (ECLAC/FAO/IICA, 2011).

Aquaculture in the region has grown at three times the world rate in recent years and has also posed environmental challenges. One of the main problems, which has been an issue since the 1980s, is the clear-cutting of mangrove forests to open the way for the construction of shrimp ponds, with the acquiescence of local governments and without regard for the associated environmental impacts. Ecologically, mangroves act as a vital natural protective barrier and buffer zone against extreme events such as tsunamis. Thus, they are a central element in protecting human lives, material assets and economic activities and dwellings (ISDR, 2011b). The destruction of mangroves has triggered ecological crises that have hurt the shrimp industry (which, in Ecuador, for example, has taken more than a decade to recover) and have had a serious impact on local economies. A similar situation occurred in Chile with the expansion of salmon farming, which set off an ecological crisis that wiped out thousands of jobs and caused heavy economic losses. Similar problems have arisen in the farming of other species, such as tilapia. These experiences point to the urgent need to adopt environmentally sound approaches to the management and development of coastal resources and their ecosystems (ECLAC/FAO/IICA, 2010).

Nearly 73% of all water use in Latin America and the Caribbean is accounted for by the agricultural sector, and the amount of irrigated land is increasing. The strongest environmental impact of the expansion of the land area under cultivation, and the water use that this entails, is the pollution of groundwater and surface water (see chapter II).¹⁸

In environmental terms, the agricultural sector is generally under-regulated. Monitoring the environmental impacts of agricultural activities is complicated because those impacts are quite disparate and producers frequently change their production practices from one area to another and over time. Some recent changes, such as the expansion of organic agriculture and the increased use of product certification, as well as public/private initiatives such as the moratorium on soy production in Brazil,¹⁹ attest to the fact that the market is exerting pressure on producers to use more sustainable practices. According to statistics cited in Willer and Kilcher, 8.1 million hectares of land in Latin America are exploited as of certified organic farms (23% of the world total) and the region has 257,238 certified farmers (18.7% of the world total), with an annual growth rate of approximately 1% (Willer and Kilcher, eds. 2011). Other advances include the introduction of more sophisticated irrigation techniques—such as drip irrigation—and the use of low-water crops and sustainable technologies such as bio-composting, small-scale, non-industrial seed production and the use of biological products for integrated pest and plant disease management. Some local communities in, for example, Peru and the Plurinational State of Bolivia are also organizing seed banks (see also chapter II, where reference is made to an experiment being conducted in Chile).

Family farms, which make a significant contribution to the food supply, can play an important role in environmental protection and local development, but they have been largely neglected by public policy in Latin America and the Caribbean (see chapter III). In addition, many women play a key role as

¹⁸ Source: Aquastat: FAO Information System on Water and Agriculture [online] <http://www.fao.org/nr/water/aquastat/main/index.stm>. Date of reference: 28 October 2011.

¹⁹ Members of the main producers associations in the vegetable oils and oilseeds industry in Brazil, which together control the lion's share of soy production in the country, have agreed to refrain from marketing soy or soy products that have been produced in deforested areas of the Amazon biosphere. Brazilian and international NGOs and the government have all taken part in implementing this moratorium (see [online] www.abiove.com.br).

heads of household in rural areas, and strengthening their access to land could enable them to improve their situation and exert greater influence in their homes and communities (see box I.6) (FAO, 2011).

Box I.6

GENDER AND LAND TENURE

Rural women account for the bulk of family farm output, yet their rights are often ignored and their expertise underestimated owing to the gender biases implicit in many laws, in daily practices and customs, and in the sexual division of labour. Only recently have their key role as food producers and suppliers and their decisive contribution to food security in the home been acknowledged. In Latin America, the distribution of land ownership between men and women is extremely unequal, with women rarely representing even one fourth of all landowners. The persistence of this gender gap in ownership would appear to be related to the following factors: a demonstrated preference to leave inheritances to men; the privileges enjoyed by men within marriage; a tendency to favour men in community and State-run land distribution programmes; and gender biases in the land market, where women are less likely than men to succeed in purchasing property. Few statistics on the outcomes of agrarian reform initiatives in various countries in the region are available, but those that do exist indicate that no more than a small number of women have benefited from these policies, inasmuch as they have received only, on average, 11% or 12% of the total amount of land distributed under these programmes (International Land Coalition, 2009, in *América Latina Genera*, UNDP, 2010). This situation is attributable to the persistence of biases in laws and regulations, such as, for example, the designation of the head of household as the recipient of any land title awarded to that household and the pervasive assumption that male farmers are the target group for agrarian policy.

In the 1990s, as the women's movement grew in strength, some progress began to be made in attaining greater gender equality in agrarian law. As a result, some countries' laws recognize women as rights holders, although most recognize the rights of married couples (joint title) or of individuals, regardless of their sex. In Chile, Colombia and Nicaragua, women heads of household have been given priority in land distribution or titling programmes. The main way that women acquire land titles is still through inheritance, as daughters or widows, however (UNDP, 2010). Many countries in the region have yet to introduce the agrarian reforms and public policies needed to promote the equitable distribution of land. Progress in guaranteeing women's and men's right to land on an equal footing is essential in order to combat rural poverty and to achieve sustainable development and gender equality.

Source: América Latina Genera/Regional Centre for Latin America and the Caribbean, United Nations Development Programme (UNDP), "Desarrollo sostenible", 2010 [online] http://www.americalatinagenera.org/es/documentos/tematicas/tema_desarrollo_sostenible.pdf.

The implications of the use of genetically modified organisms (GMOs) are closely related to the work being done to update the International Convention for the Protection of New Varieties of Plants of the International Union for the Protection of New Varieties of Plants (which dates back to 1991) and to the cost of permits for derived varieties, as well as restrictions on producers' propagation of seeds for their own use. GMOs do not offer an advantage to small-scale producers because of the high cost of GMO seeds (Diouf, 2011). State-run germplasm banks could help to encourage research and boost inventories of national varieties at affordable or subsidized prices (Fresco, 2001).

Another emerging issue that may have an impact on food security and the sustainability of the use of land and water resources in the region is the increasing concentration and appropriation of land in Latin American countries. The practice of leasing or selling vast tracts of land to investors from the region or from other countries may provide short-term economic growth opportunities for the countries of Latin America and the Caribbean, but also has risks: indeed, it may result in land grabs, unsustainable use of natural resources and expulsion of rural populations (FAO, 2009).

Other challenges that are taking shape are the genetic impoverishment of cultivated plant species and the formation of vast "dead zones" in the oceans or other bodies of water.

Lastly, climate factors are also becoming increasingly important in terms of food security, the profitability of farming and the well-being of people living in rural areas. The effects of climate change on agriculture, forestry, fisheries and aquaculture will be discussed further in chapter II.

Sustainable agricultural practices call for more efficient and responsible management of inputs such as fertilizers, pesticides and water; other practices such as conservation of the soil and its nutrients through crop rotation, periods of fallow and use of agroforest systems as alternatives to integrated pest management; and the introduction of associated cropping. Similarly, it is important to promote agroecological production among small farmers, as this can raise crop yields in places where hunger and undernutrition are the main problems (DeSchutter, 2010). Higher yields increase family income and are an effective means of ensuring food security. By encouraging production in plots with a variety of associated crops, agroecological practices help to conserve ecosystems and increase the resilience of local populations to the impacts of climate change.

(c) Manufacturing

The region has made considerable headway since the 1990s in developing regulations on atmospheric and waterborne industrial emissions and waste, although it still lags somewhat behind developed countries with regard to environmental regulation as a whole. Some progress is also now beginning to be made in the introduction of environmental assessment tools (cost-benefit analyses) and policy instruments involving the use of economic incentives (see chapter II). The steps taken to open up the region's economies since the 1990s and the arrival and expansion of transnational companies have also contributed to the adoption of international standards with respect to environmental management practices.

One factor that has been quite influential in promoting cleaner production processes in various sectors, especially in Central America, has been the inclusion of provisions covering such practices in free trade treaties. Certification is another way in which the market can differentiate between companies that use more sustainable production practices and those that do not. The United Nations Industrial Development Organization (UNIDO), in cooperation with UNEP, has supported the establishment and operation of national cleaner production centres. UNEP estimates that there were 15 such centres in the region in 2009 (UNEP/CEGESTI, 2009).

One of the challenges facing the sector is to find a better way of integrating industrial and trade policy with environmental policy so that it can promote innovative, sustainable production patterns while at the same time protecting jobs. Environmental management in small and medium-sized manufacturing enterprises raises additional difficulties because of such ventures' financial and technological constraints. The use of economic instruments for environmental management purposes will be examined in chapter II, while private-sector initiatives for attaining sustainability, many of which concern the industrial sector, will be discussed in chapter III.

Apart from production processes per se, the nature of the goods that are produced and the industrial structure itself are also important factors. For example, the production of automobiles and petrochemicals tends to make consumption patterns more rigid and, from the standpoint of economic development, these types of production decisions tend to override decisions about, for example, public expenditure. In addition, the region's governments do not oblige these industries to assume the full cost of the infrastructure that they need in order to operate (roads, highways, etc.) but instead shoulder a considerable share of those costs themselves.

(d) Tourism

Tourism continues to be a very important source of foreign exchange and job creation in many countries of Latin America and the Caribbean. In 2010, international tourism revenues in the region amounted to US\$ 166 billion. Preliminary figures for the first part of 2011 indicate that the number of international arrivals is continuing to climb (150 million in 2010) (UNWTO, 2011).

At the World Summit on Sustainable Development, held in Johannesburg in 2002, the importance of the tourism sector and its sustainability were underscored as a key element in poverty reduction and in the protection of the environment and of cultural heritage. At that summit the World Tourism Organization (UNWTO) presented its Sustainable Tourism for Eradicating Poverty (STEP) initiative, which places priority on the three dimensions of poverty mitigation, fair trade and sustainable development. Technical assistance projects are being carried out under this programme for the promotion of sustainable tourism in the region in ways that will contribute to the achievement of the Millennium Development Goals. The “green passport” of the International Task Force on Sustainable Tourism Development (ITF-STD)²⁰ and the Colombian sustainable tourism certificate are two examples of this type of initiative.²¹

Tourism activities are highly dependent on weather conditions. Many tourism destinations (especially in the Caribbean and other coastal areas) are vulnerable to the devastating effects of extreme weather and climate-related events such as hurricanes and tornados, beach erosion and coral reef bleaching and these pose a threat to local economies. In response to this situation, it is carrying forward the Davos Process on Climate Change and Tourism in an effort to find ways of coping with climate change in the sector by promoting climate-change mitigation and adaptation projects in the tourism industry.

Investment in sustainable tourism generates economic benefits, at the same time as it reduces the sector’s impact on the environment (UNEP/UNWTO, 2011). The aim of moving towards greater sustainability in the tourism industry can be advanced by public-private partnerships such as the Global Sustainable Tourism Council, which was founded in August 2010 to develop and disseminate what have come to be known as the Global Sustainable Tourism Criteria. These criteria, which were formulated after an exhaustive analysis of certification standards and principles (including those applied in Latin American and Caribbean countries, such as, for example, in Costa Rica), set out 37 straightforward standards to be met by tourism enterprises in order to achieve a satisfactory level of sustainability.

The Latin America Community-based Tourism Network (REDTURS) is another noteworthy initiative. Launched in 2001, it was one of the first ILO-supported ventures in Latin America and the Caribbean to combine eco-tourism with the protection of the natural and cultural heritage of rural and indigenous communities. This project has created decent job opportunities for women and men in remote communities and has thereby contributed to the development of rural areas and to poverty reduction by providing access to supplementary sources of income and increased business opportunities. The Network has created more than 300 community-based tourism destinations in 13 countries of the region (Maldonado, 2006, 2005).

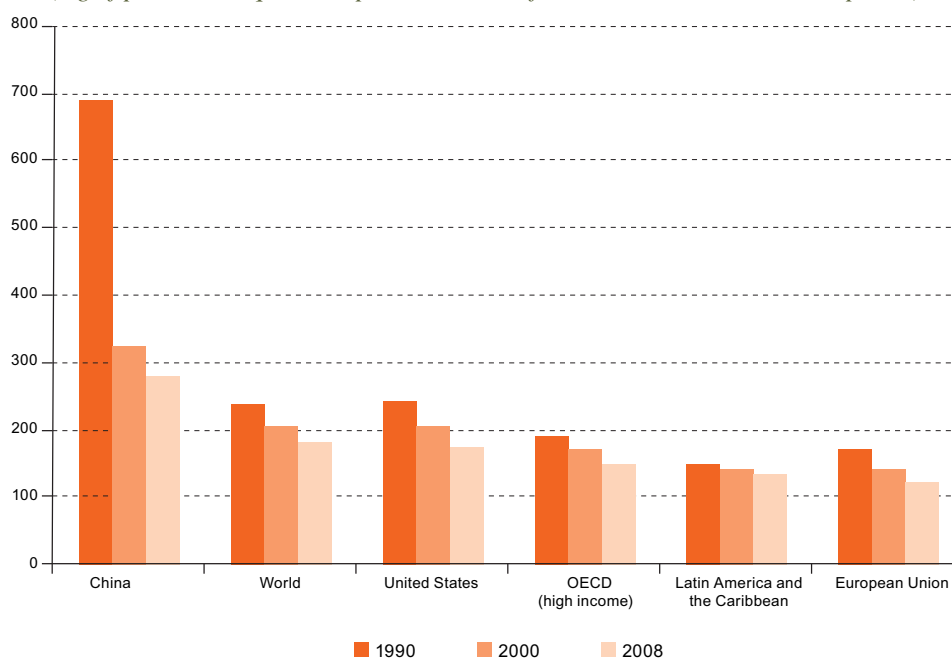
²⁰ The Green Passport Campaign seeks to raise awareness among travellers, through travel guides and other media, of what they can do to ensure sustainable tourism. National Green Passport Campaigns are underway in Brazil, Ecuador and South Africa (see United Nations Environment Programme (UNEP), “Holidays for a living planet” [online]; <http://www.unep.org/unite/30ways/story.aspx?storyID=18>].

²¹ See Ministry of the Environment and Sustainable Development of Colombia, “Sello ambiental colombiano” [online] <http://portal.minambiente.gov.co/contenido/contenido.aspx?catID=1277&conID=7748>

C. ENERGY: ENERGY INTENSITY, EFFICIENCY AND RENEWABILITY

Although the desired goal is to bring about a progressive reduction in the amount of energy used per unit of output, energy intensity has been declining much more slowly in Latin America and the Caribbean than in other regions (see figure I.20). The slow pace of progress in this respect is attributable to the production patterns discussed above, the fact that environmental and health costs are not factored into policy decisions, the use of consumption and production subsidies, and the low priority that policymakers have assigned to energy efficiency, among other factors.

Figure I.20
ENERGY INTENSITY OF THE ECONOMY
(Kg of petroleum equivalent per US\$ 1,000 of GDP at constant 2005 PPP prices)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators [on line] <http://data.worldbank.org/data-catalog/world-development-indicators> [date of reference: December 2011].

Note: Energy intensity is measured as the amount of energy consumed per unit of GDP, which, to some extent, indicates how energy-efficient a country is. It also reflects, to a certain degree, a country's economic structure at the sectoral level, including the carbon content of the goods that it imports and exports. For example, two countries which have similar levels of energy efficiency by sector but in which economic activity has a different sectoral distribution will have different aggregate levels of energy intensity. By the same token, a country that imports carbon-intensive goods will have a lower degree of energy intensity than a country that produces and exports such products (WRI, 2009).

1. Energy efficiency

The steady rise in international crude oil prices has spurred the introduction of a number of national energy efficiency programmes by countries in the region (see table I.7).

Programmes aimed at promoting energy efficiency have made a great deal of progress, but the lack of sufficient funding has hampered their efforts. Another crucial factor for the success of energy efficiency policies and programmes is proper coordination among different governmental sectors to ensure policy coherence. Subsidies based on economic considerations that fail to take the environmental costs of energy use into account are at cross-purposes with the countries' energy efficiency programmes.

Table I.7
LATIN AMERICA AND THE CARIBBEAN: STATUS OF ENERGY EFFICIENCY PROGRAMMES

	Programme	Executing agencies / donors	Start-up date (1) and approximate total funding (2)
Argentina	Energy Efficiency Programme	Energy Secretariat / National budget and other agencies such as the Global Environment Fund and the World Bank /	2003; US\$ 40 million
Brazil	(1) National Electricity Conservation Programme (PROCEL); (2) Oil and Oil Products Conservation Programme (CONPET)	(1) Eletrobras: Corporate funds and Global Reversion Reserve (RGR);; and international entities ; (2) PETROBRAS: Corporate funds	(1) 1985; (2) 1991
Chile	(1) Energy Efficiency Division (2) Chilean Energy Efficiency Agency	(1) Ministry of Mining/Ministry budget fund; (2) Board of directors made up of representatives of the ministries of energy and finance and of the Confederation of Production and Commerce	2010 (these two entities continue the work started in 2005 by the Energy Efficiency Country Programme, which came under the National Energy Commission)
Colombia	Programme for Rational and Efficient Energy Use and Non-Traditional Sources (PROURE)	Ministry of Mines and Energy/public budget fund	2001
Costa Rica	National Energy Conservation Programme (PRONACE)	National Energy Conservation Commission (CONACE). CONACE is composed of representatives of the Energy Sector Department of the Ministry of the Environment and Energy, the Public Services Regulatory Authority (ARESEP), the Costa Rican Electricity Institute (ICE), the State-run oil refinery (RECOPE) and the national power company (CNFL), as well as by the electrification companies: the Administrative Board of Cartago Electrical Services (JASEC), the Heredia Public Service Company (ESPH) and the rural electrification cooperatives: Coopeguanacaste, Coopealfaro Ruiz, Coopelesca and Coopesantos.	2001-2006
Ecuador	National Energy Efficiency Plan	Office of the Under-Secretary for Renewable Energy and Energy Efficiency, Ministry of Electricity and Renewable Energy (formerly the Renewable and Energy Efficiency Department in the Ministry of Energy and Mines)	2001; funding from the Ministry of Energy and Mines and a US\$ 508,000 World Bank loan; grant from the Global Environment Fund / World Bank (US\$ 1,226,000) plus private grants (US\$ 4,992,000)
El Salvador	Energy Efficiency Programme	Government of El Salvador /Sustainable Energy and Climate Change Initiative (SECCI) of the Inter-American Development Bank (IDB)	2007: US\$ 800,000 (preparatory stage with technical assistance from IDB)
Mexico	(1) Energy Savings; (2) "Save Energy and Live Better" pilot programme; (3) Electricity Savings; (4) Institutional Programme for Efficient Energy Use and Energy Savings of PEMEX	(1) National Commission for Energy Savings (CONAE); (2) Energy Secretariat (SENER); (3) Electricity Savings Trust Fund (FIDE); (4) Petróleos Mexicanos (PEMEX)	(1) 1989; (2) 2008; (3) 1990 (general government funding for programmes 1, 2 and 3); (4) 2001: PEMEX budget
Nicaragua	Energy Efficiency Programme	Government of Nicaragua / Inter-American Development Bank (donor: Japan Special Fund (JSF))	2004; US\$ 920,000
Peru	Energy Savings Programme and CENERGIA activities	Ministry of Energy and Mines; Energy and Environmental Conservation Centre (CENERGIA)	1998 to date: Ministry of Energy and Mines, general government budget, CENERGIA
Uruguay	Energy Efficiency Programme	Ministry of Mines and Energy / Global Environment Fund (GEF) – World Bank / National Electricity Plants and Distribution Administration (UTE) / private stakeholders	2005; US\$ 820,000

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/German Agency for Technical Cooperation (GTZ), "América Latina y el Caribe frente a la coyuntura energética internacional: oportunidades para una nueva agenda de políticas". *Project documents*, No. 220 (LC/W.220), Santiago, Chile, December 2008 (updated as at October 2011).

Fuel subsidies for private vehicles and for cargo and transit services place an added burden on fiscal accounts. Some of these subsidies are also regressive since the top income quintile accounts for a substantial proportion of expenditure on fuel for automobiles (Acquatella and Altomonte, 2010). These subsidies have been on the rise since 1992 due to the fact that most of them are based on international oil prices, which have been climbing sharply, especially since 2003.²² Calculations based on international oil prices in 1996-2008 (IMF, 2008) show that the fiscal cost of these subsidies has been very high in some countries, and their opportunity cost in terms of potential alternative uses of those resources (e.g., health care) is quite significant (see table I.8).

Table I.8
**LATIN AMERICA (SELECTED COUNTRIES): SUBSIDIES ON FOSSIL FUELS
AND PUBLIC SPENDING ON HEALTH CARE, 2008-2010**
(Billions of dollars and percentages of GDP)

	Subsidies on fossil fuels						Public spending on health	
	(billions of dollars)			(percentages of GDP)			(percentages of GDP)	
	2008	2009	2010	2008	2009	2010		
Argentina	18.1	5.9	6.5	5.5	1.9	1.8	5.3	(2008)
Colombia	1.0	0.3	0.5	0.4	0.1	0.2	1.9	(2009)
Ecuador	4.6	1.6	3.7	8.4	3.1	6.7	1.3	(2006)
El Salvador	0.0	0.0	1.2	0.0	0.0	5.6	3.4	(2007)
Mexico	22.5	3.4	9.5	2.1	0.4	0.9	2.8	(2008)
Peru	0.6	0.0	0.0	0.5	0.0	0.0	1.2	(2008)
Venezuela (Bolivarian Republic of)	24.2	14.1	20.0	7.8	4.3	5.1	1.8	(2006)

Source: Prepared by author on the basis of the subsidies on fossil fuels published in International Energy Agency (IEA), *World Energy Outlook 2011* [online] <http://www.iea.org/subsidy/index.html>; Economic Commission for Latin America and the Caribbean (ECLAC), Official figures of GDP and social expenditure database for public health-care spending.

Cuts in these subsidies would not only reduce the use of fossil fuels and their adverse environmental and health impacts, as well as boosting the profitability of alternative energy sources, but would also free up government funds for use in other areas, such as investment in education and health.

Alongside these subsidies, there are also a number of different fuel taxes (Campodónico, 2009), yet these taxes have been cut in recent years in order to cushion the impact of sharp fluctuations in international oil prices on domestic prices, without taking environmental impacts into consideration.

2. Renewable sources of energy

The early 1990s marked a turning point in terms of energy supplies in the region as it increased output of oil and natural gas. The share of total supply accounted for by oil has been shrinking, while the share of natural gas has been on the rise. Nonetheless, the predominant market share of fossil fuels in terms of the overall energy matrix in the region has changed very little since 1970.

²² The price of oil is based on the simple average of the prices of three benchmark crudes: Dubai, Brent and West Texas. For a detailed description of this index and the prices of Latin America's main commodities since 1960, see Bello, Cantú and Heresi (2011).

For the region as a whole, the renewable portion of the energy supply fell from 25.0% in 1990 to 23.2% in 2009, the most recent year for which information is available. However, the share of renewable sources in total supply varies significantly from one country to another. The renewable proportion of the energy supply represents over 67% in Paraguay and a mere 0.1% in Trinidad and Tobago.²³ Hydroelectricity makes up a very large part of Brazil's energy matrix, and the country has implemented a very successful long-term strategy for the development of its biofuels industry. In Mexico, renewable sources were slightly above 10% of the total in 2002, but have since dropped below that figure (Altomonte, 2008).

Since the 1990s, the share of primary energy supplies accounted for by renewable sources has declined due to changes in energy markets that have created incentives for short-term investment while disregarding environmental and health-care costs. This has led to a slowdown in investments in hydro-energy and to an upswing in investment in hydrocarbons. The burst in growth in hydropower seen in 1970-1990 began to subside when investment shifted to thermoelectric plants. Major hydroelectric complexes were built in the 1970s and 1980s, when the State was the main player in energy-sector development in most of the countries of the region. These projects, which figured as a component of the relevant countries' development plans, were provided with long-term financing and government loan guarantees tailored to the scales of production and lead times involved in this type of strategic venture (Acquatella, 2010). Reforms introduced in the electricity industry in the 1990s failed to take the environmental costs of the various alternatives into account and, as a result, gave preference to thermoelectric projects over large-scale hydroelectric plants. Thermoelectric plants take much less time to build, are smaller in scale and are easier to position closer to sources of demand. In the absence of mechanisms for internalizing the environmental costs of the various options, private investors' assessment of these factors leads them to conclude that thermoelectric plans entail fewer risks than large-scale hydroelectric plants.

Since 2000, most of the countries in the region have passed laws to promote investment in renewable energy sources and, in some cases, have taken other specific steps to this end. Table I.9 provides an overview of the laws that different countries in the region have passed to promote the development of renewable energy sources. Most of these measures have focused on the economic impacts of high oil prices and on ways of reducing the costs of attaining greater energy security rather than on greater environmental sustainability; however, in practice, they gave a boost to renewable energies in the region.

Considerations to be taken into account in the future development of the region's energy matrix include not only customary sorts of economic and social needs, but also the cost of environmental impacts of alternative energy sources, especially as the world's economies will be transitioning towards lower-carbon solutions. Although hydropower now accounts for a smaller relative share of the total energy supply, Latin America and the Caribbean remains the leading region in this area, and this energy source holds out an enormous and as-yet undeveloped potential. Indeed, hydroelectricity is likely to play a significant role in the region in coming decades. However, although hydroelectric projects help to reduce the demand for fossil fuels and diminish the energy sector's footprint (see section II.4), they have raised other environmental and social issues when they have been proposed. The large-scale hydroelectric plants that have been built in the region in recent years or that are in the process of being built have sparked disputes with other users of the same watersheds, local population groups (especially indigenous communities) and environmental groups.

²³ These data, which relate to 2009, were calculated by ECLAC on the basis of statistics from the Energy Economic Information System (SIEE) of the Latin American Energy Organization (OLADE).

Table I.9
LAWS FOR THE PROMOTION OF RENEWABLE ENERGY SOURCES IN SELECTED COUNTRIES OF THE REGION

Country	Laws/regulations	Year	Mechanisms / incentives
Argentina	Act No. 26190	2006	Establishes a renewable energy trust fund, to be administered and allocated by the Federal Electric Power Council, which will provide up to US\$ 0.15 per kWh of wind, solar, biomass or geothermal energy.
Barbados	Fiscal incentives for solar energy	1974 and on	Barbados has developed a variety of solar energy fiscal incentives. In 1974, it passed the Fiscal Incentives Act, which provides exemptions equivalent to 20% of the import duties on raw material inputs for solar water heaters and levies a 30% tax on conventional water heaters. In 1980, income tax amendments included an allowance for the full deduction of the cost of installing solar water heaters. This provision was suspended in 1992 but re-introduced in 1996 as part of a larger schedule of deductions for housing improvements related to energy conservation, water savings, the use of solar water heaters, etc.
Brazil	Act No. 10438/02 (PROINFA)	2002	Establishes direct incentives for hooking up biomass-powered and wind-powered thermoelectric plants and small-scale hydroelectric plants to the national grid.
Chile	Act No. 20257	2008	Amends the General Electric Power Services Act and introduces a floor rate of 5% for renewable energy sources for operators (renewable energy sources standard).
Colombia	Act No. 697 of 2001	2001	Establishes the PROURE programme for the promotion of the rational use of energy and unconventional energy sources.
Dominican Republic	Act No. 57-07	2007	Provides for a 100% tax exemption for machinery, equipment and accessories imported by companies or individuals and a 10-year profits tax exemption for corporations.
Ecuador	Regulation No. 004/04	2005	Regulates renewable energy generating plants in the country and establishes pricing parameters (prices for the purchase of electrical power from renewable sources).
Guatemala	Decree No. 52 of 2003	2003	Introduces economic and fiscal incentives.
El Salvador	The "LIFFER" Act	2007	Establishes a 10-year tax exemption for projects having a generating capacity of less than 10 MW. Provides for the creation of a revolving fund for the promotion of renewable energy sources (FOFER) to furnish soft credit, loan guarantees and aid to finance feasibility studies.
Mexico	The "LAFRE" Act	(in process)	Establishes a trust fund of US\$ 55 million per year with the objective of achieving the target of having 12% of all nationally generated energy coming from renewable sources by 2012.
Nicaragua	Act No. 532	2005	Establishes tax benefits for investors over a 10-year period (starting from the date of the promulgation of the law). Refunds between US\$ 0.5.5 and 6.5 per KWh for renewable energy sources.
Peru	Legislative Decree No. 1002	2008	Establishes premiums for renewable energy sources, to be applied to electricity charges in order to provide a minimum profitability ratio of 12% for renewable energy generators.
Uruguay	Decree No. 77/006 and Act No. 18.585	2006/2010	Decree No. 77/006 authorizes the National Electric Power Plant and Transmission Administration of Uruguay (UTE) to enter into contracts with national wind-power and biomass-power suppliers and with small hydroelectric plants. Solar Energy Promotion Act No. 18.585 states that solar-energy research, development and use is in the national interest and provides for tax exemptions for the generation, implementation and use of solar energy.

Source: Economic Commission for Latin America and the Caribbean (ECLAC) on the basis of ECLAC/German Agency for Technical Cooperation (GTZ), "América Latina y el Caribe frente a la coyuntura energética internacional: oportunidades para una nueva agenda de políticas". *Project Documents*, No. 220 (LC/W.220), Santiago, Chile, December 2008 (updated as at June 2010); for Barbados: United Nations Environment Programme (UNEP), "Economic Instruments in Barbados", *Manual on Compliance with and Enforcement of Multilateral Environmental Agreements* [online] <http://www.unep.org/dec/onlinemanual/Enforcement/InstitutionalFrameworks/EconomicInstruments/Resource/tabid/1013/Default.aspx>.

D. TERRITORY, MOBILITY AND URBAN AND RURAL DEVELOPMENT

In spatial terms, the population, economic activity and wealth are all highly concentrated in Latin America and the Caribbean. There is a very significant differential between per capita GDP in the richest and poorest regions of each country, and there has been very little change in this respect in the past two decades (ECLAC, 2010a). The concentration of economic activity is a natural consequence of development, but this means that countries must invest in capacities and infrastructure that will allow them to make use of the comparative and location advantages of different geographical areas so that living conditions in the economically less developed areas can be improved.

In the past few years, territorial issues —development, identity, land use and land management, resource distribution, decentralization or administration— have figured prominently in the debates surrounding voting on a new Constitution in the Plurinational State of Bolivia and in Ecuador and in the framing of numerous laws in various countries. In some, development plans have also included major territorial components, which have involved, for example, proposals for promoting different production clusters. Others have implemented regional development plans or land use plans that include different sorts of incentives, land-use regulations and special measures for assigning resources to given areas (ECLAC/UNFPA, 2009). There is clearly an awareness of the importance of revisiting the geographical or territorial dimension of national policies (ECLAC, 2010a). As the unit of policy analysis and intervention, the territory, a dynamic system made up of ecosystems and human communities, is useful for understanding how urban and rural universes interrelate. Indeed, these universes are very often considered in a fragmentary manner (UNCRD, 2010b).

This section will cover a number of geographical or territorial factors that are of importance for development, namely, migration flows, urban development, transport infrastructure and planning instruments that take the geographical dimension of development into account.

1. Migration flows

In Latin America and the Caribbean, cities continue to exert a strong pull on rural populations. . Another factor behind the shift away from rural areas has been the emergence of various types of conflicts over resource use (Graziano, Gómez and Castañeda, 2009). Now, however, the largest migration flows are between one urban area and another, and these flows are, in some cases, more complex and more diverse than rural-to-urban migration has been.

The growth of the region's metropolitan areas has outpaced overall population growth. These areas' expansion may be attributable to urban sprawl or to the functional convergence of one city with others (over distances of 100 kilometres or more) whereby they form “urban regions” or “dispersed or reticular metropolitan areas”. This poses a major challenge for sustainable development efforts and raises new types of problems in terms of urban management and governance. The driving forces behind this change in growth patterns are primarily speculation and the demand for inexpensive real estate. This kind of urban growth quite often damages surrounding rural areas, their ecosystems and their inhabitants, who find themselves faced with increased hazards and sources of vulnerability. Metropolitan areas are themselves highly vulnerable to natural threats, including extreme weather events, which are increasingly frequent and intense. This type of urban growth creates a need for new regional approaches to integrated land management that take into account such factors as mass transit, urban services and the formation of a suitable civic culture and institutions for these new types of settings (UNCRD/INTA, 2010). Disaster risk

reduction must also be mainstreamed into urban planning and land use management in order to build up the resilience of metropolitan areas.

The settlement of border areas in recent decades has been an influential factor locally even though the number of new arrivals is small relative to national averages. Until not long ago, environmental considerations and the interests of local (often indigenous) population groups have been largely overlooked in the course of these settlement processes. More recently, increasingly strict regulations and more rigorous environmental and social assessment procedures have been brought into play. Settlement processes driven by emergency situations in which people were seeking safe havens or were displaced by border disputes have ceased to be a major factor.

International migration has been on the rise and has become an influential factor in the demographic dynamics of Latin America as well as in various other aspects. Issues such as remittances and the links between emigrants and communities in other countries have been discussed on the front pages of newspapers, have given rise to the passage of new laws, and have been the focus of public policies and civil society action. Countries have become increasingly concerned about this issue and have engaged in talks in various forums with a view to the conclusion of agreements on the subject. Progress has been made, however, in creating stable institutional environments for coordination in specific areas and in implementing joint mechanisms for dealing with issues such as migrant smuggling, undocumented migrants, social integration, repatriation and the processing of asylum applications. This is the direction in which the good intentions reflected in policy agendas on migration should be channelled.

While progress has been made in terms of formal agreements and a growing awareness of issues that used to be passed over, such as the protection of migrants' rights and the discrimination to which many of them are subject, the millions of undocumented Latin American immigrants in developed countries are in a very difficult situation. Turning this situation around is one of the major challenges to be faced, and its resolution goes hand in hand with efforts to promote a global agenda that provides for the protection of migrants' rights and that hones in on emerging issues.

Other emerging migration issues include the displacement of population groups as a result of climate change, the depletion of production capacity, the declining liveability of some areas (due to factors that are not necessarily related to climate change but may instead have to do with improper management) or mega-projects designed to meet the demands of a growing population and economy.

2. Sustainable urban and regional development

Cities are home to nearly 80% of the population of Latin America and the Caribbean. The urbanization of the region has brought about a significant change in the living conditions of a large part of its population. Urbanization has, for the most part, enabled the region's population to secure higher incomes, better health care, more education and access to basic services and consumer goods, as well as increase life expectancy. The correlation between urbanization and economic growth is also reflected in the statistics on relative levels of poverty in urban and rural zones. People who reside in cities enjoy an "urban advantage" (UN-Habitat, 2010). All indications are that urban development is an essential element in industrialization, sustained economic growth and social development. Generally speaking, there are fewer poor people, in relative terms, in urban areas than there are in rural areas, since people in urban areas have greater access to services and to the labour market. If the cost of living is factored in, however, poverty levels in urban areas come much closer to those existing in rural zones.

As mentioned earlier in relation to access to basic services and suitable housing, however, urbanization in the region is both the outgrowth of striking asymmetries in the distribution of resources and power and a factor in the perpetuation of those gaps. As a result, it has been taking place without the benefit of robust, continuing, forward-thinking political or technical guidance. This has resulted in a number of “urban deficits” in terms of living conditions, infrastructure, facilities, connectivity, institutional arrangements, public participation, and management and governance capacity, which have built up as a consequence of the region’s inability to absorb the social costs of urbanization, population growth and the impacts of the various crises that have hit the region, especially in the 1980s. Thus, the problems of limited mobility and housing in areas exposed to pollution and uncertain land title are compounded by inequality, the preponderance of informal employment and delinquency (Linn, 2010; ECLAC, 2011a; UN-Habitat, 2009; UNFPA, 2007). Shortcomings in urban infrastructure and services add yet another dimension to poverty and, in addition to their cost in terms of health and human well-being, impair environmental quality (United Nations, 2010a; UNDP, 2010b). Box I.7 provides an overview of social and environmental features of the region’s main “mega-cities”.

Most cities in developing countries have grown as a result of the proliferation of informal settlements. The risks of locating such settlements in disaster-prone areas are compounded by the substandard quality of the dwellings and local services and the lack of proper risk-reduction infrastructure. Poverty means that many households in these cities cannot afford to buy land, or safe housing, in suitable locations. However, whether poverty translates into risk will depend on the capacity of municipal and local authorities to plan and regulate urban development, permit access to safe lands and provide infrastructure and protection so as to reduce the threats to poor households.

Informal settlements, substandard housing, lack of services and poor health are a reflection not just of poverty but also of deficiencies in planning and managing urban growth. The concentration of private capital and economic opportunities in a city does not of itself generate the institutional facilities necessary for guaranteeing that availability of land for housing, infrastructure, services keeps pace with urban growth, nor does it generate the normative framework necessary to guarantee proper management of environmental, employment and natural risks created for urban growth. Moreover, the capacity to provide supply and regulatory services in urban zones is diminishing. The decline in ecosystems increases the level of threat and reduces resilience thus constituting an underlying risk factor (ISDR, 2009).

The inhabitants of metropolitan areas (or major cities and their outlying areas) also face growing security threats in terms of the concentration of population and poverty, unemployment, degradation of natural resources, climate change, conflict and violence. There are also sharp contrasts between urban and rural areas and between territorial entities in terms of infrastructure development, communications, income and institutional capacity to address problems that go beyond the existing political and administrative limits. One of the main challenges in the countries of Latin America is institution-building, which is essential if urban planners are to manage development efficiently and comprehensively in metropolitan regions and to promote policies for decentralization and local autonomy consistent with globalization trends. This is particularly relevant in areas where diverse territorial entities with jurisdictional and administrative autonomy come into play and where there are no appropriate institutions for administering inter-jurisdictional or intersectoral justice (UNCRD, 2005).

Box I.7

**URBAN SUSTAINABILITY IN SIX METROPOLITAN CITIES IN LATIN AMERICA
AND THE CARIBBEAN**

At present, one fifth of urban residents in the region live in metropolitan cities, that is cities with five million or more inhabitants. An overview of six of these cities in Latin America and the Caribbean, namely Mexico City, São Paulo, Buenos Aires, Lima, Santiago and Bogota, reveal the following advances and challenges in terms of urban sustainability.

(a) Water consumption, pollution and treatment

Between 1996 and 2005, Bogota cut water consumption by nearly 20%, thanks to such factors as tighter controls on water use, steep price increases, a new law on rational water use and the impact of the 1997 economic crisis. São Paulo, meanwhile, has reported that water losses have been reduced as a result of the renovation of infrastructure and tighter controls on illicit water use. Santiago, Chile, has a much higher installed capacity and much more extensive wastewater treatment coverage than the other cities. In Lima, nearly 30% of the drinking water supply is lost, and the ratio of potable water hook-ups is the lowest of all of these cities. Buenos Aires and Bogota have high pollution levels due, primarily, to the volume of untreated household wastewater. All six of these cities have high biological pollution indices for their watercourses. Mexico City dumps most of its wastewater without running it through even primary treatment processes.

(b) Electric power and electricity use

Bogota, Lima and Mexico City have high carbon-efficiency levels per dollar of GDP. The mass transit systems of Santiago, Buenos Aires and Bogota are the most energy-efficient. Mexico City has the most energy-efficient economic system, while the coefficients for the rest of the cities are fairly similar (between US\$ 0.30 and US\$ 0.40 per kWh). Buenos Aires, São Paulo and Santiago have extremely high levels of carbon emissions per dollar of GDP. Residential and total electricity use is highest in Santiago, São Paulo, Buenos Aires and Bogota, while use rates are considerably lower for Lima and Mexico City.

(c) Solid waste management

In Santiago, Chile, about 50% of landfills gases are flared. Waste management in these six cities is in large part outsourced by municipalities to private companies. Informal garbage collection is a major factor in Bogota, Mexico City and Lima, but in all six mega-cities, a great deal of garbage is left uncollected and has a direct impact in terms of water, soil and air pollution. Formal recycling systems in these cities are poorly developed, and are not being used to their full potential. Greenhouse gas emissions, especially of methane, are highest in Mexico City and São Paulo. Systems for the appropriate management, disposal and recycling of solid wastes are not yet being successfully implemented in many cities of the region.

(d) Air pollution and greenhouse gas emissions

Automobile traffic and industry are the main sources of air pollution. Because Mexico City and São Paulo are so much larger, their carbon monoxide emissions are about 10 times greater than the level for Santiago. As of 2005, standards for sulphur concentrations in diesel fuels were quite different in these six cities. In Lima, for example, the ceiling was 3,000 ppm, while Santiago had the most rigorous standard (50 ppm). The aim for 2010 was for all six of these cities to introduce legal ceilings of between 15 and 50 ppm, but this target has not been met in all cases. Extremely high levels of air pollution are undermining the health of the population, and the economic cost of combustion-engine vehicles is not reflecting their actual costs. The growing use of automobiles, unsuitable land-use patterns, lax regulations, weak enforcement and an inadequate pricing system are some of the main contributing factors.

Source: Ricardo Jordán, Johannes Rehner and Joseluis Samaniego, "Regional panorama Latin America: megacities and sustainability", *Project documents*, No. 289 (LC/W.289), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/German Agency for International Cooperation (GTZ), 2010.

The issues that the region's cities will have to address in the coming years are rooted in the same safety and environmental protection issues that it has grappled with in the past. And these issues are compounded by the effects of climate change and the growing demand for products and services attributable, among other factors, to rising incomes. The configuration of urban infrastructure and the way in which investments (in the water supply, sanitation, waste management, energy mobility, food distribution) are evaluated will go a long way towards determining the impact of human activity on the environment and vice versa. At the moment, existing structures are not conducive to efficient resource use; nor are they designed with any concern for disaster-resistance. The application of the concept of eco-efficiency in the evaluation of investments (see box I.7) could serve as a useful frame of reference for improvements in this respect. The same applies to mainstreaming disaster risk reduction into decision-making criteria relating to public investment (see box I.3).

There is a great deal of interest—not only in the region, but around the world—in the extremely promising possibility of reproducing the success stories of cities that have managed to encourage investment in environmentally friendly, spatially and energy-efficient infrastructure. Many of these successful innovations have been applied outside the bounds of formal urban planning systems, however, because such systems have proven to be too rigid and resistant to change, this has limited their scope and the ability to use them to bring about concrete results.

In order to take full advantage of the potential of urbanization to promote development and to achieve an environmentally sustainable, equitable form of urban development, the region needs a long-term strategic framework for meeting the many challenges that lie ahead and for forging the necessary links between cities and their surroundings. This framework has been lacking in many Latin American and Caribbean cities. The region has succeeded in devising acclaimed approaches to urban development and planning and comprehensive neighbourhood improvement schemes (although little progress has been made in comprehensive territorial analysis and planning (UNCRD, 2010b)). One sign of its success at the urban level is the fact that, over the course of the past two decades, the Meeting of Ministers and High-level Authorities of the Housing and Urban Development Sector in Latin America and the Caribbean²⁴ has shifted its focus from housing per se to a broader approach to urban issues.

In order for these strategic planning processes to be viable and effective, they must be integrated into compatible national and regional strategies that address demographic changes occurring beyond city limits or local areas (see section E). In addition, while it is true that planning measures must be implemented at the local level (see the discussion in chapter III on the role of local authorities), these measures must still be viewed within the framework of processes that are taking place on a larger scale. Coordination among authorities at the national, state, provincial and other levels is therefore crucial (see section E).

²⁴ This forum supports intergovernmental coordination and cooperation in the countries of Latin America and the Caribbean in the field of sustainable development of human settlements. It is composed of cabinet ministers and other governmental authorities responsible for the sustainable development of human settlements in various countries of the region. See [online] <http://www.minurvi.org>.

Box I.8

THE ECO-EFFICIENCY OF URBAN INFRASTRUCTURE

As defined by the World Business Council for Sustainable Development, “eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle to a level at least in line with the Earth’s estimated carrying capacity.” The Council identifies seven key eco-efficient corporate practices:

- (i) Reducing resource intensity in the production of goods and services;
- (ii) Reducing energy intensity in the production of goods and services;
- (iii) Reducing the generation and dispersion of toxic substances;
- (iv) Supporting recycling;
- (v) Capitalizing on the maximum possible use of renewables;
- (vi) Extending product durability; and
- (vii) Increasing the quality of goods and services.

This concept can be applied to urban development, as shown in the following graphic.

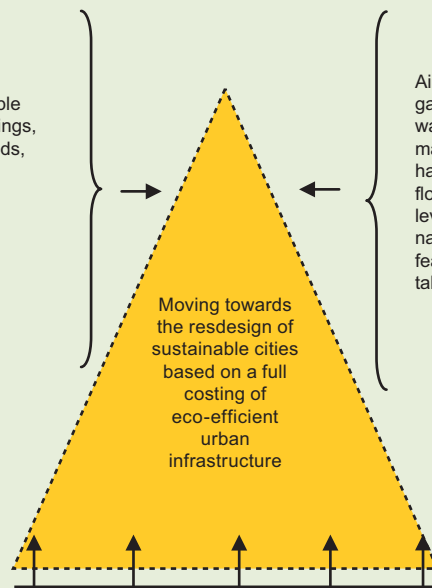
THE REDESIGN OF CITIES USING ECO-EFFICIENT INFRASTRUCTURE

Urban services and processes:

Urban mobility, sustainable housing, intelligent buildings, integrated neighbourhoods, technology parks, green spaces, public spaces, pedestrian walkways, consumption patterns, information and expert advisory services, etc.

Costing of major environmental impacts and opportunities for introducing improvements:

Air quality, reduction in greenhouse gases, sufficient supplies of clean water, integrated solid urban waste management, elimination of hazardous wastes, smoothly flowing urban transit, very low noise levels, minimal disturbance of natural surroundings and of natural features, satisfactory environmental services, etc.



Critical inputs:
Energy, water soil and land (territory, space), eco-efficient urban infrastructure

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of “Ecoeficiencia y desarrollo de infraestructura urbana sostenible en Asia y América Latina”, 2007 [online] <http://www.eclac.cl/eficiencia>.

3. Transport

The social and environmental dimensions of public transit must be taken fully into account in public transportation planning processes. Proper planning guarantees connectivity between human communities and sets up a network that manages land use and the economy of the territory (UNCRD, 2011b).

A number of interesting public transport improvement initiatives have been launched in the region in cities such as São Paulo, Quito, Cuenca, Guayaquil, Bogota and Medellín (see box I.9). However, most mass urban transit systems in Latin America and the Caribbean are still inefficient and fall short of the needs of a large part of the population, and the situation is worse in semi-urban and rural areas. This is one of the reasons why the number of privately owned motor vehicles has soared, since people cannot rely on the urban inter-urban and international transportation and cargo system in the region for sustainable, good, efficient, on-time service (see figure I.21).

Box I.9

INITIATIVES FOR IMPROVING PUBLIC TRANSPORTATION SYSTEMS IN THE REGION

Various cities in the region have made changes in their urban transport systems in the past few decades in an effort to improve air quality and reduce traffic congestion, with varying degrees of success. A few examples are outlined below:

Curitiba: The rapid transit bus system of Curitiba was introduced in 1972. The system covers routes totalling 64.6 km and a demand of 560,000 trips per day. Provision is being made for exclusive bus lanes, ticket payments at designated stations and larger-capacity vehicles.

Quito: Using Curitiba's experience as a model, Quito developed a similar, but smaller, system. In 1995, it began to construct a network of three main rapid transit routes. This system now encompasses 37 km of privately and publicly operated bus routes and transports 400,000 passengers each day. One of the system's drawbacks is the lack of operational or fee-based integration of the three major routes.

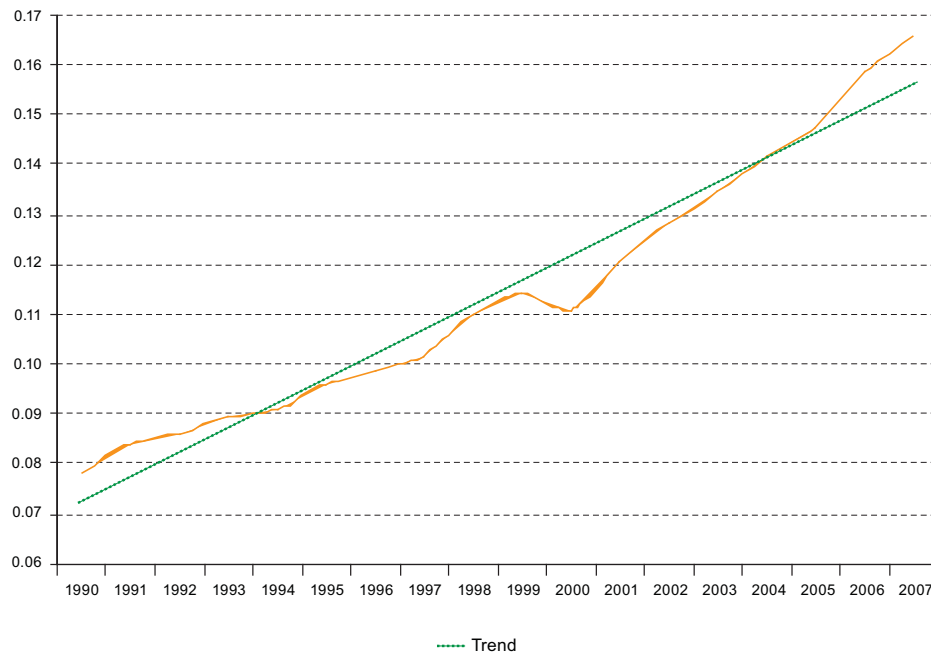
Bogota: The TransMilenio rapid transit system, which was launched in 2000, has 84 km of routes and transports around 1.4 million passengers per day. Bogota's system boasts a number of major innovations that support its claim to being the most robust transit system in the world. It has express buses that do not stop at every station, which has reduced transit times and increased the transit system's capacity, measured on a per hour and per direction basis. This system has also recently been integrated with non-motorized transport (bicycle parking facilities at stations), which has considerably increased the system's reach and reduced the pressure on feeder systems. The introduction of the TransMilenio system has reduced the city's greenhouse gas emissions by an estimated 134,000 tons per year (UNEP, 2010). In view of the success of TransMilenio in Bogota, Colombia plans to introduce similar systems in another seven cities in the country.

Mexico City: the Metrobús system was built in order to supplement the city's extensive subway system. The Federal District has constructed three major lines covering a total of 60 km that serves a demand of 260,000 trips per day. While the project's explicit objectives do not include the reduction of greenhouse gas emissions, it has nevertheless cut traffic-related emissions by 10% (50,000 tons per year). This is equivalent to nearly 0.25% of total transport emissions in Mexico City and thus points to a quite significant achievement for a small-scale project of this sort (Schipper and others, 2009).

Santiago, Chile: The introduction of the Transantiago system has overhauled the entire public transit system in Santiago, Chile. Although the system was plagued with difficulties in its early days, at this point, three years after its launch, it has reduced traffic congestion and travel times. The gains in terms of time savings are estimated to exceed the amount of the State subsidy received by the system.

Source: F. Pardo, "Los cambios en los sistemas integrados de transporte masivo en las principales ciudades de América Latina", *Project Documents*, No. 229 (LC/W.229-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), 2009; United Nations Environment Programme (UNEP), *Perspectivas del medio ambiente: América Latina y el Caribe*, 2010; L. Schipper and others, *Considering climate change in Latin American and Caribbean urban transportation: concepts, applications, and cases. Final report*, Berkeley, University of California at Berkeley, June 2009; V. Pardo, M. Pedrosa and R. Triviño, "Impactos de la aplicación de proyectos y medidas de transporte bajos en carbono: análisis del caso Transantiago. Informe final", Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), unpublished.

Figure I.21
SELECTED COUNTRIES: RATE OF MOTOR VEHICLE OWNERSHIP, 1990-2007^a
(Automobiles per person)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of figures from the CEPALSTAT database [online] <http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp> [date of reference: October 2009].

Note: Annual growth rate for 1990-2007: 6.59%.

^a Based on statistics for Argentina, Belize, Plurinational State of Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Honduras, Guatemala, Mexico, Panama, Paraguay, Peru and the Bolivarian Republic of Venezuela.

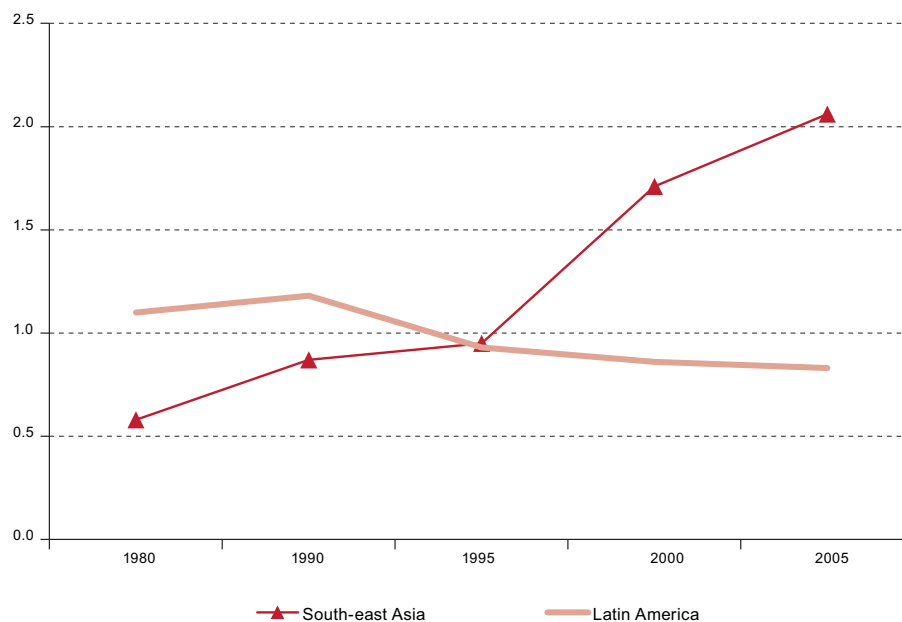
Some countries have set goals, strategies and lines of action for dealing with environmental sustainability within urban transport policies but, in most cases, these criteria are not observed in the planned targets. In practice, the partial costing of projects, erroneous price signals and the failure to align automotive infrastructure with mass transit systems has resulted in a situation where the two options interfere with one another and end up exacerbating the problem they were meant to resolve. This is yet another sign of the failure to integrate public policies in this area and of the pressures exerted on decision-makers. Looking beyond the short-term situation, it also becomes evident that the broadening of major roads and highways creates incentives for increased automobile use, which, in the medium-term, will create even more congestion (Lupano and Sánchez, 2008).

Before urban transit systems are introduced, their social impact needs to be evaluated in order to make sure that the new infrastructure will have the least negative impacts possible on the population and will not have a disproportionately adverse effect on the poorest and most marginalized sectors of the population. The transportation needs of the entire community also should be assessed so that the routes that are established will be the most useful and economical ones for the majority of the population. The transportation services also have to be of a sufficient quality to meet users' needs, if they are not, people will be dissuaded from using the system. In order to accomplish this, these systems must not only serve densely populated areas but must also meet the needs of different types of users. Broad-based social participation in this process is a key element for success.

Transportation infrastructure for connections between different cities and regions is a crucial element for the development of the entire territory of a given country. In the mid-1980s and early 1990s, most of the Latin American countries made a great deal of progress in expanding and improving transport infrastructure and services. The region still exhibits a substantial shortfall in terms of infrastructure and associated logistical services. Private enterprises have been actively encouraged to take up infrastructure concessions, but transport service coverage has not expanded a great deal, as most public and private investment in infrastructure has been channelled into highway construction, rather than into other modes of transport, such as railroads and shipping, which could provide more sustainable transportation options.

A comparison of the stock of infrastructure in the region with the stock in other emerging economies shows that the expansion of infrastructure service coverage in Latin America has fallen short of what is required to meet existing needs. This is illustrated in figure I.20, which depicts the trend in per capita kilometres of paved roadways. While the countries of South-East Asia witnessed an increase in this indicator between 1980 and 2005, the Latin American and Caribbean region has seen a decline. This situation poses a physical constraint on development, which needs to be overcome as a matter of urgency. At the same time, however, it is an opportunity to incorporate sustainability criteria in future transport infrastructure investments, so as to promote low-carbon solutions, minimize other types of environmental impact and improve (rather than impair) the quality of life of the population. This poses major institutional challenges. Most of the countries in the region make explicit reference to sustainability in government policy, but there has been very little progress in terms of the development and effective implementation of policies and programmes on public transport and related infrastructure.

Figure I.22
LAND TRANSPORT IN LATIN AMERICA AND SOUTH-EAST ASIA
(Kilometres of paved roads, per capita)



Source: D. E. Perrotti and R. Sánchez, “La brecha de infraestructura en América Latina y el Caribe”, *Recursos naturales e infraestructura series*, No. 153 (LC/L.3342), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), 2011.

E. STRENGTHENING THE STATE AND A RENAISSANCE IN DEVELOPMENT PLANNING

Agenda 21 calls for the adoption of national sustainable development strategies (NSDS). At the 2002 summit in Johannesburg, the year 2005 was set as the deadline for NSDS implementation. Until recently, however, few such strategies were in place. In fact, during much of the time since 1992, the planning exercises for development as a whole have been few and far between.

The series of crises that have erupted in the world in recent years and the disappointing results of economic and social development efforts over the last 20 years have spurred a revival of practices that had been set aside in the 1990s. The countries of the region are finding a new appreciation for medium- and long-term policies, and development planning and inclusive, equality-based land use development policies appear to be gaining momentum (ECLAC, 2011c). These policies need to be grounded in comprehensive national visions—in which the society, the territory, the environment and the economy all come into play—with the interaction of different stakeholders and backed by mechanisms that ensure their continuity from one Administration to the next.

This renewed awareness of the need for development planning comes at a time when the region is in a good fiscal position to take these policies forward in ways that will support the three pillars of sustainable development. The recent crisis notwithstanding, public finances have improved remarkably in the past decade. Public debt levels are down and the debt structure has become more balanced, since its maturity profile has improved and the relative share of domestic debt has increased. At the same time, in nearly all the countries of the region, government expenditure on such items as public investment and social spending has become more efficient.

The concept of the “quality” of public finances is linked to the definition of objectives for changing production patterns with social equity. Viewed from this vantage point, a qualitative improvement in public finances entails enhancing the tax structure and raising the level of tax receipts, expanding the public sector’s investment capacity and, certainly, reinforcing social security systems. The re-establishment of the budget as a transparent, democratic resource-allocation mechanism in many Latin American countries has played a highly important role in the efficient distribution of public expenditure. Progress has also clearly been made in overall long- and medium-term public planning and in the use of multi-year budgets (ECLAC, 2011c).

Many countries in Latin America are making a determined effort to refine their planning instruments and, in many cases, this effort has focused on providing a better institutional framework for planning processes. National and subnational governments are working very hard to improve the way in which they define policy priorities, formulate strategic programmes and plans, and design monitoring and evaluation systems. Policymakers are learning new techniques for projecting and constructing macro-fiscal scenarios, are using multi-annual budgets and strategic institutional planning tools, and are looking at the various systems for evaluating public policies and programmes. The work being done in this area has led to the formulation of national development strategies that are being used as medium-term national development plans (in Colombia, the Dominican Republic, Ecuador, Mexico, and Peru), strategic government guidelines and lines of action (Uruguay) or a coordinated set of public policy priorities that take the form of medium- and long-term commitments on the part of the government (Chile) (ECLAC, 2011c).

Governments in the region have also been incorporating environmental issues into their policies and planning systems by including environmental protection as one of the stated objectives of their national development plans, integrating environmental institutions into their legal and general institutional frameworks, concluding multilateral environmental agreements, incorporating environmental considerations into trade integration mechanisms and developing fiscal tools that can be used to promote environmental management. Concern about climate change is also reflected in the vast majority of these development strategies or plans, with climate change being seen as a mega-trend that will be one of the determinants of national development processes or as a component of environmental policy. Where this latter approach is taken, climate change strategies have been developed that set out defined objectives, lines of action, benchmarks and targets. Some countries, such as Mexico, have strategic programmes for dealing with climate change that have been designed to incorporate medium- and long-term projections into short-term actions aligned with their national development plan.²⁵

Strengthening planning processes is of crucial importance in order to coordinate the various areas of government action. Poor coordination in this respect is, as noted earlier, one of the factors that reduces the effectiveness of policies designed to promote sustainability (e.g., energy efficiency policies) (see also chapter II). Moreover, any socioeconomic activity has a territorial impact. Land-use planning is a scientific, technical and administrative discipline and involves political action. Indeed, it is conceived as a comprehensive, interdisciplinary practice, designed to achieve balanced development between the regions and proper organization of land space. Authorities should be urged to develop national, subnational/regional or local land-use plans that project spatially the social, economic and environmental policies that are part and parcel of sustainable development. The distribution of human activities under these plans should be subject to the potential and limitations of the land, thereby preventing and/or mitigating risks for human security (UNCRD, 2011b).

Other challenges also remain to be met, such as those involved in expanding and implementing planning mechanisms and achieving an appropriate allocation of resources among their various components. This is the framework within which the need to strengthen the environmental pillar of development must be understood, as will be discussed in the following chapter.

²⁵ See the presentations made at the twenty-third Regional Seminar on Fiscal Policy held in January 2011 [online] <http://www.cepal.org/cgi-bin/getprod.asp?xml=/ilpes/noticias/paginas/1/41751/P41751.xml&xsl=/ilpes/tpl/p18f.xsl&base=/ilpes/tpl/top-bottom.xsl>

Bibliography

- Acquatella, Jean (2010), “Energías renovables no convencionales en América Latina: tendencias y costos”, paper presented at the International Forum on Renewable Energies, Santiago, Chile, Ministry of Energy/Production Development Corporation (CORFO), November.
- Acquatella, Jean and Hugo Altomonte (2010), “Instrumentos fiscales para la mitigación de problemas ambientales específicos” Economic Commission for Latin America and the Caribbean (ECLAC) [online] <http://www.eclac.org/dmni/noticias/noticias/1/41791/HugoAltomonteJeanAcquatellaCEPAL.pdf>.
- Adioetomo, S. and others (2005), “Policy implications of age-structural changes”, *CICRED Policy Papers*, Paris.
- Altomonte, Hugo (coord.) (2008), “América Latina y el Caribe frente a la coyuntura energética internacional: oportunidades para una nueva agenda de políticas”, *Project Document*, No. 220 (LC/W. 220-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), December.
- Amaral, (do), R.S. and others (2006), “An analysis of the impact of the Schistosomiasis control programme in Brazil”, *Memórias do Instituto Oswaldo Cruz 101 (Suppl. 1)*, Brasilia, University of Brasilia.
- Argentina, Government of (2010), “Subsecretaría de Desarrollo Urbano y Vivienda” [online] <http://www.vivienda.gov.ar/>.
- Bello, Omar, Fernando Cantú and Rodrigo Heresi (2011), “Variabilidad y persistencia de los precios de los productos de exportación de América Latina”, *Revista CEPAL*, No. 103 (LC/G.2487-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), April.
- Bernardini, D.A. (2009), “Health in Megacities: Buenos Aires, Argentina”, Washington, D.C., World Bank.
- Bloom, D., D. Canning and J. Sevilla (2003), “The demographic dividend: a new perspective on the economic consequences of population change”, *RAND Population Matters Program*, No. MR-1274, Santa Monica, California.
- Bravo, V. and others (2011), “Pesticide import data as a tool for monitoring health hazards in Central America”, *International Journal of Occupational and Environmental Health*, vol. 17, No. 3.
- Campodónico, Humberto (2009), “Gestión de la industria petrolera en períodos de altos precios del petróleo en países seleccionados de América Latina”, *Recursos naturales e infraestructura series*, No. 147 (LC/L.3162-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- CESCR (Committee on Economic, Social and Cultural Rights) (2003), The right to water. General Comment No. 15.
- _____ (2001), Substantive issues arising in the implementation of the International Covenant on Economic, Social and Cultural Rights: Poverty and the International Covenant on Economic, Social and Cultural Rights. Statement adopted by the Committee on Economic, Social and Cultural Rights on 4 May 2001, (E/C.12/2001/10), Geneva.
- _____ (1999), The right to adequate food. General Comment No. 12.
- _____ (1991), The right to adequate housing. General Comment No. 4.
- Chile, Government of (2010), Ministerio de Vivienda y Urbanismo [online] http://www.minvu.cl/opensite_20101129092614.aspx.
- CHS (Commission on Human Security) (2003), *Human Security Now*, New York [online] <http://www.humansecurity-chs.org/finalreport/English/FinalReport.pdf>.
- DeSchutter, Olivier (2010), “Report submitted by the Special Rapporteur on the right to food, Olivier De Schutter”, Human Rights Council Sixteenth session Agenda item 3. Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development.
- Diouf, J. (2011), “Involve the users in developing and disseminating technologies”, *Global. The International Briefing* [online] <http://www.global-briefing.org/2011/04/%E2%80%9Cinvolve-the-users-in-developing-and-disseminating-technologies%E2%80%9D/>.

- Ducci, Jorge (2007), “Salida de operadores privados internacionales de agua en América Latina”, Washington, D.C., Sustainable Development Department, Inter-American Development Bank (IDB) [online] <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=957044>.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011a), *Social Panorama of Latin America, 2010* (LC/G.2481-P), Santiago, Chile. United Nations publication, Sales No. E.11.II.G.6.
- _____ (2011b), *Social Panorama of Latin America, 2011*. Briefing paper, Santiago, Chile.
- _____ (2011c), “Panorama de la gestión pública en América Latina. En la hora de la igualdad”, (LC/IP/L.243), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- _____ (2010a), *Time for Equality: closing gaps, opening trails* (LC/G.2432(SES.33/3)), Santiago, Chile.
- _____ (2010b), *What kind of State? What kind of equality?* (LC/G.2450(CRM.11/3)), Santiago, Chile.
- _____ (2010c), “Desastres y desarrollo: el impacto en 2010 (cifras preliminares)”, Bulletin, No. 2, Santiago de Chile, Economic Commission for Latin America and the Caribbean (ECLAC) [online] http://www.eclac.org/desastres/noticias/noticias/2/42102/Desastres2010_WEB.pdf.
- _____ (2009), Challenges in Sustainable Consumption and Production, Mining, Transport, Chemicals and Waste Management. Report to the eighteenth Session of the Commission on Sustainable Development of the United Nations (LC/R.2161), Santiago, Chile.
- _____ (2008), *Structural Change and Productivity Growth - 20 Years Later. Old problems, new opportunities* (LC/G.2367(SES.32/3)), Santiago, Chile.
- ECLAC/FAO/IICA (Economic Commission for Latin America and the Caribbean/Food and Agriculture Organization of the United Nations/Inter-American Institute for Cooperation on Agriculture) (2010), *The Outlook for Agriculture and Rural Development in the Americas: A Perspective on Latin America and the Caribbean*, Santiago, Chile.
- ECLAC/UNDP/Club de Madrid/GTZ (Economic Commission for Latin America and the Caribbean /United Nations Development Programme/Club de Madrid/German Agency for Technical Cooperation) (2009), “Contribución de los servicios energéticos a los Objetivos de Desarrollo del Milenio y la mitigación de la pobreza en América Latina y el Caribe”, *Project Document*, No. 278 (LC/W.278-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- ECLAC/UNFPA (Economic Commission for Latin America and the Caribbean/United Nations Population Fund) (2009), “América Latina: una síntesis de los avances y desafíos de la implementación del Programa de Acción de la Conferencia Internacional sobre la Población y el Desarrollo, 1994-2009” (DDR/1), Regional Seminar on the Progress Made and Key Actions for the Implementation of the Cairo Programme of Action 15 years after its Adoption [online] http://www.eclac.org/publicaciones/xml/0/37380/Versionpreliminar_Sintesis_CIPD15_AL.pdf.
- FAO (Food and Agriculture Organization of the United Nations) (2011), *The State of Food and Agriculture 2010-11. Women in agriculture: closing the gender gap for development*, Rome.
- _____ (2010a), *The State of Food Insecurity in the World 2010. Addressing food insecurity in protracted crises*, Rome.
- _____ (2010b), *Panorama de la seguridad alimentaria y nutricional en América Latina y el Caribe 2010*, Santiago, Chile.
- _____ (2009), “From land grab to win-win. Seizing the opportunities of international investments in agriculture”, Economic and Social Perspectives Policy Brief, June [online] <ftp://ftp.fao.org/docrep/fao/011/ak357e/ak357e00.pdf>.
- Fay, M. and M. Morrison (2007), *Infrastructure in Latin America and the Caribbean. Recent Developments and Key Challenges*, Washington, D.C., World Bank
- Fernández, Diego and others (2009), “Contabilidad regulatoria, sustentabilidad financiera y gestión mancomunada: temas relevantes en servicios de agua y saneamiento”, *Recursos naturales e infraestructura series*, No. 146 (LC/L.3098-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).

- Fresco, Louise (2001), “Genetically modified organisms in food and agriculture: where are we? Where are we going?”, paper presented at the conference “Crop and Forest Biotechnology for the Future”, Royal Swedish Academy of Agriculture and Forestry Falkenberg, 16-18 September.
- Graziano da Silva, José, Sergio Gómez E. and Rodrigo Castañeda S. (eds.) (2009), *Boom agrícola y persistencia de la pobreza rural. Estudio de 8 casos*, Rome, Food and Agriculture Organization of the United Nations (FAO).
- Haddad, E., P. Aguilar and J.L. Nobre Gouveia (2010), “Emergencias ambientales tecnológicas y desastres naturales”, *Determinantes ambientales y sociales de la salud*, L. Galvao, J. Finkelman and S. Henao (eds.), Washington, D.C., Pan American Health Organization (PAHO).
- Ifoam (International Federation of Organic Agricultural Movements) (2010), *The World of Organic Agriculture* [online] http://www.ifoam.org/pdfs/World_of_OA_Teaser.pdf.
- ILO (International Labour Organization) (2010), *Labour Overview 2010. Latin America and the Caribbean*, Lima.
- _____ (2009a), *Empleos verdes. Programa de la OIT*, Geneva.
- _____ (2009b), *Empregos verdes no Brasil: quantos são, onde estão e como evoluirão nos próximos anos*, Brasília.
- IMF (International Monetary Fund) (2008), *Fuel and Food Price Subsidies: Issues and Reform Options*, Washington, D.C.
- ISDR (International Strategy for Disaster Reduction) (2011a), *2011 Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/download.html>.
- _____ (2011b), *Aligning Regional and Global Disaster Risk Reduction Agendas. Summary of Key Regional Political Commitments and Disaster Risk Reduction Priorities*, Geneva.
- _____ (2009) *Risk and Poverty in a Changing Climate. Summary and Recommendations: 2009 Global Assessment Report on Disaster Risk Reduction*, Geneva.
- Jordán, R. and R. Martínez (2009), “Pobreza y precariedad urbana en América Latina y el Caribe, situación actual y financiamiento de políticas y programas”, *Project Document*, No. 245 (LC/W.245), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Jouravlev, Andrei (2010), “Participación privada sustentable: perspectivas y experiencias”, *Project Document*, No. 332 (LC/W.332), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Katz, J. and G. Stumpo (2001), “Sectoral regimes, productivity and international competitiveness”, *CEPAL Review*, No. 75 (LC/G.2150-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Lindert, K. (2005), *Brazil: Bolsa Família Program. Scaling-up Cash Transfers for the Poor Update on Implementation of the Results Framework*, Brasília, World Bank [online] <http://www.mfdr.org/sourcebook/6-1brazil-bolsafamilia.pdf>.
- Linn, J.F. (2010), “Urban poverty in developing countries. A scoping study for future research”, Wolfensohn Center for Development, Washington, D.C., [online] http://www.brookings.edu/~media/Files/rc/papers/2010/06_urban_poverty_linn/06_urban_poverty_linn.pdf.
- Lupano, J. and R. Sánchez (2008), “Políticas de movilidad urbana e infraestructura urbana de transporte”, *Project Document*, No. 230 (LC/W.230-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Maldonado, C. (2006), “Turismo y comunidades indígenas: impactos, pautas para autoevaluación y códigos de conducta”, *Red de Turismo Sostenible Comunitario para América Latina (REDTURS) series*, Geneva, International Labour Organization (ILO).
- _____ (2005), “Pautas metodológicas para el análisis de experiencias de turismo comunitario”, *Red de Turismo Sostenible Comunitario para América Latina (REDTURS)*, Geneva, International Labour Organization (ILO).

- Maldonado, C. and F. Enríquez (2007), “Restaurando la esperanza con comunidades indígenas de Guatemala”, *Red de Turismo Sostenible Comunitario para América Latina (REDTURS)*, Geneva.
- Mansilla, E. (2011), “Riesgo urbano y políticas públicas en América Latina: La irregularidad y el acceso al suelo”, *2011 Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* [online] http://www.preventionweb.net/english/hyogo/gar/2011/en/bgdocs/GAR-2011/SP_GAR2011_Report_Frontmatter.pdf.
- Millennium Ecosystem Assessment (2005), *Ecosystems and Human Well-being: Synthesis*, Washington, D.C., Island Press.
- Ministry of Mines and Energy of Brazil (2010), “Luz para todos: Un marco histórico. 10 millones de brasileños salieron de la oscuridad. Programa luz para todos” [online] <http://luzparatodos.mme.gov.br/luzparatodos/Asp/publicacoes.asp>
- Ministry of Mines and Energy of Peru (2011), “Ley 29788, que modifica la ley 28258 de regalía minera; Ley 29789 que crea el impuesto especial a la minería; Ley 29790 que establece el marco legal del gravamen especial a la minería” [online] <http://www.minem.gob.pe/legislacionSector.php?idSector=1>.
- Núñez de León, J.P. (2011), “México y Reino Unido estrenan códigos para la construcción sostenible”, Construdata.com, 9 February.
- OHCHR/WHO (Office of the United Nations High Commissioner for Human Rights/World Health Organization) (2008), “El derecho a la salud”, *Folleto informativo*, No. 31, Geneva.
- OLADE (Latin American Energy Organization) (various issues), *Informe estadístico energético*.
- Oliner, S., D. Sichel and K. Stiroh (2007), “Explaining a productive decade”, *Brookings Paper on Economic Activity*, vol. 38, No. 2007-1.
- PAHO (Pan American Health Organization) (2011a), “PAHO-HSD/NC. Mortality database browser. Total deaths by country, year, sex, age group and causes of deaths” [online] http://new.paho.org/hq/index.php?option=com_content&task=blogcategory&id=2391&Itemid=2392.
- _____ (2011b), *Observatorio regional de la salud* [online] http://new.paho.org/hq/index.php?option=com_content&task=blogcategory&id=2395&Itemid=2523&lang=es [date of reference: 28 March 2011].
- _____ (2010a), *Promoting Health, Well-being and Human Security. Annual Report of the Director, 2010*, Washington, D.C.
- _____ (2010b), *Implementation of the Regional Strategy and Plan of Action for an integrated approach to the prevention and control of chronic diseases, including diet, physical activity and health* (CD50/INF/6 Annex F), Washington, D.C.
- _____ (2010c), *Health Situation in the Americas. Basic Indicators 2011*, Washington, D.C.
- _____ (2009a), *Annual Report of the Director 2009. Advancing toward Health for All: Progress in Primary Health Care in the Americas*, Washington, D.C.
- _____ (2009b), Resolution CD49.R19. Elimination of neglected diseases and other poverty-related infections (CD49.R19 (Esp.)), Washington, D.C.
- _____ (2009c), *Informe sobre el estado de la seguridad vial en la región de las Américas*, Washington, D.C.
- _____ (2008a), *El informe de la situación del paludismo en las Américas 2008* [online] http://new.paho.org/hq/index.php?option=com_content&task=view&id=2459&Itemid=2000.
- _____ (2008b), *Regional Program of Action and Demonstration of Sustainable Alternative to DDT for Malaria Vector Control in Mexico and Central America*, Washington, D.C.
- _____ (2007), *Health in the Americas 2007*, Washington, D.C.
- Pérez, G. and R. Sánchez (2010), “Convergence and divergence of transport and mobility policies in Latin America: lack of urban co-modality”, *FAL Bulletin*, No. 289, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), September.

- Perroti, D.E. and R. Sánchez (2011), “La brecha de infraestructura en América Latina y el Caribe”, *Recursos naturales e infraestructura series*, No. 154, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), forthcoming.
- Poschen, P. (2007), “Green jobs: climate change in the world of work”, *World of Work*, No. 60, August).
- Romieu, I. and others (2010), “La contaminación atmosférica en las Américas: tendencias, políticas y efectos”, *Determinantes ambientales y sociales de la salud*, L. Galvao, J. Finkelman and S. Henao (eds.), Washington, D.C, McGrawHill Interamericana Editores/Pan American Health Organization (PAHO).
- Ros, Jaime (2009), “Poverty reduction in Latin America: the role of demographic, social and economic factors”, *CEPAL Review*, No. 98 (LC/G.2404-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), August.
- Rozas, P. and R. Sánchez (2004), “Desarrollo de infraestructura y crecimiento económico: revisión conceptual”, *Recursos naturales e infraestructura series*, No. 75 (LC/L.2182-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Sánchez, A. F. and J. Lardé (2006), “Minería y competitividad internacional en América Latina”, *Recursos naturales e infraestructura series*, No. 109 (LC/L.2532-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Sánchez, R. and G. Wilmsmeier (2005), “Provisión de infraestructura de transporte en América Latina: experiencias recientes y problemas observados”, *Recursos naturales e infraestructura series*, No. 94 (LC/L.2360-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Schipper, L. and others (2009), “Considering climate change in Latin American and Caribbean urban transportation: Concepts, applications, and cases. Final report”, Center for Global Metropolitan Studies, University of California, Berkeley.
- SEDESOL (Secretariat of Social Development of Mexico) (2008), “Evaluación externa del programa Oportunidades 2008”, *A diez años de intervención en zonas rurales (1997-2007)* [online] http://www.oportunidades.gob.mx/EVALUACION/es/convenio_ciesas_2008.php.
- Smith, P. and others (2007), “Agriculture”, *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press.
- Stallings, B. and W. Peres (2000), *Crecimiento, empleo y equidad. El impacto de las reformas económicas en América Latina y el Caribe*, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/Fondo de Cultura Económica (FCE).
- Sunkel, O. (1990), “El difícil contexto internacional para un desarrollo sustentable”, *Diálogo con “Nuestro futuro común”: perspectivas latinoamericanas del informe Brundtland*, Mexico City, Friedrich Ebert Foundation-Mexico.
- _____ (1985), “Dívida, desenvolvimento e meio-ambiente”, *Espaços & Debates. Revista de Estudos Regionais e Urbanos*, year 5, No. 16, Campinas.
- UN-Habitat (United Nations Human Settlements Programme) (2011), *Affordable Land and Housing in Latin America and the Caribbean*, forthcoming.
- _____ (2010), *State of the World's Cities, 2010-2011: Bridging the Urban Divide*, Nairobi, Earthscan.
- _____ (2009), *Planning Sustainable Cities. Global Report on Human Settlements 2009*, Nairobi.
- UNAIDS (Joint United Nations Programme on HIV/AIDS) (2011a), “Análisis regional consolidado de los informes UNGASS presentados por 17 países de América Latina en 2010” [online] <http://laccaso.net/publicaciones/informes/?id=14>.
- _____ (2011b), *World AIDS Day Report, 2011. How to Get to Zero: Faster. Smarter. Better* [online] http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/JC2216_WorldAIDSday_report_2011_en.pdf.

- UNAIDS/PAHO/UNICEF (Joint United Nations Programme on HIV/AIDS/Pan American Health Organization/United Nations Children's Fund)(2011), "Análisis regional consolidado de los informes UNGASS presentados por 17 países de América Latina en 2010" [online] <http://laccaso.net/publicaciones/informes/?id=14>.
- UNCRD (United Nations Centre for Regional Development) (2011a), *Biodiversity and Human Security. Analysis on the linkages and the potential approach toward sustainable regional development (Draft)*.
- _____ (2011b), "Guía conceptual y metodológica sobre principios generales para apoyar procesos de integración y desarrollo territorial de aplicación en América latina y el Caribe", Consulting final paper, July, unpublished.
- _____ (2010a), *Seguridad humana y desarrollo regional en Bogotá y Cundinamarca*, Bogota, Bogota-Cundinamarca Regional Planning Board.
- _____ (2010b), "Hacia una agenda territorial frente a Río + 20", unpublished.
- _____ (2005), *De las ciudades a las regiones. Desarrollo regional integrado en Bogotá-Cundinamarca. Volumen 1: Soporte técnico*, Bogota, Bogota-Cundinamarca Regional Planning Board.
- _____ (2000), "Seguridad humana y desarrollo regional en América Latina", *UNCRD Research Report Series*, No. 44.
- UNCRD/INTA (United Nations Centre for Regional Development/International Urban Development Association) (2010), "Una 'lectura' de la región capital desde la óptica de la seguridad territorial y la adaptación al cambio climático", *Informe final del Panel Internacional para el Fortalecimiento de la Dimensión Regional, Fiscal y Tributaria en el Ordenamiento Territorial de la Región Capital Bogotá-Cundinamarca* [online] <http://es.scribd.com/doc/38701537/Reporte-Panel-Region-Capital-UNCRD-INTA>.
- UNDP (United Nations Development Programme) (2010a), *Informe regional sobre desarrollo humano para América Latina y el Caribe 2010*.
- _____ (2010b) "Informes sobre desarrollo humano. Perspectiva general. La verdadera riqueza de las naciones: caminos al desarrollo humano" [online] <http://hdr.undp.org/es/informes/mundial/idh2010/resumen/>.
- UNEP (United Nations Environment Programme) (2010), *Perspectivas del medio ambiente: América Latina y el Caribe* (GEO ALC 3).
- UNEP/CEGESTI (United Nations Environment Programme / Technology Management Center of Costa Rica) (2009), "Consumo y producción sustentable (CPS). Estado de avances en América Latina y el Caribe" [online] http://www.redpys.net/MD_upload/redpys_net/File/Reuniones_Regionales/Reunion%20Colombia/informe%20cps%20alc%202009-28%20agosto%2009.pdf.
- UNEP/ILO (United Nations Environment Programme/International Labour Organization) (2008), *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, Nairobi.
- UNEP/UNWTO (United Nations Environment Programme/World Tourism Organization) (2011), *Tourism: Investing in Energy and Resource Efficiency. Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* [online] http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_11_Tourismpdf.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2011), "Temas educativos centrales en América Latina y el Caribe. Borrador, No. 2", paper presented at the regional ministerial meeting "Key education challenges in Latin America and the Caribbean: teachers, quality, and equity", Buenos Aires, 12- 13 May, UNESCO Regional Office for Education in Latin America and the Caribbean (OREALC) [online] http://www.orealc.cl/informe-ept-2011/wp-content/blogs.dir/5/files_mf/temaseducativo2web.pdf.
- United Nations (2010a), *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).

- _____ (2010b), *Achieving the Millennium Development Goals with Equality in Latin America and the Caribbean: Progress and Challenges* (LC/G.2460), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- _____ (1996), “Platform for Action”, Report of the Fourth World Conference on Women (A/CONF.177/20/Rev.1), New York [online] <http://www.un.org/womenwatch/daw/beijing/pdf/Beijing%20full%20report%20S.pdf>.
- UNWTO (World Tourism Organization) (2011), *World Tourism Barometer*, vol. 9, No. 1 [online] www.unwto.org/facts/menu.html.
- Weller, Jürgen (2000), *Reformas económicas, crecimiento y empleo: los mercados de trabajo en América Latina*, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/Fondo de Cultura Económica.
- WFP (World Food Programme) (2010), *VIH y nutrición: apoyando el acceso universal al tratamiento, atención, apoyo y la prevención del VIH en América Latina y el Caribe*, El Dorado, Panamá [online] http://es.wfp.org/sites/default/files/VIH_y_Nutricion.pdf.
- WHO (World Health Organization) (2010a), “Report from the 2009 Inter-American Conference on Onchocerciasis: progress towards eliminating river blindness in the region of the Americas”, *Weekly Epidemiological Record*, No. 85, Geneva.
- _____ (2010b), “Global programme to eliminate lymphatic filariasis”, *Weekly Epidemiological Record*, No. 85, Geneva.
- _____ (2010c), *Global Tuberculosis Control*, Geneva.
- _____ (2005), “Ecosystems and Human Well-Being. Health Synthesis” [online] <http://www.who.int/globalchange/ecosystems/ecosys.pdf> [date of reference: 29 March 2011].
- WHO/UNICEF (World Health Organization/United Nations Children’s Fund) (2010), *Progress on Sanitation and Drinking Water. 2010 Update*, Geneva.
- WHO/UNICEF/UNAIDS (World Health Organization/United Nations Children’s Fund /Joint United Nations Programme on HIV/AIDS) (2011), *Global HIV/AIDS Response. Epidemic Update and Health Sector Progress towards Universal Access. Progress Report 2011*, Geneva.
- _____ (2010), *Towards Universal Access: Scaling up Priority HIV/AIDS Interventions in the Health Sector. Progress Report 2010*, Geneva.
- Willer, Helga and Lukas Kilcher (eds.) (2010), *The World of Organic Agriculture – Statistics and Emerging Trends 2010*, Bonn, International Federation of Organic Agricultural Movements (IFOAM).
- Wong, L.R. and J.A. Carvalho (2006), “Age-structural transition in Brazil: demographic bonuses and emerging challenges”, *Age-Structural Transitions: Challenges for Development*, I. Pool and L.R. Wong (eds.), Paris, Committee for International Cooperation in National Research in Demography (CICRED).
- WRI (World Resources Institute) (2009), “COP15 brochure” [online] http://cait.wri.org/downloads/CAIT_7.0_COP15.pdf.

Chapter II

STRENGTHENING THE ENVIRONMENTAL PILLAR

In 1992, the environmental pillar was the weakest of the three pillars of sustainable development, reflected in the importance placed by the Rio Declaration on Environment and Development on strengthening it in a number of areas: legislation and policies on the environment and responsibility for damage; the precautionary approach; internalization of environmental costs; the polluter pays principle; and environmental impact assessment (see table II.1). Since then, Latin American and Caribbean countries have made significant progress with environmental management. There has been a proliferation and consolidation of public, private and civil society institutions working in the field of the environment and progress has been made in the areas of public policy and private-sector initiatives, development of environmental legislation and access by countries in the region to international environmental agreements, as well as their participation in international and regional sustainable development institutions, which have served as forums for addressing environmental issues in an integrated way with development issues (see table II.1 and box II.1). This chapter reviews some of these legislative and institutional advances (see section A) and the evolution of a number of environmental issues that are highly relevant to the region (see section B), starting with the subjects of the two conventions concluded in 1992: the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity.

PRINCIPLES OF THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT

- 2 States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.
- 11 States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.
- 13 States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.
- 15 In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- 16 National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.
- 17 Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

Table II.1
RATIFICATION OF MULTILATERAL ENVIRONMENTAL AGREEMENTS^a

	Antigua and Barbuda	Argentina	Bahamas	Barbados	Belize	Bolivia (Plurinational State of)	Brazil	Chile	Colombia	Costa Rica	Cuba	Dominica	Ecuador	El Salvador	Grenada	Guatemala	Guyana	Haiti	Honduras	Jamaica	Mexico	Nicaragua	Panama	Paraguay	Peru	Dominican Republic	Saint Kitts and Nevis	Saint Vincent and the Grenadines	Saint Lucia	Suriname	Trinidad and Tobago	Uruguay	Venezuela (Bolivarian Republic of)		
United Nations Framework Convention on Climate Change (1992)	1993	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1993	1993	1995	1994	1995	1994	1994	1996	1995	1993	1995	1995	1994	1993	1998	1993	1996	1993	1997	1994	1994	1994		
Convention on Biological Diversity (1992)	1993	1994	1993	1993	1993	1994	1994	1994	1994	1994	1994	1994	1993	1994	1994	1995	1994	1994	1996	1995	1993	1995	1995	1994	1993	1996	1993	1996	1996	1996	1996	1996	1993	1994	
Convention on the Conservation of Migratory Species of Wild Animals (1979)	2007	1992			2003	2003		1983	2007	2008	2008	2004											1989	1999	1997							1990			
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)	1997	1981	1979	1992	1986	1979	1975	1975	1981	1975	1990	1995	1975	1987	1999	1979	1976	1976	1985	1997	1991	1977	1978	1976	1975	1986	1994	1988	1980	1984	1984	1975	1977		
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1971)	2005	1992	1997	2005	1998	1990	1993	1981	1998	1991	2001	1990	1990	1999	1990	1990			1993	1997	1986	1997	1990	1995	1992	2002	1985	1985	1985	1992	1984	1988			
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)	1993	1991	1992	1995	1997	1996	1992	1992	1996	1995	1994	1998	1993	1991		1995	2001		1995	2003	1991	1997	1991	1995	1993	2000	1994	1996	1993	1994	1991	1998			
Stockholm Convention on Persistent Organic Pollutants (2001)	2003	2005	2005	2004	2010	2003	2004	2005	2008	2007	2007	2003	2004	2008	2008	2008	2007	2007	2005	2007	2003	2005	2003	2004	2005	2007	2004	2005	2002	2002	2004	2005	2005	2005	
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)																																			
Vienna Convention for the Protection of the Ozone Layer (1985)	1992	1990	1993	1992	1997	1994	1990	1990	1990	1991	1992	1993	1990	1992	1993	1987	1993	1993	2000	1993	1987	1993	1989	1992	1989	1993	1992	1996	1993	1997	1989	1989	1988	1988	
United Nations Convention to combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (1994)	1997	1997	2000	1997	1998	1996	1997	1997	1999	1998	1997	1997	1995	1997	1997	1998	1997	1997	1996	1997	1995	1998	1996	1997	1995	1997	1997	1998	1997	2000	2000	1999	1998	1998	

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

^a The lighter shading indicates agreements ratified since 1992. The darker shading indicates agreements ratified before that date. Boxes without a date indicate that the agreement concerned has not been ratified by the country in that column. Date of revision: October 2011.

Box II.1

**LATIN AMERICA AND THE CARIBBEAN IN INTERNATIONAL AND REGIONAL FORUMS
ON THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

United Nations Commission on Sustainable Development (CSD): Latin American and Caribbean countries have participated actively in CSD since its establishment in 1992. At its thirtieth session held in San Juan in 2004, the Economic Commission for Latin America and the Caribbean (ECLAC) decided to create a Regional Implementation Forum on Sustainable Development feeding into the two-year cycle of CSD Meetings on Regional Implementation of the Johannesburg Summit, pursuant to the Summit mandate to the Regional Commissions.^a

Forum of Ministers of the Environment of Latin America and the Caribbean: Established in 1982 under the Secretariat of the United Nations Environment Programme (UNEP), the Forum brings together the region's 33 environment ministers or equivalent and heads of environment agencies or committees, who meet regularly to agree joint positions before global organizations and to conclude regional cooperation agreements. The Forum has a regional action plan that serves as an important cooperation platform.

Latin American and Caribbean Initiative for Sustainable Development (ILAC): ILAC was adopted in 2002 by the Governments of Latin America and the Caribbean within the framework of the World Summit on Sustainable Development in Johannesburg. Its main objective is to assess progress and take effective action towards sustainable development in countries of the region. In 2003, the Forum decided to support a project for producing national environmental indicators, as well as any economic, social and institutional indicators required to assess progress in implementing ILAC.

Meeting of Ministers and High-level Authorities of the Housing and Urban Development Sector in Latin America and the Caribbean (MINURVI): MINURVI is the main entity facilitating intergovernmental coordination and cooperation among the countries of Latin America and the Caribbean in the area of sustainable development of human settlements. It has prioritized improving the urban environment and reducing environmental vulnerability as a key focus of its work. At its most recent meeting held in Asunción in September 2011, MINURVI agreed to promote the development of territorial sustainable development policies with a view to creating synergies among the environmental, economic and social aspects and highlighting the environmental and social costs. It also agreed to appoint Argentina as Permanent Technical Secretariat with technical support and coordination provided by ECLAC and the United Nations Human Settlements Programme (UN-HABITAT).

Central American Commission on Environment and Development (CCAD): Established in 1989 as part of the Central American Integration System (SICA), it has acquired great importance as a subregional forum for environment ministers or equivalent authorities. Based on joint positions, a series of agreements for the subregion were proposed in such areas as biological diversity, hazardous waste and forests, which are accompanied by a portfolio of environmental projects and a successful financial strategy.

Southern Common Market (MERCOSUR): Established in 1991 by Argentina, Brazil, Paraguay and Uruguay to promote the integration of the States Parties, since 1996 it has included a subworking group on environment. It adopted a Framework Agreement on the Environment with a corresponding action plan, as well as cooperation initiatives on specific issues.

Caribbean Community (CARICOM): CARICOM was established in 1973 to stimulate economic cooperation within the Caribbean common market, forge closer political and economic relations between Member States and promote educational, cultural and industrial cooperation between CARICOM countries. Since its establishment, CARICOM has led projects in such areas as renewable energy development, climate change adaptation and food safety.

Association of Caribbean States (ACS): The Convention establishing ACS was signed on 24 July 1994 in Cartagena, Colombia, with the aim of promoting consultation, cooperation and concerted action among all the countries of the Caribbean. It comprises 25 Member States and three Associate Members. Eight other non-independent Caribbean countries are eligible for associate membership. There are five special committees on trade development and external economic relations; sustainable tourism; transport; natural disasters; and budget and administration.

Andean Community: In 1999 it approved the establishment of the Andean Committee of Environmental Authorities, as a forum for dialogue and consensus-building on the environment.

Box II.1 (concluded)

Union of South American Nations (UNASUR): Established on 23 May 2008 in Brasilia, UNASUR has included in its agenda cooperation on natural disasters and protection of natural resources.

Summits of the Americas: Under the auspices of the Organization of American States (OAS), since the very first summit in Miami in 1994, all summits have discussed the agenda for sustainable development.

Ibero-American Summits: Held every year since 1991, they are attended by the Heads of State and Government of the countries comprising the Ibero-American Community. In the Declaration signed at the XXI Summit held in Asunción in October 2011, the countries agreed to implement a land management policy that includes the development of public sector sustainable development strategies across the various levels of government and the participation of local actors and citizens, taking into account geographical, cultural and sociodemographic conditions. Each country will decide how to implement the decisions taken.

Community of Latin American and Caribbean States (CELAC): Comprising the 33 countries of the region, CELAC was established in Caracas in December 2011 as the successor to the Rio Group and the Latin American and Caribbean Summit on Integration and Development. It serves as a mechanism for political coordination, cooperation and integration among Latin American and Caribbean States. In the Caracas Declaration, the countries expressed the need to continue joining forces and building capacities to promote sustainable development in the region, focusing efforts on strengthening political, economic, social and cultural integration and cooperation. In the Caracas Action Plan the countries agreed to convene a meeting of environment ministers before the United Nations Conference on Sustainable Development (Rio+20) to follow up on the agreements made under the Caracas Ministerial Environmental Declaration and contribute to the success of the Conference.

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Environment Programme (UNEP), *The Sustainability of Development in Latin America and the Caribbean: challenges and opportunities*, Libros de la CEPAL series, No. 68 (LC/G.2145/Rev.1-P/I), Santiago, Chile, 2002. United Nations publication, Sales No. E.02.II.G.48; R. Quiroga, “Indicadores ambientales y de desarrollo sostenible: avances y perspectivas para América Latina y el Caribe”, Manuales series, No. 55 (LC/L.2771-P), Santiago, Chile, ECLAC, 2007; official websites of the respective organizations and forums.

^a The documents produced in preparation for the regional meetings of the CSD process are available at www.cepal.org/ddisah.

A. LEGISLATION, INSTITUTIONS AND INSTRUMENTS

1. Environmental legislation and institutions

Environmental rights and obligations have now been enshrined in the constitutions of most Latin American and Caribbean countries. In addition, all countries in the region have enacted general or framework laws on the environment, some of which have already been reformed. A large body of supplementary legislation incorporating instruments and principles in the Rio Declaration has subsequently been added to these general laws (see table II.2). As mentioned in chapter I, some countries have adopted national environmental strategies, or have incorporated an environmental component into their national development plans. However, environmental institutions are still finding it difficult to secure that the environment is represented in public budgets (United Nations, 2010).

Table II.2
LATIN AMERICA AND THE CARIBBEAN (14 COUNTRIES): ENVIRONMENTAL FRAMEWORK LAWS, LEGISLATION ON ENVIRONMENTAL IMPACT ASSESSMENT, LEGAL DEFINITION OF ENVIRONMENTAL DAMAGE AND INCORPORATION OF THE PRINCIPLE OF PARTICIPATION IN ENVIRONMENTAL LAW-MAKING

Country	Environmental framework laws	Has legislation on environmental impact assessment	Has a legal definition of environmental damage	Incorporates the principle of participation in environmental law-making
Argentina	Law 25675 (2002)	X	X	X
Brazil	Law 6938 (1981)	X	X	X
Chile	Law 19300 (1994)	X	X	X
Colombia	Law 99 (1993)	X	X	X
Costa Rica	Framework law on the environment (1995)	X	X	X
Cuba	Law 81 (1997)	X	X	X
Ecuador	Law on environmental management (1999)	X	X	X
El Salvador	Law on the environment (1988) and related regulations	X	X	X
Guatemala	Law 68-86 (1986)	X	–	X
Haiti	Decree on environmental management for sustainable development (2001)	X	–	–
Nicaragua	Law 217 (1996)	X	X	X
Panama	Law 41 (1998)	X	–	X
Peru	Law 28611 (2005)	X	X	X
Dominican Republic	Law 64-00 (2000)	X	X	X
Uruguay	Law 17283 (2000)	X	X	X

Source: Economic Commission for Latin America and the Caribbean (ECLAC) on the basis of United Nations Environment Programme (UNEP), “Derecho y políticas ambientales. Legislación por países”, 2009 [online] www.pnuma.org/deramb/legislacionporpaíses.php?menusup=8&menuinf=3.

Since 1992 there has also been a steep increase in the number of national institutions devoted to the environment or to sustainable development. All countries in the region now have a ministry, secretariat or equivalent devoted to the environment and, in some cases, they are linked to related issues, such as agriculture, housing, energy or natural resources (see table II.3). However, many of these organizations are given lower priority than other areas of public policy, including in the allocation of financial and human resources. Indeed, public spending on the environment as a percentage of GDP did not exceed 1% throughout the first decade of this century (United Nations, 2010).¹ This applies not only to the national level, but also the State and provincial levels. Local authorities have a crucial role to play in environmental management, as the sphere of action for many environmental problems is local. Local authorities are recognized explicitly in Agenda 21 (see chapter III).

¹ As a reference, in member countries of the Organization for Economic Cooperation and Development (OECD) public spending on the environment represents between 1% and 2% of GDP (United Nations, 2010).

Table II.3
LATIN AMERICA AND THE CARIBBEAN: HIGHEST ENVIRONMENTAL AUTHORITIES

Country	Highest authority
Antigua and Barbuda	Ministry of Agriculture, Lands, Housing and the Environment
Argentina	Secretariat of Environment and Sustainable Development
Bahamas	Ministry of the Environment
Barbados	Ministry of Environment and Drainage
Belize	Ministry of Natural Resources and the Environment
Bolivia (Plurinational State of)	Ministry of Environment and Water
Brazil	Ministry of the Environment
Chile	Ministry of the Environment
Colombia	Ministry of Ministry of the Environment , Housing and Territorial Development
Costa Rica	Ministry of the Environment, Energy and Telecommunications
Cuba	Ministry of Science, Technology and the Environment
Dominica	Ministry of Environment, Natural Resources, Physical Planning and Fisheries
Dominican Republic	Ministry of Environment and Natural Resources
Ecuador	Ministry of the Environment
El Salvador	Ministry of the Environment and Natural Resources
Grenada	Ministry of the Environment, Foreign Trade and Export Development
Guatemala	Ministry of the Environment and Natural Resources
Guyana	Environmental Protection Agency
Haiti	Ministry of the Environment
Honduras	Secretariat of Natural Resources and the Environment
Jamaica	Ministry of Land and the Environment
Mexico	Secretariat of the Environment and Natural Resources
Nicaragua	Ministry of the Environment and Natural Resources
Panama	National Authority for the Environment
Paraguay	Secretariat of the Environment
Peru	Ministry of the Environment
Saint Kitts and Nevis	Ministry of Finance, Sustainable Development and Human Resource Development
Saint Lucia	Ministry of Physical Development, Environment and Housing
Saint Vincent and the Grenadines	Ministry of Health and the Environment
Suriname	National Institute for Environment And Development
Trinidad and Tobago	Ministry of Planning, Housing and the Environment
Uruguay	Ministry of Housing, Land-Use Planning and Environment (National Environment Directorate)
Venezuela (Bolivarian Republic of)	Ministry of People's Power for the Environment

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Environment Programme (UNEP) [online] www.pnuma.org/deramb/legislacionporpais.php?menusup=8&menuinf=3; and websites of the respective environment ministries and secretariats.

As mentioned in the previous chapter, in many countries of the region, public policies and decisions relating to the environment are poorly coordinated and inconsistent, meaning that, while significant efforts are being made to enhance the environment, policies (such as subsidizing fossil fuels) that allow inefficient behaviour to continue or exacerbate problems that environmental legislation is seeking to resolve, remain in force.

The difficulty of ensuring coordinated, consistent policies can be blamed at least partly on information failures that lead to inappropriate resource allocation (see chapter III on environmental statistics). Environmental protection objectives are usually treated separately—and ranked differently—from other public policy objectives (growth, employment or poverty reduction) mainly because the vital role played by the environment in sustaining economic activity and long-term prosperity is not fully recognized. The costs to the environment and human health in the short term are numerous (United Nations, 2010).

In recent years there have been some successful experiences with policy coordination through committees and other means of grouping institutions, which bring together a number of government entities to address specific issues. Examples include the Inter-ministerial Commission on Climate Change (CICC) in Mexico (see chapter VI) and the National Sustainable Development Commission in Barbados.

There have also been some noteworthy experiences in the region relating to coordination of actions among different political units. In Brazil, the Constitution provides that states may group together to form metropolitan regions, urban agglomerations and microregions to carry out public functions of common interest. In addition, the law defining the national policy on water resources stipulates that the river basin—as opposed to the municipality—is the territorial unit responsible for implementing this policy and creates river basin committees to that end. A 2005 law also provides for the possibility of establishing inter-municipal consortiums for the management of certain matters. These include the inter-municipal consortium for the sustainable development of the trans-Amazonian and Xingu regions (IPAM, 2011). Another noteworthy initiative is the municipal partnerships in Colombia (see chapter III).

2. Experience with the use of economic instruments for environmental management

Since the 1990s, several countries in the region have introduced economic instruments to complement the direct regulation strategies that characterize the environmental legal framework. These instruments include taxes, charges for the use of natural resources and on emissions, subsidies, tax credits, fiscal incentives and special financial facilities for activities with positive environmental externalities, tradable permits and certification.

However, an analysis of these experiences has shown that environmental authorities have encountered a number of barriers in implementing these instruments, including unfavourable institutional environments and public policy coordination problems (Acquatella, 2001; Acquatella and Bárcena, 2005). A high percentage of the economic instruments developed were implemented for only a short time or not at all (Acquatella, 2009).

Two of the factors that may have influenced these outcomes are: (i) limited cooperation from fiscal authorities and (ii) the high transaction costs involved in coordinating the implementation of economic instruments across bureaucratic sectors (tax and environmental authorities) and levels of government (central environmental authorities and municipal, provincial or other authorities) (Acquatella, 2009). Two patterns are in evidence: the emergence of resistance within the tax system to the introduction of environmental goals and the existence of incentives that undermine the effectiveness of environmental incentives.

It is difficult, in practice, to implement economic instruments aligned with environmental goals and to integrate them into existing fiscal structures and sectoral policy incentives (such as energy, transport or agriculture). The economic incentives that environmental regulators can manipulate directly are relatively modest signals. If the underlying fiscal structure determining end-user costs is stacked in the opposite direction, there is little possibility of installing a net marginal effect that can function as an effective environmental incentive.

The same applies to the incentive structure implicit in certain trade policies (such as the importation of used cars or low-efficiency refrigeration equipment) and in policies for promoting investment in environmentally sensitive sectors (such as mining) when they fail to internalize the environmental costs of trade and investment decisions. There is an obvious need for greater overall policy coherence across fiscal, trade, investment and environmental arenas. All the more so as the region's current pattern of insertion in the global economy depends on the sustainable management of their natural resource endowments.

The result of not incorporating environmental costs fully is that activities that pollute or degrade the environment and damage health become more profitable than they would be if their costs were paid in full. The failure to do so means that these costs are actually being paid by those affected (in the form of poor health and health-care costs or production losses) and therefore price signals are incorrect for sustainable development. Apart from price signals, there are shortcomings in methodologies for evaluating public and private investments, which exclude environmental and health costs.

B. PROGRESS WITH SPECIFIC ENVIRONMENTAL ISSUES

1. Climate change

Climate change is a key item on Latin American and Caribbean public agendas because of the impact that it is expected to have and due to the region's contribution to greenhouse gas (GHG) emissions.

(a) The impact of climate change in the region

By 2050 climate change is expected to have a significant impact on fragile ecosystems (such as mangroves, glaciers and coral reefs) and the production sectors (especially agriculture) in association with extreme weather events. It is also expected to take a heavy socioeconomic toll, especially in Central America and the Caribbean (see map II.1). The estimated costs of damage caused by extreme weather events in Latin America and the Caribbean over the past 10 years are in excess of US\$ 40 billion (see figure II.1). Climate change therefore represents a new challenge to the region's development.

According to the special report of the Intergovernmental Panel on Climate Change (IPCC) on managing the risks of extreme events and disasters to advance climate change adaptation (IPCC, 2011), exposure and vulnerability are key determinants of disaster risk and climate impacts. Exposure and vulnerability are dynamic, differing in timing and location, and they depend on cultural, economic, social, geographic, demographic, institutional, governance and environmental factors.

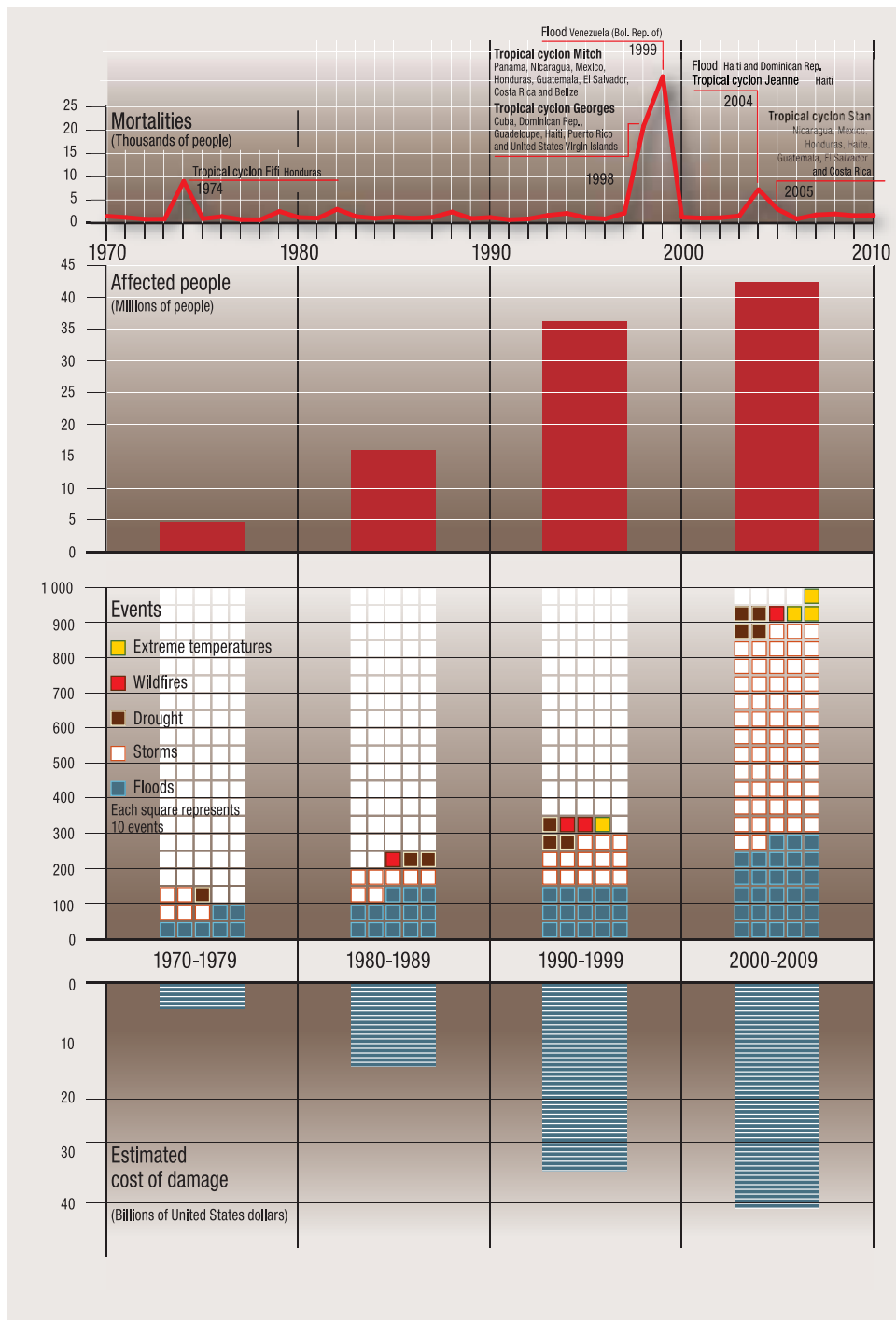
Map II.1
**LATIN AMERICA AND THE CARIBBEAN: AREAS MOST VULNERABLE TO CLIMATE CHANGE
 ACCORDING TO ITS EXPECTED IMPACTS BY 2050**



Source: United Nations Environment Programme (UNEP)/Economic Commission for Latin America and the Caribbean (ECLAC), *Vital Climate Change Graphics for Latin America and the Caribbean 2010* [online] www.grida.no/publications/vg/lac2/.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

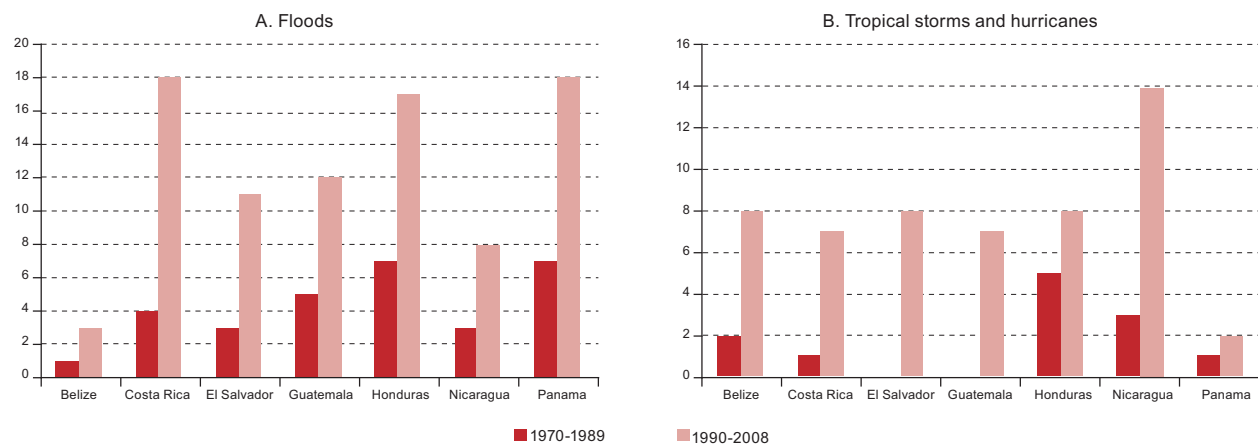
Figure II.1
LATIN AMERICA AND THE CARIBBEAN: HYDROMETEOROLOGICAL EVENTS, 1970-2009



Source: United Nations Environment Programme (UNEP)/Economic Commission for Latin America and the Caribbean (ECLAC), *Vital Climate Change Graphics for Latin America and the Caribbean*, 2010 [online] www.grida.no/publications/vg/lac2/, on the basis of Catholic University of Louvain, “EM-DAT, The OFDA/CRED International Disaster Database” [online] www.cred.be/emdat/intro.html.

In Central America, which includes some of the countries in the region that are most vulnerable to climate change, the frequency of floods has doubled in the past two decades (1990-2008) compared with the period 1970-1989. The frequency of tropical storms and major hurricanes has also increased significantly, striking countries that were unaffected or hardly affected between 1970 and 1989 (see figure II.2) (ECLAC, 2010b).

Figure II.2
CENTRAL AMERICA: MAIN EXTREME WEATHER EVENTS, 1970-2008
(Number of recorded events)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *The Economics of Climate Change in Central America. Summary 2010* (LC/MEX/L.978), Mexico City, ECLAC subregional headquarters in Mexico.

The increasing incidence of extreme weather events will have by far the greatest impact on the lives, livelihoods and assets of the poorest sectors of the population. Table I.4 in chapter I showed the magnitude of the impact of disasters in the past 40 years. Risk management targeting the most disadvantaged groups, which are more vulnerable to risk, is closely related to the fight against poverty. It is estimated that the costs would be particularly high in countries with the worst urban deprivation and high dependency on agriculture. In Central America, the agriculture sector is a driver of the economy, representing 18% of total GDP including agro-industry, and will be one of the sectors most affected by climate change. According to initial estimates aggregated for the region, not including the effect of adaptation measures, under the trend scenario for GHG emissions (scenario A2 of the Intergovernmental Panel on Climate Change (IPCC)), by 2100 the agricultural index could have fallen by around 9%. Of particular concern are estimates of possible large reductions in the production of staple grains, such as maize and beans, with a knock-on effect on food safety and the livelihoods of small farmers (ECLAC, 2010b). In many Caribbean countries, agriculture also plays a very important role and their geographical situation means that these countries will be severely exposed to the impact of climate change on agriculture, compounded by the effect of a possible rise in sea level.

Box II.2 describes some of the potential effects of climate change on key economic sectors in the region.

Box II.2

LATIN AMERICA AND THE CARIBBEAN: PROJECTED TRENDS IN PRIMARY PRODUCTION CAPACITY AS A RESULT OF CLIMATE CHANGE

Studies predict major changes in the region's agricultural, forestry and aquaculture production capacity as a result of climate change. In particular, they suggest that agricultural productivity in South America could fall by between 12% and 50% by 2100. In Mexico, there could be an even greater loss of economic productivity in 30% to 85% of farms. In Brazil, an 18% drop in agricultural productivity would increase the country's rural poverty by 3.2 percentage points (De La Torre, Fajnzylber and Nash, 2008).

Agriculture	Forestry	Fisheries and aquaculture
Increased yields of some crops (soy bean, wheat) in temperate zones (such as south-east Latin America), as well as some permanent crops.	Tropical forests are likely to be harder hit by changes in water availability in the soil (seasonal drought, soil erosion and nutrient losses) and by CO ₂ fertilization than by high temperatures.	More frequent storms, hurricanes and cyclones will affect fisheries and aquaculture in coastal communities, especially in the Caribbean subregion.
One-third drop in productivity in tropical and subtropical regions as a result of increased heat stress and drier soils.	Trend towards the 'savannization' of the eastern Amazon. A higher risk of forest loss in Central America and the Amazon.	Reduced water availability resulting from the shrinking of some Andean glaciers could affect some aquaculture production technologies.
Increased salinization and desertification of agricultural land in arid zones (central and northern Chile and north-east Brazil).	More frequent wildfires in the Amazon.	The distribution of some fish species in tropical and subtropical seas could move southwards.
More frequent floods and droughts will affect production. Rain-fed agriculture in semi-arid zones will face a growing risk of crop losses.	More surface runoff in north-western parts of South America and less runoff in Central America.	Primary production in the tropical Pacific could fall owing to increased stratification and reduced nutrient availability.
Irrigation will be threatened by salinization, increased flooding and rising sea levels.	A longer dry season will make it harder for forests to become re-established.	Low-lying areas could suffer the effects of rising sea levels, which would alter the morphology of coastal areas, coral reefs and mangroves, as well as the location of fish.
In temperate zones, rangeland productivity could increase, benefiting livestock production.	The risk of wildfires is likely to increase. Mangroves will be endangered in many parts of the Caribbean and in parts of Central America and South America.	

Source: Food and Agriculture Organization of the United Nations (FAO), "Climate change implications for fisheries and aquaculture. Overview of the current scientific knowledge", *Fisheries and Aquaculture Scientific Paper*, No. 530, 2009; Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, 2007; A. De la Torre, P. Fajnzylber and J. Nash, *Desarrollo con menos carbono: respuestas latinoamericanas al desafío del cambio climático*, Washington, D.C., World Bank, 2008.

Importantly, disaster reduction and adaptation policies are most effective and influential when they are at the centre of national development planning and the responsibility of central planning institutions. Financing for adaptation should be used to strengthen risk management and the capacities of developing countries (ISDR, 2010). In Argentina, for example, the Under-Secretariat for Territorial Planning of Public Investment of the Ministry of Planning, Public Investment and Services and the Secretariat of the Environment and Sustainable Development have developed guidelines for including both matters in planning and territorial administration as a basis for guiding public investment. In Peru, mechanisms are being created to facilitate the development of a concerted agenda for defining development policies based on disaster risk reduction and adaptation to climate change.

As regards health impacts, the World Health Organization (WHO) estimates that climate change is responsible for 3% of deaths worldwide from diarrhoea, 3% from malaria and 3.8% from dengue fever; of these, 85% are child deaths (WHO, 2009a). The lack of quantitative assessments means that, so far, it has not been possible to incorporate into these evaluations the full range of climate change-related diseases, which also include the health impact of temperature extremes, weather disasters, photochemical air pollution and vector-borne diseases, as well as the indirect impact of ecosystem changes and water shortages. The magnitude and potential severity of the effects of these factors would indicate, even without tools to quantify them, that the actual impact is much greater (PAHO, 2008).

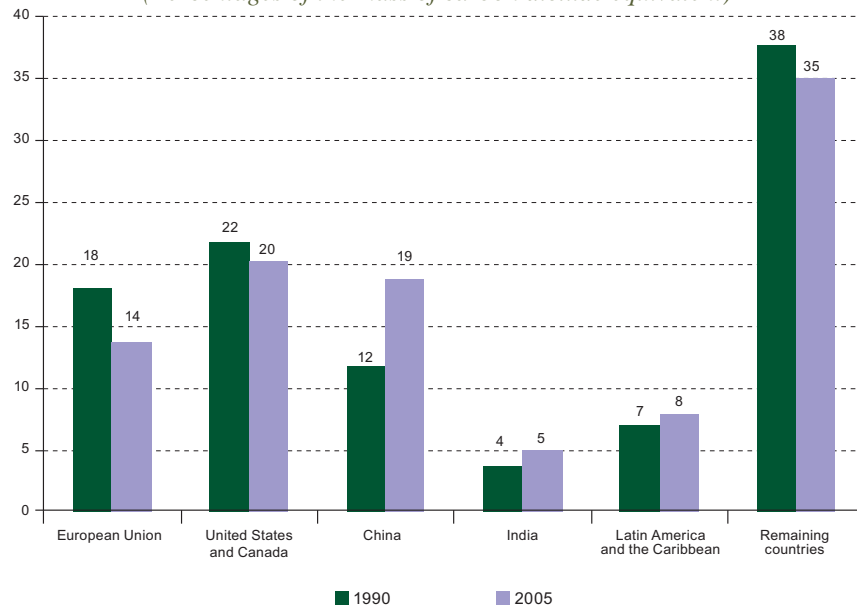
As regards climate change adaptation, one of the main challenges lies in incorporating adaptation measures into national, sectoral and local strategies, policies and plans. An immediate concern is how to determine the amount of resources that should be devoted to the design, planning and implementation of adaptation policies and how those resources should be invested (ECLAC, 2010a). Together with international funding, the national funding strategy will be key to balancing public finances in the face of pressure from higher domestic public expenditure. A variety of funding sources should be explored, such as direct and indirect taxes, internal and external debt or budget reallocation.

(b) The contribution of Latin America and the Caribbean to greenhouse gas emissions

The Latin American and Caribbean region makes a smaller contribution to global climate change than other regions. If greenhouse gas (GHG) emissions from land-use change are excluded, the region contributes only 8% of global emissions (see figure II.3) but, when land-use change emissions are included, its contribution rises to 12% (see figure II.4).

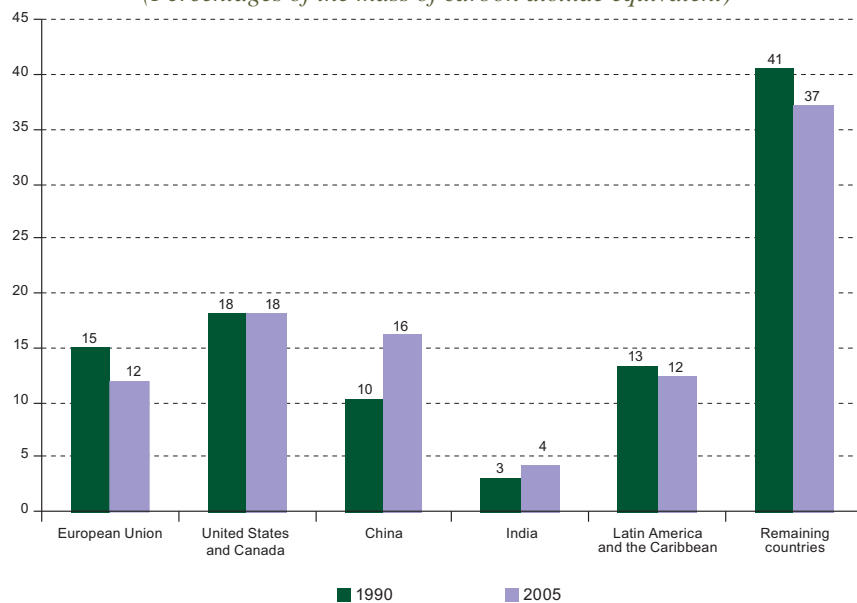
Greenhouse gas emissions from Latin America and the Caribbean have been increasing steadily since 1990. Between 1990 and 2005, they increased at an average annual rate of 1.2%, similar to the global average (United Nations, 2010; ECLAC, 2010a). The structure of emissions by sector in the region differs from that of global emissions (see figure II.5). Land-use change in the region accounts for nearly half of all emissions (46%) while agriculture accounts for 20%, in contrast with the global average, where emissions come chiefly from electricity, agriculture, transport, land-use change and manufacturing and construction. Emissions per country in the region are concentrated mainly in a few large countries and there are wide disparities in per capita share. The biggest emitter in the region is Brazil, with a 52% share. Brazil, together with Mexico, the Bolivarian Republic of Venezuela and Argentina, were responsible for 79% of the region's total greenhouse gas emissions in 2005 (see figure II.6).

Figure II.3
**SHARE OF GLOBAL GREENHOUSE GAS EMISSIONS EXCLUDING
 LAND-USE CHANGE EMISSIONS**
(Percentages of the mass of carbon dioxide equivalent)



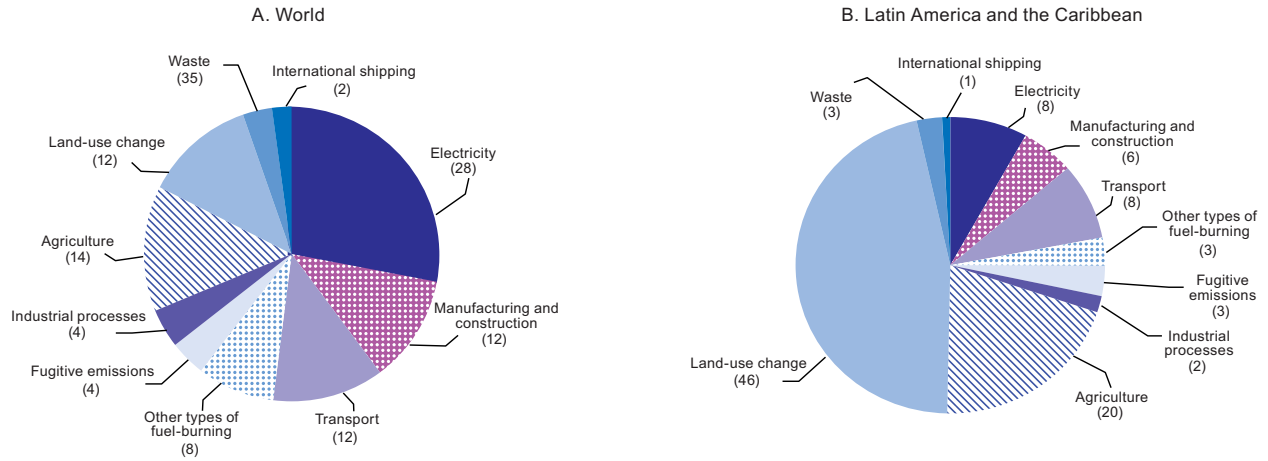
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Climate Analysis Indicators Tool (CAIT), Version 7.0, Washington, D.C., World Resources Institute, 2010.

Figure II.4
**SHARE OF GLOBAL GREENHOUSE GAS EMISSIONS INCLUDING
 LAND-USE CHANGE EMISSIONS**
(Percentages of the mass of carbon dioxide equivalent)



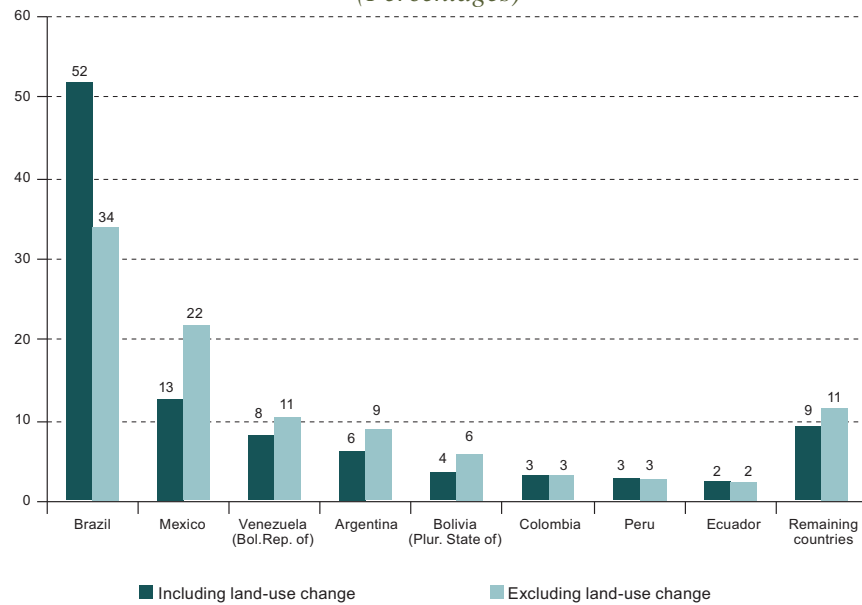
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Climate Analysis Indicators Tool (CAIT), Version 7.0, Washington, D.C., World Resources Institute, 2010.

Figure II.5
SHARE OF GREENHOUSE GAS EMISSIONS BY SECTOR, 2005
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Climate Analysis Indicators Tool (CAIT), Version 7.0, Washington, D.C., World Resources Institute, 2010.

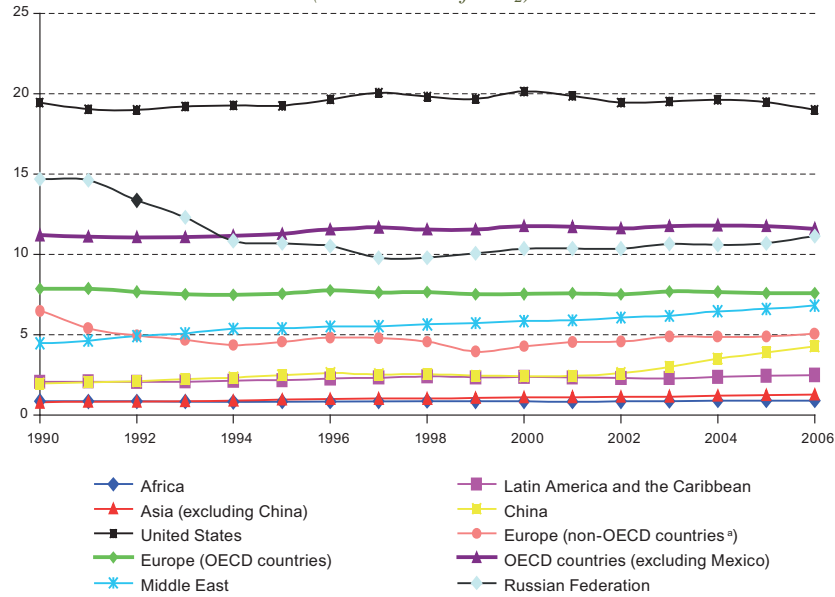
Figure II.6
LATIN AMERICA AND THE CARIBBEAN (9 COUNTRIES): SHARE OF CARIBBEAN GREENHOUSE GAS EMISSIONS BY COUNTRY, 2005
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Climate Analysis Indicators Tool (CAIT), Version 7.0, Washington, D.C., World Resources Institute, 2010.

Although per capita CO₂ emissions from the burning of fossil fuels remained fairly stable in Latin America and the Caribbean as a whole between 1990 and 2006 (see figure II.7), there are wide disparities within the region (see figure II.8).

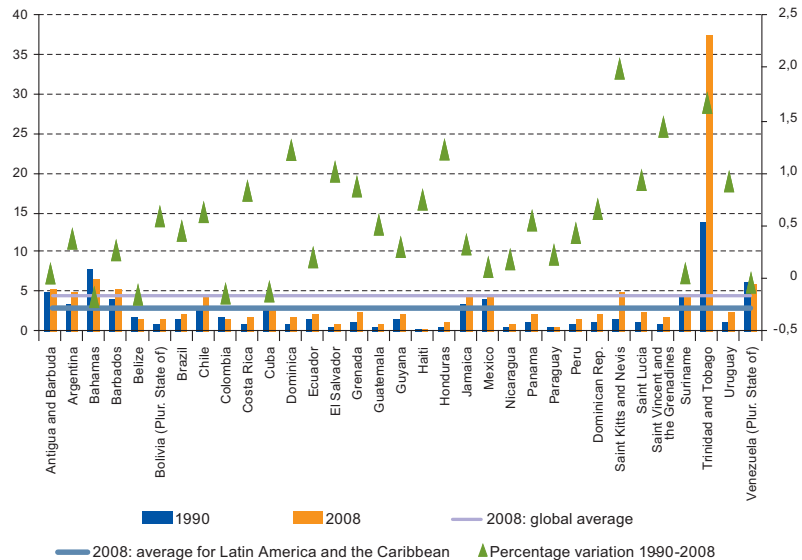
Figure II.7
**PER CAPITA CO₂ EMISSIONS FROM THE BURNING OF FOSSIL FUELS
 BY REGION, 1990–2006**
(Metric tons of CO₂)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA) [online] www.iea.org/.

^a OECD: Organization for Economic Cooperation and Development.

Figure II.8
LATIN AMERICA AND THE CARIBBEAN: PER CAPITA CO₂ EMISSIONS, 1990 AND 2008
OFFICIAL MILLENNIUM DEVELOPMENT GOALS (MDG) INDICATOR 7.2.1
(Metric tons of CO₂ and percentages)



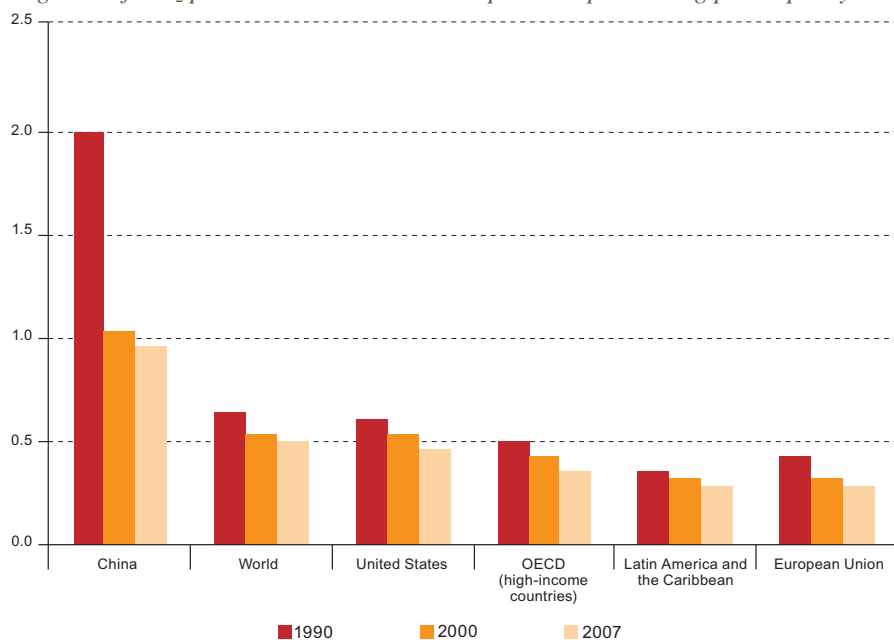
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the United Nations Millennium Development Goals indicators database [online] <http://mdgs.un.org/unsd/mdg/Default.aspx>, with CO₂ statistics compiled by the Carbon Dioxide Information Analysis Center (CDIAC) [date of reference: 10 November 2011].

In 2008, the global average of per capita CO₂ emissions was 4.4 tons, compared with 2.9 tons in Latin America and the Caribbean. Figure II.8 shows the variation in per capita CO₂ emissions per country between 1990 and 2006. The case of Trinidad and Tobago is interesting. With an oil-based economy, the cost of energy is lower. Although the country has supported some energy-efficiency initiatives, there are few economic incentives to expand them. This translates in higher levels of CO₂ emissions per capita (United Nations, 2010).

In all likelihood, emissions from energy sources in the region will continue to increase because, in spite of rising energy efficiency, a growing share of renewable energy sources (see chapter I), energy decoupling (where energy consumption increases proportionally less than GDP growth) (see figure II.9) and decarbonization of energy (see figure II.10), these efforts are still not enough to offset rapidly increasing energy demand. According to the energy intensity index by region for the period 1990–2007, there has been no sustained process of energy decoupling in Latin America and the Caribbean, unlike in other regions, or in the world as a whole, where rising incomes have been accompanied by lower relative energy consumption levels (UNEP/ECLAC, 2010).

Some countries have started to invest in low-carbon infrastructure, which could reduce carbon emissions over the coming decades, for example by building public transport systems as an alternative to roads that encourage car use (Li and Colombier, 2009, IPCC, 2007). While the large-scale impact of climate change and the huge effort needed to decouple the economic growth trajectory from energy consumption and emissions place an additional constraint on the region's development, they also open up opportunities to implement solutions that have the added effect of expanding access to services (such as public transport), which fosters equality (United Nations, 2010; ECLAC, 2010a).

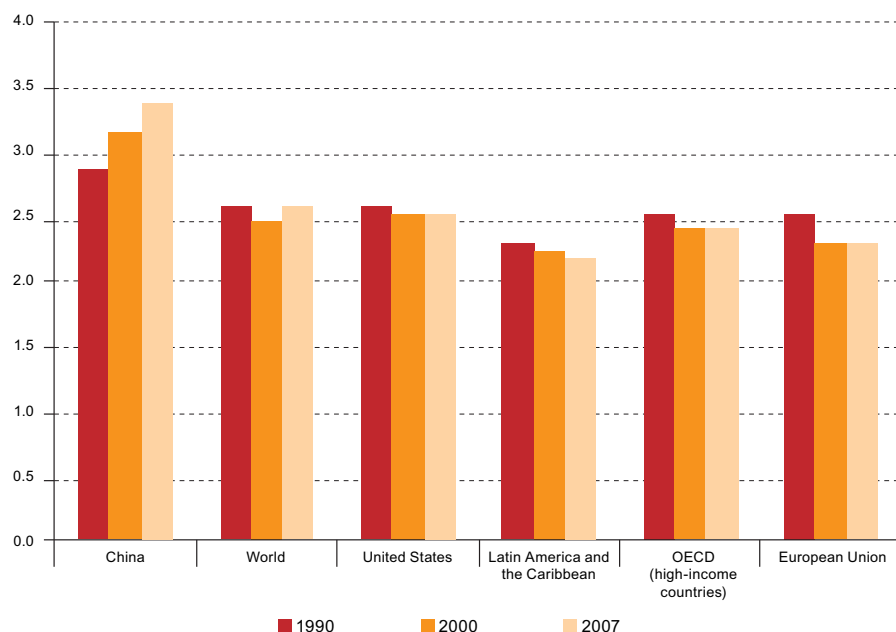
Figure II.9
CARBON INTENSITY OF THE ECONOMY, 1990, 2000 AND 2007
(Kilograms of CO₂ per constant dollar at 2005 prices in purchasing power parity terms)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators [online] <http://data.worldbank.org/data-catalog/world-development-indicators>.

Note: OECD does not include Chile, Mexico or Turkey.

Figure II.10
CARBON INTENSITY OF ENERGY USE, 1990, 2000 AND 2007
(Kilograms of CO₂ per kilogram of oil equivalent)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators [online] <http://data.worldbank.org/data-catalog/world-development-indicators>.

Note: OECD does not include Chile, Mexico or Turkey.

The carbon intensity of energy is the amount of CO₂ emitted per unit of energy consumed. This ratio depends on the type of energy used and, therefore, on the technology each country adopts. For a given amount of energy consumption, emissions vary depending on the carbon content of the energy used. For example, coal has the highest carbon content (26.8 tons per terajoule of energy), followed by petroleum (20 tons per terajoule of energy), and natural gas (15 tons per terajoule of energy). Accordingly, countries with similar levels of energy consumption but whose energy sources are distributed differently will have different energy intensities (WRI, 2009).

The region has major potential to help mitigate global climate change through CO₂ retention services (United Nations, 2010). According to the Food and Agriculture Organization of the United Nations (FAO) (2011), the total carbon stored in forest biomass in Latin America and the Caribbean was estimated at around 104 gigatons (Gt), having decreased by 424 million tons annually during the period 1990–2010. In terms of forested surface area, the region accounted for 24% of the world's forests in 2010 (FAO, 2011).

Controversy reigns over the role of forest plantations as carbon sinks. Latin American and Caribbean countries possess 18 million hectares of planted forest, representing 2% of the region's total forest area. Between 2000 and 2010, the region's forest area expanded by an annual average of around 3.2%, which is a little over 400,000 hectares of forest per year (FAO, 2011). Young, fast-growing trees extract carbon from the atmosphere at a much faster rate and so one would expect the South America forest plantations, which are mainly the fast-growing species eucalyptus, to mitigate the effects of global climate change. However, most of the carbon stored in plantations will again be released into the atmosphere within 10–20 years, when the timber is used industrially or for generating power. In addition, monoculture forest plantations create a negative impact on run-off and the availability of water in local basins as well as on biodiversity.

Studies suggest that the amount of carbon stored in native forests (and released during land-use conversion) is much greater than the amount sequestered in any plantation project. As a result, slowing down deforestation is arguably a much more effective strategy to address global warming than establishing new plantations (UNEP, 2010a).

Many countries in the region already have or are developing emissions reduction strategies. All have ratified both the United Nations Framework Convention on Climate Change and the Kyoto Protocol (see box II.3). Owing to the special vulnerability of small island developing States, the Barbados Programme of Action (1994) considers climate change and sea level rise priority issues (see chapter IV). Moreover, Latin American and Caribbean countries have been actively involved in the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, which encourages consideration of the Hyogo Framework for Action and the strengthening of national climate change-related disaster risk-reduction strategies, as well as supporting implementation of the Cancun Adaptation Framework and calling for increased multilateral funding for adaptation.

Box II.3

LATIN AMERICA AND THE CARIBBEAN AND THE CLEAN DEVELOPMENT MECHANISM

The Clean Development Mechanism (CDM) allows countries with a commitment to limit or reduce emissions under the Kyoto Protocol (Parties listed in Annex B to the Protocol) to implement emissions reduction projects in developing countries. Since early 2006, the CDM has registered more than 1,650 projects that are expected to produce saleable certified emission reduction (CER) credits for more than 2.9 billion tons of CO₂ equivalent during the first commitment period of the Kyoto Protocol (from 2008 to 2012).

At the start of the carbon market, Latin America was the largest supplier of CDM projects. However, now the region has only a 15% share of all projects, whereas Asia has 79% (chiefly in China, India and Korea). Five countries (Brazil, Mexico, Chile, Colombia and Peru) account for almost 80% of the region's CDM projects and emissions reductions. In fact, Brazil, Mexico and Chile are among the largest issuers of certified emissions reductions.

At the fifteenth session of the Conference of the Parties (COP 15) in Copenhagen in 2009, the Parties agreed to promote the development of nationally appropriate mitigation actions (NAMAs) among developing countries. By 2010, Antigua and Barbuda, Brazil, Chile, Colombia, Costa Rica, Mexico and Peru had submitted NAMAs. All these countries have pledged to reduce their greenhouse gas emissions over the coming years, particularly through projects and programmes for energy efficiency, renewable energy, waste management and the reduction of deforestation. Some countries have been more specific than others in their commitments.

Source: United Nations Framework Convention on Climate Change [online] www.unfccc.int; and United Nations Environment Programme (UNEP)/UNEP, Risoe Centre on Energy, Climate and Sustainable Development (URC), "CDM/JI Pipeline Analysis and Database", 2011 [online] www.cdmpipeline.org.

2. Conservation of biological diversity

Latin America and the Caribbean is the most ecologically diverse area on the planet. It includes 6 of the world's 17 megadiverse countries (Bolivarian Republic of Venezuela, Brazil, Colombia, Ecuador, Mexico and Peru), as well as the most megadiverse area on the planet: the Amazon. The region is home to between 30% and 50% of the world's species of mammals, birds, reptiles, amphibians and fish, as well as a large proportion of its plant and insect species (UNEP, 2010a) (see table II.4).

Table II.4
**LATIN AMERICA AND THE CARIBBEAN: KNOWN SPECIES
 AS A PERCENTAGE OF THE WORLD'S KNOWN SPECIES**
(Number and percentages)

	Total number of known species	Species in Latin America and the Caribbean	Percentage of world's known species
Birds	9 990	4 110	41
Mammals	5 847	1 791	30
Amphibians	6 347	3 148	50
Reptiles	8 734	3 060	35
Fish	30 700	9 597	31

Source: United Nations Environment Programme (UNEP), *Latin America and the Caribbean: Environment Outlook*, Panama City, 2010.

The region has a high level of endemism: 50% of the plant life found in the Caribbean subregion exists nowhere else in the world (UNEP, 2010a). The Mesoamerican Reef is the largest barrier reef in the Western Hemisphere. Although Central America accounts for only 0.5% of the world's land mass, it contains 10% of its biological diversity (Bayon, Lovink and Veening, 2000).

Biodiversity is crucially important to the survival of communities and, in a number of sectors, production relies on a variety of ecosystem services. For example, biodiversity-related tourism and wood and non-wood forest products are important sources of income in some areas. Ecosystem regulating services are also vital, especially in view of the increased frequency of climate change-related extreme weather events. They protect lives and assets from weather-related natural hazards by acting as protective barriers and buffers. In addition, they increase disaster resilience by strengthening subsistence livelihoods and increasing the availability and quantity of goods and resources. In the Caribbean alone, healthy coral reefs are estimated to provide between US\$ 0.7 billion and US\$ 2.2 billion worth of coastal protection from erosion and the effects of extreme weather events (ISDR, 2011).

Furthermore, the region's immense array of natural resources makes for a unique laboratory for products and processes that could foster medical, agricultural and other solutions for present and future generations. The region also offers considerable potential for bioprospecting,² which should be properly promoted and regulated. A concept that has recently gained prominence is sociobiodiversity, which combines species diversity with the diverse knowledge of indigenous peoples and communities that rely on biotic resources. Peru, for example, is home to 14 language families and at least 44 different ethnic groups, 42 of which live in the Amazon region. The way in which the various cultures have adapted to their environment over the centuries and the wisdom gained from their interaction with it have generated a wealth of knowledge about the uses and properties of species, diversity of genetic resources and techniques for managing them. The country has around 4,400 native plant species with known uses and nutritional, medicinal, ornamental, seasoning, colouring, aromatic and other properties. Peru, as one of the areas of the world to which the roots and development of agriculture can be traced, occupies an important place in terms of agrobiodiversity. Of the four main global food crops (wheat, potatoes, maize and rice), Peru ranks first in potato diversity (85 wild species, 9 domesticated species and around 3,000 varieties) and maize (36 varieties) and is also a major producer of cucurbitaceous plants, fruit trees, cassava, sweet potatoes and other groups. Just one hectare of traditional potato field in the Titicaca Altiplano can contain up to three species of potato and ten varieties (Brack, 2000). This traditional knowledge about the

² The systematic search for bioactive substances that can be used to develop new commercial products based on biodiversity, such as medicines, nutrients and cosmetics (United Nations, 2010).

properties of certain plants as well as their history of use in the country has enabled Peru to avoid non-tariff barriers to trade in exotic products, such as the application of the European Union's regulation on novel foods to products such as Maca (*Lepidium meyenii* Walp) and Lúcumá (*Pouteria obovata*). This has also enabled Peru to protect its biological resources against biopiracy by successfully challenging international applications for patents for products derived from Maca and Sacha Inchi.

The region has initiatives for genetic diversity conservation, such as ex situ seed banks, and several centres for species diversity are already in operation. The booming market for biodiversity-based medicinal products could enable the region to position itself as a leader in the sector through further investment in research and technology development. For example, plant-based medicinal products have an estimated global market of US\$ 60 billion (Lasmar, 2005; UNEP, 2010a). However, much of the technological development based on the region's genetic wealth is currently taking place beyond its borders.

There have also been moves in the region to recover traditional knowledge and use of biodiversity. In Chile, they include a project by the national association of rural and indigenous women (ANAMURI), the Aukinko Zomo corporation of Mapuche women and the sustainable societies foundation (Fundación Sociedades Sustentables), which have promoted the concept of women seed guardians, curators and caretakers, who have kept alive the tradition of saving, growing and exchanging seeds from ancient crop varieties. The women caretakers also domesticate various species to make them edible and diversify their use, recognizing this as an effective way to preserve local agricultural biodiversity and pass on traditional knowledge (Government of Chile, 2008).

Despite the obvious importance of Latin American and Caribbean biodiversity for both the region itself and the world as a whole, the region's enormous biodiversity is being lost or seriously threatened by human activity at all levels and throughout nearly all of the region (UNEP, 2010a). As a result, the goal of reducing the rate of biodiversity loss by 2010³ set in the Convention on Biological Diversity has not been met.

Five principal pressures on biodiversity in the region have been identified by the Secretariat of the Convention on Biological Diversity (2010): habitat loss and degradation; over-exploitation and unsustainable use of resources; climate change; invasive alien species; and excessive nutrient load and other forms of pollution. The greatest risks to biodiversity stem from land-use change, with the resulting reduction, fragmentation and even disappearance of habitat (UNEP, 2010a).

The existence of forested areas rich in biodiversity and endemic species, combined with heavy anthropogenic pressure from economically profitable alternatives, has resulted in many 'hot spots'⁴ in the region (see map II.2).

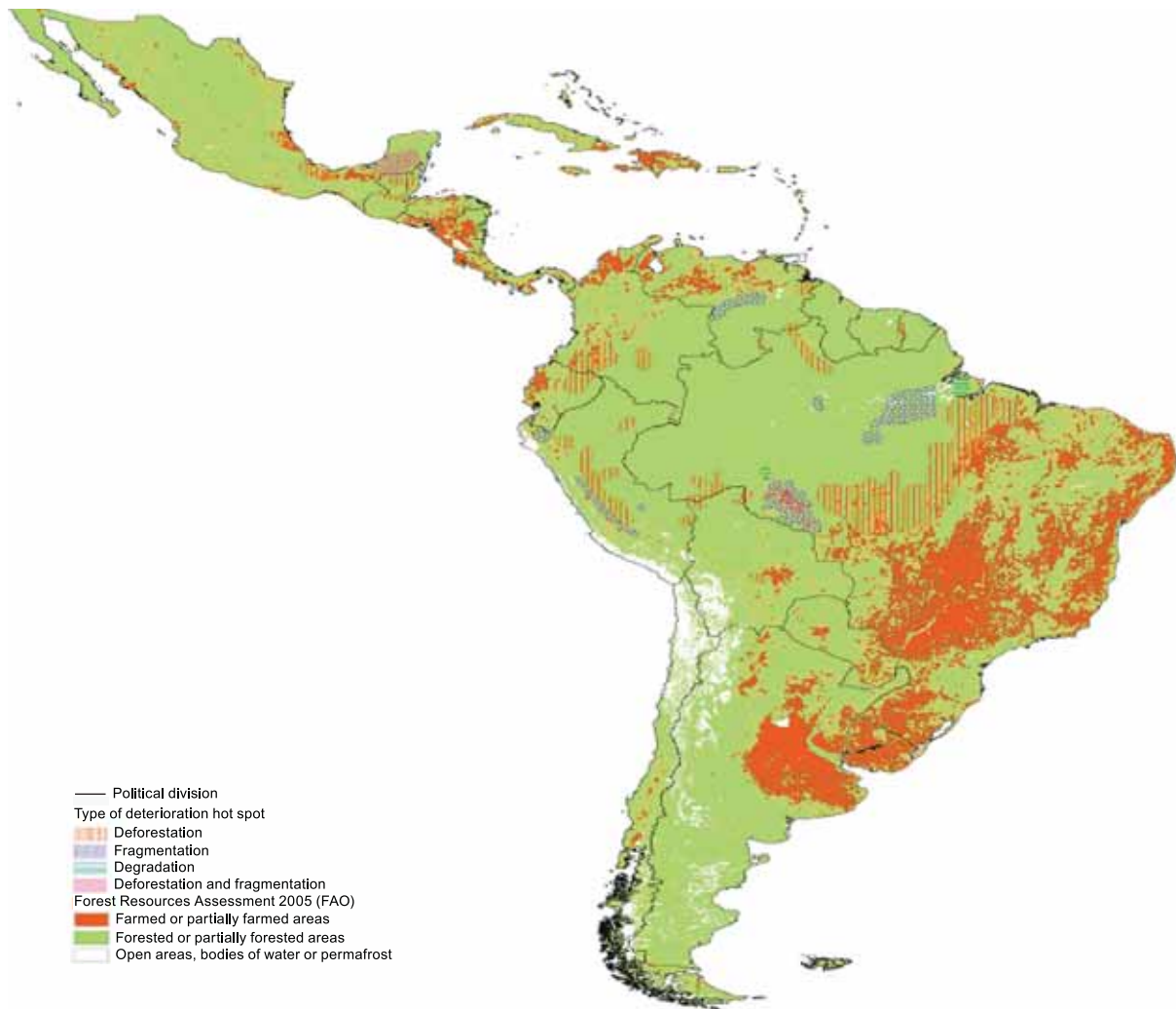
One of the main forces driving this process has been land-use change, resulting from major growth in recent years in commercial crops for export (such as soy beans, biofuel crops, livestock, fruits, vegetables and flowers) (see chapter I). The construction of roads without proper management of their surroundings or internalization of their social costs has been another major factor in deforestation processes, mainly in South America (World Bank, 2007; UNEP-CATHALAC, 2010a). All along the

³ Decision of the sixth Conference of the Parties to the Convention on Biological Diversity (April 2002): "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth".

⁴ Hotspots are the biologically richest and most endangered places on earth. For further information, see [online] www.conservation.org.

coast and in marine areas, the heaviest pressure comes from tourism and unplanned urban sprawl, pollution from land-based sources and aquaculture. Attempts to safeguard the coastal and marine zone by declaring protected areas are still very modest. Only 0.1% of the Latin American and Caribbean exclusive economic zone (EEZ) enjoys some form of protection, and most of the 255 marine reserves are not managed effectively (PISCO, 2008).

Map II.2
LATIN AMERICA AND THE CARIBBEAN: HOT SPOTS BY TYPE OF DETERIORATION, 2005



Source: F. Achard and others, "Identification of deforestation hot spot areas in the humid tropics", *Research Report*, No. 4, Brussels, European Commission, 1998; Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2005*, Rome, 2005; and information from GlobCover project.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

A major factor underlying this trend is that investment decisions are based on traditional economic criteria that do not take into account the importance of protecting biodiversity. In addition, short-term benefits of economic activities that damage biodiversity are reaped by specific agents—often private ones—whereas the benefits of protection are less concrete and only materialize in the long term. The absence of effective mechanisms enabling civil society to participate in decision-making and the dissemination of information on the benefits of protecting biodiversity (and the costs of degradation) perpetuates the bias towards activities that yield short-term private profits to the detriment of the environment. This issue is addressed further in chapter III. With regard to biodiversity, the economic valuation of ecosystem services—which is not necessarily associated with payment systems—can be useful for translating the loss of benefits arising from the loss of ecosystems into a material language and can complement decision-making (TEEB, 2010).

Higher temperatures in some marine areas, rising sea levels and the greater frequency and intensity of weather phenomena as a result of climate change, also pose a threat to the region's biodiversity. In its fourth assessment report, published in 2007, the Intergovernmental Panel on Climate Change predicts significant losses of biodiversity (IPCC, 2007). In addition, the ecosystems that serve to support biodiversity provide other ecosystem services that are essential to mitigation (such as carbon absorption) or adaptation (such as protecting water sources or resilience to extreme weather events). Box II.4 illustrates the impact of climate change on Central America's biodiversity.

Latin American and Caribbean countries have played an active part in international conventions and protocols on biodiversity and protected species, from the Ramsar Convention in 1971 to the Nagoya Protocol in 2010 (see box II.5).

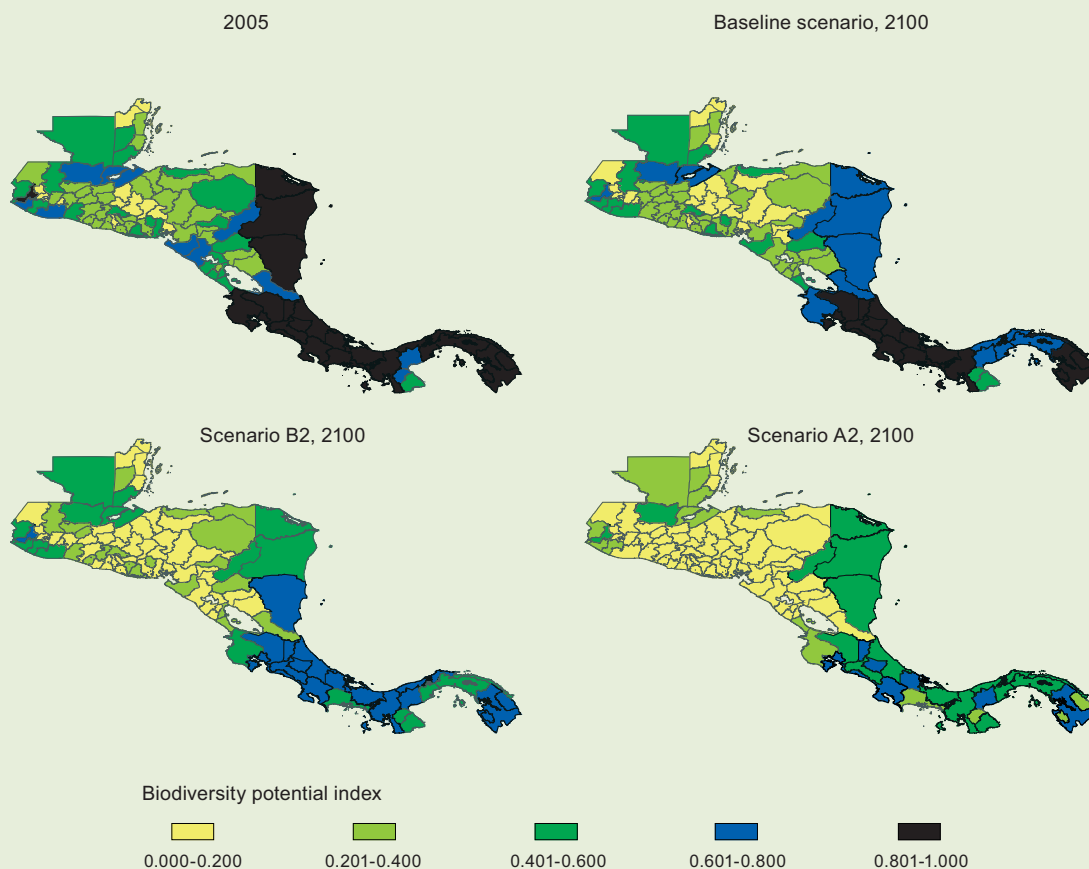
Since 1992, significant progress has been made in the establishment of conservation areas, the use of best practices in agriculture, sustainable forest management, the development of sustainable fisheries and the implementation of payment schemes for environmental services. As regards the establishment of conservation areas, between 1990 and 2010 the number of officially protected marine and terrestrial areas in Latin America and the Caribbean more than doubled, surpassing the global average, including the averages in developing and developed countries (see figure II.11). There are a total of 4 million square kilometres (km²) of protected areas in the region, representing 20% of the world total (ECLAC, 2010a) (see map II.3). In many instances, the sustainable forest management of protected areas has been combined with other techniques, such as reforestation and community forest management, payment for environmental services, land management, certification and sustainable, community or certified forest management (UNEP, 2010a).

The fact that protected areas are extensive does not necessarily mean that all ecosystems are adequately represented within those areas (Armenteras, Gast and Villareal, 2003; Urquiza, 2009). For protected areas to serve as an effective mechanism for biodiversity conservation, they must be representative of biomes and ecosystems, interconnected and endowed with sufficient human, financial and technological resources to enforce restrictions on activities.

Box II.4
**CENTRAL AMERICA: BIODIVERSITY REDUCTION SCENARIOS WITH
 AND WITHOUT CLIMATE CHANGE**

Central America contains 7% of the world's biodiversity and great geological, geographical, climatic and biotic diversity. A recent study (ECLAC, 2010b) estimated biodiversity by means of the biodiversity potential index (BPI), which includes species and ecosystems and makes inferences about the probability of finding greater diversity based on a set of variables that contribute to biodiversity. Under a trend scenario of land-use change (without climate change), the BPI will fall by approximately 13% during the course of this century, especially in the period up to 2050. With climate change, under the lowest-trajectory scenario for GHG emissions (IPCC scenario B2) and the trend scenario (IPCC scenario A2), the BPI is estimated to fall by 33% and 58% respectively by the year 2100. The countries with the worst BPI outcomes are Guatemala, Nicaragua, El Salvador and Honduras, with expected declines of between 75% and 70% under the trend scenario for GHG emissions (scenario A2).

**CENTRAL AMERICA: BIODIVERSITY POTENTIAL INDEX IN 2005 AND EVOLUTION BY 2100
 UNDER THE BASELINE SCENARIO (WITHOUT CLIMATE CHANGE)
 AND THE B2 AND A2 CLIMATE CHANGE SCENARIOS**
(On a five-level scale, with black representing the highest biodiversity potential index)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *The Economics of Climate Change in Central America. Summary 2010* (LC/MEX/L.978), Mexico City, ECLAC subregional headquarters in Mexico.

Note: Territorial divisions correspond to departments, provinces or districts depending on the country. The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Box II.5

CONVENTIONS ON BIODIVERSITY AND PROTECTED SPECIES

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), adopted in 1971, established rules to address international concerns over wetlands as habitats for migratory waterfowl. Only two years later, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted in response to concerns about illegal international trade that was decimating biodiversity and threatened the survival of a number of animals and plants. In 1979, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) was adopted. In 1992, the Convention on Biological Diversity (CBD) was the first to consider biodiversity holistically, as including all the forms of life—genes, ecosystems and species—that form the world’s ecological infrastructure and provide vital services, with a focus on regulating access to biodiversity. These four conventions, together with the International Treaty on Plant Genetic Resources for Food and Agriculture and the Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), make up the set of multilateral agreements related to biodiversity economics and protection.

The major goals of the CBD are to conserve biological diversity through the sustainable use of the components of biological diversity and to ensure fair and equitable sharing of benefits arising from the use of genetic resources. Also, the CBD deals with people and their role in terms of reliance on and protection of biodiversity. With particular regard to women, the preamble to the CBD highlights the “vital role that women play in the conservation and sustainable use of biological diversity” and affirms the “need for the full participation of women at all levels of policy-making” (CBD, 1992). In addition, a CBD subsidiary body acknowledged the knowledge, practices and gender roles of women in food production (CBD, 1996). In line with the commitments made under the CBD, all countries in the region have produced national inventories and strategies and 26 countries have submitted their fourth national report.

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement governing international trade in living modified organisms (LMOs) resulting from modern biotechnology. The Protocol was adopted on 29 January 2000 and entered into force on 11 September 2003. A total of 28 countries in the region have signed the Protocol. In the knowledge that biotechnology can contribute to human welfare, the Protocol adopts a precautionary approach (by invoking principle 15 of the Rio Declaration) to ensure the conservation and sustainable use of biological diversity in the face of possible risks posed by living modified organisms. The Protocol guarantees the transfer of information to the purchasing Parties to enable them to come to a decision prior to approving the importation of such organisms into their country. It establishes a Biosafety Clearing House to assist countries in implementing the Protocol.

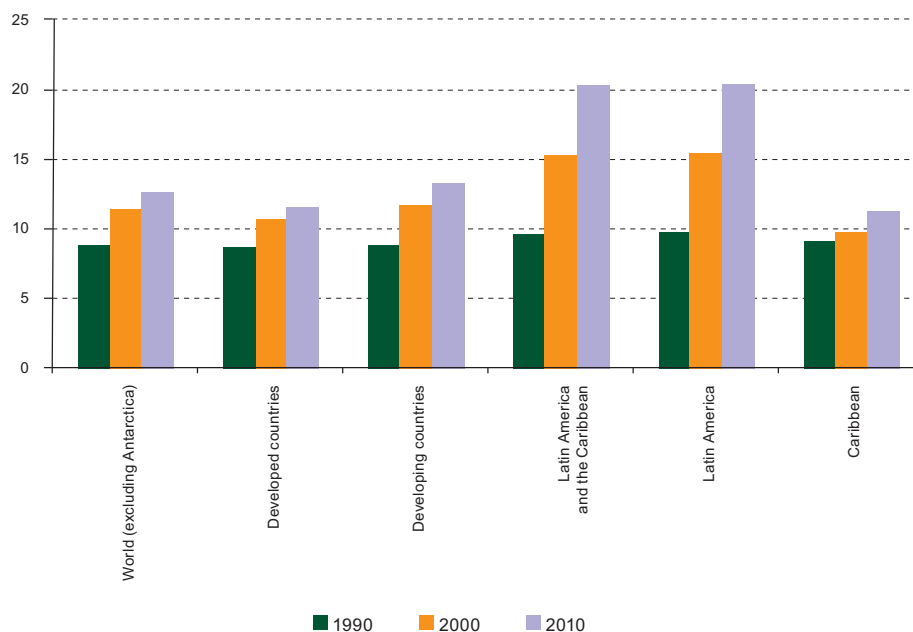
The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization to the Convention on Biological Diversity was adopted in Nagoya, Japan, in October 2010. The objective of this Protocol is to further the third goal of the Convention on Biological Diversity by the fair and equitable sharing of economic benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components.

Countries that ratify the Nagoya Protocol assume obligations in three main areas: access to genetic resources; compliance with national policies and laws on access; and fair and equitable sharing of benefits arising from the use of genetic resources. These three main economic obligations also apply to traditional knowledge of genetic resources in situations where local communities have provided access. In this context, countries must take measures to ensure the prior informed consent of these communities.

Within the region, the Caribbean has been particularly active in protecting its marine environment. In 1983 it adopted the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Cartagena Convention), which is supplemented by three Protocols (the Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region, adopted in 1983; the Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region, adopted in 1990; and the Protocol Concerning Pollution from Land-Based Sources and Activities, adopted in 1999). The Convention provides a legal framework for regional cooperation and national actions in the Wider Caribbean region.

Source: Prepared on the basis of the Secretariat of the Convention on Biological Diversity, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable sharing of Benefits arising from their Utilization to the Convention on Biological Diversity, Montreal, 2011, [online] www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf; Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region [online] <http://cep.unep.org/cartagena-convention>; and official websites of the Conventions mentioned.

Figure II.11
PROPORTION OF TERRESTRIAL PROTECTED AREAS, 1990–2010
(Percentages of the world's land mass)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Database on Protected Areas [online] www.wdpa.org/Default.aspx [date of reference: December 2011].

Efforts are being made in the region to provide protection based on corridors, such as the Vilcabamba-Amboró Conservation Corridor, the Mesoamerican Biological Corridor and the Caribbean Biological Corridor, created in 2010. The Vilcabamba-Amboró Conservation Corridor was created in 1993. It includes natural areas of Peru and the Plurinational State of Bolivia located in one of the most important areas for conservation of biological diversity on the planet—the tropical Andes—and covers 30 million hectares. Its achievements include promoting the creation of new national, regional and municipal protected areas, as well as private conservation areas, and strengthening the management of existing protected areas.⁵ The Mesoamerican Biological Corridor was created in 1997 by the governments of the countries comprising the Mesoamerican region (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama) with the aim of safeguarding biological diversity, minimizing fragmentation and enhancing the connectivity of the landscape and ecosystems, as well as encouraging sustainable production that improves the quality of life of local human populations.⁶

The funding available in the region for protected area schemes totals US\$ 404 million, distributed among 19 countries (Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia and Uruguay), meaning that approximately 1% of national budgets for environmental issues is earmarked for protected areas. However, for the region as a whole, this figure corresponds to an average of 0.006% of GDP, which is a significantly lower percentage than other sectors receive (Bovarnick, Fernández and Negret, 2010). There are protected areas with management plans which, for lack of resources, are not effectively protected and are at the mercy of economic forces.

⁵ For further information, see [online] http://revistavirtual.redesma.org/vol2/pdf/programas/vilcabamba_amboro.pdf.

⁶ For further information, see [online] <http://www.biodiversidad.gob.mx/corredor/corredorbiomeso.html>.

Map II.3
LATIN AMERICA AND THE CARIBBEAN: PROTECTED AREAS, 2009



Source: United Nations Environment Programme (UNEP) and World Conservation Monitoring Centre (WCMC), *Data Structure of the World Database on Protected Areas (WDPA) Annual Release 2009*.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Demonstrating the profitability of conservation areas —by highlighting the economic value of ecosystem services and biodiversity-based income-generating capacity— will help to channel adequate resources. A study in Brazil shows that conservation units generate more resources than required for their operation. It also shows that many of the sustainable economic activities within these units have major economic and job-creation potential (Medeiros and others, 2011).

The valuable assets related to biodiversity in Latin America and the Caribbean could be a source of income and jobs in many countries of the region. The *Economics of Ecosystems and Biodiversity* study presents a practical approach to the valuation of biodiversity that highlights the economic benefits of biodiversity protection (TEEB, 2010). The opportunities associated with payment for environmental services are increasingly widely recognized. Innovative payment schemes for environmental services have been implemented that not only protect biodiversity but also achieve other social and environmental objectives, including offering economic opportunities for local communities. Among many other initiatives, Costa Rica began implementing a programme of payment for environmental services as far back as 1996; Mexico has launched a large-scale mechanism for payment for watershed services that assigns the appropriate value to water resource protection (Pagiola, Landell-Mills and Bishop, 2006); and Colombia, Costa Rica and Nicaragua have reported increases of between 10% and 15% in farmers' income levels where agroforestry practices are promoted. Payment schemes for environmental services also hold significant job-creation potential (UNEP/ILO, 2008).

The UNESCO Programme on Man and the Biosphere (MAB) was established in 1971 with the aim of developing an interdisciplinary research and capacity-building agenda to improve people's relationship with the environment. A World Network of Biosphere Reserves was established under the programme. This serves as a forum for research and exchanges and aims to promote the integration of people with nature through participatory dialogue, research and knowledge sharing, poverty reduction, improved welfare, respect for cultural values and society's adaptability to change. A total of 109 of the world's 580 biosphere reserves are located in 20 countries of Latin America and the Caribbean. They have a combined surface area of approximately 1.8 million square kilometres, representing 10% of the region's land mass. The Earth Summit in 1992 gave a huge boost to the creation of biosphere reserves. Of the 109 biosphere reserves in the region, 70 were created after 1992.⁷

Looking ahead, the challenges are to reverse biodiversity loss and, at the same time, internalize the benefits of biodiversity conservation. Biodiversity is still not evaluated systematically and the major underlying causes of its decline have not been reduced to any significant degree. National and international financial and regulation structures should be geared towards internalizing the environmental and social costs of biodiversity loss, or the benefits of biodiversity conservation.

In October 2010, the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) adopted a new strategic plan for biodiversity from 2011 to 2020. The commitments respond to new challenges and are simple, measurable and understandable to all relevant sectors. To move towards these goals, it is necessary to overcome a number of challenges relating to the representativeness of ecosystems, incentives and resource management and availability, to ensure that the planned safeguards are truly effective.

3. Forests

The Forest principles adopted in 1992 emphasized the importance of national policies for the sustainable management of forest resources, institutional development, the provision of information, local communities and indigenous peoples, and international cooperation. There is growing recognition of the interrelationship between the protection of forests and biodiversity, and the development of the international climate change regime has increased awareness of the importance of forests in carbon sequestration, as well as the role of local communities in protecting it.

⁷ See [online] <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves> [date of reference: December 2011].

Forest cover in Latin America and the Caribbean is around 9 million km², representing roughly 49% of the region's land area (FAO, 2010a). Between 1990 and 2010, the region's share of global forest cover fell from 25% to 24% (see table II.5). Deforestation in the region during the same period accounted for more than one third of global deforestation. Between 2000 and 2010, the annual rate of loss was 0.46%, three times the global annual rate of 0.13% (FAO, 2011).

Table II.5
LATIN AMERICA AND THE CARIBBEAN: FOREST AREA AND ANNUAL RATES OF CHANGE, 1990–2010, AND PERCENTAGE OF GLOBAL FOREST AREA

	Forest area (thousands of hectares)				Annual rate of change					
	1990	2000	2005	2010	1990-2000		2000-2005		2005-2010	
					Thousands of hectares/year	%	Thousands of hectares/year	%	Thousands of hectares/year	%
Caribbean	5 902	6 434	6 728	6 933	53	0.87	59	0.90	41	0.60
Central America	25 717	21 980	20 745	19 499	-374	-1.56	-247	-1.15	-249	-1.23
Mexico	70 291	66 751	65 578	64 802	-354	-0.52	-235	-0.35	-155	-0.24
South America	946 454	904 322	882 258	864 351	-4 213	-0.45	-4 413	-0.49	-3 581	-0.41
World	4 168 399	4 085 168	4 060 964	4 033 060	-8 323	-0.20	-4 841	-0.12	-5 581	-0.14
Percentage of global forest area	25%	24%	24%	24%						

Source: Food and Agriculture Organization of the United Nations (FAO), *Forest Resources Assessment 2010*, Rome, 2010.

The regional trend in deforestation is determined by the trend in South America, where 92% of the region's forest area is found, especially Brazil, which is home to 60% of the forests in South America (FAO, 2011). Between 1990 and 2005, deforestation rates increased in South America. This upward trend began to be reversed in 2005, owing largely to a series of actions to combat deforestation carried out in the Brazilian Amazon (see box II.6). In Brazil, the rate of forest area change was -0.57% in the period from 2000 to 2005 and -0.42% in the period from 2005 to 2010. In Mexico, the rate was -0.35% in the period from 2000 to 2005 and -0.24% in the period from 2005 to 2010. In Central America, the deforestation rate increased again between 2005 and 2010, following a significant downward trend in the 1990s (FAO, 2011). In the Caribbean, forest area has increased over the past 20 years, mainly as a result of the abandonment of agricultural land (mostly banana-producing areas) (United Nations, 2010).

In addition to deforestation rates in the region, forest fragmentation has become a concern. As mentioned in the previous section, highly fragmented terrestrial habitats threaten the viability of species and their ability to adapt to climate change (see previous section on biological corridors).

In the region, more and better information on forests now exists, relating not only to the volume of commercial forest but also to forest services and functions, extent, designation, characteristics, health and vitality, biodiversity, production, protection and economic, legislative and institutional aspects. This enables more effective decisions to be taken on how to use and protect forests, how to change policies and how to improve forest law. Nowadays there are more trained personnel and better techniques for forest management and monitoring. There has been more provision for community participation since 1992, which has enabled the communities that depend on forest resources to demonstrate their skills and capacity for good forest management. Some States recognize the vital role that local communities play in forest management and the importance of sharing responsibilities. Technological advances in satellite

monitoring have been instrumental in guiding actions to combat deforestation, as evidenced by Brazil's experience with satellite monitoring in the Amazon.⁸ In total, 18% of the region's forests are located in protected areas (FAO, 2011).

At present, 26 countries in the region have forest policies and 31 have forest laws, many of which have been revised in the past 20 years. The earliest are in the Caribbean. Environmental policies and legislation have been given an integrated approach to forest functions, services and values. Increasingly, environmental, social and economic components are being incorporated into forest management, and command and control actions are being combined with actions to transform the production patterns that lead to deforestation. The International Tropical Timber Organization (ITTO) has highlighted the role of land tenure and the potential for tenure by local communities. Brazil's experience with adopting an integrated approach to command and control actions, land regularization and transformation of the production model serves as a benchmark (see box II.6) (FAO, 2010a).

As mentioned in the previous section, much of the deforestation in the region is due to large-scale agricultural and livestock activities (extensive in the case of livestock production). A major challenge in combating deforestation is the fact that the profitability of sustainable activities is often compared unfavourably with activities such as livestock production, permanent cropping or unsustainable timber harvesting, as traditional measures of profitability are short-termist and ignore the positive externalities of standing forest and the negative externalities of activities resulting in deforestation.

In many countries there have been efforts to develop non-wood products or supply chains (see box II.7). In addition, markets have begun to realize the value of some ecosystem services provided by forests, such as carbon sequestration. The region's forests harbour a large proportion of the world's carbon stocks (see section II.b.1). Forest ecosystem services are still not evaluated comprehensively (water storage and recycling, soil fertility, pollination and seed dispersal, microclimate, support for biodiversity).

With regard to the timber industry, in 2005 wood removals marketed in the Latin American and Caribbean formal market were worth a total of US\$ 6.8 billion, accounting for 7% of global extractions. Although this figure represents only 5% of the global planted forest area (FAO, 2011), the region is emerging as a leader in high-productivity forest plantations, in many cases benefitting from government policies. South America has become the foremost investment destination for pulp and paper producers from the region and the rest of the world, even though some of the consequences of this trend have been called into question. The forest area set aside for production, based on a management plan approved by the State, has increased from 73 million hectares in 1990 to just over 78 million hectares in 2000 and 83 million hectares in 2010 (FAO, 2011). The area assigned to certified forest production in the region grew from a little under 3.1 million hectares in 2002 to nearly 13.5 million hectares in 2010, meaning that it increased by an annual average of just over 1.25 million hectares.⁹ Certification programmes in the forestry industry assess forest management systems, environmental impact and social and economic factors. A certification seal guarantees global standards of good management.

⁸ See [online] <http://www.obt.inpe.br/prodes/>.

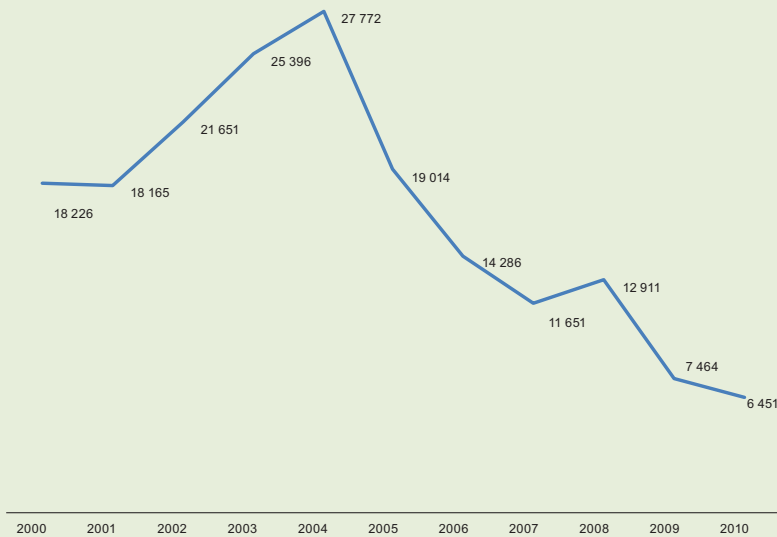
⁹ GEO Data Portal [online] <http://geodata.grid.unep.ch/> [date of reference: December 2011].

Box II.6

**BRAZIL: ACTION PLAN FOR PREVENTION AND CONTROL OF DEFORESTATION
IN THE LEGAL AMAZON**

The Amazon rainforest plays a key role in the region's climate system. High deforestation rates in the Amazon led the Government of Brazil to establish the Action Plan for Prevention and Control of Deforestation in the Legal Amazon Plan (PPCDAM) in 2003. PPCDAM is an unprecedented initiative in terms of institutional coordination between government sectors (ministries) and levels (federal, State, municipal). The complexity of the deforestation issue required the plan to be implemented jointly by 13 ministries, under the coordination of the Civil House of the Presidency of the Republic. PPCDAM has three main components: land use and issues relating to land ownership; environmental monitoring and control; and promotion of production activities. Since 2005, there has been a marked decline in deforestation rates (see the following figure).

BRAZIL: ANNUAL DEFORESTATION RATE IN THE LEGAL AMAZON, 2000-2010
(Square kilometres/year)



Source: Instituto Nacional de Pesquisas Espaciais (INPE), “Taxas anuais do desmatamento - 1988 até 2010” [online] www.obt.inpe.br/prodes/prodes_1988_2010.htm

Some of the key measures have been auditing, the dissemination of lists of municipalities where deforestation has reached critical levels and a decree preventing public-sector financial institutions from funding economic agents with activities in deforested areas. Added to this has been growing market pressure to obtain guarantees concerning the legal provenance of products (such as meat) and economic action by the private sector and civil society (such as a moratorium on buying soy produced in deforested areas). The action plan has been re-evaluated and readjusted periodically in response to lessons learned and changes in deforestation patterns and causal factors.

During the first quarter of 2011, an increase in the deforestation rate highlighted the structural fragility of these achievements. This was caused by such factors as legal uncertainty arising from the parliamentary discussions on the Forest Code over reducing the compulsory percentage of forest area to be maintained within farms as legal forest reserves and permanent conservation areas and the resulting amnesty on illegal deforestation.

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/German Agency for International Cooperation (GIZ)/Institute of Applied Economic Research (IPEA), “Avaliação preliminar dos resultados atingidos pelo Plano de Ação para a Prevenção e Controle ao Desmatamento na Amazônia Legal (PPCDAM)”, 2011, forthcoming.

Box II.7

**LATIN AMERICA AND THE CARIBBEAN: PROMOTION OF FOREST MANAGEMENT
FOR NON-WOOD FOREST PRODUCTS – CASE STUDY IN BOYACÁ (COLOMBIA)**

The municipality of Ráquira, in Boyacá, is considered Colombia's craftwork capital and is famous for its clay crafts, as well as its hand-woven bags, baskets and hammocks and for pottery in general. It has 13,300 inhabitants of whom around 1,250 are craftworkers, and 75% of its economy hinges on the craft trade. Of all the forest species recorded in the municipality of Ráquira (287), it was found that 46% have current or potential use and that the pottery trade uses 42 species for fuelwood and 19 species for crafts, including the lianas, *Smilax floribunda* and *Smilax aff. tomentosa*, and other species like *Indigofera suffruticosa* (indigo), used as a dye, and *Juncus effusus* (rush), used in basketwork. These species are priorities for the development of management plans relating to harvesting models and market research to ensure an economic benefit for the region's farmers and craftspeople (López, 2006).

Equally successful cases of local communities deriving enormous social and economic benefit from harvesting non-wood products from forests can be found in other areas of Latin America and the Caribbean (one such case is the Maya Biosphere Reserve in Guatemala, as reported by Mollinedo and others, 2001).

Source: United Nations Environment Programme (UNEP), *Latin America and the Caribbean: Environment Outlook*, Panama City, 2010. R. López, "Lista de especies vegetales vasculares registradas en el municipio de Ráquira, Boyacá. Informe final", Bogota, Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, 2006; A.C. Mollinedo and others, "Beneficios sociales y económicos del bosque en la Reserva de Biósfera Maya", *Revista forestal centroamericana*, No. 34, 2001, pp. 57–60.

The economic importance of forests goes far beyond formal trade figures for forest products. On the one hand, the economic value of many of the products sourced from forests is included in agricultural accounts. On the other hand, conventional statistics take no account of the great importance of various forest products and services for the survival and lifestyles of families and local communities, as well as for the local and global environment (ecosystem resources account for about 89% of the income generated by some 20 million poor (TEEB, 2010)). As mentioned earlier, the region has great potential in innovative markets for payment for environmental services. Initiatives such as the World Bank Forest Carbon Partnership Facility and the United Nations Collaborative Programme on reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) support countries in establishing payment mechanisms for forest environmental services.¹⁰ Two examples of ongoing initiatives are Brazil's *Bolsa Floresta* programme (Viana, 2008) and Costa Rica's payment for environmental services programme.

Many of the region's success stories have been limited to one-off initiatives or relatively small areas. In many cases, a weak State presence in remote forest areas compounds problems of logistics, funding and technical capacity, hampering the implementation of larger-scale, more effective measures. There is room for: the transfer of successful experiences; the widespread introduction of models of participation in forest management by civil society, communities and specific groups, such as women (see box II.8); and the use of technology tools such as information and communication technologies.

An emerging issue is governance of the region's forests to realize the potential of carbon sequestration, including financing mechanisms for communities reliant on forest resources. Another issue of increasing importance is upgrading the forestry industry by introducing the principles of efficiency, cleaner production, appropriate working conditions, social benefits for the communities living in the vicinity of forests and certification schemes accessible to small farmers.

¹⁰ See [online] <http://www.forestcarbonpartnership.org/fcp/> and <http://www.un-redd.org>.

Box II.8

DESIRED ROLE OF WOMEN IN FOREST CONSERVATION

Women have proved vital to forest conservation worldwide. At present, strategies are under way to: understand and take into account the various benefits that men and women derive from forest services; recognize gender differences in access, control, knowledge and decision-making on forest resources, institutions and economic opportunities; and adopt a gender perspective regarding opportunities for reducing emissions from deforestation and forest degradation (REDD), ensuring the full participation of women and including them in relevant national and regional policymaking. These programmes should also promote women's equal access to land ownership and other resources required for their effective socioeconomic participation in forest management and in climate mitigation strategies (including land, capital, technical assistance, technology, tools, equipment, markets and time). In Costa Rica, the payment for environmental services programme, administered by the national forestry financing fund (FONAFIFO), contributes to carbon emissions mitigation and the sustainable management of natural resources by offering owners economic incentives not to deforest their land. As most owners of this land are men, and women have little access to land, FONAFIFO charges a fee to ensure that some of the profits from this programme go to support women wishing to buy land.

Source: Union for Conservation of Nature (IUCN)/United Nations Development Programme (UNDP), "Training Manual on Gender and Climate Change", 2009 [online] http://cmsdata.iucn.org/downloads/eng_version_web_final_1.pdf.

4. Reduction in emissions of ozone-depleting substances

Solving the problem of ozone layer thinning is critical for South America, particularly the region's southern latitudes (Argentina, Brazil, Chile, Paraguay and Uruguay), which receive a great deal of ultraviolet-B rays.

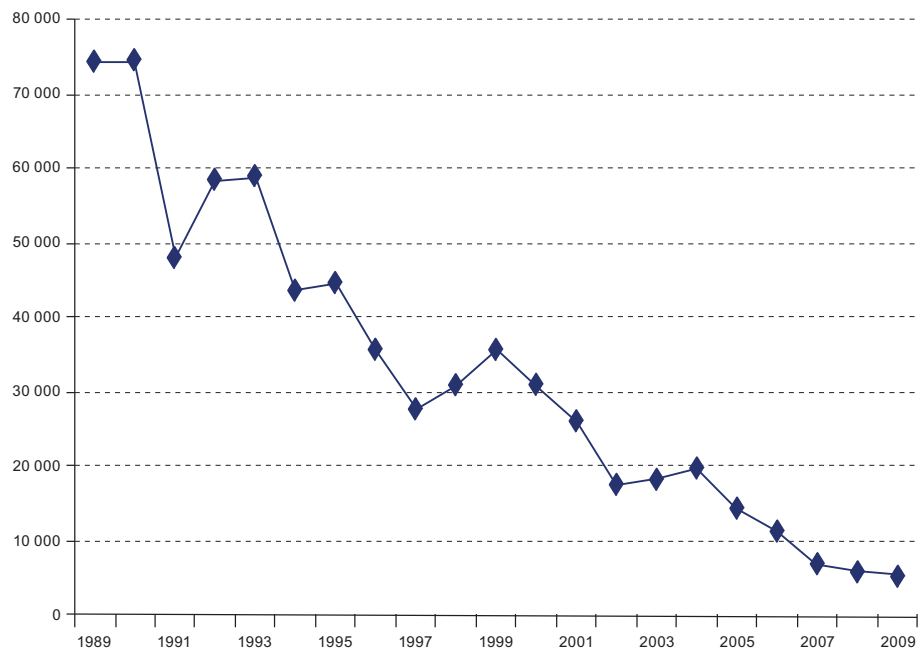
The international regime for the protection of the stratospheric ozone layer by reducing ozone-depleting substances is widely acknowledged as a global success story in terms of protecting a global public good. Ten years after signature of the Montreal Protocol, more than 95% of the ozone-depleting substances in the Protocol had been eliminated and the timetable for eliminating substances has been speeded up. The chlorofluorocarbon (CFC) industry has made the transition to a range of alternatives, including hydrocarbons (HC) and hydrofluorocarbons (HFCs). The transition has begun from hydrochlorofluorocarbons (HCFCs) to alternatives that neither affect the ozone layer nor contribute to climate change, as many HCFCs contribute to climate change (UNDP, 2011).

Emissions of ozone-depleting substances have fallen steadily in Latin America and the Caribbean. Between 1990 and 2009, the consumption of ozone-depleting substances fell by around 90%, from 74,652 tons to 5,359 tons (see figure II.12). A number of countries have achieved their targets before the initial deadline. This achievement reflects the national efforts made within the framework of the Montreal Protocol, including international cooperation, technological progress and successful collaboration between the public and private sectors (United Nations, 2010).

Although experience with reducing ozone-depleting substances cannot easily be replicated to address other global environmental problems, it does help to identify some conditions under which countries progress in the adoption of technological improvements with positive effects on the environment. First, the commitments made under the Protocol acted as a powerful incentive in encouraging and facilitating business decisions to adopt environmentally friendly technology. Second, it was essential to have funds available to pay the incremental costs associated with switching to alternative technologies. In particular, technical and financial support through the Multilateral Fund for the Implementation of the Montreal Protocol has been crucial. Third, there was a realization that

technology transfer is successful only when backed by measures to build human and institutional capacity. Fourth, it was found that private-sector support and active participation are still essential to technology development and adaptation and to the creation of substitute goods. Lastly, the experience emphasized the importance of a lifecycle approach to the adoption of alternative technologies and substances (UNDP, 2011).

Figure II.12
**LATIN AMERICA AND THE CARIBBEAN: CONSUMPTION OF OZONE-DEPLETING
 SUBSTANCES, 1990-2009**
(Ozone-depleting potential (ODP) tons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Millennium Development Goals indicators database based on figures from the Ozone Secretariat of the United Nations Environment Programme (UNEP) [online] http://ozone.unep.org/Data_Reporting/Data_Access/ [date of reference: May 2011].

5. Combating desertification, land degradation and drought: a priority for arid regions

Latin America and the Caribbean are actually about one quarter desert and drylands.¹¹ The degradation of these lands is contributing to the decline in the biological productivity of ecosystems and the economic productivity of agriculture, livestock production and forestry. All Latin American and Caribbean countries have ratified the 1994 United Nations Convention to Combat Desertification (UNCCD), have appointed focal points based in ministries of environment or agriculture and conduct programmes to combat desertification and land degradation. A number of countries have also developed national action programmes.

¹¹ See [online] www.unccd.int/.

A regional action programme was established in March 1998 to coordinate national efforts. The Regional Implementation Annex for Latin America and the Caribbean of the United Nations Convention to Combat Desertification (UNCCD) was drawn up on the basis of the region's particular characteristics:

- (i) the existence of broad expanses which have been severely affected by desertification and/or drought; this threatens one of the largest resources of biological diversity in the world;
- (ii) the frequent use of unsustainable development practices in affected areas;
- (iii) a sharp drop in the productivity of ecosystems, coupled with a decline in agricultural, livestock and forestry yields and a loss of biological diversity; from the social point of view, the results are impoverishment, migration, internal population movements, and deterioration of the quality of life.

The degradation of lands in terms of their biological value or economic productivity is fairly slow and largely invisible, if measured in terms of policy time frames. Even though the techniques, procedures and strategies for sustainable land management are well known, the low priority assigned by the region's Governments prevents the problem from being tackled with the required forcefulness.

Another reason for the scant attention paid to the issue is insufficient statistical, cartographic and economic information to disseminate present and future effects. It is hoped that the 10-year strategic plan and framework to enhance the implementation of the United Nations Convention to combat Desertification (2008–2018), which has revised the format and content of national reports on combating desertification, will help to improve this situation. Since 2010, Parties to the UNCCD have been required to quantify and deliver indicators of progress.

Recent studies by ECLAC and the Global Mechanism of the United Nations Convention to Combat Desertification¹² highlight the economic impact of inaction. According to preliminary long-term scenarios, in Central America, land area with six or more dry months will double (from 9% in 2010 to 20% in 2100 under IPCC scenario A2). By way of example, it is estimated that, by 2100, a total of 92.5% of El Salvador will experience six or more dry months (as compared with 39.8% in 2010). Honduras will be the country to lose the most wetlands (44,632 km²) by 2100. In percentage terms, between 2010 and 2100 Belize will lose 45.4% of its wetlands, El Salvador 45.6% and Honduras 48.4% (ECLAC/Global Mechanism, 2011).

Table II.6 below shows estimated productivity losses in some countries in the region under IPCC scenario A2, measured as a percentage of agricultural GDP.

In 2010, the second International Conference: Climate, Sustainability and Development in Semi-arid Regions (ICID) was held as part of the preparatory process for the United Nations Conference on Sustainable Development (Rio+20). The conference issued the Declaration of Fortaleza, which defines key issues for Rio+20 relating to desertification, land degradation and drought.

¹² The Global Mechanism was set up by Article 21 of the United Nations Convention to Combat Desertification and came into operation in October 1998. As a subsidiary body of the Convention, its mandate is to “increase the effectiveness and efficiency of existing financial mechanisms” and to “promote actions leading to the mobilization and channelling of substantial financial resources [...] to affected developing country Parties”.

Table II.6
AGRICULTURAL PRODUCTIVITY LOSSES ACCORDING TO CLIMATE CHANGE SCENARIO A2
(Percentages of agricultural gross domestic product (GDP))

Country	Agricultural GDP as a percentage of total GDP, 2008	Percentage reduction in agricultural GDP by 2020	Percentage reduction in agricultural GDP by 2050	Percentage reduction in agricultural GDP by 2100
Bolivia (Plurinational State of)	12.1	17.8	18.5	19.9
Chile	5.4	3.5	7.2	7.3
Ecuador	10.5	8.0	16.3	18.0
Paraguay	22.1	8.0	16.1	28.0
Peru	6.7	5.5	7.1	9.6

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/Global Mechanism of the United Nations Convention to Combat Desertification.

6. Water resource management

The issue of water was addressed in chapter 18 of Agenda 21. Subsequently, the Plan of Implementation for the World Summit on Sustainable Development emphasized the importance of: access to safe drinking water and basic sanitation; developing plans for the integrated management and efficient use of water resources; and facilitating access to information on the sustainable use of water resources. In 2003 the United Nations established the International Decade for Action, “Water for Life” 2005–2015, the main objective of which is to promote activities aimed at meeting, by 2015, the commitments on water, including the Millennium Development Goals of halving, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation as well as to stop the unsustainable exploitation of water resources.¹³

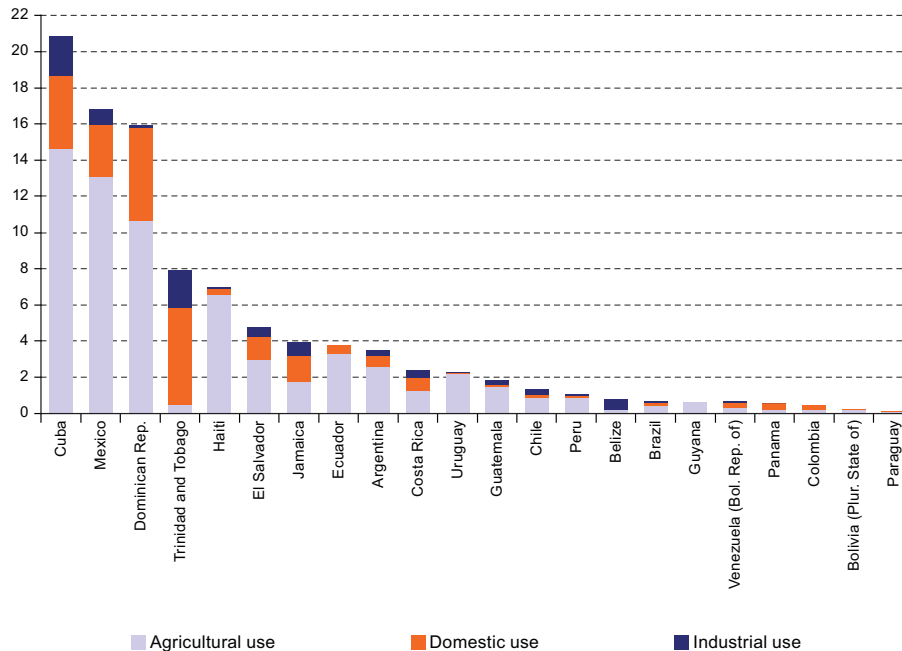
Latin America and the Caribbean is one of the regions with the greatest abundance of water on the planet. It harbours one third of the world’s renewable water resources and, although it has only 15% of the world’s land mass and 8.4% of its population, it receives 29% of global precipitation (United Nations, 2010). However, water distribution is highly unequal, and water resources are strained by multiple factors, such as excessive abstraction for agriculture and mining, aquifer depletion, increasing water pollution, deforestation and the destruction of catchment basins and replenishment areas (United Nations, 2010). The melting of glaciers in Andean regions that supply water for agriculture and cities is becoming an increasingly important factor in these areas (UNEP, 2010a).

Climate change will compound existing problems. Less rainfall in some areas and more frequent droughts and floods in others will affect water availability and quality. According to IPCC predictions, the number of people experiencing water shortages in the region will range between 12 million and 81 million in 2025, and between 79 million and 178 million in 2055 (Arnell, 2004).

As is the case everywhere in the world, in Latin America and the Caribbean water is used mainly for agriculture, followed by domestic and industrial consumption. Figure II.13 shows water withdrawal rates by these sectors in selected countries of the region (United Nations, 2010).

¹³ See [online] www.un.org/waterforlifedecade/.

Figure II.13
LATIN AMERICA AND THE CARIBBEAN (SELECTED COUNTRIES): WATER WITHDRAWAL AS A PROPORTION OF RENEWABLE WATER, BY SECTOR, 1998-2002
(Percentages)



Source: Food and Agriculture Organization of the United Nations (FAO) [online] www.fao.org/nr/water/aquastat/main/indexsp.stm.

Regional trends point to a significant increase in water demand. From 1990 to 2004, region-wide demand grew by 76% (from 150 cubic kilometres (km³) per year in 1990 to 264.5 km³ per year in 2004). This was a result of population growth (especially urban), the expansion of industrial activity and the high demand for irrigation (UNEP, 2010a). As all this took place without a parallel development of wastewater treatment services, it led to widespread contamination of many water sources, especially near and beneath major cities (United Nations, 2010). Locally, the continuing increase in water demand could create uncertainty regarding water availability and even heighten the risk of water shortages and conflict between the various uses and users (ECLAC, 2011a).

The region has many transboundary surface water and groundwater resources and has amassed valuable experience with cooperation, dating back several decades in the case of surface water and, more recently, in the case of groundwater. Examples are the Treaty on the River Plate Basin, concluded in 1969 by the five countries bordering it (Argentina, Brazil, Paraguay, Plurinational State of Bolivia and Uruguay), and the Agreement on the Guarani Aquifer, which is shared by Argentina, Brazil, Paraguay and Uruguay, concluded on 2 August 2010.

Below is a review of progress by Latin America and the Caribbean in implementing the recommendations in chapter 18 of Agenda 21 and chapter IV of the Johannesburg Plan of Implementation in relation to water.

(a) Integrated water resources development and management

In the 1980s and 1990s, many countries of the region undertook reforms of their institutional structure for water resource management, a process that is still ongoing. A common feature of these reforms is a shift of the State's responsibilities towards overseeing, promoting and regulating the activities of others. Other common features are decentralization and greater private-sector involvement in the water sector. Processes are also under way to change legislation regarding water resource management and the organizations responsible in this area. These changes are designed to improve water management, assigning responsibility for water policymaking and coordination to a non-user regulatory or coordinating body that is independent and separate from traditional users (such as agriculture and the electricity, drinking-water supply and sanitation sectors) and that takes an integrated approach to water resources, with the watershed as the appropriate unit.

Many countries in Latin America and the Caribbean have water basin plans (albeit under varying denominations), but their implementation is severely hindered by a lack of governance mechanisms, legal regulations, commitment by actors and sustainable sources of financing. The main challenge is to secure functional methods of administration for policymaking, institutional coordination, conflict resolution and project planning and implementation. There is recognition of the basic fact that sectoral regulatory bodies cannot be responsible for allocating water resources properly among competing uses because they would be acting as both judge and jury. In this respect, experience of local water governance in Central America is interesting (see box II.9).

Box II.9

LOCAL WATER GOVERNANCE IN CENTRAL AMERICA

The seven countries of the Central American Integration System (SICA) have agreed joint public policies and strategies for integrated water resource management and integrated rural development. In 2009 and 2010, they approved three regional strategies: the Central American Strategy for Integrated Water Resource Management (ECAGIRH); the Regional Agro-Environmental and Health Strategy (ERAS); and the Central American Strategy for Rural Territorial Development (ECADERT).^a These three Central American public policies are aimed at promoting sustainable development at the local level, with special emphasis on the sustainable use of water resources. One of the key aspects of these policies and of new national legislation on water is the use of sustainable watershed management criteria for establishing local water governance bodies and for land-use planning as part of the development process.

For example, Nicaragua's new National Water Authority (ANA), established in mid-2010, is organizing a network of local committees responsible for water governance and for defining local management plans. In the Coco River basin, part of which is in Honduras, since 2010 ANA has been conducting a pilot initiative for establishing a local water authority and defining local development plans based on sustainable watershed management. Municipalities in the basin have joined forces in two associations —AMUNSE in Nicaragua and MANORPA in Honduras— that work together to define management plans for sub-basins. With financial support from the European Union, the United Nations Office for Project Services (UNOPS), UNEP and the Regional Unit for Technical Assistance (RUTA) provide technical assistance and training to ANA and to local authorities, to build the capacities of local watershed organizations and provide technical criteria for defining management plans, which are geared towards: the rational use of natural resources; combating poverty and exclusion; developing environmental resources; promoting ventures that produce environmental goods and services; and reducing socio-environmental vulnerability to extreme weather events, such as alternating droughts and floods. At the same time, ANA is building on the Coco River experience to define models and methods for organizing micro-basin and sub-basin authorities throughout Nicaragua. The Coco River experience and other pilot initiatives being undertaken in Central America are providing the community with practices in a region where proper water management is crucial.

Source: United Nations Office for Project Services (UNOPS), on the basis of Central American Integration System, "Estrategia Centroamericana Agroambiental y de Salud – ERAS", 2009; "Estrategia Centroamericana para la Gestión Integrada de los Recursos Hídricos", 2009; "Estrategia Centroamericana de Desarrollo Rural Territorial – ECADERT", 2010; "Estrategia Centroamericana para la gestión integrada de los recursos hídricos", 2009.

^a The three public policies mentioned have been approved in the past two years by the Governments of Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

(b) Water resources assessment

A major effort in this area is the World Water Assessment Programme (WWAP), founded in 2000, which oversees freshwater-related issues in order to build national assessment capacity, among other aims. Despite the great importance of water resources assessment in the region, little progress has been made in this area. Insufficient information is available and there are watersheds for which not even the basic background details are known for calculating the water balance. In spite of considerable progress in incorporating new technology, there are often long delays in data storage and processing. The main challenge is to improve institutional capacity for implementing and administering a system of continuous monitoring and assessment of water resources, in order to supply water managers with reliable information with which to work.

In many countries, water monitoring is done piecemeal in response to sectoral interests, and available information is either very scarce or ad hoc.

(c) Protection of water resources, water quality and aquatic ecosystems

The biggest problems facing water resource management include the unwarranted degradation of water quality and pollution of surface water and groundwater associated with urban growth, industrial expansion, mining, agriculture and the use of chemicals, with no proper wastewater treatment or pollution control facilities. To counter this, in recent years virtually all Governments of the region have announced policies to protect water resources, water quality and aquatic ecosystems, which, while diverse, share a number of common features: (i) greater awareness of environmental issues; (ii) interest in using economic instruments for inducing water resource protection; and (iii) mainstreaming pollution control from a watershed perspective.

In terms of water pollution regulation and economics, progress has been made in recent decades. On the one hand, water-use charges (Brazil) and wastewater discharge fees or charges (Brazil, Colombia, Mexico) are starting to be introduced (Acquatella, 2001). On the other hand, the focus is still on the use of regulatory instruments such as standards, discharge permits and regulations, which entail an implicit economic cost. While approximately 30 million cubic metres (m³) of domestic wastewater are discharged into surface water bodies, no more than 28% is treated prior to discharge (Lentini, 2008). The percentage of treated wastewater varies widely from country to country and in some, such as El Salvador (3%), Haiti (5%), Colombia (8%), Guatemala (9%) and Honduras (11%) (WSP, 2007), the figures are worryingly low, whereas a city like Santiago, Chile, treats more than 80% of its wastewater (UNEP, 2010a).

Many challenges remain in protecting water resources, water quality and aquatic ecosystems, starting with the need for national policies to protect ecosystems comprehensively, such as water sources, and for a variety of mechanisms to be designed and implemented to promote water resource availability and quality. In order to protect health, there is an urgent need to increase investment in wastewater treatment facilities and to incorporate innovative technologies for wastewater treatment and recycling. To achieve this, it is important to ensure both ethical propriety and appropriate discount rates and to make a proper assessment of damage caused by resource degradation in water infrastructure investment.

Several countries in the region have incorporated innovative provisions in their legislation on water that take an ecosystem approach to water management. Paraguay's law on water resources (Law 3.239/2007) ranks the water needs of aquatic ecosystems second only to water allocations for human consumption and ahead of agricultural, power generation and industrial uses. Similarly, under the Nicaraguan General Law on National Waters (Law 620, approved on 15 May 2007) the granting of

concessions, authorizations and licences for freshwater resources for ecological conservation ranks fourth after water for human consumption, potable water services, and agriculture and forestry, and ahead of water for public energy generation, industrial uses, recreational purposes and other purposes (UNEP, 2010c).

It is also important to consider the role of different groups of people in the management of water resources. Box II.10 discusses the role of women in sustainable water management.

Box II.10

WOMEN AND SUSTAINABLE WATER MANAGEMENT

Women play a crucial role in water provision, management and protection, in order to supply and care for their families. This makes them the main providers and users of water. Problems arising from water mismanagement and climate change will seriously affect women's everyday lives and workload. In most countries of the region, women are responsible for supplying rural households and their unpaid labour is dedicated to transporting water (where there is no domestic water supply), preparing food and cleaning the home. The amount of time women devote to these activities, which are necessary for survival, limits their opportunities for professional and personal development. They are also primarily responsible for the irrigation of small crops and feeding animals for household consumption, while men are usually responsible for major commercial crops. Land ownership and/or tenure also determine access to water, especially in the case of women, who own barely 1% of land and are required to use community water sources, which very often forces them or their children to walk long distances. Poverty and the obstacles women face in securing access to productive resources, to technological training in hydrology and to decision-making processes concerning water management (Rico, 1998) contribute to inequitable water management.

Despite the important role played by women in water management, the gender perspective is still absent from legislation, public policies and programmes relating to water resources. Current national programmes in the region benefitting from bilateral and multilateral support fail to take into account either the different water uses and specific needs of women and men, or the need to ensure equal representation in decision-making to guarantee water governance, with the result that they allocate no funding to this. In this regard, the Governments of Latin American and Caribbean countries should consider the following order of priorities in the context of multiple and integrated water use: (i) mainstreaming the gender perspective into water assessment, monitoring, management and research, including watershed management and the ecology of water resources; (ii) greater access to safe drinking water and basic sanitation, to advance in achieving the Millennium Development Goals; and (iii) promotion and regulation of women's participation in community water boards to make water available for irrigation and food production.

Source: United Nations Development Programme Regional Centre, America Latina Genera, *Boletín Genera*, August 2010 [online] www.americalatinagenera.org/boletin/boletin-es-agosto-2010.html.

(d) Climate change and water resources

Climate change is posing new challenges to the region's water resources. Expected increases in temperature and evaporation, along with precipitation increases or decreases and the resulting change in flow rates, will alter water availability and quality. In some cases, rising sea levels will cause saltwater intrusion into aquifers near the coast. Extreme phenomena of floods and droughts, as well as desertification processes (CRA, 2009), will exert a very heavy impact on water. Rising temperatures are also having a marked effect on glaciers and their role as water sources and runoff regulators in fragile ecosystems (CRA, 2009), which is a special cause of concern for Andean countries (Andean Community, 2008).

Although the Central American region is privileged in terms of average water availability, water distribution among countries, regions and in the Pacific and Atlantic watersheds is highly uneven, with wide variations both during and between years. This, coupled with rainfall, causes flooding to alternate with periods of severe drought. Population growth could drive up water demand by nearly 300% by 2050 and by more than 1,600% by 2100 under a trend scenario without conservation measures and without climate change. With climate change, demand could increase by a further 24% under the trend scenario for GHG emissions (IPCC scenario A2). At the same time, the total availability of renewable water resources could fall by approximately 60% by the end of this century under scenario A2 compared with current availability. Unless adaptation and conservation measures are taken, changes in demand and availability, coupled with climate change, could lead to water use intensity similar to that of Egypt and some countries of the Arabian peninsula today (ECLAC, 2010b).

Many climate change problems will be associated with changes in water resource availability and the resulting effects on hydroelectric power generation, drinking water supply and water use for irrigation and other production sector activities, including manufacturing and mining (ECLAC, 2010a). This raises the need to consider possible climate variations when designing and implementing infrastructure projects and when formulating water resource management policies and strategies, so that new infrastructure is resilient enough to withstand the risks of disasters.

7. Protection of coasts, oceans and seas

Approximately 50% of the region's population and many of its development activities are concentrated within 100 kilometres (km) of the coast. This exerts strong pressure on coastal ecosystems and poses a threat to the resources that ensure people's survival in coastal areas (UNEP, 2007).

The region's oceans receive high pollutant loads and face a number of threats as a result: 86% of wastewater (up to 90% in the Caribbean) enters rivers and oceans untreated; eutrophication caused by land-based sources of nutrient pollution; inadequate wastewater treatment in cities; salinization of estuaries owing to declining flows of freshwater; and the introduction of invasive alien species through the uncontrolled release of ballast water from vessels. Another threat is acidification of oceans as a result of CO₂ concentrations, affecting fisheries and coral reefs (UNEP, 2010b).

In the past 10 years, the region's marine and coastal ecosystems have contributed between 15% and 30% of the world's total fish supply. The west coast of South America, the west coast of Central America, the Gulf of Mexico and the Caribbean coasts are the most degraded coastlines in Latin America and the Caribbean (UNEP/CATHALAC, 2010).

Some of the region's most degraded ecosystems are mangroves, wetlands and coral reefs. These coastal habitats play an important role in protection against weather-related risks, stabilization and other ecosystem services, as well as in the development of ecosystem-based economic activities. The ecosystem services provided by mangroves include protecting marine rangelands and reefs by filtering pollutants; contributing to the catch of economically valuable fish and crustacean species by providing nesting and nursing grounds; reducing coastal erosion; and offering high recreational value. In addition, they play a key role in adaptation to climate change by acting as a buffer against extreme weather events (Granek and Ruttenberg, 2007) and in climate change mitigation by absorbing up to four times more carbon dioxide than terrestrial forest (Crooks and others, 2011; Nellemann and others, 2009). However, they are at risk because of urban and tourist development, aquaculture, invasive alien species, pollution and changes in

water flows caused by land-use changes, including hydroelectric development, in drainage basins connected to coastal lakes.

Wetlands, including freshwater coastal lakes, peatlands, mountain lakes, seasonal pools and subterranean karst systems, play numerous essential roles, from aquifer recharging and flood control—crucial in the context of climate variability—to regulation of nutrient cycles, climate stabilization and the provision of food, medicines, fibre and wood. These roles are now gravely threatened by land conversion, infrastructure development, water withdrawal, pollution, overexploitation of resources and the introduction of invasive alien species (Millennium Ecosystem Assessment, 2005).

Nearly two thirds of Caribbean coral reefs are threatened by coastal development externalities that are not included in development costs, the free discharge of wastewater, sedimentation, toxic pollution, water acidification and overfishing. Global warming has also had a major impact. The mass coral bleaching events that took place between 1997 and 1998 and in 2005 had a huge impact on these reefs (UNEP, 2010a).

A full 30% of Caribbean coral reefs have either been destroyed or are at serious risk from economic/social factors. If current trends continue, a further 20% is expected to be lost in the next 10 to 30 years (Sherman and Hempel, 2009). The destruction of these ecosystems could have a devastating effect on the Caribbean subregion and its small island developing States (see box II.11).

Box II.11

COSTS OF CORAL REEF DEGRADATION FOR HUMAN POPULATIONS IN THE CARIBBEAN REGION

The degradation of coral reefs will lead to a poorer quality of life for local residents. Both consumable resources and tourism will decline. Coral reefs, a source of eggs, larvae, juveniles and adults of numerous fish species, will disappear and other ecological services, such as carbon dioxide sequestration and nutrient recycling, might cease to be provided. As the Caribbean's attractions diminish and disappear, so will the tourists and their contribution to local economies.

A reduction in the number of diving tourists, who generate around 17% of the region's total government revenue from tourism, will cause estimated losses of around US\$ 300 million per year.

The degradation of Caribbean coral reefs is also predicted to reduce fish production and incur annual losses of more than US\$ 140 million in government revenue. This will increase poverty levels, as well as the region's dependence on imported fresh and processed fish products.

Deterioration in the quality of Jamaica's coral reefs led to a steep fall in revenue from fisheries and diving tourism. Other Caribbean islands with declining catches of reef fish could suffer similar consequences in terms of resource and biodiversity depletion.

Source: United Nations Environment Programme (UNEP), *Latin America and the Caribbean: Environment Outlook*, Panama City, 2010.

Other marine areas in the region are also facing a range of environmental problems, as summarized in Box II.12.

These combined pressures are threatening many of the region's coastal ecosystems. Reducing some forms of pressure on coral systems could lessen their vulnerability to acidification and warmer waters. In the case of other coastal ecosystems, the implementation of policies that allow for the migration of marshes, mangroves and inland lakes would make them more able to withstand the impact of rising sea levels and would help to protect the vital services they provide.

Box II.12

LATIN AMERICA AND THE CARIBBEAN: MAIN PROBLEMS OF MARINE REGIONS**South-West Atlantic Region**

The South-West Atlantic Region corresponds to the States of Argentina, Brazil and Uruguay. Evaluations by Governments and non-governmental organizations in countries of this region indicate that stocks of the principal fish species are overfished and others are depleted, collapsed or in danger of extinction. Even though recommendations have been drafted to strengthen regulations and address the problem, the prioritization of economic gain without considering environmental externalities is hampering their implementation. The hydrocarbon industry incurs a significant impact and cost on marine species. Growth in oil and gas exploration increases the risk. Compulsory damage assessments and processes of mitigation and compensation should be made a prerequisite for obtaining licences. Climate change presents new challenges, in particular the risk of extreme weather events, which will exacerbate coastal erosion and have an impact on biodiversity and fisheries.

Wider Caribbean Region

Coastal water quality has begun to decline throughout the region as a result of pollution from land-based sources caused by: high population density; poor economic management of such activities as transport, tourism and oil extraction; and the associated waste discharges from industry and agriculture, especially pesticides and fertilizers. Priority concerns include unsustainable harvesting of fish and other live marine resources, and the pollution and modification of coastal habitats and communities. This region has one of the highest dependencies on tourism in the world. Many habitats near the coast have been modified and destroyed and pollution from tourism developments has grown. Around 30% of Caribbean coral reefs are considered to have been destroyed or at extreme risk from anthropogenic pressures and from the impact of hurricanes.

South-East Pacific Ocean Region

The South-East Pacific Ocean region includes the coasts of Chile, Colombia, Ecuador and Peru. The most important issues in this area include specific problems of wastewater, marine debris, aquaculture and fisheries. The greatest pressure has come from the steady growth of coastal populations and shipping. Although the total amount of discharges into the sea is unknown, agro-industrial and domestic wastewater discharges are the main source of marine pollution and of pressure on ecosystems. Inadequate wastewater treatment and disposal has exerted pressure on both human health and the environment and incurred economic losses. Two transboundary environmental problems in the region are pollution of coastal ecosystems by land-based activities and unsustainable harvesting of fish and other live marine resources, which, in short, are the result of economic activities that fail to cover their costs adequately.

Source: United Nations Environment Programme (UNEP)/Intergovernmental Oceanographic Commission (IOC), *An Assessment of Assessments: Findings of the Group of Experts. Pursuant to UNGA Resolution 60/30, 2009.*

In the early 1990s, marine protected areas (MPAs) began to gain prominence. However, attempts to safeguard the region's coastal and marine areas by means of protected areas are still very modest. Only 0.1% of the exclusive economic zones of the countries of the region is under some form of protection, and most of the 255 marine reserves are not managed effectively (UNEP, 2010a).

The oceans are managed by means of a fragmented system in which national and international entities have separate and overlapping jurisdictions. This governance structure has been insufficient to tackle the threats to marine ecosystems. In addition, many of the policies have not been implemented effectively.

Gradually, countries and international organizations have reinforced their commitments to integrated management by adopting special marine spatial planning and ecosystem-based management approaches. Examples include the Plan of Implementation for the World Summit on Sustainable Development, the decisions of the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity in 2010 and bioregional planning schemes.

Climate change will exacerbate the risks and vulnerabilities of the coasts of Latin America and the Caribbean. There is irrefutable evidence that sea levels rose gradually in the twentieth century and they are expected to rise further in the twenty-first century, owing mainly to thermal expansion of ocean water and the melting of polar ice caps. Rising sea levels are not the only threat to the region's coasts, however. Variations in swell, surface water temperature, salinity and meteorological tides may pose significant risks and result in further coastal erosion and coral bleaching, loss of beach tourism and coastal defences, reduced port infrastructure operability and security offered by maritime defence structures, and ecosystem flooding. The outlook is not encouraging; current trends pose significant challenges when it comes to devising policies on integrated coastal management and planning. Such policies should take into account the need to adapt to new patterns and trends, as well as climate variability.¹⁴

8. Protection of fishery resources

The seas of Latin America and the Caribbean provide between 15% and 30% of the world supply of fish, mainly from three areas of high and very high fish abundance: Central America's west coast and South America's Atlantic east coast and its west coast. Reduced biomass production is evident to differing degrees in all three. Between 2002 and 2006, the region's leading biomass producers were Peru (between 6 million tons and almost 10 million tons), Chile (between 4 million tons and 5 million tons) and Argentina (between 0.9 million tons and 1.2 million tons) (UNEP, 2010a).

As mentioned in chapter I, there has been an increase in aquaculture in the region. Between 1992 and 2008, aquaculture grew by an annual average of 8.4%, becoming the world's fastest-growing food-producing activity. In fact, in the Latin American region the aquaculture growth rate has outstripped that of every other region in the world, with an annual average of more than 21% in the period from 1970 to 2008. However, this growth has not been exempt from environmental problems, such as the destruction of mangroves associated with shrimp farming (see chapter I) (FAO, 2010b; ECLAC/FAO/IICA, 2010).

In contrast, marine fisheries have tended to stabilize, with a total production of around 80 million tons per year, indicating that, in most cases, it has reached its maximum sustainable level of exploitation (FAO, 2010b). It is a matter of concern that, overall, the percentage of the world's underexploited major fisheries fell from 29% in 1992, the year of the Rio Summit, to less than 15% in 2008, whereas overexploited fisheries increased from 24% to 33% over the same period (FAO, 2010b).

The measures adopted globally and regionally, some of which have been incorporated into national policies in line with Agenda 21, have been major steps in preserving the equilibrium of ecosystems. However, in many cases, compliance with international agreements or their inclusion in national legal frameworks is still severely lacking.

There have been changes in the fisheries and aquaculture sector at national and regional levels, including the creation of an institutional framework in countries like Brazil and Ecuador, the establishment of the Ministry of Environment in Chile, with a close regulatory relationship with fisheries, and the establishment of the Central American Organization of the Fisheries and Aquaculture Sector (OSPESCA), which have enabled food supplies from the sea to grow within a sustainable framework.

¹⁴ For further information, see ECLAC, 2011b.

Small-scale fisheries continue to be important in the region in terms of providing food and employment to thousands of communities, both on the coast and in inland fisheries. Like other food-producing sectors, fisheries and aquaculture are strongly affected by climate change. Direct effects on resources include changes in the physiology of organisms and in patterns of spatial and temporal distribution and hence in their abundance, owing to changes in hydrographic or temperature patterns, rising mean sea levels, erosion of beaches and disruption from weather phenomena such as acidification.

Indirectly, climate change has had a significant impact on the production of various inputs for the production of balanced feed, such as fishmeal, soy bean, sorghum and other grains. The upward trend in the price of these products, as well as in energy prices, has undermined the competitiveness of small aquaculture producers, in many cases leading them to abandon aquaculture altogether.

9. Environmentally sound management of toxic chemicals

As mentioned in chapter I, chemicals production in the region and in developing countries generally is an activity that generates significant negative environmental and health-related externalities (IPCS, 2010; WHO, 2009b). Neither the industry nor users bear the costs of proper disposal of chemical waste.

Institutional progress has been made, however, including new national and international regulations and improvements in risk assessment measures, as well as in the definition of indicators and metrics (WHO, 2005, IPCS, 2010). Most countries of the region have adopted strategies for management of chemical products and have ratified the relevant international conventions on chemicals as described below. As there are significant problems in implementing these conventions, particularly in terms of financial, institutional and technical capacity, the synergies among the three conventions and among countries need to be exploited more fully.

(a) Control of transboundary movements of hazardous wastes and their disposal (Basel Convention)

Countries of the region have implemented the Basel Convention measures to varying degrees in accordance with their capabilities, characteristics and needs. Some of the issues of concern to the region are smuggling of hazardous waste, training of customs officials and enforcement officers, raising the awareness of judges, improving legislative and regulatory frameworks, waste management infrastructure (including monitoring and analysis aspects) and financing, educating and raising the awareness of public and private sectors.

Even though it has not yet come into force, nine countries in the region¹⁵ and 71 in total (including the European Union) have signed the 1995 amendment to the Basel Convention prohibiting the export of hazardous waste from developed to developing countries for final disposal, recovery or recycling. The Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal was signed by only three countries in the region.¹⁶

¹⁵ The countries in the region that have ratified the Protocol are Argentina, Chile, Ecuador, Panama, Paraguay, Plurinational State of Bolivia, Saint Lucia, Trinidad and Tobago, and Uruguay. See [on line] <http://www.basel.int/Countries/StatusofRatifications/BanAmendment/tabid/1344/Default.aspx> [date of reference: December 2011].

¹⁶ Chile, Colombia and Costa Rica.

With regard to the safe recovery and recycling of hazardous wastes, reports from the region's countries to the Basel Convention in 2005 showed that ten countries had policies in effect, seven were formulating such policies, and four still lacked any such policy. Only one country reported that it had adequate facilities to treat waste oil. The vast majority of countries in the region lack facilities to treat, dispose of, or recycle these substances (OAS, 2009).

In 1992, a group of six Central American countries signed and ratified a Regional Agreement on Transboundary Movements of Hazardous Wastes, based on the Basel Convention, banning the import and transit of waste considered as hazardous from countries that are parties to the agreement to Central America. For the purposes of technical assistance, technology transfer and capacity-building, Argentina, El Salvador, Trinidad and Tobago and Uruguay are all hosting Basel Convention Regional Centres, which require the countries' reinforcement and support.

(b) Prior informed consent (Rotterdam Convention)

The Rotterdam Convention, in force since 2004, establishes a prior informed consent (PIC) procedure for imports of hazardous chemicals. The challenges facing the convention include: poor administrative capacity to enforce obligations; weak structures for promoting harmonization and fostering synergy between international agreements; and poor intersectoral coordination. This makes the Convention ineffective as an economic and regulatory instrument.

Some of the proposed ways forward to resolving these problems are: training in toxicology and risk assessment; information dissemination; the establishment of mechanisms to ensure the participation and commitment of all the parties required to implement the convention; involving customs more actively; securing the commitment of industry; and encouraging information-sharing and collaboration among designated national authorities (Montreal, 2007).

(c) Persistent organic pollutants (Stockholm Convention)

The Stockholm Convention on Persistent Organic Pollutants (POPs) has been adopted by 30 countries in the region, 22 of which have submitted national implementation plans.¹⁷ The region is progressing with banning the 12 substances covered by the Stockholm Convention at the outset and now faces the challenge of banning the additional 9 substances incorporated in 2009. At the fifth meeting of the Conference of the Parties to the Convention (COP5) held in 2011 it was also agreed to ban endosulfan, used in such applications as coffee and soybean plantations. The worst lags in implementing the provisions of the Convention include deficiencies in monitoring and research capacity, final disposal, information dissemination and strengthening the legislative and institutional framework (Secretariat of the Stockholm Convention, 2009; UNEP, 2008a). Another major challenge is managing stocks of obsolete products. The Persistent Organic Pollutants Review Committee (POPRC) is also assessing a number of products, including short-chain chlorinated paraffins, used in the metal-processing industry, and hexabromocyclododecane, used in a variety of applications as a fire retardant, with a view to banning them under the Convention.

While major progress has been made in terms of information, including inventories of dioxins, furans and polychlorinated biphenyls (PCBs), the lack or inadequacy of data is another major barrier to implementing the Stockholm Convention in the region (UNEP, 2008a). There are a number of projects

¹⁷ The national implementation plans (NIP) contain detailed information on measures taken to implement the Stockholm Convention [date of reference: December 2011].

under the Stockholm Convention to help countries to meet their monitoring commitments, financed by the Quickstart Programme (QSP) of the Strategic Approach to International Chemicals Management (SAICM) and by the Global Environment Facility (GEF). In this connection, Chile and Peru are conducting a project to implement best practices in the management of PCBs in the mining sector. So far, 12 of the region's countries have submitted reports on implementation and on the production, import and export of the POPs listed in the annexes to the Convention.¹⁸

(d) Strategic Approach to International Chemicals Management

The Strategic Approach to International Chemicals Management (SAICM), a policy framework for promoting chemical safety worldwide by 2020, was adopted as part of the Plan of Implementation for the World Summit on Sustainable Development. The forum is unique in that it includes representatives of all stakeholders involved in chemicals, on an equal footing and in a participatory framework. A number of countries have begun to develop national implementation plans for SAICM and have received support from the Quickstart Programme to fund projects for fostering activities and building capacity in chemicals management. Parties to Rounds I and II of the Quickstart Programme include: Barbados, Chile, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Plurinational State of Bolivia and Trinidad and Tobago. At the recent Third Latin American and Caribbean Regional Meeting on the Strategic Approach to International Chemicals Management (Panama City, 2-3 June 2011), five resolutions were adopted on nanotechnology and manufactured nanomaterials; hazardous substances within the life cycle of electrical and electronic equipment; the health sector strategy; lead in paint; and financing SAICM implementation.

(e) Pollutant release and transfer registers

Pollutant release and transfer registers (PRTRs) are key instruments in ensuring that civil society has access to information on the management of chemicals and their sources of emission. Since the early 1990s, a number of national and regional organizations have developed systems for collecting and disseminating data on emissions and transfers of toxic chemicals from industrial facilities.

Since Mexico's pioneering experience in establishing a PRTR under the North American Free Trade Agreement (NAFTA), several countries in the region have developed such systems, influenced also by free-trade agreements such as the agreement between Chile and Canada. As part of the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR), a number of Central American countries, together with the Dominican Republic, currently benefit from a cooperation programme with the United States for the development of PRTRs. However, in most countries there are still no comprehensive systems for information access and sharing that are rigorously and systematically updated (Salinas, 2007).

(f) Globally Harmonized System of Classification and Labelling of Chemicals

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS), which was originally established in 2003 and whose latest edition dates from 2009, facilitates communication and action in the event of accidents and allows measures to be taken to protect health and the environment during chemicals handling, transport and use. GHS implementation calls for initiatives in a variety of sectors, in particular transport, industry and agrochemicals, as well as for the incorporation of civil society participation and labour issues.

¹⁸ See [online] <http://chm.pops.int/Countries/NationalReporting/tabid/254/language/en-US/Default.aspx>.

MERCOSUR countries are implementing measures relating to the transport of hazardous products and have accorded priority to GHS implementation.¹⁹ The Andean Community has a draft regulation under review. Countries have made progress in other areas too: raising awareness; training; setting standards on the submission of reports and certification; and conducting sectoral studies. Cooperation between MERCOSUR and the European Union provides for assistance in implementing the GHS (Government of Argentina, 2009). According to the Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals, Nicaragua has worked on an institutional assessment of existing national capabilities. With regard to GHS implementation of pesticide certification, the process is in the early stages in the region, as in other developing regions.

The gaps identified in GHS implementation relate to information dissemination about the GHS and training for government officials and various sectors involved in chemicals registration, control, management and marketing.

(g) Heavy metals

Countries in the region have taken measures to reduce mercury pollution and, as stated previously, have succeeded in removing lead from petrol.²⁰ The challenge that now remains concerning lead is to consider its effects throughout the product life cycle and to substitute it with alternatives in products such as toys and paint. The use of lead in paint is a matter still to be resolved and the International Conference on Chemicals Management signalled the need to form a global alliance to promote the phasing out of lead paint and invited UNEP and WHO to act as secretariat. There have been some noteworthy national initiatives. For example, in 2008, Brazil introduced legislation setting maximum lead levels in paints and other coating materials used in construction and in items for use by children and schools.

An important first step towards mercury control has been the creation of inventories. Chile, Ecuador and Panama, with the support of the United States Environmental Protection Agency (EPA), UNEP and the United Nations Institute for Training and Research (UNITAR), have developed pilot inventories with a risk management plan and have included mercury in the emissions inventory of PRTRs. These pilot inventories are now being replicated in Nicaragua and the Dominican Republic and future projects are also being evaluated. Countries in the region are also active participants in the preliminary discussions being held with a view to creating a legally binding global instrument on mercury.

One of the main sources of mercury pollution in the region is its use in gold mining, particularly in family and small-scale mining, and this has had a heavy impact on the Amazon Basin, affecting human health through mercury ingestion from eating fish (IOMC/UNEP, 2002). Technical alternatives exist that call for outreach efforts. In developing its National Cleaner Production Policy, Colombia has promoted technologies for reducing or eliminating mercury use in mining. A number of projects have been carried out in cooperation with UNEP and the United Nations Industrial Development Organization (UNIDO), under the Quickstart Programme of the Strategic Approach to International Chemicals Management. UNEP is currently developing a database on mercury use in mining. Other mercury-related issues are mercury use in products (including hospital products) and industrial processes, mercury storage and the management of mercury waste and contaminated sites.

¹⁹ See the proceedings of MERCOSUR Subworking Group 6 (SGT 6), March 2006.

²⁰ See [online] http://www.unep.org/transport/pcf/PDF/MapLACLead-May_2010.pdf.

The main barrier to increased mercury substitution is the cost of substitutes. Given that the costs of mercury damage for society are not calculated, the alternative products and solutions that are less contaminating are regarded as too expensive. Some countries of the region have implemented projects for eliminating mercury use in hospital products. Argentina is conducting a global pilot project for the demonstration and promotion of best practices, which includes the elimination of dioxins (Government of the Republic of Argentina, 2009). Costa Rica and Honduras have also implemented an initiative for reducing mercury use in hospitals (regarding Costa Rica, see MINAET, 2009). In order to substitute mercury with safe inputs in such items as light fittings for liquid crystal displays (LCDs), dental amalgam and compact fluorescent lamps, or in industrial processes such as chlor-alkali plants, definitions regarding waste storage are required as well as corresponding resources (UNEP, 2008b). This issue is also relevant to the region's economy, which presents major opportunities and where progress has been made, including technology developed by Brazil for deactivating mercury cells in the chlor-alkali industry.

Negotiations for a global convention on mercury will be crucial to the future management of the issue.

10. Solid waste management

Solid waste management remains one of the critical issues for human safety, especially in urban areas. The worst problems are poor management of economic incentives, low collection coverage, shortage of suitable sites for final disposal and use of inappropriate technologies. However, there has been excellent progress with public policies for solid-waste disposal and management, even though the situation is far from optimal. Table II.7 summarizes the situation in Latin America and the Caribbean.

Table II.7
PRODUCTION AND DISPOSAL OF SOLID WASTE IN LATIN AMERICAN MEGACITIES

	Solid waste production (per person)		Solid waste disposal (tons/year)	Uncollected/improperly disposed of (estimated, percentage)	Emissions from landfills
	Domestic production (kilograms/person/year)	Total production (kilograms/person/year)			Methane (tons/year)
Bogota	267	442	1 792 211	2-40	25 200
Buenos Aires	281	606	5 300 000	10-27	
Lima	246	310	2 164 893	14-30	
Mexico	210	438	6 518 900	23	168 240
Santiago	462	949	2 578 697	0 ^a	60 000
São Paulo	380	726	5 235 195	10	176 000

Source: Ricardo Jordán, Johannes Rehner and Joseluis Samaniego. "Regional Panorama Latin America: Megacities and Sustainability", *Project Document*, No. 289 (LC/W.289), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/German Agency for International Cooperation (GIZ), 2010.

^a Approximate figure.

Unlike in the early 1990s, all Latin American capitals now have landfills. However, this does not necessarily mean that all waste is deposited in them because, in parallel, makeshift landfills in natural systems or in wasteland are used, causing problems of gas emissions, leaching and the development of vectors of various diseases. Illegal dumps are still a serious problem because of their implications in terms of health, pollution, soil degradation and the impact on tourism (Díaz, 2009). Since 2000, coverage rates of street sweeping, collection and final disposal services have improved throughout the entire region. More than half Latin America's urban population now disposes of its waste in proper landfills, compared with less than one quarter of the population at the beginning of this decade. These are major achievements, although they are not necessarily uniform across all countries or all cities within a country (UNEP, 2010a). Data also reveal that cities are spending more on waste management.

In spite of the progress made with public cleaning services, collection and final disposal, waste reduction, recovery and recycling practices are not widespread. There are numerous opportunities to be explored in these markets, as well as in biogas recovery. Major programmes promoted by local governments have been implemented and, in some cases, in partnership with civil or private organizations (UNEP, 2010a). The International Labour Organization (ILO) supports the Governments of some countries in the region in defining policies to include waste-pickers in the solid-waste management system, with the dual aim of increasing recycling and creating decent work for a traditionally highly vulnerable segment of workers. Electronic waste has gained prominence in industrial waste management (see box II.13).

Box II.13

ELECTRONIC WASTE: A CHALLENGE FOR LATIN AMERICA AND THE CARIBBEAN

Growth in the use of information and communication technologies (ICTs) has led to an increase in electronic waste when equipment reaches the end of its useful life. Considering that large numbers of electronic devices are abandoned owing to minor defects or no defects at all, there is huge social potential for reconditioning disused equipment. The sustainable management of electronic equipment includes a variety of measures according to its usefulness. In cases where reconditioning is appropriate, the steps include: collection, sorting, disassembly, analysis, mechanical processing, reconditioning, assembly and distribution to beneficiaries. Recycling of end-of-life equipment includes: disassembly, separation of components and processing of recyclable materials in recycling plants, as well as final processing and storage of hazardous substances. Public-private partnerships are essential to ensuring sustainable and effective solutions for managing electronic waste.

To encourage and promote greater producer accountability, including waste management, the European Union enacted Directive 2002/196/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE), defining extended producer responsibility (EPR) for ecological product design, collection of disused equipment and systematic treatment of hazardous components, as well as reconditioning and recycling of usable components. This directive could serve as a model for formulating various bills for legislation in Latin America.

The Basel Convention Partnerships Programme is developing the Mobile Phone Partnership Initiative (MPPI) and the Partnership for Action on Computing Equipment (PACE). The MPPI aims to ensure the environmentally sound management of used and end-of-life mobile phones. PACE, whose partners include Argentina, Brazil, Chile and Mexico, operates as a forum for Governments, industry, non-governmental organizations (NGOs) and academia to tackle the environmentally sound management, refurbishment, recycling and disposal of end-of-life computing equipment.

Source: Economic Commission for Latin America and the Caribbean (ECLAC) on the basis of United Nations Educational, Scientific and Cultural Organization (UNESCO), Regional Bureau for Sciences in Latin America and the Caribbean, *Los residuos electrónicos: Un desafío para la Sociedad del Conocimiento en América Latina y el Caribe*, Montevideo, 2010; and ECLAC, *Sustainable development in Latin America and the Caribbean: trends, progress and challenges in sustainable consumption and production, mining, transport, chemicals and waste management* (LC/R.2161), Santiago, Chile, 2009.

In some countries, there are large gaps in the basic collection and disposal stages. In many countries, collection remains a local government responsibility. Just as with basic sanitation, the efficient scale for waste collection and disposal operations does not always match the size of municipalities. Institutional arrangements for cooperation between Governments can facilitate investment and services. Where payment for services is guaranteed, collection is usually adequate, but is not always accompanied by proper final disposal or treatment.

Improper waste management, particularly where waste is disposed of in open dump sites, can exact a heavy toll on human health, especially when fires break out (PAHO, 2005). Costs are also incurred by air-quality deterioration and by gas emissions, particularly biogas (composed primarily of methane), with the resulting impact on climate change. Fire hazards, strong odours from uncontrolled decomposition of organic matter, proliferation of disease vectors, improper use and degradation of land, and contamination of aquifers are all economic and environmental impacts typical of poorly managed domestic solid waste.

Bibliography

- Acquatella, J. (2009), "Market-based environmental policy in Latin America and the Caribbean: theory and reality", Boston, The Fletcher School, Center for International Environment and Resources Policy, Tufts University.
- _____ (2001), "Aplicación de instrumentos económicos en la gestión ambiental en países de América Latina y el Caribe: desafíos y factores condicionantes", *Medio ambiente y desarrollo series*, No. 31 (LC/L.1488-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC). United Nations publication, Sales No. 01.II.G.28.
- Acquatella, J. and A. Bárcena (2005), *Política fiscal y medio ambiente: bases para una agenda común*, *Libros de la CEPAL*, No. 85 (LC/G.2274-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC). United Nations publication, Sales No. S.05.II.G.140.
- Andean Community (2008), *El cambio climático no tiene fronteras. Impacto del cambio climático en la Comunidad Andina*, Lima.
- ARC (Americas Regional Consortium) (2009), *Americas Regional Document*, paper presented at the fifth World Water Forum, Istanbul, 16-22 March.
- Argentina, Government of (2009), "Informe nacional al decimotercero período de sesiones de la Comisión sobre el Desarrollo Sostenible", Buenos Aires.
- Armenteras, D., F. Gast and H.V. Villareal (2003), "Andean forest fragmentation and the representativeness of protected natural areas in the Eastern Andes, Colombia", *Biological Conservation*, vol. 113, N° 2, Bogota.
- Arnell, N.W. (2004), "Climate change and global water resources: SRES scenarios emissions and socio-economic scenarios", *Global Environmental Change*, vol. 14.
- Bayon, R., J.S. Lovink and W.J. Veening (2000), "Financiamiento de la conservación de la biodiversidad", *Sustainable Development Department Technical Paper Series*, Washington, D.C., Inter-American Development Bank (IDB).
- Bovarnick, A., Fernández and Negret (2010), *Financial Sustainability of Protected Areas in Latin America and the Caribbean: Investment Policy Guidance*, Santiago, Chile, United Nations Development Programme (UNDP)/The Nature Conservancy.
- Brack Egg, Antonio (2000), "Perú, biodiversidad y biocomercio: Situación actual y potencial", working document prepared for Comité Biocomercio Perú.
- Chile, Government of (2008), "Segundo informe país sobre el estado de los recursos fitogenéticos para la alimentación y la agricultura", Mecanismo Nacional de Intercambio de Información sobre la aplicación del Plan de Acción Mundial para la Conservación y Utilización Sostenible de los Recursos Fitogenéticos para la Alimentación y la Agricultura, Santiago, Chile.
- Crooks, S. and others (2011), "Mitigating climate change through restoration and management of coastal wetlands and near-shore marine ecosystems: challenges and opportunities", *Environment Department Paper*, No. 121, Washington, D.C., World Bank.
- De la Torre, A., P. Fajnzylber and J. Nash (2008), *Low Carbon, High Growth: Latin American responses to climate change : an overview* Washington, D.C., World Bank.
- Díaz, L.F. (2009), "Disposición final de residuos y perspectivas ambientales", *Panorama mundial del manejo de los residuos sólidos: problemas y perspectivas. Memorias del noveno Congreso Internacional*, Armenia, Colombia.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011a), "Contribución al cuarto informe de las Naciones Unidas sobre el desarrollo de los recursos hídricos del mundo (2012)", Santiago, Chile, forthcoming.
- _____ (2011b) "Efectos del cambio climático en la costa de América Latina y el Caribe: Dinámicas, tendencias y variabilidad climática", *Project documents*, No. 447 (LC/W. 447), Santiago, Chile.

- _____ (2010a), *Economics of Climate Change in Latin America and the Caribbean. Summary 2010* (LC/G.2474), Santiago, Chile.
- _____ (2010b), *The Economics of Climate Change in Central America. Summary 2010* (LC/MEX/L.978), Mexico City, ECLAC subregional headquarters in Mexico.
- _____ (2009), “Sustainable development in Latin America and the Caribbean: trends, progress, and challenges in sustainable consumption and production, mining, transport, chemicals and waste management” (LC/R.2161), Santiago, Chile.
- ECLAC/FAO/IICA (Economic Commission for Latin America and the Caribbean/Food and Agriculture Organization of the United Nations/Inter-American Institute for Cooperation on Agriculture) (2010), “The Outlook for Agriculture and Rural Development in the Americas: A Perspective on Latin America and the Caribbean” [online] <http://www.rlc.fao.org/es/prioridades/desarrollo/pdf/ISPA10esp.pdf>.
- ECLAC/Global Mechanism (Economic Commission for Latin America and the Caribbean/Global Mechanism of the United Nations Convention to Combat Desertification) (2011), “Valoración económica de la degradación de las tierras ante escenarios alternativos de cambio climático. Informes preliminares”, Santiago, Chile.
- FAO (Food and Agriculture Organization of the United Nations) (2011), *State of the World's Forests 2011*, Rome.
- _____ (2010a), *Global Forest Resources Assessment 2010*, Rome.
- _____ (2010b), *The State of World Fisheries and Aquaculture 2010*, Rome.
- Granek, E.F. and B.I. Ruttenberg (2007), “Protective capacity of mangroves during tropical storms: a case study from ‘Wilma’ and ‘Gamma’ in Belize”, *Marine Ecology Progress Series*, No. 343.
- Hacon, S. and F. Azevedo (2006), “Plan de Acción Regional para la Prevención y el Control de Contaminación por Mercurio en los Ecosistemas Amazónicos” [online] http://www.otca.org.br/imagens/ep/documentos/mercurio_esp.pdf.
- IOMC/UNEP (Inter-Organization Programme for the Sound Management of Chemicals/United Nations Environment Programme) (2002), *Global Mercury Assessment*, Geneva.
- IPAM (Amazon Environmental Research Institute) (2011), “A Região da Transamazônica rumo à economia de baixo carbono: estratégias integradas para o desenvolvimento sustentável”, Brasília [online] <http://www.ipam.org.br/biblioteca/livro/A-Regiao-da-Transamazonica-rumo-a-economia>.
- IPCC (Intergovernmental Panel on Climate Change) (2011), “Summary for policymakers”, *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*.
- _____ (2007), *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Cambridge, Cambridge University Press.
- IPCS (International Programme on Chemical Safety) (2010), *WHO Human Health Risk Assessment Toolkit: Chemical Hazards*, Geneva, World Health Organization (WHO).
- ISDR (International Strategy for Disaster Reduction) (2011), *Revealing Risk, Redefining Development. Global Assessment Report on Disaster Risk Reduction*, Geneva.
- _____ (2010), “Strengthening climate change adaptation through effective disaster risk reduction”, *Briefing note*, No. 03 [online] <http://www.unisdr.org/we/inform/publications/16861>.
- ITTO (International Tropical Timber Organization) (2011), *Tropical Forest Tenure Assessment. Trends, Challenges and Opportunities*, Washington, D.C.
- Lasmar, J.L. (2005), “Valorização da biodiversidade: capacitação e inovação tecnológica na fitoindústria no amazonas”, Ph.D. thesis, Rio de Janeiro Federal University.
- Lentini, E. (2008), “Servicios de agua potable y saneamiento: lecciones de experiencias relevantes”, document presented at the Regional Conference 2008 “Policies for Economically Efficient, Environmentally Sustainable and Socially Equitable Drinking Water Supply and Sewerage Services”, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).

- Li, J. and M. Colombier (2009), “Sustainable urban infrastructure for long-term carbon emissions mitigation in China”, *IOP Conference Series: Earth and Environmental Science*, vol. 6, Copenhagen, IOP Publishing.
- López, R. (2006), “Lista de especies vegetales vasculares registradas en el municipio de Ráquira, Boyacá. Informe final”, Bogota, Alexander von Humboldt Biological Resources Research Institute.
- Medeiros, Rodrigo and others (eds.) (2011), *Contribuição das unidades de conservação para a economia nacional: sumário executivo*, Brasília, United Nations Environment Programme (UNEP)/World Conservation Monitoring Centre (WCMC).
- MINAET (Ministry of the Environment, Energy, and Telecommunications of Costa Rica) (2009), “Informe sobre transporte, productos químicos, gestión de residuos, minería, marco decenal de programas sobre pautas sostenibles de producción y consumo”, San José.
- Millennium Ecosystem Assessment (2005), *Ecosystems and Human Well-Being. Synthesis*, Washington, D.C., World Resources Institute (WRI).
- Molina, M. and others (2010), “Energía, desarrollo sostenible y salud”, *Determinantes ambientales y sociales de la salud*, L. Galvao, J. Finkelman and S. Henao, Washington, D.C., Pan American Health Organization (PAHO).
- Mollinedo, A.C. and others (2001), “Beneficios sociales y económicos del bosque en la reserva de la Biósfera Maya, Petén, Guatemala”, *Revista forestal centroamericana*, No. 34.
- Monreal, J. (2007), “Challenges, constraints and possible way forward in the Latin American region”, document presented at the Regional Experts Meeting on Principles and Tools for Assisting Countries in the Implementation of the Rotterdam Convention (Geneva, 15-19 October), Food and Agriculture Organization of the United Nations (FAO)/United Nations Environment Programme (UNEP) [online] <http://www.pic.int/Proceedings/RegionalExperts07%20proceedings.pdf>.
- Nellemann, C. and others (eds.) (2009), “Blue Carbon. A Rapid Response Assessment”, United Nations Environment Programme (UNEP), GRID-Arendal [online] www.grida.no.
- OAS (Organization of American States) (2009), “Towards a Regional Action Plan for SAICM Implementation in Latin America and the Caribbean”, Washington, D.C.
- Pagiola, S., N. Landell-Mills and J. Bishop (2006), “Los mecanismos basados en el mercado para la conservación y el desarrollo”, *La venta de servicios ambientales forestales*, Mexico City, Secretariat of the Environment and Natural Resources/National Institute of Ecology.
- PAHO (Pan American Health Organization) (2008), *Climate Change and Human Health: Risks and Responses. Summary*, Washington, D.C.
- _____ (2005), *Report on the Regional Evaluation of Municipal Solid Waste Management Services in Latin America and the Caribbean*, Washington, D.C.
- PISCO (Partnership for Interdisciplinary Studies of Coastal Oceans) (2008), “The Science of Marine Reserves” [online] www.piscoweb.org.
- PRODES/INPE (Programa de Despoluição de Bacias Hidrográficas/Institute for Space Research) (2011), “Taxas anuais do desmatamento - 1988 até 2010” [online] http://www.obt.inpe.br/prodes/prodes_1988_2010.htm.
- Rico, N. (1998), “Las mujeres en los procesos asociados al agua en América Latina. Estados de situación, propuestas de investigación y de políticas” (LC/R.1864), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Rodricks, S. (2010), “Enabling the Legal Framework for PES, Costa Rica” [online] <http://www.eea.europa.eu/teeb/teeb/enabling-the-legal-framework-for>.
- Salinas, A. (2007), “Pollutant Release and Transfer Register (PRTR). Preparation in LAC” [online] <http://www.oas.org/dsd/Quimicos/Pollutant%20Release%20and%20Transfer%20Registers.pdf>.
- Sancha, A.M. and R. O’Ryan (2008), “Managing hazardous pollutants in Chile: arsenic”, *Reviews of Environmental Contamination and Toxicology*, vol. 196, New York, Springer.

- Secretariat of the Convention on Biological Diversity (2011), Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from Their Utilization to the Convention on Biological Diversity. Text and annex, Montreal [online] <http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf>.
- _____ (2010), *Global Biodiversity Outlook 3*, Montreal.
- Sherman, K. and G. Hempel (eds.) (2009), “The UNEP large marine ecosystem report: a perspective of changing conditions in LMEs of the world’s regional seas”, *UNEP Regional Seas Report and Studies*, No. 182, Nairobi.
- TEEB (The Economics of Ecosystems and Biodiversity) (2010), *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature. A Synthesis of the Approach, Conclusions and Recommendations of TEEB*, Malta, Progress Press.
- UNDP (United Nations Development Programme) (2011), *UNDP Montreal Protocol Unit’s Contribution to Sustainable Development in Latin America and the Caribbean Region Since 1992: Achievements, Gaps and Way Forward to Sustainability*.
- UNEP (United Nations Environment Programme) (2010a), *Latin America and the Caribbean: Environment Outlook*, Panama City.
- _____ (2010b), “UNEP Emerging Issues: Environmental Consequences of Ocean Acidification: a Threat to Food Security” [online] http://www.grid.unep.ch/product/publication/download/Environmental_Consequences_of_Ocean_Acidification.pdf.
- _____ (2010c), “The greening of water law: managing freshwater resources for people and the environment” [online] http://www.unep.org/dec/PDF/UNEP_Greening_water_law.pdf.
- _____ (2008a), “Supporting the Implementation of the Global Monitoring Plan of POPs in Latin America and Caribbean States (LAC)”, *Project Document* [online] http://www.chem.unep.ch/pops/GMP/LAC/Annex_1_prodoc_GRULAC.pdf.
- _____ (2008b), *Report on the Major Mercury-containing Products and Processes, Their Substitutes and Experience in Switching to Mercury-free Products and Processes* (UNEP(DTIE)/Hg/OEWG.2/7), Nairobi.
- _____ (2007), “Global Environmental Outlook. Environment for development” [online] <http://www.unep.org/geo/geo4.asp>.
- UNEP/ECLAC (United Nations Environment Programme/Economic Commission for Latin America and the Caribbean) (2010), “Gráficos vitales del cambio climático para América Latina y el Caribe” [online] http://www.pnuma.org/informacion/comunicados/2010/6Diciembre2010/LAC_Web_esp_2010-12-07.pdf.
- UNEP/CATHALAC (United Nations Environment Programme/Water Centre for the Humid Tropics of Latin America and the Caribbean) (2010), *Latin America and the Caribbean: Atlas of Our Changing Environment* [online] http://www.cathalac.org/lac_atlas/image_full/Top10_LAC-Atlas.pdf.
- UNEP/ILO (United Nations Environment Programme/International Labour Organization) (2008), *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, Washington, D.C.
- UNIDO (United Nations Industrial Development Organization) (1997), *Introducing New Technologies for Abatement of Global Mercury Pollution, Phase II: Latin America*, Vienna.
- United Nations (2010), *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Urquiza, E.G. (2009), “Análisis de capacidades nacionales para la conservación in situ”, *México: capacidades para la conservación y el uso sustentable de la biodiversidad*, Mexico City, United Nations Development Programme (UNDP)/Nacional Commission for Knowledge and Use of Biodiversity (CONABIO) [online] <http://www.biodiversidad.gob.mx/pais/MexCapacidades.html>.
- Viana, V. (2008), “Bolsa Floresta (Forest Conservation Allowance): an innovative mechanism to promote health in traditional communities in the Amazon”, *Estudos avançados*, vol. 22, No. 64, São Paulo, Instituto de Estudos Avançados, Universidade de São Paulo.

- WHO (World Health Organization) (2009a), "Global Health Risks. Mortality and Burden of Disease Attributable to Selected Major Risks" [online] http://www.who.int/healthinfo/global_burden_disease/global_health_risks/en/index.html.
- _____ (2009b), *Assessment of Combined Exposures to Multiple Chemicals: Report of a WHO/IPCS International Workshop*, Geneva.
- _____ (2005), *International Health Regulations* [online] <http://www.who.int/ihr/en/index.html>.
- World Bank (2007), "América Latina y el Caribe: una región sumamente vulnerable a los efectos del cambio climático" [online] <http://web.worldbank.org/WBSITE/EXTERNAL/BANCOMUNDIAL/EXTSPPAISES/LACINSPANISHEXT/0,,contentMDK:21575007~menuPK:508626~pagePK:2865106~piPK:2865128~theSitePK:489669,00.html>.
- WRI (World Resources Institute) (2009), "COP15 brochure" [online] http://cait.wri.org/downloads/CAIT_7.0_COP15.pdf.
- _____ (2003), *Ecosystems and Human Well-Being. A Framework for Assessment. Summary*, Washington, D.C., Island Press.
- WWAP (World Water Assessment Programme) (2006), *Water a Shared Responsibility. The United Nations World Water Development Report 2*, Paris, United Nations Educational, Scientific and Cultural Organization (UNESCO).

Chapter III

INFORMATION FOR DECISION-MAKING, AND CIVIL SOCIETY, PRIVATE SECTOR AND LOCAL GOVERNMENT PARTICIPATION FOR SUSTAINABLE DEVELOPMENT

While the Rio Declaration on Environment and Development highlights the crucial role of States in leading the transition to sustainable development, it also recognizes that the participation of all social groups is key to achieving this objective. Principle 10 of the Declaration states that environmental issues, a key component of sustainable development, are best handled with the participation of all citizens, and that States shall facilitate and encourage public participation by making information widely available and by ensuring effective access to judicial and administrative proceedings. Principles 20 to 22 of the Declaration emphasize the importance of specific groups: women, youth and indigenous peoples and communities. High-quality official information on the environment and tools for applying this to public policy analysis are essential, both for a society to exercise its rights, remain informed and participate actively in decision-making, and for the State to function effectively, in concert and consistently.

PRINCIPLES OF THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT

- 10 Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.
- 20 Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.
- 21 The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.
- 22 Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

A. INFORMATION FOR DECISION-MAKING

Access to environmental information includes two key elements: first, the production of information on the environment, and second, the right of citizens to gain access to information held by the public authorities and consequently the obligation of Governments to make information easily accessible and available to all. This section examines the first of these elements, looking at (i) statistics and indicators; (ii) ways of measuring wealth and economic growth that take into account the state of the environment; and (iii) technological progress and information.

1. Statistics and indicators

Since 1992, the countries of the region have invested heavily in producing environmental statistics. Whereas in the 1990s only a few countries published official environmental statistics and sustainable development indicators, most now publish systematic statistical compendia and reports on environmental (or sustainable development) indicators. According to a study conducted by the Economic Commission for Latin America and the Caribbean (ECLAC), in 2010 a total of 25 countries had staff assigned specifically to environmental statistics, while 29 national institutes (of the 36 surveyed) stated that they had a unit devoted solely to producing environmental statistics (ECLAC, 2011). However, most of the institutes participating in the study (75%) stated that they had three or even fewer staff dedicated to working on environmental statistics. Altogether, 26 countries (15 in Latin America and 11 in the Caribbean) had at least one publication on environmental statistics up to 2008.

Countries have also invested in formulating sustainable development indicators, based on different approaches. The experiences in Argentina, Barbados, Brazil, Chile, Colombia and Mexico, for example, have been interesting (see Quiroga, 2007). In the context of the Latin American and Caribbean Initiative for Sustainable Development (ILAC), in 2003 the Forum of Ministers of the Environment of Latin America and the Caribbean adopted a set of environmental indicators, grouped into six thematic areas: biological diversity; water resource management; vulnerability, human settlements and sustainable cities; social issues, including health, inequity, and poverty; economic aspects, including competitiveness, trade, and production and consumption patterns; and institutional aspects.¹ A group of 45 indicators was agreed upon in 2009 and presented to the Forum of Ministers in 2010.

At the regional level, the Working Group on Environmental Statistics of the Statistical Conference of the Americas of ECLAC was established in 2009. Acknowledging the importance of this subject for the development of the countries of the region, the tenth meeting of the Executive Committee of the Statistical Conference of the Americas, held in Havana from 6 to 8 April 2011, agreed to urge national statistical offices to promote —through the official national delegations— the development and strengthening of environmental statistics at the meetings held in preparation for the United Nations Conference on Sustainable Development (Rio+20) and in the resolutions adopted at that Conference.

Despite recent progress, greater attention, investment and training is required in the area of environmental statistics. One obstacle is the shortage of human and financial resources. A number of international organizations have supported the preparation and dissemination of environmental statistics in the region. ECLAC has helped the countries of the region build statistical capacity and implement international recommendations on environmental statistics, and it acts as technical secretariat of the Working Group on Environmental Statistics. Since 1999, the United Nations Environment Programme (UNEP) has been working with Governments and specialized centres in the region to perform integrated environmental assessments covering varying subjects and geographical areas. To date, UNEP has supported the drafting and publication of national environment outlook reports (national GEO reports²) in 19 countries, and 14 countries prepared GEO reports on cities or subregions. There were also thematic, subregional and youth GEO reports. The *Latin America and the Caribbean: Environment Outlook* reports for 2000, 2003 and 2010 provide an overview of the region. The United Nations Population Fund (UNFPA) has supported the countries of the region in carrying out the 2010 round of population censuses. Although censuses have been little used for environmental studies so far, they are an invaluable source of information for sustainable development planning.

¹ See GEO Latin America and the Caribbean Data Portal [online] <http://www.geodatos.org/geodatos/>.

² See UNEP national environmental outlook reports (national GEO reports) [online] <http://www.pnuma.org/deat1/nacionales.html>.

Records are also kept in Latin America and the Caribbean of disaster-related loss and damage. These have become more robust and help provide an overview of the consequences of inappropriate land use and occupation, lack of governance, and environmental degradation, as the main causes of this loss and damage. It is still believed, however, that this information does not belong in environmental information systems and, in general, it does not yet constitute a mainstay of decision-making processes aimed at reducing the region's exposure and vulnerability to various threats (ISDR, 2011).³

In terms of the future development of environmental statistics, one challenge is to produce data disaggregated by sex, age and other factors such as race and ethnicity for variables relating to people (such as access to services and exposure to pollutants). This disaggregation will highlight any inequalities regarding these factors, in order to orient policies and measures.

International environmental sustainability goals adopted at the global level in Millennium Development Goal 7 encouraged the monitoring of environmental sustainability indicators in the region and explains in part the progress made on environmental issues in public agendas (see United Nations, 2010). Millennium Development Goal 7 has been periodically evaluated at the regional level by all the bodies of the United Nations system that operate in the region.⁴

2. Incorporating an environmental perspective into measurements of wealth and economic growth

An outstanding issue with regard to use of information both in the region and internationally is how to account for wealth and assign value to the environment and to environmental degradation. This must be resolved in order to fully integrate the three pillars of development and ensure that the different arms of government act consistently. Methodologies are already available or are being developed, each with a different approach.

“Environmental accounts” is one such approach. Environmental information is integrated with economic information to adjust macroeconomic indicators and reflect environmental damage and the loss of natural resources. The System of Integrated Environmental and Economic Accounts (SEEA), which is consistent with the System of National Accounts (SNA), is an example of this. The SEEA makes it possible to incorporate measurements that reflect the impact of economic processes on the environment and the contribution of natural assets to economic development and growth. SEEA implementation in Latin America has been given fresh impetus in recent years. Several countries in the region are drawing up plans to implement it over the next few years, but progress has been uneven (UNEP, 2010a).

Colombia and Mexico are the only countries in the region that have permanent programmes for calculating environmental accounts, and both are based in the national statistical institutes. In Mexico, one of the main overall indicators that is published annually is the Ecological Net Domestic Product (ENDP). This indicator is drawn from the national accounts calculated by the National Institute of Statistics and Geography (INEGI) and is obtained by deducting two costs from GDP: fixed capital consumption and environmental use costs (analogous to depreciation). The latter includes natural resource depletion and environmental degradation costs. As a reference, in 2009 Mexico's ENDP was 81% of GDP (see table I.5).

³ See databases [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/what/ddp.html> or <http://online.desinventar.org/>.

⁴ See United Nations (2010) and “Millennium Development Goals in Latin America and the Caribbean” [online] <http://www.eclac.cl/mdg/default.asp?idioma=IN>

3. Technology and environmental information

Technology developments are a significant factor to consider in comparing the environmental information available now with the situation in the early 1990s. Information and communication technologies (ICTs) have become key tools not only for providing access to existing information (see section B) but also for generating and analysing data.

Thanks to advances in satellite technology, vulnerable areas such as the Amazon can now be monitored over shorter time lapses. Government agencies can provide a timely response to crises and chart the course of long-term policies more effectively. In Brazil, advances in satellite technology and ICTs have made possible, principally since 2003, real-time tracking; the blending of images from different satellites or from the same satellite taken at different times in order to fill cloud gaps; digital processing; and the dissemination of digital maps to different government bodies and research institutes. This information has played a key role in directing policies and projects in different spheres of government (ECLAC/GTZ/IPEA, 2011). Nevertheless, much of the region currently has no access to these technologies.

Software development has also permitted the processing, analysis, storage and dissemination of an unprecedented amount of information, faster. Tools such as geographic information systems (GIS) help manage and analyse such information for specific parts of the territory. System dynamics software is used to develop models for assessing inter-relations between different areas of development and the direct and indirect effects of policies or measures, in the short or long term, enhancing development planning exercises. One example is Threshold 21 (T21), developed by the Millennium Institute.⁵

Governments and civil society in the region need greater access to existing tools. The vast amount of data in the hands of private agents represents another challenge. According to a study undertaken by The Access Initiative (2005), an associated challenge is to consolidate schemes and mechanisms for periodic reporting on the state of the environment and the impact of industrial activities by both private and public enterprises. In particular, the assessment acknowledges that much remains to be done to ensure that the industrial sector takes responsibility for reporting on its emissions into the environment. Initiatives such as the Carbon Disclosure Project,⁶ which gathers standardized information on the environmental performance of cities and large companies, enable civil society actors to compare company pollution levels and natural-resource intensity and track this performance over time. Each company's commitment to the environment can be measured based on reported greenhouse gas emissions, the water footprint of its products and the strategies implemented to combat climate change. This information is made available to a very wide audience, ranging from investors, corporations, politicians, public sector organizations and academics to the general public; each actor can therefore take the appropriate steps to exert pressure within his, her or its realm of influence and encourage the development of cleaner and more sustainable production methods. This experience could be replicated at a country level, on a voluntary or regulated basis, so that civil society and public sector actors can learn about the environmental impact of different companies.

⁵ See Millennium Institute, "A General Introduction to Threshold 21 Integrated Development Model" [online] http://www.millennium-institute.org/resources/elibrary/papers/T21brief_general.pdf.

⁶ See [online] <https://www.cdproject.net/en-US/Pages/HomePage.aspx>.

B. ACCESS TO INFORMATION, PARTICIPATION AND JUSTICE IN ENVIRONMENTAL DECISION-MAKING

In the past two decades, countries in the region have made major progress in the legal recognition of rights of access to information, participation and justice in environmental matters. Examples are Mexico's federal law on transparency and access to public government information (2002), Chile's law on access to public information (2009), and Peru's law, enacted in 2011, on indigenous peoples' right to prior consultation, as recognized in Convention 169 of the International Labour Organization (ILO). In addition, the vast majority of the environment-related framework laws passed since the 1980s incorporate access to information and citizen participation, either through consultation or by convening organized civil society or integrating it directly into some form of management body. As in other parts of the world, civil society has played an important role in disseminating the access rights enshrined in principle 10 of the Rio Declaration in the region. Of particular note are the large-scale, coordinated efforts of around 64 non-governmental and civil society organizations in the region, which, under The Access Initiative⁷ and assisted by ECLAC, have supported government processes and pushed for more effective implementation of access rights. Since 2002, The Access Initiative in Latin America has assessed access to information, participation and justice in decision-making processes that affect the environment in 15 countries of the region, providing an independent evaluation of progress towards implementation of principle 10. The main advances and remaining gaps regarding the three components of principle 10 are outlined below.

1. Access to information

In most countries in the region, access to information is guaranteed in the constitution (for example, in Costa Rica, Ecuador, Mexico and Peru) or through specific laws (as in Brazil and Ecuador). In addition, some countries have enacted specific laws on access to environmental information, including Argentina (Law 25831 of January 2004), Mexico and the Plurinational State of Bolivia (The Access Initiative, 2005). Many countries have introduced into domestic law the obligation for a designated authority to submit information on the state of the environment at specified intervals. In special cases, as in Colombia, the constitution enshrines an obligation to produce annual reports on the state of the environment.

Countries in the region have therefore invested significant human and financial resources in compiling and disseminating information and in reporting on compliance with obligations under multilateral environmental agreements. As already mentioned, the expansion of access to and the use of information and communication technologies have been a major factor in the dissemination of available information. Despite this progress, not all of the region's public organizations systematically disclose available information (Acuña, 2010).

A promising initiative, implemented in Chile and Mexico as a result of commitments acquired in the free trade agreements that these countries have signed with the United States, involves, as mentioned in the previous chapter, publishing freely accessible pollutant release and transfer registers (PRTRs) on the Internet (United Nations, 2010). Other bilateral and multilateral free trade agreements have included articles or chapters recognizing the importance of access to environmental information.

⁷ The Access Initiative is a network of civil society organizations that works to ensure that citizens have the rights and the abilities to influence decisions regarding the natural resources that sustain their communities. For more details, see [online] <http://www.accessinitiative.org/>

2. Citizen participation in environmental decision-making

Since the early 1990s, most countries have incorporated provisions on citizen participation into environmental legislation or into thematic or sectoral laws and have created a variety of citizen participation councils. Countries with the longest democratic tradition and track record of environmental management have gone further and implemented environmental impact assessments, land-use planning or other instruments.

Also commendable are the efforts made by many countries in starting to integrate into their work groups of people that are disadvantaged on account of discrimination, poverty, health or socioeconomic inequality, in particular indigenous peoples. They include initiatives by Argentina, Chile, Costa Rica, Mexico and Paraguay to establish model forests to demonstrate sustainable management practices, taking into consideration production and environmental aspects, with broad social participation that includes community and indigenous groups (UNEP, 2010a).

Even though there has been progress in incorporating into national legislation the recognition of the right to participation and in the creation of bodies for that purpose, the proper implementation of such mechanisms continues to be a challenge. Participation is often limited to formal forums such as public consultation and does not ensure a follow-up mechanism for society's contributions. In addition, in many cases, social participation is still dependent on stakeholders proving a previously established legal interest to the relevant authorities (The Access Initiative, 2005). They are ad hoc arrangements that fail to abide by the basic tenet that participation should be a gradual, informed, transparent and effective process. This has made it more difficult to resolve socio-environmental conflicts in the region, which in some cases have even crossed borders and become binational conflicts (see box III.1).

Box III.1

SOCIO-ENVIRONMENTAL CONFLICTS IN LATIN AMERICA AND THE CARIBBEAN

The region has entered a period in which socio-environmental conflicts—that is, those arising from the interest of different social groups to have exclusive use of shared ecosystems, while refusing to bear external costs—play an ever more important role (UNEP, 2010b). For example, a 2011 report by the Peruvian human rights Ombudsman (Defensoría del Pueblo) states that 55% of the 214 social conflicts identified were socio-environmental and that most of these were between mining companies and local communities living within their sphere of operation.

Socio-environmental conflict in the region currently occurs in the context of a growing economy with persistent levels of poverty and extreme poverty, especially in rural areas, and a marked expansion in extractive activities, such as mining, oil and gas, fisheries, forestry and hydropower. In many cases, there is also a persistent crisis of political representation and social fragmentation, coupled with the State's difficulties in reaching out to the entire national territory. This is compounded by the limited capabilities of subnational local authorities and civil society leaders, as well as of public and private agents, to create spaces for discussion, dialogue and constructive participation in preference to confrontation or violence. The region still faces the challenge of building and strengthening democracy; the surest way of achieving this is to narrow social gaps and ensure that growth is inclusive, that natural resources are exploited in an environmentally and socially responsible manner and that the authorities and citizens adopt dialogue as both a means and an end.

The first step in resolving conflicts should be to create and disseminate information and to build the capacity of local authorities and leaders, leaders of grass-roots organizations and the general public on their rights as citizens and on avenues for reaching satisfactory agreements for all the parties involved in such conflicts.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Defensoría del Pueblo de Perú *Reporte de conflictos sociales*, No. 91, 2011 [online] http://www.defensoria.gob.pe/modules/downloads/conflictos/2011/reportes_91_1.pdf; and United Nations Environment Programme (UNEP), *Latin America and the Caribbean: Environment Outlook*, Panama City, 2010.

Many of the existing mechanisms for participation do not recognize the great number of individual actors involved. Their reach does not often cover indigenous populations, rural organizations, unions, cooperatives, associations of producers, and small and isolated communities, among others (The Access Initiative, 2005).

3. Access to justice

The countries in the region have progressed in designing and establishing specialized bodies with environmental jurisdiction in justice systems or in institutions attached to ministerial or autonomous agencies. However, there are difficulties in access to environmental courts, as the courts are concentrated in urban centres and major cities. UNEP national reports agree on the need to improve mechanisms for disseminating information on access to and the content of environmental justice, which has a special impact on criminal activities such as illegal logging and trade in endangered species.

The Access Initiative (2005) adds that traditional courts are not the right place for addressing environmental issues because their legal reasoning usually concerns administrative, civil or criminal matters rather than environmental ones. Judges or members of tribunals are not normally sufficiently trained in environmental matters, despite the efforts of legal training institutions. Furthermore, in most countries, there are no alternative mechanisms for conflict resolution. This has led to a trend towards judicializing environmental conflicts, which incurs significant costs and delays and does not always provide acceptable or sustainable solutions for the various stakeholders. Environmental conflicts, especially those where there has been very active public participation in terms of providing ideas, information and possible solutions, tend to create opportunities for positive change by bringing up issues and options that have never been considered before.

Over the last few years, however, legislation enacted in several of the region's countries has offered a broader range of procedural remedies, and burgeoning jurisprudence is paving the way towards a more functional form of environmental law. There is also an open debate on the timeliness and advisability of setting up specialized jurisdictional bodies. In this connection, several countries have set up specialized environmental prosecutors' offices: one is Brazil, where public prosecutors already have several years' experience. Mexico has a federal prosecutor's office and state prosecutor's offices, Argentina created an environmental prosecutor unit and, more recently, Peru set up environmental prosecutor offices in March 2008.

In addition, the justice system has been proactive in defending environmental rights in several countries, overcoming procedural obstacles and adapting traditional legal institutions to the specifics of environmental law to resolve disputes of great technical and legal complexity. Examples include the decision adopted by the Supreme Court of Argentina in the Riachuelo case⁸ and the ruling by the Constitutional Court of Guatemala on an appeal for protection, which found the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal to be directly applicable (UNEP, 2010b).

⁸ In 2004, 17 people living close to the Matanza-Riachuelo river basin submitted a petition to the Supreme Court of Justice of Argentina, consisting of two separate complaints: in the first, they sued 40 companies, the State, Buenos Aires province and the city of Buenos Aires, seeking compensation for harm caused by pollution. In the second, they requested that the Court order the various authorities to implement sanitation measures to reduce and resolve the environmental problem. The Supreme Court declared itself competent to hear the first matter and two years later found in favour of the petitioners, an unprecedented decision in ordinary judicial processes. It conducted public hearings and required that the respondents put forward a comprehensive plan for alleviating the environmental crisis in the river basin (Coalición Argentina, for the Access Initiative, 2009).

Reforms that would improve access to environmental justice in the region include: elimination of barriers to the prosecution of environmental crimes; recognition of common and collective environmental interests in legal and administrative processes; ensuring legal enforceability of consultation mechanisms and citizen participation procedures; the establishment of environmental courts and prosecutors' offices with adequate geographical distribution; coordination between levels of government; the capacity to halt activities that are damaging to the environment or to health; provision for the greater guarantees needed by indigenous people, affording them access to land tenure and social housing, respect, the formalization of their territories and recognition of linguistic and cultural diversity; protection of women's right to access to productive assets such as land and natural resources, and to credit. Reforms along these lines also require crimes to be clearly categorized, with greater consistency between administrative standards and punishable actions. Criminal law needs to be supported by a comprehensive policy on environmental crime to facilitate prevention and punishment.⁹

C. ROLE OF KEY STAKEHOLDERS IN IMPLEMENTING SUSTAINABLE DEVELOPMENT

Principles 20 to 22 of the Rio Declaration refer specifically to three groups of people that play a key role in sustainable development: youth, women, and indigenous peoples and local communities. Agenda 21 goes further by defining a total of nine main groups involved in developing and implementing sustainable development policies. They include, in addition to the above three groups, the private sector, workers and trade unions, non-governmental organizations, farmers, the science and technology community and local authorities.

1. Women towards sustainable and equitable development

The international community considered the Convention on the Elimination of All Forms of Discrimination against Women (United Nations, 1979) as the basis for action under Agenda 21, chapter 24. Paragraph 4 of that chapter urges Governments to ratify all relevant conventions pertaining to women if they have not already done so. At the Fourth World Conference on Women: Action for Equality, Development and Peace and in the Beijing Platform for Action (1995) a host of measures were outlined concerning the role of women in sustainable development —echoing Agenda 21, chapter 24. The 12 areas of special concern that represent a barrier to women's advancement include inadequate recognition and a lack of support for women's contribution to natural resource management and environmental protection (United Nations, 2006).

Despite a strong regulatory base and the fact that in the late 1990s Latin America and the Caribbean was the only region in which all countries had ratified the Convention on the Elimination of All Forms of Discrimination against Women, there are still challenges in implementing it, the Beijing Platform of Action and the principles of the Rio Declaration. As such, the potential of women to participate in sustainable development issues as agents and beneficiaries of change has yet to be fully exploited.

⁹ See information on access to justice and reforms in national GEO reports [on line] <http://www.pnuma.org/deat1/nacionales.html>

Over the past two decades, there has been slow progress in women's participation in the following areas: (i) leadership positions and decision-making; (ii) land ownership; and (iii) resource access, management and planning—all requisites for achieving sustainable development.

(a) Leadership positions and decision-making

Almost 20 years after the Rio Declaration, women's participation in decision-making and in leadership positions is still low at every level.

Agenda 21, chapter 24, paragraph 2(b) states that one of its objectives is “to increase the proportion of women decision makers, planners, technical advisers, managers and extension workers in environment and development fields”. Paragraph 7 specifies that “women should be fully involved in decision-making and in the implementation of sustainable development activities” to ensure that the goal of averting rapid environmental and economic degradation in developing countries is achieved.

Since 1995, the proportion of women heads of State worldwide has remained below 10%. Women's representation in Latin America and the Caribbean follows this global trend but reached two peaks during this 20-year period: in 1995, women heads of State in the region accounted for 25% of all women heads of State worldwide; in 2010 they accounted for 23.5%, rising from only 12.5% in 2000 and 0% in 2005 (IPU, 2006, 2010).

There has been a gradual increase in the proportion of seats held by women in the region's national parliaments. In 2010, this share averaged 20%, only six percentage points under the average for developed countries.¹⁰ At least 23 of the 28 countries that have achieved a 30% representation in national parliaments have applied quotas (UN-Women, 2010a). At least 10 Latin American and Caribbean countries now have laws establishing quotas to promote women's participation in politics (ECLAC, 2010). The trend in women's seats in national parliaments is repeated in women's participation in ministerial positions, which is only 19% in Latin America and the Caribbean (the majority in social portfolios).¹¹ The low percentage of women ministers in science and technology portfolios, as well as in finance, trade and national budget portfolios, limits women's influence in these areas that are so important for sustainable development and resource allocation (ECLAC, 2010).

Women's representation in local public office is also low. Between 1998 and 2009, the proportion of women elected as mayors rose slightly from around 5% to nearly 8%, with women holding more than 10% of mayoral posts in the Bolivarian Republic of Venezuela and the Dominican Republic (ECLAC, 2010).

Affirmative action promoted by the Convention on the Elimination of All Forms of Discrimination against Women, including quotas, helps to increase women's participation in politics, fostering a more balanced representation and ensuring that women's views are considered. However, it is essential for Governments to become more aware of the gender perspective and to adopt positive measures, in order to promote an enabling environment for women's representation and participation at all levels of decision-making (global, national and local). In response to the recommendations in the section on international and regional cooperation and coordination, the United Nations General Assembly established the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) in 2010.

¹⁰ See ECLAC, Gender Equality Observatory for Latin America and the Caribbean [online] <http://www.eclac.org/oig/adecisiones/default.asp?idioma=IN>.

¹¹ UN-Women, internal records of women in parliament and women ministers of State. March 2011 update.

(b) Land ownership

Land rights can improve people's social and economic status, as they bring other benefits, such as access to credit and technology training, and participation in community decision-making processes on land management and use. This is a major source of women's empowerment (UNDP/América Latina Genera, 2010).

All countries in Latin America recognize equal land inheritance rights for women (UN-Women, 2010a). In some legal frameworks, women are included as holders of rights, although most recognize the right of the partner (with joint title) or of the individual, irrespective of gender. Chile, Colombia and Nicaragua gave priority to women heads of household in land distribution or titling (RIMISP, 2006). In practice, though, women's control over land tends to be limited. Effective implementation of laws guaranteeing equal rights to land ownership is constrained by being interwoven with the discrimination inherent in other aspects of the legal framework, particularly in matters of divorce and inheritance. In addition, the factors determining who controls land usually result from a complex interplay between various legal systems—state, traditional and religious—and cultural norms (see box I.4).

In many countries of the region, no land reforms or public policies promoting equitable land distribution have yet been introduced. Strengthening women's access to, and control over, land is an important means of raising their status and influence within households and communities. Improving women's access to land and security of tenure has direct impacts on farm productivity and can also have far-reaching implications for improving household well-being (FAO, 2011).

There is a pressing need to make progress in this area and to guarantee women and men the right to land on equal terms, in order to fight rural poverty and achieve sustainable development and gender equality. Agricultural extension services should mainstream the gender perspective into their work, taking concrete actions to promote women's participation in climate-change adaptation programmes, as well as making available new technologies, such as solar-powered irrigation systems or drought-resistant crops (Lambrou and Piana, 2006).

(c) Resource access, management and planning

Women face greater obstacles in access to productive resources (such as land or livestock), training, credit or other financial services and making decisions on the management of resources (including the use of their own time), with the result that they are more likely to be poor (Rico, 1998).

Agenda 21, chapter 24, paragraph 2(f) states that a key objective is to formulate and implement clear government policies and national guidelines, strategies and plans for the achievement of equality "in all aspects of society". Ensuring that women participate in public planning processes and that policies have adequate funding is therefore critical to their success. However, few policies and programmes focus on women from rural areas, and few national adaptation programmes of action mention women as key stakeholders or players in adaptation activities.

It is crucial to identify women as stakeholders in development processes, by including them in consultations and in policy and programme design and implementation, thereby ensuring equal access to, and an equal share in the benefits of, resource management and planning.

One solution is to develop and implement gender-responsive planning and public budgeting (see box III.2) in order to guarantee —among other factors— that funds will be earmarked to meet the differing needs of women and men, to ensure that the outcomes of participatory and planned development are equitable (UN-Women, 2010a).

Almost half the countries in the region have conducted pioneering experiments in participatory gender-responsive budgeting: Argentina, the Bolivarian Republic of Venezuela, Brazil, Costa Rica, Ecuador, El Salvador, Haiti, Honduras, Mexico, Nicaragua, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. This trend has been supported by decentralization processes promoting local government autonomy and women’s participation in decision-making, which has also provided women with opportunities to organize themselves and to take part in budgeting for projects that meet their own needs and those of their communities.

Box III.2

GENDER-RESPONSIVE BUDGETING IN ECUADOR

In 2010, the gender-responsive budgeting programme of the Ministry of Finance of Ecuador won the German Agency for Technical Cooperation (GTZ) prize for innovation in addressing gender inequalities. A public expenditure analysis conducted as part of the programme revealed that only 5% of Government resources benefit women, children and adolescents directly, mostly through allocations to health and maternity issues. As a result, 14 government institutions introduced gender indicators into their performance monitoring systems, with a view to determining to what extent public resources are responding to gender equality concerns and to take the necessary corrective action. Even though gender-responsive budgeting is used mainly for social services, the Ministry of Environment of Ecuador has already begun to mainstream the gender perspective into its planning. Special allocations were included in the 2011 budget for promoting and supporting sustainable development activities, as part of a policy for institutionalizing gender and multiculturalism in environmental management.

Source: United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), *How can aid be gender-responsive in the context of the new aid modalities?* Gender Responsive Budgeting, 2010; and Ministry of Finance of Ecuador, *La equidad de género en la pro forma del Presupuesto General del Estado 2011*, December 2010.

2. Children and youth in sustainable development

The important role of children and young people, highlighted in principle 21 of the Rio Declaration and in Agenda 21, chapter 25, requires education to be considered in ensuring the effective participation of civil society. Chapter 36 states that education is linked to virtually all areas of Agenda 21. It is recognized that education unequivocally plays a key role. In demographic terms, the region’s growth rate has fallen significantly over the past 50 years, dropping from an annual 2.8% in the middle of the twentieth century to 1.3% in 2010 (UNESCO, 2011). This provides States with excellent opportunities to invest in improving the quality of education and closing the quality gap between State education (which basically serves the poor) and private education (which is beyond the means of disadvantaged groups).

The statistical evidence demonstrates that the education gaps of today, which have also been a historical feature of the region, may be explained to a greater or lesser extent by demographic, social, ethnic, cultural and environmental factors associated, inter alia, with housing, overcrowding, and access to water and sanitation (Katzman, 2011) (see box III.3). In particular, socioeconomic status, living in a rural or an urban area and household income are some of the factors that determine access to the right to education. Although considerable progress has been made on gender equality, there continue to be wide gaps between urban and rural areas and along the lines of ethnicity and household income.

Box III.3

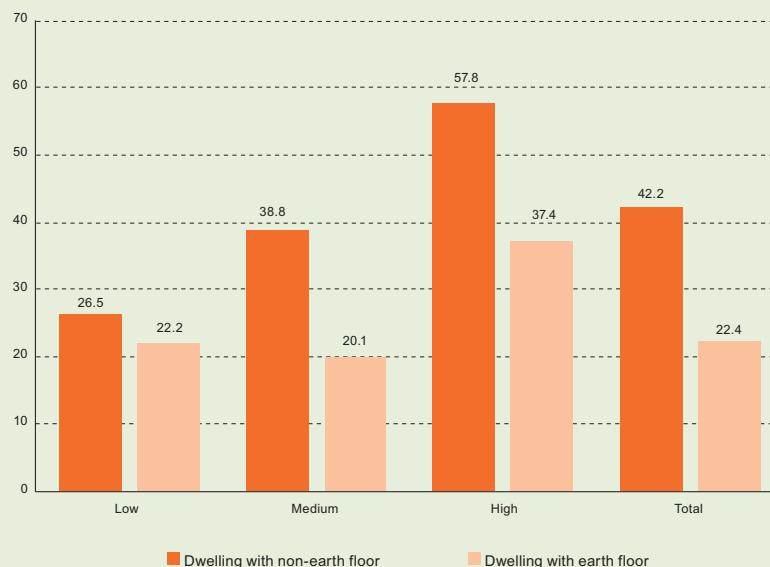
LATIN AMERICA AND THE CARIBBEAN: RELATIONSHIP BETWEEN CHILDHOOD LIVING CONDITIONS AND EDUCATIONAL ATTAINMENT

The Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Children's Fund (UNICEF) carried out an empirical analysis in the urban areas of 17 Latin American countries of the relationship between habitability (overcrowding, housing materials and access to drinking water and sanitation) and being an overage student within the population aged 13 to 17, meaning a difference of two or more years between years of education and years that should have been completed for the chronological age based on a standard educational trajectory, whether because the student left the education system prematurely, repeated a year, or for both reasons. The results indicate that, among urban Latin American residents, poor housing conditions may be more closely correlated to childhood educational attainment than economic deprivation (Katzman, 2011).

The most effective policies for improving educational attainment are therefore those that endeavour to raise the average income of low-income households as well as reduce habitability deficiencies. Overcrowding is a serious problem and clearly affects school performance; studies in many countries have shown that this is at least as important as poverty and the home educational environment.

The Second Regional Comparative and Explanatory Study (SERCE) on mathematics scores for sixth-graders in 17 countries of the region confirm this theory. Overcrowding is associated with poorer mathematics scores, irrespective of socioeconomic level. Similar results are also obtained in relation to access to drinking water, sanitation and the flooring material used in the home (see figure below).

LATIN AMERICA (17 COUNTRIES): URBAN SIXTH-GRADERS WHO PERFORM WELL IN MATHEMATICS TESTS (III AND IV), BY TYPE OF FLOORING IN THE HOME AND HOUSEHOLD SOCIOECONOMIC LEVEL
(Percentages)



Living conditions during childhood may therefore be a major contributory factor to the unequal acquisition of knowledge and educational credits, which are key to accessing opportunities for future well-being. This substantiates the usefulness of multi-dimensional analysis of poverty where this may enrich the understanding of mechanisms that are partly responsible for perpetuating these situations in childhood (ECLAC/UNICEF, 2010). The findings also call for examination of whether the effectiveness of education policies depends on formulating effective policies on housing and water and sanitation infrastructure.

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Children's Fund (UNICEF), *Pobreza infantil en América Latina y el Caribe* (LC/R.2168), Santiago, Chile, 2010; Rubén Katzman, "Infancia en América Latina: Privaciones habitacionales y desarrollo de capital humano", *Project document*, No. 431 (LC/W.431), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), 2010.

From a sustainable development perspective, it is interesting to look at the quality of education in the region. For the purposes of assessing the performance of students in the Second Regional Comparative and Explanatory Study (SERCE), the tests used had common elements and were structured along the lines of the “skills for life” approach promoted by the United Nations Educational, Scientific and Cultural Organization (UNESCO), which emphasizes not only the acquisition of knowledge but also its application to a range of daily situations and settings in order to interpret and understand the world. The data confirms that the performance of most students in the region in the sciences is severely hampered in this respect.

Early parenthood affects the capacity of young people, particularly girls, to make the transition to adulthood with the resources and human capital they need for their future life. Sexual and reproductive health education for adolescents, within the framework established by the International Conference on Population and Development (ICPD) (Cairo, 1994), is a key policy tool for preventing intergenerational reproduction of poverty and promoting sustainable development (Delamónica and Mehrotra, 2006).

Twenty years after the Rio Declaration on Environment and Development and the recommendation to reorient education towards sustainable development (Agenda 21, chapter 36), and seven years after the United Nations Decade of Education for Sustainable Development began, the majority of Latin American and countries and some Caribbean countries have approved national policies or strategies for education on the environment or sustainable development (see box III.4). This demonstrates that the education community, and, above all, policymakers, have identified the need to include sustainable development issues in national plans, with a view to creating education competencies in this area. However, more action is needed in regard to education on issues such as climate change, biodiversity and disaster risk reduction.

Other policy proposals may be prompted by the impact of environmental degradation on childhood and adolescence (Tamburlini, von Ehrenstein and Bertollini, 2002; UNICEF, 2007). The impact begins even before gestation, as toxic agents in water, air or food can affect the reproductive organs of men and women and cause congenital diseases. During gestation, cells reproduce more quickly and the foetus may be affected by the environment via the placenta, which can lead to growth anomalies and a greater propensity to develop cancer in later life. Babies that are not fed exclusively on breast milk during the neonatal period are more likely to ingest toxins, since the gastro-intestinal tract has minimal resistance at this time. Babies and children have higher calorie consumption and respiration rates per kilo of body weight than adults and are therefore more vulnerable to environmental pollution while eating and breathing. This is particularly true in poorer households whose only alternative is to use polluting materials for cooking and heating, and in urban centres affected by industrial pollution. Children and adolescents may also be exposed to toxic substances at school, since few families or schools have access to materials and toys that have been certified as non-toxic. The school’s location and facilities may exacerbate the situation (it may be close to factories or rubbish dumps, sanitary conditions may be poor or there may be no connection to drinking water). Other potential sources of contamination are asbestos, mould owing to moisture and a lack of maintenance, and lead in paint or in other surfaces in the home. In urban areas, children and adolescents, especially the poorest, often play in rubbish dumps, having no other alternatives (UNICEF, 2012).

Box III.4

LATIN AMERICA AND THE CARIBBEAN: EDUCATION FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL EDUCATION

A significant number of countries in the region have designed and/or implemented national initiatives on education for sustainable development and/or environmental education. The concept of education for sustainable development emerged in the late 1990s and gained momentum following the declaration of the United Nations Decade of Education for Sustainable Development, giving rise to the Regional Strategy on Building Education for Sustainable Development in Latin America and the Caribbean and the Latin American and Caribbean Programme for Environmental Education (PLACEA).

In addition, there are a large number of initiatives outside the formal education sector, in which non-governmental organizations (NGOs) play a major role. Many NGOs are keenly interested in working on cultural diversity issues, as well as on indigenous, gender, inequality and poverty issues.

LATIN AMERICA AND THE CARIBBEAN: NATIONAL INITIATIVES ON EDUCATION FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL EDUCATION

Countries with policies, strategies and/or plans on education for sustainable development, and year of implementation	Countries with policies, strategies and/or plans on environmental education, and year of implementation
Chile (2008)	Argentina (2008)
Costa Rica (2006)	Peru (2007)
Mexico (2006)	Ecuador (2006)
Uruguay (2005)	El Salvador (2006)
Jamaica (1998)	Brazil (2004)
	Nicaragua (2003)
	Colombia (2002)
	Cuba (1997)
	Guatemala (1996)
	Dominican Republic (1992)
	Panama (1992)

Source: United Nations Educational, Scientific and Cultural Organization (UNESCO), “Políticas, estrategias y planes regionales, subregionales y nacionales en educación para el desarrollo sostenible y la educación ambiental en América Latina y el Caribe. Decenio de las Naciones Unidas de la Educación para el Desarrollo Sostenible, 2005-2014” (OREALC/2009/PI/H/2), Santiago, Chile, Regional Bureau for Education in Latin America and the Caribbean 2009, “Organismos No Gubernamentales que trabajan en Educación para el Desarrollo Sostenible y en Educación Ambiental en América Latina y el Caribe” (OREALC/2009/PI/H/5), Santiago, Chile, Regional Bureau for Education in Latin America and the Caribbean, 2009; E. Tréllez, “Algunos elementos del proceso de construcción de la educación ambiental en América Latina”, *Revista iberoamericana de educación*, No. 41, 2006; Programa Latinoamericano y del Caribe de Educación Ambiental, Informe final [online] www.medioambiente.cu/download/PLACEA.doc; y Programa Latinoamericano y del Caribe de Educación Ambiental en el Marco del Desarrollo Sostenible (PLACEA) [online] <http://www.pnuma.org/educamb/placea.php>.

This has led to various policy initiatives, some of which are common to the sustainable development agenda while others target children. The first category includes water and sanitation provision, which, together with precarious housing, is the best indicator of child poverty (ECLAC/UNICEF, 2010; Katzman, 2011), while the second includes the regulation and certification of non-toxic educational toys and materials. The use of asbestos and lead paint in general but particularly in nurseries and schools should be prohibited, given that infants and children spend most of their time at home or at school. Policies on sustainable development and equity should also address decisions on the location of schools and safe public play and recreation areas. Feeding babies exclusively on breast milk

until six months of age should also be promoted, which is another initiative designed to protect babies from environmental pollution, given the huge nutritional and emotional benefits. This could be promoted by extending current maternity and paternity leave (Rico and Pautassi, 2011).

3. Indigenous peoples and local communities

Principle 22 of the Rio Declaration on Environment and Development states that indigenous peoples and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. It calls upon States to recognize and support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

In the past two decades, the region has made visible progress. In constitutions and in legislation on access to land and other matters, there is now greater recognition of the rights of indigenous peoples and their communities and other local communities, as well as an appreciation of the rich culture of indigenous peoples. Programmes of democratically elected Governments have incorporated indigenous worldviews, including the ancestral concept of “good life” (*buen vivir*) (ECLAC/UNFPA, 2009).

Some global agreements have set precedents on the course to be followed and have been signed by most countries in the region. Two key instruments are Convention 169 of the International Labour Organization (ILO)¹² and the more recent United Nations Declaration on the Rights of Indigenous Peoples, adopted by the United Nations General Assembly in 2007 (ECLAC/UNFPA, 2009). Of the 22 countries that have ratified ILO Convention 169, 15 are in Latin America and the Caribbean (see box III.5). In a region with such a large indigenous population, this is an important area of work. In the Plurinational State of Bolivia, the indigenous population forms 62% of the total population; in Guatemala, 41%; and in Panama, 10%.¹³

Box III.5

RATIFICATION OF CONVENTION 169 OF THE INTERNATIONAL LABOUR ORGANIZATION: CASE OF THE PLURINATIONAL STATE OF BOLIVIA

The Plurinational State of Bolivia ratified ILO Convention No. 169 in 1991; in 1994 the Constitution recognized the country’s “multi-ethnic and multicultural” nature. The constitutional reforms of 2004 recognized indigenous peoples’ right to present candidates directly, recognizing them as political and social actors in their own right. Other national regulations recognize indigenous rights to their native communal lands, to a share of natural resource profits, and, among others, the right to consultation. The Plurinational State of Bolivia also made the United Nations Declaration on the Rights of Indigenous Peoples binding as national law, and the 2006–2007 constitutional process included a high level of indigenous participation.

Source: International Labour Organization (ILO) [online] <http://www.ilo.org/indigenous/Activitiesbyregion/LatinAmerica/Bolivia/lang--en/index.htm>.

¹² ILO Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries, which was adopted in 1989, is the first comprehensive international agreement to specify the rights of these peoples. It sets out the obligations of States to recognize and respect the customs and institutions of indigenous peoples “where these are not incompatible with fundamental rights defined by the national legal system and with internationally recognized human rights”.

¹³ See the Socio-demographic Indicators System on Indigenous People and Populations in Latin America [online] <http://celade.cepal.org/redatam/PRYESP/SISPPI/>.

Many countries have created institutions devoted specifically to indigenous peoples. Some sectoral initiatives have been targeted at indigenous peoples, safeguarding aspects of cultural relevance, endeavouring to involve indigenous peoples and recognizing their unique characteristics and knowledge (ECLAC/UNFPA, 2009). The Brazilian State of Amazonas, for instance, runs scientific research and development programmes aimed primarily at promoting the identity and building the knowledge of indigenous peoples and communities.

However, there is still a long way to go, especially in terms of empowerment and the ability of indigenous peoples to participate effectively in decision-making (see box III.6). The illiteracy rate among the indigenous population is a clear indicator of this (see table III.1).

Box III.6

LEADERSHIP TRAINING FOR INDIGENOUS WOMEN IN ECUADOR

Despite the fact that Ecuador introduced its quota law in 1997, setting a minimum quota of 20% women in political positions, indigenous women were not standing as candidates in local elections. Most women lacked leadership training and had poor public-speaking skills. To address these shortcomings, the United Nations Development Fund for Women (UNIFEM) conducted a project between 2000 and 2002 entitled ‘Indigenous Women: Local Development and Leadership Building’, to train indigenous women to enable them, in turn, to provide leadership training to a larger number of indigenous women in Saraguro. The specific changes arising from this project include (i) the development of the Saraguro Indigenous Women’s Agenda for Action and (ii) the establishment of a Municipal Commission on Gender.

Source: Inter-Agency Network on Women and Gender Equality (IANWGE), *Indigenous Women and the UN System. Good Practices and Lessons Learned*, 2006, pp.63-66.

Table III.1

LATIN AMERICA AND THE CARIBBEAN: ILLITERACY RATE AMONG INDIGENOUS AND NON-INDIGENOUS POPULATIONS

(Percentages)

Country	Illiteracy rate among the indigenous population	Illiteracy rate among the non-indigenous population
Bolivia (Plurinational State of) (2001)	18	7
Brazil (2000)	26	13
Chile (2002)	9	4
Costa Rica (2000)	20	5
Ecuador (2001)	28	8
Guatemala (2002)	48	20
Honduras (2001)	29	19
Mexico (2000)	32	8
Panama (2000)	38	6
Paraguay (2002)	51	7
Venezuela (Bolivarian Republic of) (2001)	33	7

Source: Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, System of Sociodemographic Indicators for Indigenous Peoples and Populations of Latin America [online] <http://celade.cepal.org/redatam/PRYESP/SISPPI/> [date of reference: December 2011].

The challenge remains to build democratic and pluricultural societies from which ethnic inequities have been eliminated and which give effective recognition to the contributions and worldview of the region's indigenous peoples (ECLAC/UNFPA, 2009).

4. Non-governmental organizations

Agenda 21, chapter 27, states that non-governmental organizations play a vital role in the shaping and implementation of participatory democracy. It goes on to say that the community of non-governmental organizations offers a global network that should be tapped, enabled and strengthened in support of efforts to achieve sustainable development.

The opening and democratization seen in most countries in the region in the 1980s and 1990s enabled non-governmental organizations (NGOs) to be set up with missions in different areas of development. In the environmental arena, this did not translate into broadening the social base of environmental organizations in the region but rather transnationalizing many of them through financial and programme links with NGOs in developed countries (UNEP, 2010). Despite this, over the past two decades, non-governmental organizations in the region have matured and helped to advance the transition to sustainable development by means of programmes and projects on a whole range of issues, such as informal environmental education, sustainable resource management, support for local communities faced with socio-environmental conflicts, and other initiatives.

Since 1992, non-governmental organizations in the region have also been actively involved in implementing projects and actions to further full implementation of Agenda 21. The World Summit on Sustainable Development in Johannesburg promoted partnership-building between civil society and international organizations and Governments to generate sustainable development actions. One such is the Partnership for principle 10, which seeks to develop practical actions to ensure citizen access to information, participation and justice in environmental matters. The members of this partnership are four Latin American and Caribbean Governments and 10 NGOs from the region.

Funding is still a key issue for NGOs. To ensure the sustainability of their programmes and activities, NGOs are now expected to be more transparent and accountable for their actions.

5. Local authorities

Agenda 21, chapter 28, states that, because so many of the problems and solutions relating to sustainable development have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling this objective.

Local governments have called for greater inclusion of stakeholders in international negotiation processes and for greater recognition for their special status as governmental institutions. This special status was recognized by the United Nations Framework Convention on Climate Change (UNFCCC) at the sixteenth session of the Conference of the Parties (COP 16), in Cancun, Mexico in December 2010, where local governments were described as "governmental stakeholders" for the first time (ICLEI, 2011a).

Since 1992, municipalities in Latin America and the Caribbean have made progress in setting up environment departments and have put in motion processes for integrating the environment with the economic and social development pillars in areas under their institutional and geographic jurisdiction. A large number have implemented their own local Agenda 21, emphasizing the unique challenges of each area, including community development, tourism, economic development, poverty eradication, water resource management, or culture and heritage preservation. Some of the challenges facing local authorities are funding difficulties and achieving an optimum scale for solving such problems as waste treatment or sanitation. Various countries in the region have set up associations of municipalities for resolving sustainable development issues by sharing capacities and matching the policy scale to the scale of problems. Two examples are the Intermunicipal Consortium for the Sustainable Development of Transamazônica and Xingú, in the Brazilian Amazon (IPAM, 2011) and Colombia's associations of municipalities.

Box III.7 discusses the role local governments could play in greening local economies.

Box III.7

ROLE OF LOCAL GOVERNMENTS IN GREENING LOCAL ECONOMIES

Local governments can encourage, enable, motivate and regulate the local economy to make it greener. For instance, they can:

- Steer municipal investments and purchasing power to influence the market. Environmental and social criteria can be taken into account in investment and procurement decisions, for example when procuring municipal vehicles or investing in buildings. Investments in municipal services, such as energy, public transport, waste and water, can change the energy usage and waste production of a city. Such investments send clear signals to the market in favour of sustainable goods and services.
- Set framework conditions for investments. Local governments can also use their regulatory powers for strategic urban development. A smart, connected and compact city can be enabled through full-costing policies and methodologies, building codes, land-use policies and energy-efficiency standards.
- Provide incentives and financing. Local governments can influence private sector behaviour through financial incentives and disincentives, such as environmental taxes, charges or reductions.
- Inform private behaviour. Raising awareness, providing public information and involving stakeholders can contribute to changing purchasing and consumption patterns of individuals and organizations.
- Drive local innovation. Local governments can set targets and incentives for local renewable energy production, adopt innovative policies to overcome barriers, pioneer new approaches, create forums for exchanges or bridge research and local practice.
- Scale up. From procurement to construction, local governments can play a key role in catalysing and scaling up a green urban economy.

Source: International Council for Local Environmental Initiatives (ICLEI), "Green urban economy", *Briefing Sheet*, January 2011.

6. Workers and trade unions

Workers and trade unions in Latin America and the Caribbean are increasingly aware of the importance of the environment in the public debate. Trade union participation in sectoral, regional and international discussions on sustainable development has risen over the past 10 years. Box III.8 describes the region's most important trade union declarations and platforms. The declaration of the second Trade Union Conference on Labour and the Environment in Latin America and the Caribbean in 2009 expresses concern at the scant progress made in effecting the far-reaching changes required in production, trade and financing models.

Box III.8
LATIN AMERICA AND THE CARIBBEAN: TRADE UNION ACTION ON ENVIRONMENTAL MATTERS

The most important benchmarks for trade union action on environmental matters in the region are:

- The declaration of the first Trade Union Conference on Labour and the Environment in Latin America and the Caribbean organized by the International Labour Foundation for Sustainable Development (Sustainlabour) and the Inter-American Regional Organization of Workers (ORIT) of the International Confederation of Free Trade Unions (ICFTU) in São Paulo, Brazil, in April 2006, attended by more than 60 representatives from ORIT and the Latin American Workers' Confederation (CLAT), representatives of subregional trade union coordinating bodies and global federations. In the Declaration, the signatories decided to “strengthen the links between the environment, work and poverty”, stating that “decent work is essential for people to enjoy a sustainable livelihood”.
- The declaration of the second Trade Union Conference on Labour and the Environment in Latin America and the Caribbean, adopted in May 2009, states the position of the Trade Union Confederation of the Americas (TUCA) on climate change negotiations.
- *Labour's platform for the Americas: Decent work for sustainable development* is a document produced jointly by the Inter-American Regional Workers' Organization (ORIT), the Andean Labour Consultative Council (CCLA), the Caribbean Congress of Labour (CCL), the Southern Cone Union Coordinating Body (CCSCS), the Central America and Caribbean Union Coordinating Body (CCSCAC) and the national labour centres of Canada, the United States and Mexico. Point 2 of the platform is entitled: “Economic objectives which pursue sustainable development and focus on decent jobs and full employment”.

Source: International Labour Organization (ILO).

However, trade unions face a number of obstacles to participating in decisions relating to environmental matters. First and foremost, Governments rarely call upon unions to discuss and voice their concerns about environmental policies or measures. As a result, it is unusual for environmental policies to consider social and labour aspects, or for social and labour negotiations to integrate the environmental dimension. Fortunately, this has begun to change, and some environment ministries, such as that of Chile, are now incorporating areas for working jointly with trade unions. Similarly, some labour ministries, such as that of Brazil, are incorporating the environment area.

Unions also have their limitations, such as poor integration of programmes of action and technical expertise. It is essential for monitoring instruments and strategies to include training and experience-sharing opportunities. A good example is the project by the Trade Union Confederation of the Americas on strengthening trade union action on environmental and sustainable development issues. The aim of this project is to develop a programme of joint trade union action on environmental issues in Latin America, by building the capacity of trade unions and workers to take action in the workplace and in the community and to increase their participation in local, national, regional and international environmental processes.

7. Private sector

Substantial progress has been made in business environmental performance since the early 1990s. Examples of this progress are the adoption of environmental management technologies and systems to prevent and combat pollution and fulfil environmental regulations and standards; efforts to provide products and services that meet environmental criteria or employ cleaner processes that exceed the

requirements of legislation;¹⁴ and the development of corporate social responsibility strategies. This trend is explained, among other factors, by the development of environmental legislation, by a changing ethical perspective and by market preferences, particularly in export markets. Initiatives that promote corporate responsibility —such as the United Nations Global Compact — have taken hold in a growing number of firms in Latin America and the Caribbean (United Nations, 2010). Global Compact members contribute in various ways to the Millennium Development Goals, a subject that has been tackled by the Regional Centre for Latin America and the Caribbean in support of the United Nations Global Compact, set up in 2009.¹⁵

A company's environmental impact largely depends on the nature of its activities. A significant proportion of productive activity in the region concerns sectors and activities that are highly sensitive environmentally, since they involve the extraction of natural resources, compete for land use with ecosystem services such as carbon dioxide capture and biodiversity protection, or are energy-intensive. Of the 50 largest firms in the region, 25 (including the five largest) operate in primary activities or the processing of natural resources (hydrocarbons, mining, agribusiness, steel-metallurgy, petrochemicals). Many smaller firms, including small and medium-sized enterprises (SMEs), operate within production chains associated with the large firms in these sectors (United Nations, 2010), making environmental management particularly important for the region.

However, progress to date in terms of business behaviour varies according to company size, ownership and financing mechanisms, among other points (United Nations, 2010). Large firms —whether transnational or local— linked to the global market through exports, investments and access to international capital markets, have advantages over smaller businesses, both in terms of their capacity to implement environmental management measures and corporate social responsibility strategies and in terms of the cost-effectiveness of such initiatives. Critics also claim that these actions (which are usually intensively publicized) have a relatively small impact on the environment and communities and do not compensate for the broader environmental damage and social consequences inherent in the scale of their activities and in production patterns (United Nations, 2010).

In addition, SMEs often lack access to capital or the ability to make significant changes to their production methods. Numerous SMEs still do not comply with current environmental regulations, often because managers are unsure of the advantages of investing in environmental management and the environmental impact their companies are causing (Correa, Van Hoof and Nuñez, 2010).

Organizations in a number of countries and territories in the region have joined the World Business Council for Sustainable Development (WBCSD), through which they provide member firms with sustainability-related technology dissemination services, innovative approaches to entrepreneurship, linkages with suppliers of products and services conducive to sustainable development and other support (see table III.2).¹⁶ Over the last few years, instruments have been implemented to promote triple-bottom-line management (economic-financial, environmental and social) among companies. These include the International Finance Corporation (IFC) guidelines for implementing and evaluating responsible management systems; the guide for SMEs of the Global

¹⁴ For example, the number of firms with ISO 14001 certification has gone up. Nevertheless, the number of certified companies is still very low. Only 6,423 firms in the region had been certified in 2010, while in Europe there were 103,126 and in the Far East 124,922. See [online] <http://www.iso.org/iso/iso-survey2010.pdf> [date of reference: December 2011]

¹⁵ See [online] <http://www.centroregionalmal.org/>.

¹⁶ See WBCSD [online] <http://www.wbcd.org/>.

Reporting Initiative (GRI); the IndicaRSE indicators system, used in several Central American countries; the indicators tool of the Colombian Business Council for Sustainable Development (CECODES); and the systems proposed by Instituto Ethos in Brazil and the Argentine Institute of Business Social Responsibility (IARSE). There are also specific indicators for each industrial sector (United Nations, 2010; Correa, Van Hoof and Nuñez, 2010).

Table III.2
LATIN AMERICA AND THE CARIBBEAN: MEMBER ORGANIZATIONS OF THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT

Organization	Country or territory	Year of membership
Action RSE	Chile	2004
AED Costa Rica	Costa Rica	2003
BCSD Argentina (CEADS)	Argentina	1992
BCSD Bolivia (CEDES)	Bolivia (Plurinational State of)	2003
BCSD Brazil (CEBDS)	Brazil	1997
BCSD Colombia (CECODES)	Colombia	1997
BCSD Ecuador (CEMDES)	Ecuador	2002
BCSD El Salvador (CEDES)	El Salvador	1992
BCSD Honduras (CEHDES)	Honduras	1994
BCSD Mexico (CESPEDES)	Mexico	1994
BCSD Nicaragua (uniRSE)	Nicaragua	2006
BCSD Uruguay (DERES)	Uruguay	2006
CentraRSE	Guatemala	2003
Curacao BCSD-Bedrijven Platform Milieu	Curacao	2009
Perú 2021	Peru	2001
REDES	Paraguay	2003
SumaRSE	Panama	2004
UniRSE	Nicaragua	2006

Source: World Business Council for Sustainable Development [online] <http://www.wbcds.org/regional-network/members-list/latin-america/accionrse.aspx> [date of reference: December 2011].

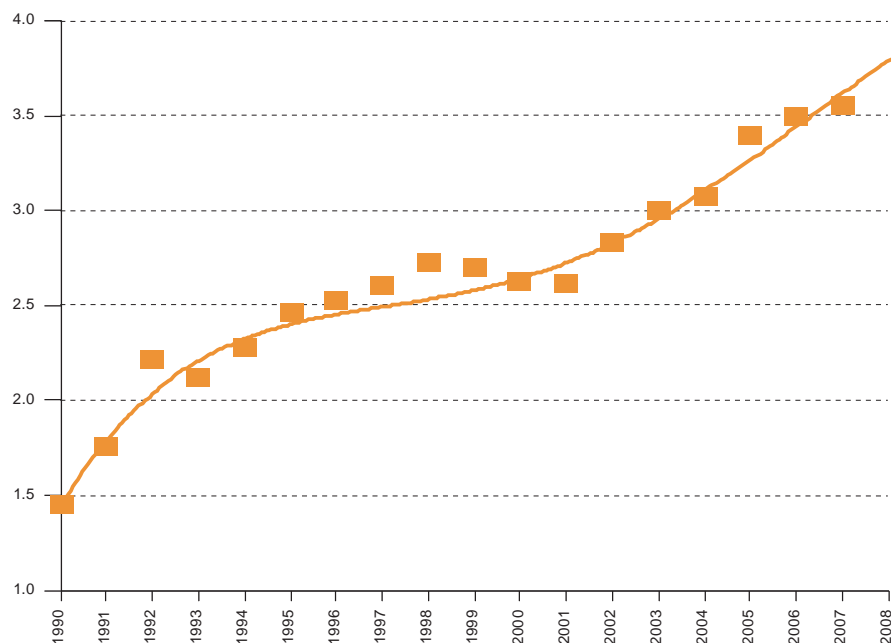
The financial sector has great potential to influence both the behaviour of the productive private sector and public investment. Several banks in the region—and multinational banks with operations in the region—have adopted measures for financing environmentally friendly and sustainable investments. The financial sector has undertaken initiatives to assess environmental risk in investment decisions and to require that clients comply with environmental legislation. These measures have been promoted through international actions such as the UNEP Finance Initiative (UNEP-FI) and the Equator Principles of the International Finance Corporation (United Nations, 2010). However, these initiatives are still maturing and a change is needed in the way in which investments are evaluated, by taking into consideration external costs and life cycles.

8. The science and technology community

Agenda 21, chapter 31, recognizes the role of the science and technology community in implementing sustainable development. The Johannesburg Plan of Implementation takes a cross-cutting approach to science and technology as key factors in the implementation of several aspects of sustainable development. The situation of the science and technology community across the region varies widely. In general, it has developed over the past 20 years, but there are still marked lags in comparison with other regions.

In 2007, researchers in Latin America and the Caribbean represented 3.5% of the world total, a proportion which, while small, is significantly higher than in 1990, when they represented only 1.5% of the world's researchers (see figure III.1). The number of researchers and technologists in the region has doubled over the past decade, rising to a little over 250,000 in 2007 (expressed as full-time equivalent units) (RICYT, 2009).¹⁷

Figure III.1
**LATIN AMERICA AND THE CARIBBEAN: TREND IN THE GLOBAL SHARE
 OF RESEARCHERS, 1990-2008**
(Percentage of all researchers, expressed as full-time equivalent units)



Source: United Nations Educational, Scientific and Cultural Organization (UNESCO), *Sistemas nacionales de ciencia, tecnología e innovación en América Latina y el Caribe*, Montevideo, 2010.

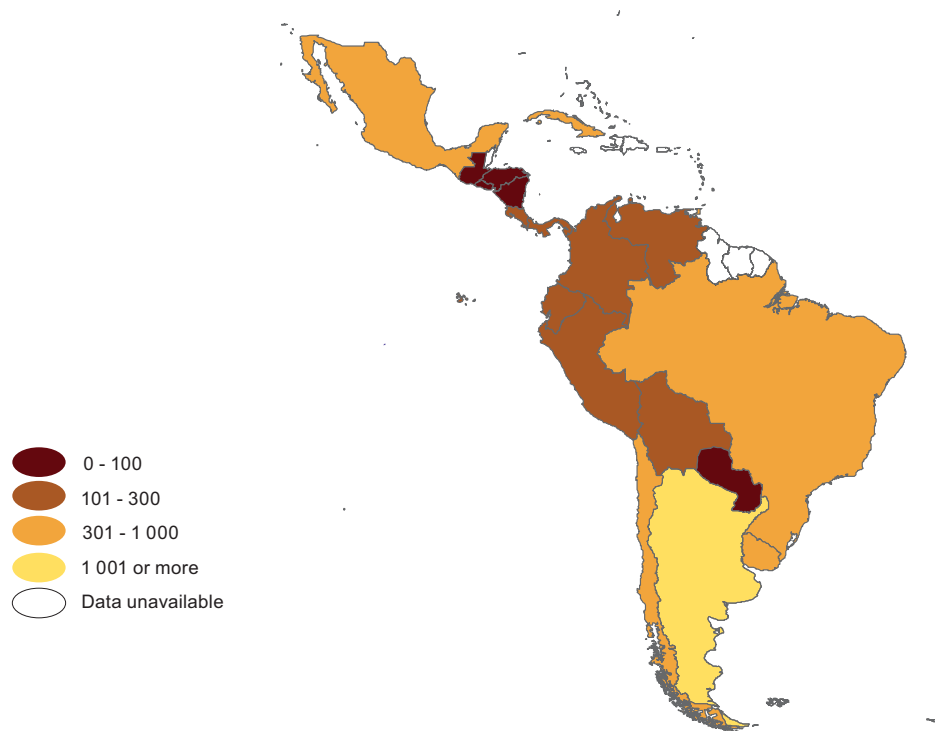
Growth in the number of researchers in the region also outstrips the global growth rate. However, Latin America and the Caribbean accounts for 8.6% of the world population, so at the current growth rates the region's share of the world's researchers would not equal its share of the world population until 2030 (UNESCO, 2010).

¹⁷ See [online] <http://www.uis.unesco.org>.

This means that, in relation to its population, the region has a high capacity to absorb new researchers and especially technologists. Some countries in the region have made major efforts to increase human resources in research and development (R&D), especially Brazil, and, in recent years, Argentina, the Bolivarian Republic of Venezuela, Chile, Colombia and Mexico.

The outlook within the region is mixed, as illustrated by map III.1, which shows the density of researchers in each country in terms of the number of researchers (expressed as full-time equivalent units) per million population, in 2009 or the latest available year. The data presented indicate a major structural weakness in the training of new researchers and technologists in the region.

Map III.1
**LATIN AMERICA AND THE CARIBBEAN: NUMBER OF RESEARCHERS,
 2009 OR LATEST AVAILABLE DATA**
(Per million inhabitants)



Source: UNESCO Institute for Statistics [online] <http://uis.unesco.org> [date of reference: 22 June 2011].

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

According to data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), women represent slightly more than one quarter (29%) of the researchers in the world. In Latin America and the Caribbean, the proportion of women researchers far exceeds that figure, with 46% of all researchers (UNESCO, 2010). Six countries of the subcontinent have achieved gender parity among researchers: Argentina, Bolivarian Republic of Venezuela, Brazil, Cuba, Paraguay and Uruguay.

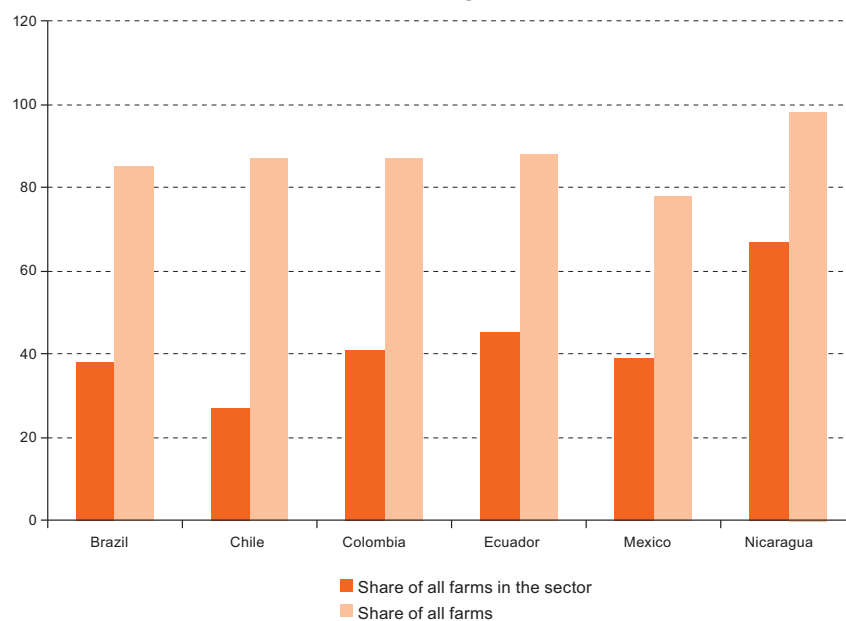
9. Farmers

Rural households, indigenous peoples and their communities, and farmers, a large proportion of whom are women, are the stewards of many of the planet's resources. For this reason, Agenda 21, chapter 32, states that a farmer-centred approach is the key to the attainment of agricultural sustainability in both developed and developing countries, and many of the programme areas in Agenda 21 address this objective.

In 2010, rural inhabitants accounted for approximately 19% of the total population in the region. Of this group, between 11% and 33% work in agriculture (ECLAC/FAO/IICA, 2011). They are the people most directly affected by poor management of water resources and land. A lack of financial resources, coupled with remoteness from urban centres, where legal institutions, training centres and institutions offering technical and financial support are based, often mean that programmes are not effective. The challenges facing farmers in the region include proper access to education, technical training and financial support; access to new production technologies that are compatible with human and material development; sustainable use of natural resources, aquifers and the environment; and the need to take a sustainable approach to boosting productivity. Retaining and incorporating young people into farming was also identified as a major challenge for the region.

A remaining challenge for the region is to ensure that public agricultural policies take family farming into consideration. Family farming accounts for a large share of agricultural output in every country in the region. In Nicaragua, it makes up 67% of the value of agricultural output; in Ecuador, 45%; in Colombia, 41%; in Mexico, 39%; in Brazil, 38%; and in Chile, 27% (IDB/FAO, 2007). In some countries, family farms account for a large share of all farms. In Nicaragua, family farmers run 98% of all farms; in Ecuador, 88%; in Chile and Colombia, 87%; in Brazil, 85%; and in Mexico, 78% (see figure III.2).

Figure III.2
LATIN AMERICA (SELECTED COUNTRIES): FAMILY FARMING AS A SHARE OF THE VALUE OF AGRICULTURAL PRODUCTION AND AS A SHARE OF ALL FARMS
 (Percentages)



Source: Inter-American Development Bank (IDB)/Food and Agriculture Organization of the United Nations (FAO), *Políticas para la agricultura familiar en América Latina y el Caribe*, Santiago, Chile, 2007.

Family farming also represents a significant share of sectoral employment in some countries in the region, including Brazil, where family farms employ 77% of all agricultural workers, or Mexico, where the figure is 70%.

Despite its contribution, family farming faces multiple challenges, including lack of access to extension services; lack of access to and linkages with markets for goods and services; lack of access to quality seed; pest and pesticide risks; limited production resources; and low awareness of these factors on the part of decision makers. Climate change poses additional challenges for the sector. Other areas where there are deficiencies are: access to agricultural inputs and capital; rescheduling farm debt; and promoting the use of farm insurance.

Bibliography

- Acuña, G. (2010), “El acceso a la información y participación pública en la toma de decisiones ambientales en América Latina: avances y desafíos hacia una mejor aplicación del Principio 10 de la Declaración de Río”, *Quinto Programa de Capacitación en Derecho y Políticas Ambientales, Memorias*, United Nations Environment Programme (UNEP) [online] <http://www.pnuma.org/gobernanza/PonenciasVPrograma.pdf>.
- Coalición Argentina de la Iniciativa de Acceso (2009), *Situación del acceso a la información, la participación y la justicia ambiental en Argentina*, Centre for Human Rights and Environment (CEDHA), Foro Ciudadano de Participación por la Justicia y los Derechos Humanos (FOCO), Organización Argentina de Jóvenes para las Naciones Unidas (OAJNU), November.
- Correa, M.E., B. Van Hoof and G. Nuñez (2010), *Cambio y oportunidad: La responsabilidad social corporativa como fuente de competitividad en pequeñas y medianas empresas en América Latina y el Caribe* (LC/L.3197-P. LC/WAS/L110), Economic Commission for Latin America and the Caribbean (ECLAC)/Young Americas Business Trust/Canadian International Development Agency/Organization of American States (OAS). United Nations Publication, Sales No.S.10.II.G.9.
- Delamónica, E. and S. Mehrotra (2006), “A capability centred approach to environmental sustainability: is productive employment the missing link between micro and macro policies?”, *Working Paper*, No. 13, International Poverty Center (IPC), United Nations Development Programme (UNDP).
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011), *Report on the coordination of international statistical activities in the area of the environment* (LC/L.3288(CE.10/7)), Santiago, Chile.
- _____ (2010), *What Kind of State? What Kind of Equality?* (LC/G.2450(CRM.11/3)), Santiago, Chile.
- _____ (2008), *Structural Change and Productivity Growth – 20 Years Later. Old Problems, New Opportunities* (LC/G.2367(SES.32/3)), Santiago, Chile, May.
- ECLAC/FAO/IICA (Economic Commission for Latin America and the Caribbean/Food and Agriculture Organization of the United Nations /Inter-American Institute for Cooperation on Agriculture) (2011), *The Outlook for Agriculture and Rural Development in the Americas: A perspective on Latin America and the Caribbean 2011-2012*.
- ECLAC/GTZ/IPEA (Economic Commission for Latin America and the Caribbean/German Agency for International Cooperation/Institute of Applied Economic Research) (2011), “Avaliação preliminar dos resultados atingidos pelo Plano de Ação para a Prevenção e Controle ao Desmatamento na Amazônia Legal (PPCDAM)”, forthcoming.
- ECLAC/UNFPA (Economic Commission for Latin America and the Caribbean/United Nations Population Fund) (2009), “América Latina: una síntesis de los avances y desafíos de la implementación del Programa de Acción de la Conferencia Internacional sobre la Población y el Desarrollo, 1994-2009” (DDR/1), paper presented at the Regional Seminar on the Progress Made and Key Actions for Implementation of The Cairo Programme of Action 15 Years After Its Adoption [online] http://www.eclac.org/publicaciones/xml/0/37380/Versionpreliminar_Sintesis_CIPD15_AL.pdf.
- ECLAC/UNICEF (Economic Commission for Latin America and the Caribbean/United Nations Children's Fund) (2010), *Pobreza infantil en América Latina y el Caribe* (LC/R.2168), Santiago, Chile.
- FAO (Food and Agriculture Organization of the United Nations) (2011), *The State of Food and Agriculture 2010-11. Women in Agriculture. Closing the Gender Gap for Development*, Rome.
- IANWGE (Inter-Agency Network on Women and Gender Equality) (2006), *Indigenous Women and the United Nations System. Good Practices and Lessons Learned*, Permanent Forum on Indigenous Issues.

- IDB/FAO (Inter-American Development Bank/Food and Agriculture Organization of the United Nations) (2007), *Políticas para la agricultura familiar en América Latina y el Caribe*, Santiago, Chile, FAO Regional Office for Latin America and the Caribbean.
- ICLEI (International Council for Local Environmental Initiatives) (2011a), “Rio+20: towards the UN Conference on Sustainable Development 2012”, *ICLEI Briefing Sheet*, Bonn, June.
- _____ (2011b), “Green urban economy”, *ICLEI Briefing Sheet*, Bonn, January.
- IPAM (Amazon Environmental Research Institute) (2011), “A Região da Transamazônica rumo à economia de baixo carbono: estratégias integradas para o desenvolvimento sustentável” [online] <http://www.ipam.org.br/biblioteca/livro/A-Regiao-da-Transamazonica-rumo-a-economia-de-baixo-carbono-estrategias-integradas-para-o-desenvolvimento-sustentavel/576>.
- IPU (Inter-Parliamentary Union) (2010), “Women in Politics 2010” [online] http://www.ipu.org/pdf/publications/wmnmmap10_en.pdf.
- _____ (2006), “Women in Politics: 60 Years in Retrospect”, *Data sheet*, No. 4, Geneva [online] http://www.ipu.org/PDF/publications/wmnmfokit06_en.pdf.
- ISDR (United Nations International Strategy for Disaster Reduction) (2011), “Global Assessment Report on Disaster Risk Reduction” [online] <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/index.html>.
- Kaztman, R. (2011), “Infancia en América Latina: Privaciones habitacionales y desarrollo de capital humano”, *Project documents*, No. 431 (LC/W.431), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Children's Fund (UNICEF), Santiago, Chile.
- Lambrou, Y. and G. Piana (2006), *Gender: The Missing Component of the Response to Climate Change*, Rome, Food and Agriculture Organization of the United Nations (FAO).
- Ministry of Finance of Ecuador (2010), “La equidad de género en la pro forma del Presupuesto General del Estado 2011”, Quito, December.
- Quiroga Martínez, R. (2007), “El séptimo objetivo del Milenio en América Latina y el Caribe: 2007”, *Estudios estadísticos y prospectivos series*, No. 57 (LC/L.2782-P/E), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), October. United Nations publication, Sales N° S.07.II.G.116.
- Rico, M. Nieves (1998), “Gender, the environment and the sustainability of development”, *Mujer y desarrollo series*, No. 25 (LC/L.1144), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- Rico, M. Nieves and Laura Pautassi (2011), “Childcare leave: A right of children and parents”, *Childcare and Parental Leave*, Challenges, No. 12, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/United Nations Children's Fund (UNICEF).
- RICYT (Network for Science and Technology Indicators) (2009), *El estado de la ciencia 2009. Principales indicadores de ciencia y tecnología iberoamericanos/interamericanos*, Buenos Aires.
- RIMISP (Latin American Center for Rural Development) (2006), “Género, tierra y propiedad en América Latina”, *América Latina Genera/United Nations Development Programme (UNDP)* [online] http://www.americalatinagenera.org/es/documentos/tematicas/tema_desarrollo_sostenible.pdf.
- Tamburlini, G., O.S. von Ehrenstein and R. Bertollini (2002), “Children’s health and environment: A review of evidence”, *Environmental Issue Report*, No. 29, Copenhagen, World Health Organization Regional Office for Europe/European Environment Agency.
- The Access Initiative (2005), “Situación del acceso a la información, a la participación y a la justicia ambiental en América Latina, 2004-2005” [online] <http://www.accessinitiative.org/sites/default/files/Situacion%20del%20Acceso.pdf>.

- Tréllez, E. (2006), “Algunos elementos del proceso de construcción de la educación ambiental en América Latina”, *Revista iberoamericana de educación*, No. 41, Madrid, Organization of Ibero-American States for Education, Science and Culture.
- UN-Women (United Nations Entity for Gender Equality and the Empowerment of Women) (2010a), “Gender Justice: Key to Achieving the Millennium Development Goals” [online] <http://www.unifem.org/progress/pdfs/MDGBrief-English.pdf>.
- _____ (2010b), “How can aid be gender-responsive in the context of the new aid modalities?”, *Gender Responsive Budgeting and Aid Effectiveness Knowledge Briefs*, New York.
- UNDP (United Nations Development Programme)/América Latina Genera (2010), “Desarrollo sostenible” [online] http://www.americalatinagenera.org/es/documentos/tematicas/tema_desarrollo_sostenible.pdf.
- UNEP (United Nations Environment Programme) (2010a), *Latin America and the Caribbean: Environment Outlook 2010*, Panama City.
- _____ (2010b), “Jurisprudencia ambiental: Selección y análisis de casos relevantes en América Latina y el Caribe”, *Environmental Law Documents series*, No. 16 [online] http://www.pnuma.org/gobernanza/Jurisprudencia_Ambiental.pdf.
- _____ (2003a), *Latin America and the Caribbean: Environment Outlook 2003*, Panama City.
- _____ (2003b), “Latin America and the Caribbean Proposed Program on Environmental Education within the Framework of Sustainable Development” (UNEP/LAC-IGWG.XIV/10), document presented at the Fourteenth Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean, Panama City.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2011), “Temas educativos centrales en América Latina y el Caribe”, second draft, Working paper prepared for the Regional Ministerial Meeting for Latin America and the Caribbean, Buenos Aires, 12 and 13 May, UNESCO Regional Office for Education in Latin America and the Caribbean [online] http://www.orealc.cl/informe-ept-2011/wp-content/blogs.dir/5/files_mf/temaseducativo2web.pdf.
- _____ (2010), “National science, technology and innovation systems in Latin America and the Caribbean”, *Science Policy Studies and Documents in Latin America and the Caribbean*, vol. 1, Guillermo A. Lemarchand (ed.), Montevideo.
- _____ (2009a), *Políticas, estrategias y planes regionales, subregionales y nacionales en educación para el desarrollo sostenible y la educación ambiental en América Latina y el Caribe: Decenio de las Naciones Unidas de la Educación para el Desarrollo Sostenible, 2005-2014*, Santiago, Chile, UNESCO Regional Office for Education in Latin America and the Caribbean.
- _____ (2009b), *Organismos no gubernamentales que trabajan en educación para el desarrollo sostenible y en educación ambiental en América Latina y el Caribe* (OREALC/2009/PI/H/5), Santiago, Chile, UNESCO Regional Office for Education in Latin America and the Caribbean.
- UNICEF (United Nations Children's Fund) (2012), *The State of the World's Children.2012: Children in an Urban World*, forthcoming.
- _____ (2007), *Climate Change and Children*, New York, December.
- United Nations (2010), *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- _____ (2006), “Beijing Declaration and Platform for Action”, *Report of the Fourth World Conference on Women* (A/CONF.177/20/Rev.1), New York.
- _____ (1979), *Convention on the Elimination of All Forms of Discrimination against Women*.

Chapter IV

SUSTAINABLE DEVELOPMENT IN THE SMALL ISLAND DEVELOPING STATES OF THE CARIBBEAN**PRINCIPLE OF THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT**

- 6 The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

A landmark outcome of the United Nations Conference on Environment and Development (the Earth Summit) was the inclusion and recognition of small island developing states (SIDS) as a special case for environment and sustainable development. Reflecting this outcome, principle 6 of the Rio Declaration calls for priority to be given to the special needs of the least developed and most environmentally vulnerable countries. In parallel, Agenda 21 recognizes the special situation of small island developing States (SIDS) as follows:

“Small island developing States and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a disadvantage economically and prevent economies of scale. For small island developing States the ocean and coastal environment is of strategic importance and constitutes a valuable development resource.” (United Nations, 1993, chap. 17, para. 124).

Since 1992, specific commitments and action plans have been adopted by and for SIDS. In 1994, pursuant to General Assembly resolution 47/189 and as a follow-up to decisions taken at the Earth Summit, the United Nations convened the Global Conference on the Sustainable Development of Small Island Developing States. At the Conference, held in Bridgetown, Barbados, the Programme of Action for the Sustainable Development of Small Island Developing States (the Barbados Programme of Action) was adopted (United Nations, 1994). The Barbados Programme of Action defined and recommended a number of actions and policies related to environmental and development planning to be undertaken by SIDS, with the cooperation and assistance of the international community. In 1999, at a special session of the General Assembly convened to conduct a five-year review of the Barbados Programme of Action, the following six priority targets were identified for the following five years: adapting to climate change and rising sea levels; improving preparedness for and recovery from natural and environmental disasters; preventing worsening shortages of freshwater resources; protecting coastal ecosystems and coral reefs from pollution and overfishing; developing solar and other renewable forms of energy; and managing growth in tourism so as to protect the environment and the cultural integrity of the local population.

In 2005, a conference was held in Mauritius to conduct a 10-year review of the implementation of the Barbados Programme of Action. The conference resulted in the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (United Nations, 2005a). The Barbados Programme of Action and the Mauritius Strategy are the sustainable development blueprints for SIDS in line with the implementation of Agenda 21 and include development clusters in five areas: natural resources and environmental threats, economic issues, social issues, governance and issues relating to implementation (UNDP Pacific Centre, 2008).

A. IMPLEMENTATION OF INTERNATIONAL COMMITMENTS ON SUSTAINABLE DEVELOPMENT BY THE CARIBBEAN SIDS

The pursuit of sustainable development in the Caribbean SIDS has met with many of the same challenges as in Latin America, and the preceding analyses also largely apply to this group of countries, which include the following Caribbean SIDS: Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago. However, there are issues of specific relevance to the Caribbean SIDS that have further hindered progress towards the original Earth Summit commitments.

Sustainable development in a SIDS context is both more challenging and more urgent due to the unique and distinctive vulnerabilities of SIDS: small populations; remoteness and insularity; human, financial and technical constraints; dependence on scarce natural resources, such as coastal and marine ecosystems; vulnerability to natural disasters that devastate entire sectors, including agriculture and infrastructure; and excessive dependence on international trade and susceptibility to adverse global developments. Also, SIDS are often unable to benefit from economies of scale (thus losing the advantages of preferential market access and competitiveness) and are adversely impacted by high transportation and communication costs (UNFCCC, 2008; UNDESA, 2010a).

To further compound the difficulties for long-term sustainability endeavours, climate change is expected to result in changes in rainfall patterns,¹ increased temperatures in the Caribbean and increased frequency of extreme events (IPCC, 2007; Stern, 2007; Campbell and others, 2010; UNFCCC, 2007; Trotz, 2008). These changes will pose additional risks to the Caribbean SIDS, such as rises in sea level that will inundate coastal ecosystems and negatively impact mangrove forests, sea-grass beds and coral reefs; increased opportunities for insect vectors of dengue fever and malaria to breed; and saline intrusion of groundwater aquifers (IPCC, 2007; Stern, 2007; UNDESA, 2010a; Trotz, 2008). Given the challenges faced by Caribbean SIDS in managing environmental issues, these additional risks would further exacerbate the region's vulnerability to disasters.

A review of the implementation of the Mauritius Strategy in the Caribbean indicates that some progress has been made, despite serious constraints on technical, financial and human resources (ECLAC, 2010b). Specifically, countries have reported advances at both the national and regional levels as they have increased their institutional capacity for sustainable development and made progress in carrying out policy reforms and creating appropriate strategies and action plans, especially in the area of climate change.

While some support has been received from the international community to implement the Mauritius Strategy, the bulk of progress has been achieved primarily through the efforts of the Caribbean SIDS themselves. The majority of Caribbean SIDS consider their financial resources to be insufficient to fully implement the Strategy, and half of them deem their technical resources inadequate for achieving or accelerating further progress (United Nations, 2010c).

¹ Annual precipitation is projected to increase in areas north of 22° N and decrease by 25% to 50% south of this demarcation, according to a recent regional climate model (Campbell and others, 2010).

Additionally, environmental challenges, such as land degradation, waste and pollution, natural disasters and biodiversity management issues, among others, have further hindered implementation of the Mauritius Strategy and further hinder progress towards sustainable development goals..

The risk of disasters is very high in the development and environment agenda of Caribbean countries. The recognition of the vulnerability of the region led to several initiatives at both national and regional levels designed to reduce this vulnerability. These date back to the 1980s and include the establishment of regional and national institutional and legislative frameworks as well as the development of programmes.

The Hyogo Framework for Action 2005-2015 (HFA) provided a platform for the regional Comprehensive Disaster Management (CDM) strategy, to link development decision-making and planning initiatives to comprehensive disaster risk management within the context of sustainable development. In line with this, the sixth Caribbean Conference on Comprehensive Disaster Management, December 2011, in Trinidad and Tobago, reflected on the achievements and lessons learned and the commitment of Caribbean countries that will nurture an Enhanced Comprehensive Disaster Management Strategy beyond 2012.

The following paragraphs outline the key aspects of implementation by Caribbean SIDS of the international commitments on sustainable development which emanated from the Earth Summit in 1992.

1. National sustainable development strategies (NSDS)

In order to integrate environment and development at the policy, planning and management levels, Chapter 8 of Agenda 21 calls on countries to conduct national reviews and adopt national sustainable development strategies, aimed at harmonizing sectoral economic, social and environmental policies and plans in each country. Caribbean SIDS have developed strategies in line with these goals, as well as other integrated policies and planning tools for sustainable development.

Barbados has formally submitted its National Sustainable Development Strategy, which comprises the National Sustainable Development Policy (ratified by the Parliament in 2004) and Action Plan (UNDESA, 2010b). The Policy includes sustainable development principles to orient a national framework for decision-making and focuses on quality of life, conservation of resources and economic efficiency and equity (Government of Barbados, 2009). Other countries have created strategies that can be considered a national sustainable development strategy, such as national environmental management strategies or the adoption of integrated development planning. Examples of implementation of national sustainable development strategies include those of Antigua and Barbuda (National Environmental Management Strategy), Cuba (National Environmental Strategy), Dominica (Growth and Poverty Strategy), Guyana (Low Carbon Development Strategy), Jamaica (National Development Plan, Vision 2030-Jamaica), Saint Vincent and the Grenadines (National Economic and Social Development Plan) and Trinidad and Tobago (National Strategic Development Plan, Vision 2020). Among the thematic areas of the Mauritius Strategy that are also consistently included in these strategies, plans and programmes are climate change, sea level rise, natural and environmental disasters, waste management, and energy and renewable energy sources (ECLAC, 2010b).

In general, the Caribbean SIDS face financial and technical challenges in implementing both the Mauritius Strategy and their national development strategies. Specific challenges include the need to intensify national efforts by giving greater priority to the use of national sustainable development

strategies, develop mechanisms for regional collaboration, identify sources of international assistance and strengthen the legal authority for enforcement. The lack of basic data and/or statistics for developing sustainable development indicators, insufficient understanding of indicators and their application in decision-making, lack of political will, lack of financial and human resources and a decrease in official development assistance are all major barriers to the successful development and implementation of such strategies (ECLAC, 2010b).

2. United Nations Framework Convention on Climate Change

Vulnerability to climate change is a major challenge for SIDS and one of their key common issues. Caribbean SIDS have made considerable progress in addressing the challenges of climate change and implementing the United Nations Framework Convention on Climate Change (the Climate Change Convention). National communications to the Convention secretariat² include a first report sent by all Caribbean SIDS beginning in 2000 and a second report sent by Antigua and Barbuda, Belize, the Dominican Republic and Jamaica. Some key areas of progress are listed below:

- (i) *Greenhouse gas emissions reporting.* Most Caribbean SIDS have established climate change committees responsible for overseeing the preparation of national communications under the Climate Change Convention. In addition, Caribbean SIDS have calculated anthropogenic greenhouse gas emissions and removal by sinks, following the Revised 1996 Guidelines for National Greenhouse Gas Inventories of the Intergovernmental Panel on Climate Change.
- (ii) *Climate modelling.* An ongoing collaborative climate modelling effort by the Institute of Meteorology of Cuba, the Caribbean Community Climate Change Centre and Mona and Cave Hill Campuses of the University of the West Indies has published climatic temperature and precipitation projections that have enabled Caribbean SIDS to plan for adaptation to and mitigation of climate change. The activities of the Water Centre for the Humid Tropics of Latin America and the Caribbean have complemented this work for the Dominican Republic (and Mesoamerica) by assessing the vulnerability of ecosystems and their constituent species to climate change (UNEP, 2008). There are also new opportunities for climate research in the region through the Coordinated Regional Climate Downscaling Experiment (CORDEX) (ECLAC, 2010a), which was initiated in 2010 and is expected to generate new and more abundant information for climate change projections and planning. Building climate modelling capacity across the region will help raise awareness and enhance the ability of States to consider adaptation and mitigation options with a view to effective policy development and strategic action aligned with the Climate Change Convention and Caribbean challenges.
- (iii) *Adaptation.* Given their low contributions to global greenhouse gas emissions, Caribbean SIDS have prioritized adaptation in mitigating climate change effects (Trotz, 2008; UNDESA, 2010a). The majority of Caribbean SIDS have participated in the Global Environment Facility-funded Caribbean Planning for Adaptation to Climate Change (CPACC) project and its ensuing initiatives, which include Mainstreaming Adaptation to Climate Change, Adaptation to Climate Change in the Caribbean and the Special Programme for Adapting to Climate Change. Under the CPACC project, countries formulated initial adaptation policies,

² National communications and reports from non-Annex I parties [online] http://unfccc.int/national_reports/non_annex_i_natcom/items/2979.php [date of reference: December 2011].

compiled national inventories of coastal resources, established databases of climate-related parameters and benefited from the design and establishment of a sea level monitoring programme (Trotz, 2008). Furthermore, in 2009 the Caribbean Community (CARICOM) Heads of Government approved the Caribbean Community Climate Change Centre Regional Framework for Achieving Development Resilient to Climate Change (CCCCC, 2011). The Centre is also preparing an implementation plan for the regional framework.

- (iv) *Mitigation*. As part of their climate change mitigation efforts, Caribbean SIDS have focused on increased efficiency in the energy and transport sectors and have worked on national awareness-building and incorporated several new initiatives utilizing renewable energy technologies. In addition, Caribbean SIDS have targeted both supply- and demand-side measures for energy mitigation, such as energy conservation and efficiency, cogeneration, modernization of thermoelectric utilities, improvement of transport infrastructure, enhancement of energy efficiency in lighting and air conditioning and implementation of demand-side management programmes. In the transport sector, Caribbean SIDS have attempted mitigation through the introduction of electric or compressed natural gas vehicles, encouragement for early adoption of hybrid vehicles and the introduction of vehicle emissions standards (Trotz, 2008). These efforts will not only improve transport sector efficiency but will also create positive spillovers for other policy goals, such as reducing local pollution, energy costs and traffic congestion. Despite their low contributions to global greenhouse gas emissions and the efforts mentioned in (i) above, however, Caribbean SIDS face challenges in moving to clean energy. An increase in energy consumption resulted in carbon dioxide emissions increasing by an annual average of 3.0% between 1990 and 2008.³

3. Convention on Biological Diversity

The Caribbean countries have consistently reported progress in implementing the Convention on Biological Diversity. Almost half of the Caribbean SIDS⁴ have submitted all four national reports, and the majority of the remaining countries have submitted at least three national reports since 1998. In addition to national reporting, the principle mechanism for implementing the Convention at the national level is through national biodiversity strategies and action plans.⁵ Over half of all Caribbean SIDS⁶ have completed an initial strategy and action plan since 1998, and an additional four countries⁷ are revising or have revised their strategy. The process of mainstreaming biodiversity into national development planning has been relatively successful, with most countries rating their progress in this regard as medium to high. Specifically, Belize, Cuba, Guyana, Jamaica and Saint Lucia have reported high levels of Convention implementation.⁸ In particular, Saint Lucia has achieved near complete implementation of its first strategy and action plan, with the success of implementation due in large part to an active biodiversity focal point in government; strong inclusion of sectors, communities and stakeholders in a

³ ECLAC calculation based on carbon dioxide emissions data from the Millennium Development Goals Indicators database, [online] <http://mdgs.un.org/unsd/mdg/Data.aspx> [date of reference: December 2011].

⁴ Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana and Saint Lucia.

⁵ National biodiversity strategies and action plans under the Convention on Biological Diversity [online] <http://www.cbd.int/nbsap/> [date of reference: December 2011].

⁶ Barbados, Belize, Dominica, Grenada, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

⁷ Cuba, Guyana, Bahamas and Saint Lucia.

⁸ National reports under the Convention on Biological Diversity [online] <http://www.cbd.int/reports/search/> [date of reference: December 2011].

participatory process; and national funding and investment for biodiversity (Prip and others, 2010). These reports also illustrate the extensive biodiversity and biological uniqueness of Caribbean SIDS, as evidenced by their high concentration of flora, fauna and endemic species (CBD, 2010). In fact, the Caribbean Islands are considered biodiversity hotspots, due to their high number of endemic species (upwards of 1,500 on each island) and extremely threatened habitat (with losses of at least 70% of original habitat) (Mittermeier and others, 2005, cited in CEPF, 2010). Habitat that is under threat includes over 10,000 square kilometres of reefs, 22,000 square kilometres of mangroves and 33,000 kilometers of seagrass beds, along with a range of amphibians (all endemic), highly endemic reptiles, mammals and plants (CEPF, 2010).

Biodiversity in the Caribbean is threatened by enforcement shortcomings, other institutional deficiencies and mounting pressures that translate into the overexploitation of species, the introduction of alien invasive species, loss of habitat and habitat fragmentation, pollution, resource extraction, unsustainable land-use practices and unregulated development, all of which have deleterious effects on the ecosystems of Caribbean SIDS (CBD, 2010). Invasive species, an emerging issue for the region, are having dramatic effects on ecosystems and leading to species extinction, which is exacerbated on small islands due to high marine traffic and the lack of natural predators (United Nations, 2010b). Furthermore, as in the rest of the region, the economic and social costs of environmental degradation are not adequately considered or evident. Despite an increase in the area of forest designated primarily for biodiversity conservation (FAO, 2011), the Caribbean reports a high species extinction rate (see table IV.1).

Table IV.1
NUMBER OF THREATENED AND EXTINCT SPECIES IN THE CARIBBEAN SUBREGION, 2011

	Animals		Plants	
	Threatened ^a	Extinct ^b	Threatened ^a	Extinct ^b
Antigua and Barbuda	37	0	4	0
Bahamas	60	2	7	0
Barbados	38	0	2	0
Belize	65	0	32	0
Dominica	41	1	10	0
Grenada	39	0	3	0
Guyana	51	0	22	0
Jamaica	77	6	209	2
Saint Kitts and Nevis	37	1	2	0
Saint Vincent and the Grenadines	40	1	4	0
Saint Lucia	43	1	6	0
Suriname	41	0	26	0
Trinidad and Tobago	52	0	1	0
Total	621	12	328	2

Source: International Union for Conservation of Nature (IUCN), “The IUCN Red List of Threatened Species. Summary Statistics”, Cambridge 2011 [online] <http://www.iucnredlist.org/about/summary-statistics> [date of reference: December 2011].

^a Includes values for the “critically endangered”, “endangered” and “vulnerable” categories of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

^b Includes values for the “extinct” and “extinct in the wild” categories of the IUCN Red List of Threatened Species.

In addition, Caribbean countries are vulnerable to natural disasters that threaten their biodiversity. Severe storms often have a disproportionately higher impact on the biodiversity of small islands in comparison with other regions or countries due to smaller land mass and smaller habitats (Wong and others, 2005). Climate change effects on oceans will also likely result in bleaching and possible destruction of coral reefs, which are crucial to biodiversity in the Caribbean and are a unique tourist attraction (UNDP, 2010). In the Caribbean, many forests were cleared in the past for sugar and banana plantations, and any remaining forests now tend to be secondary forests that lack the rich biodiversity of old-growth forests. As a result, bird species and marine mammals are becoming increasingly endangered.

4. United Nations Convention to Combat Desertification

All the Caribbean countries have signed and/or ratified the United Nations Convention to Combat Desertification. The achievements of Caribbean SIDS in implementing the Convention have been documented in four national communications submitted to the Convention secretariat since 2000.⁹

Key areas of progress include the following:

- (i) National action programmes under the Convention have been submitted by 10 Caribbean SIDS,¹⁰ and the remaining countries have reported their programmes to be in preparation.
- (ii) Participatory processes as part of the implementation of the Convention are being encouraged by all parties to the Convention and are considered an important component of success. Most SIDS have organized national-level meetings to validate their reports and some countries of the Organization of Eastern Caribbean States (OECS) have also conducted awareness campaigns in their processes for defining national action programme priorities (United Nations, 2002).
- (iii) Legislative and institutional frameworks or arrangements have progressed in three areas: (a) formulation of legislation in areas related to desertification (forest and water resources); (b) legal reforms aimed at facilitating coherent policies and regulations to combat desertification and drought; and (c) laws and regulations on the use of natural resources and their enforcement (United Nations, 2002). For example, the St. George's Declaration of Principles for Environmental Sustainability in the OECS helped promote legal and institutional reforms to harmonize and strengthen the environmental sector. Since 2001 the Dominican Republic has introduced legal and institutional frameworks stipulating environmental policies on land, water, biological and human resources along its border with Haiti through the Hispaniola Subregional Action Programme. In addition, most countries have appointed focal points and have elected a national coordinating body to guide the implementation of the Convention (United Nations, 2002).
- (iv) Linkages and synergies with other conventions and national development strategies have been explored by Caribbean SIDS. An important initiative has been the identification of national-level synergies between government agencies and departments on land degradation

⁹ National Communications under the United Nations Convention to Combat Desertification [online] <http://www.unccd.int/cop/reports/menn.php>.

¹⁰ Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Jamaica and Saint Kitts and Nevis.

issues, which have been incorporated into other policies such as sustainable use of water resources and forestry. Closer working relationships are also being established between the Convention to Combat Desertification and the Convention on Biological Diversity in order to streamline efforts and resources.

- (v) Measures for the rehabilitation of degraded land and for early warning systems to mitigate the effects of drought have been implemented in Caribbean SIDS with notable progress. The rehabilitation of degraded land is mostly being addressed through collaborative projects with international organizations or non-governmental organizations (NGOs) working in the areas of integrated coastal zone management, sustainable agricultural practices, reform and regularization of land ownership and physical planning activities. For example, there have been agreements among the African, Caribbean and Pacific Group of States for the integration of priority activities to combat desertification (United Nations, 2002).

However, because the Caribbean has not developed any standard drought and desertification monitoring assessment method, it is difficult to report accurately on land degradation trends. Despite reports of damage to land resources, there have been some efforts towards sustainable management of these resources in the region. For example, the area of forest designated primarily for protection of soil and water increased from 869,000 hectares in 1990 to 1.43 million hectares in 2010 (FAO, 2011). Some Caribbean countries have begun establishing a common framework for drought, coastal erosion and soil degradation issues within their environmental agendas.

In the Caribbean, a combination of economic and social factors has led to the persistence of poorly planned development, unsustainable agricultural practices, water pollution and uncontrolled land clearing, which are degrading land resources. In addition, more intense droughts, floods and other weather events are further damaging the land and thereby worsening erosion and the loss of soil, particularly the fertile topsoil which is critical for agricultural productivity and, consequently, food security. Another barrier to adequate implementation of the Convention to Combat Desertification has been lack of access to basic knowledge and appropriate technologies for managing natural resources. Many countries have also reported difficulties in implementing the Convention successfully due to a lack of predictable financial resources, adequate human resources and the necessary technological capacity (United Nations, 2002).

B. ISSUES OF SPECIAL CONCERN TO SIDS

1. Economic challenges

Limited progress in implementing the Barbados Programme of Action and the Mauritius Strategy in the Caribbean is due to a number of factors. Economic challenges and limited financing capacity in the subregion are of particular concern as Caribbean SIDS suffer from vulnerability to external shocks such as the recent global financial crisis, high indebtedness, vulnerability to extreme weather events and their effects on public finances and infrastructure investment needs and high dependence on increasingly costly food and fuel imports (IDB, 2008). Fuel imports are especially straining on Caribbean SIDS economies' as some countries, like Jamaica, are almost totally dependent on imported fuel (95%), which services mining, transportation and power grid. Jamaica also reports some of the highest energy intensity rates in the Latin America and Caribbean region, coupled with low efficiency (Ministry of Energy and Mining of Jamaica, 2009; Sampson, 2006). Additional economic challenges include less favourable conditions of trade and market access, a high dependence on narrow economies or a narrow range of exports

(UNDESA, 2010a) and increasing difficulties in the main economic sectors, namely financial services and tourism (ECLAC, 2008a), as well as agriculture. Since many of the activities in the Barbados Programme of Action rely on national budgets, a number of the gains achieved in the implementation of the Programme of Action and the subsequent Mauritius Strategy are additionally being eroded by budgetary constraints due to the repercussions of the global financial, food and energy crises.

2. Capacity constraints

Other difficulties for SIDS include constraints in institutions and technical capacity. Governance in many SIDS is organized by sector (for example, energy, agriculture and health). Consequently, a limited number of new policies are actually integrated across sectors or are the subject of significant public participation. For example, economic issues are sometimes divorced from environmental considerations and there is only limited capacity for social planning (ECLAC, 2010b). Existing institutions working on sustainable development are underfunded, and the migration patterns of highly skilled and professional populations have contributed to a reliance on a project-oriented management approach that addresses short-term needs rather than a programme and resources management approach that takes a more integrated and long-term perspective. This has also resulted in a reliance on recruiting outside expertise at significant cost but with no continuity, capacity-building or institutional strengthening (Greene, 2009; World Bank, 2011).¹¹ Most of the educated residents of Caribbean SIDS emigrate, and the “brain drain” of public sector employees who work on sustainable development issues further exacerbates the limited capacity of the countries (UNDESA, 2010a). Lack of funding has also resulted in decreased capacity, such as incomplete data on the implementation of sustainable development commitments and limited availability of quantitative tools for effective monitoring and identification of corrective actions.

Additionally, the 2010 Mauritius Strategy review indicates a clear need to better consolidate and more effectively coordinate the existing responsibilities of the United Nations institutional entities that share responsibility for supporting sustainable development of the Caribbean SIDS, perhaps through a regional coordinating mechanism (ECLAC, 2010b). This would allow a higher level of consolidation, integration and harmonization to implement the Barbados Programme of Action and the Mauritius Strategy.

3. International cooperation

Less than anticipated international cooperation and the global trend of declining official development assistance have also been evident in the Caribbean SIDS. Due to their classification as middle-income countries, most are excluded from a number of development opportunities. The criterion for allocating funds on the basis of GDP does not adequately consider the particular challenges faced by SIDS. For instance, Caribbean SIDS that are not classified as least developed countries (LDCs) do not qualify for debt relief assistance. In addition, they are increasingly considered ineligible for development aid (UNDESA, 2010a), despite their high debt burdens, many of which are in excess of 100% of GDP (ECLAC, 2008b).

There have been numerous efforts to gain international recognition to consider the particular development challenges faced by SIDS. In 2002, the Caribbean Community urged the International Conference on Financing for Development held in Monterrey, Mexico, to address this issue directly.

¹¹ The emigration rate among the university-educated population is as high as 89% in Guyana (World Bank, 2011).

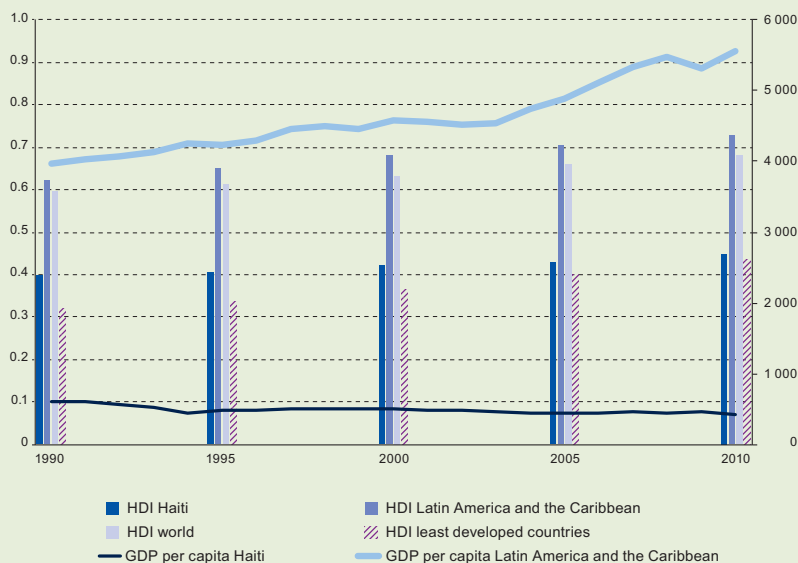
Furthermore, at the international meeting held for the 10-year review of the Barbados Programme of Action in 2005, the donor community committed to increasing the level of support for the sustainable development efforts of SIDS (United Nations, 2005b). However, this high debt burden has remained largely unaddressed in the international policy community (United Nations, 2011) and translates into weakened support for financial resources, technology transfer and capacity-building —crucial cross-cutting issues for advancing the implementation of sustainable development in the subregion.

A country in the region where many of the issues of special concern to the Caribbean SIDS are most pressing is Haiti, the only country in the Latin American and Caribbean region categorized as a least developed country (LDC). Principle 6 of the Rio Declaration on Environment and Development focuses on least developed countries and thus applies especially to Haiti. The country consistently suffers from very low GNI per capita, low human capital development and high economic vulnerability. Haiti shares the challenges common to most Caribbean SIDS, but it suffers additionally from other severe environmental, economic and social challenges of its own (see box IV.1).

Box IV.1 SIDS COUNTRY PROFILE: HAITI

Haiti's real annual average GDP growth rate between 2000 and 2010 was -1.5%, with mostly negative rates in the first half of the decade and a rate of -6.6% in 2010 and 2.8% in 2011^a. Over 77% of the population lives below the poverty line (World Bank, 2011)^b, and the country's 2010 Human Development Index rating of 0.449 is only slightly above least developed countries (0.435) and is substantially lower than the regional average of .728 (UNDP, 2010). Slow growth, high poverty rates and a waning human development index point to challenging circumstances for Haiti in the pursuit of sustainable development, environmental management and disaster preparedness.

HUMAN DEVELOPMENT INDICATOR TRENDS and GDP PER CAPITA (USD): 1990-2010



Source: United Nations Development Programme (UNDP), Regional and National Trends in the Human Development Index, 1980-2011[online] <http://hdr.undp.org/en/>, [date of reference: December 2011] / CEPALSTAT database, date of reference: January 2012.

Note: Human Development Index (HDI) composite scores range from 0 to 1, with greater values indicating more development. The HDI includes measurements of health, education and living standards.

Box IV.1 (concluded)

Haiti is situated in a region of the world that is prone to natural disasters, and its mountainous terrain and acute levels of environmental degradation increase its vulnerability to environmental damage (UNEP/Ministry of the Environment of Haiti/Quisqueya University, 2010). As of 2010, over 96% of Haiti was deforested (FAO, 2011; Brigety and Ondiak, 2009) and the lack of vegetation and forests threatens the country's access to clean water, capacity for agricultural production and protection from natural disasters (Brigety and Ondiak, 2009; CEPF, 2010; UNEP/Ministry of the Environment of Haiti/Quisqueya University, 2010). Environmental conservation is challenging due to severe overexploitation of natural resources, uncontrolled population growth, dependence on unsustainable sources of energy, poor water quality resulting from waste and contamination and a lack of adequate sanitary structures (UNEP/Ministry of the Environment of Haiti/Quisqueya University, 2010). Four hurricanes destroyed 112,000 homes in 2008 and caused an estimated US\$ 897 million in damage (Brigety and Ondiak, 2009; Buss and Gardner, 2008). The January 2010 earthquake afflicted nearly 15% of the population, resulting in over 220,000 deaths and an estimated US\$ 7.863 billion in losses and damages—nearly 120% of the country's 2009 GDP (Government of Haiti/World Bank/Inter-American Development Bank (IDB)/United Nations/European Commission, 2010). A post-disaster evaluation conducted by the Haitian government, United Nations bodies and other international organizations estimated that over 15% of the country's projected development needs for a three-year period would be in the area of environmental, risk and disaster management (Government of Haiti/World Bank/Inter-American Development Bank (IDB)/United Nations/European Commission, 2010). The United Nations Environment Programme has also spearheaded the Côte Sud Initiative, a US\$ 200 million environmental recovery programme for long-term recovery and sustainable, integrated development (HRI, 2011).

Haiti's ability to weather natural disasters and improve its economy and quality of life depends largely on governmental capacity and public management. The government and the judicial system are thwarted by inadequate funding and by the limited ability to provide high-quality public services and create jobs (Brigety and Ondiak, 2009). Private investors have exploited natural resources without adequate government control, and waste and water management systems have not been able to balance the preservation and proper distribution of resources (UNEP/Ministry of the Environment of Haiti/Quisqueya University, 2010). These challenges have been further exacerbated by constant socio-political crises; the United Nations has maintained a peacekeeping and stabilization mission in Haiti since 2004, and the country has faced a series of government oustings (see MINUSTAH [online] <http://www.un.org/en/peacekeeping/missions/minustah/>). The post-disaster evaluation that followed the 2010 earthquake identified the need for an extra US\$ 806.7 million in funding over three years and additional resources to improve governance, particularly in justice, the democratic process, public services and administration (7% of the total projected needs) (Government of Haiti/World Bank/IDB/United Nations/European Commission, 2010).

The country's internal turmoil has resulted in spiralling emigration rates and increasing violence. Due to a predominantly informal economy and limited growth opportunities, nearly 80% of university-educated Haitians live outside Haiti (Brigety and Ondiak, 2009). Despite continued international engagement in Haiti, the effectiveness of donor participation has been weakened by, among other factors, the underfunded Haitian government, fluctuating donor commitments to meet the country's needs and weak coordination mechanisms for the donor community (Brigety and Ondiak, 2009).

Given Haiti's economic needs, environmental vulnerabilities and socio-political challenges, sustainable development requires not only renewed commitment by the international community, but also a strategic and coordinated effort in the region that ensures long-term engagement within all levels of society and government.

Source: Reuben Brigety, and Natalie Ondiak, *Haiti's Changing Tide: A Sustainable Security Case Study*, Washington, D.C., Center for American Progress, September 2009; Terry Buss, and Adam Gardner, *Haiti in the Balance: Why Foreign aid has Failed and What We Can Do about It*, Washington, D.C., Brookings Institution Press, 2008; Critical Ecosystem Partnership Fund (CEPF), *Ecosystem Profile: The Caribbean Islands Biodiversity Hotspot*, January 2010; World Bank Online Database, 2011 [online] <http://data.worldbank.org/>; Food and Agriculture Organization of the United Nations (FAO), *State of the World's Forests*, Rome, 2010; Government of Haiti/World Bank/IDB/United Nations/European Commission *Haiti Earthquake PDNA: Assessment of Damage, Losses, General and Sectoral Needs*, 2010; The Haiti Regeneration Initiative (HRI), *What is the Côte Sud Initiative?*, 2011; United Nations Development Programme (UNDP), International Human Development Indicators [online] <http://hdr.undp.org/en/statistics/hdi/>; United Nations Environment Programme (UNEP)/Ministry of the Environment of Haiti/Quisqueya University *Haiti State of the Environment Report 2010*, Panama City, 2010.

^a CEPALSTAT database [online] <http://www.cepal.org/estadisticas/> [date of reference: January 2012].

^b Population below the poverty line is a 2001 estimate.

4. Freshwater resources, water management and sea level rise

Many Caribbean countries rely almost entirely on a single source of water supply, and available freshwater in the Caribbean SIDS is considerably less compared to other oceanic islands (UNEP, 2008). Climate change is expected to cause severe water stress, especially for countries that are already categorized as water scarce (Antigua and Barbuda, Barbados and St. Kitts and Nevis) (UNEP, 2008; CEPF, 2010; UNEP, 2010). The situation is most urgent in the low-lying limestone islands, where the seasonality of rainfall is particularly pronounced (Trotz, 2008). In addition, rises in sea level result in saline intrusion to underground aquifers or groundwater and threaten these already taxed water supplies and have led some countries (Antigua and Barbuda, the Bahamas and Barbados) to use desalinated water (UNEP, 1999; UNEP, 2010). Decreased river flows, as a result of climate change, are expected to also negatively affect hydroelectric installations, such as those found in Dominica and Saint Vincent and the Grenadines (Trotz, 2008). The tourism industry's large presence in the Caribbean SIDS has come at an environmental price, as it creates an even greater burden on water consumption, reported in the Dominican Republic as 4 times higher in the tourism industry than for residential uses (PricewaterhouseCoopers, 2007). Tourism, agricultural use, rising urban populations and excessive draw-down are placing increased demands on these freshwater resources (UNEP, 1999).

Progress has been made in developing a legal, political and institutional framework for water management where, for example Antigua and Barbuda, Barbados, Jamaica, Saint Lucia and Trinidad and Tobago, have national water policies and are seeking to streamline water laws and institutions (Chase, 2008; ICS/CEHI/OAS, 2002). In addition, regional initiatives, such as the Caribbean Water and Waste Water Association (CWWA), Caribbean Environmental Health Institute (CEHI) and the Caribbean Basin Water Management Programme (CBWMP), have been established over the last decades to help advance water resource management (Chase, 2008; ICS/CEHI/OAS, 2002). However, additional progress towards integrated water resource management within watersheds and with respect to groundwater supplies is necessary in the region (ECLAC, 2007; ICS/CEHI/OAS, 2002). In order to protect freshwater resources, it is crucial for the region to continue its work in integrating water resource management into policies and programmes which address the drivers for scarcity (among them, rising populations, tourism, agriculture, and excessive draw-down) and establish legal, policy and institutional frameworks for water resource management.

In addition, efforts to mainstream gender considerations into water management are essential; both men and women manage water resources, but the gender division of labour differentiates the way in which men and women use water. Women and men carry different volumes of water daily. On average, women carry 114 litres to 133 litres, primarily for households, while men carry 76 litres to 95 litres, primarily for livestock, two to three times a day (UNDP, 2009a). Water management strategies should include a gender analysis of needs in a community to ensure that water services are provided in an equitable manner that does not unfairly burden women.

5. Waste management and chemical substances

Reports highlight a shortage of investment in sewage and wastewater facilities in SIDS, as well as the high incidence of eutrophication caused by the dumping of sewage into rivers and coastal waters, which is caused by an estimated 80% to 90% of wastewater discharge being fed untreated into rivers and oceans in the Caribbean SIDS (Binger, 2011; UNEP, 2010). Waste management is considered a major problem on small islands, since the limitations on the space that can be allocated to landfills increase the risks of contamination of ground, surface and ocean waters from sewage, industrial effluents and agriculture.

Compounding the issue is a lack of financial, technological and legislative national capacities for managing wastewater pollution (United Nations, 2010b). The primary sources of marine litter in the Caribbean region are land-based sources (91.7%) (from municipal solid waste, sewage, etc.) and ocean-based sources (8.3%) (Smith, 2010). Unmanaged waste from the tourism sector places an additional burden on small islands' disposal and treatment facilities. Rising consumption is increasing waste streams, which carry hazardous wastes such as electronic, chemical and radioactive wastes. Improper or unsafe disposal of hazardous industrial waste represents a huge social and environmental cost for SIDS, exacting a heavy toll on human health, water resources, air quality and biodiversity (Smith, 2010). Some current methods for combating waste issues while addressing energy concerns have resulted in countries, such as the Bahamas and Jamaica, looking at waste-to-energy facilities (Smith, 2010).

Many SIDS have implemented specific legislation and systems to improve waste management, but their progress has been limited by a lack of financial support, incentives for assuming social costs and a shortage of technical capacity and infrastructure. As a result of these economic shortfalls, and despite international conventions banning dumping, there has been increased accumulation of known and unidentified toxins and chemicals (ECLAC, 2010c).

Several countries do not even have regulations on dumping, and inventories of chemicals are in some cases critically incomplete. For example, a 2003 study on hazardous waste in Trinidad and Tobago conducted by the Caribbean Environmental Health Institute found that obsolete pesticides had been stored in severely damaged containers in private laboratories, ports, agrochemical workshops and sugar cane production facilities (ECLAC, 2010c). In response, the Food and Agriculture Organization of the United Nations (FAO) initiated the Programme on the Prevention and Disposal of Obsolete Pesticides, to provide expertise and increase awareness regarding the disposal of obsolete pesticide stockpiles and lists seven different countries in the subregion with pesticide stocks since the program began in 1994.¹² Several factors have allowed this problem to persist: lack of inventories; lack of adequate storage; lack of special installations and lack of regulations or fulfilment of various international conventions related to chemical substances (i.e. Rotterdam, Basel, Stockholm). Again, Caribbean SIDS cite financial and capacity constraints as the main barriers to action (Williams, 2007).

6. Coastal and marine resources and biodiversity

As noted in the Mauritius Strategy, SIDS are defined by their historical, cultural and economic links to the oceans and seas. Caribbean countries' heavy reliance on the resources of the coastal areas and marine environment of the Caribbean Sea has resulted in strong interaction and competition for the use of these resources. Several SIDS have developed coastal zone management plans to minimize the degradation of marine and coastal environments caused by land-based activities and climate change. As a result of national and international efforts, the average proportion of marine protected areas (MPAs) has steadily increased in SIDS (UNDESA, 2010a), but only a small percentage of these MPAs have a developed management plan (UNEP, 2010). One recent initiative for more marine protection is the Caribbean Challenge, which was endorsed in the Liliendaal Declaration on Climate Change and Development by CARICOM Heads of State and Government at the Thirtieth Regular Meeting of the Conference of Heads of Government of the Caribbean Community, held in Liliendaal, Guyana, in 2009 (CARICOM, 2009). The Challenge's goal is to protect at least 20% of the Caribbean's marine and coastal habitats by 2020.

¹² See [online] www.fao.org/ag/AGP/AGPP/Pesticid/Disposal/en/index.html [date of reference: November 2011].

With respect to coastal and marine resources, the Barbados Programme of Action discusses the development of a proposal by Caribbean countries to seek international recognition of the Caribbean Sea as a special area in the context of sustainable development (Insanally, 2007). This was addressed by the Association of Caribbean States pursuant to General Assembly resolution 63/214, adopted on 19 December 2008 (United Nations, 2009), and was reported on in August 2010 to the General Assembly regarding possible legal and financial implications of the Caribbean Sea concept. Progress to date includes the creation of three subcommissions within the Caribbean Sea Commission (which was established in 2006 to promote coordinated governance of the Caribbean Sea). Support of the proposal is crucial to the ongoing regional initiative for securing this special designation (United Nations, 2010b).

Marine and coastal resources are under tremendous pressure, which is only increasing with climate change effects. Warming and acidifying oceans will result in more frequent bleaching and possible destruction of coral reefs in the Caribbean, which are nurseries for an estimated 65% of all fish species in the basin (UNDP, 2010). Coral reefs also provide natural protection against storm surges and are a critical tourism asset (World Bank, 2010); an estimated 7% of the world's coral reefs are in the Caribbean subregion (UNEP, 2010). The combined impacts of ocean acidification and warmer sea temperatures make tropical coral reef systems vulnerable to collapse.¹³ When the bleaching impact of warmer water combines with other human-induced stresses, reefs increasingly become algae-dominated, leading to a catastrophic loss of biodiversity (CBD, 2010). Additional threats include discharged wastewater, as approximately 36% of the coral reefs in the Caribbean are found within 2 kilometres of the coast and are therefore vulnerable to coastal activities (UNEP, 2010); tourism; land degradation and subsequent soil erosion and sediment transport to coastal waters; fishing; hurricanes/natural disasters and pollution from the sea all endanger coral reefs as well as the coastal habitats that are so important to this subregion (UNEP, 2010).

7. Natural disaster threats

Extreme events such as hurricanes, cyclones, flooding, drought and earthquakes are particularly common in the region due to its geographical and geophysical make-up. Climate change has increased the severity and frequency of such events and heightened their impact, potentially delaying what was already a fraught development process in the region, as economic, structural, ecological and human losses have combined. In the period 1975-2007, the region experienced over 7,650 fatalities and natural disasters affected over 5 million people, with an average yearly loss that exceeded US\$ 1.114 billion at 2007 prices (Zapata and Madrigal, 2009). The potential economic impact can be quite severe, as in the Cayman Islands after Hurricane Ivan in 2004, when losses were estimated at 138% of GDP (ECLAC, 2004).

Countries with small and vulnerable economies, such as SIDS, not only suffer higher levels of economic loss but are also characterized by low resilience to loss that could lead to major setbacks in their economic development (UNISDR, 2009). The gravity of future impact of physical hazards will therefore depend mainly on the region's ability to reduce its vulnerability and strengthen risk governance capacities.

¹³ More acidic water, the result of higher carbon dioxide concentrations in the atmosphere, decreases the availability of the carbonate ions required to build coral skeletons. At atmospheric carbon dioxide concentrations of 450 parts per million (ppm), the growth of calcifying organisms is inhibited in nearly all tropical and subtropical coral reefs. At 550 ppm, coral reefs dissolve (CBD, 2010).

Given their special circumstances, Caribbean governments have taken measures to integrate disaster risk reduction strategies into both national and regional sustainable development strategies. In addition, many countries are participating in the Caribbean Disaster Emergency Management Agency, which ensures a coordinated response when countries request assistance after natural disasters (ECLAC, 2010b). Insurance schemes also play a significant role in managing risk (both financial and environmental) and the effects of natural disasters in the region, but need to be strengthened and broadened to include additional types of disasters in the area and other vulnerable sectors (such as agriculture and infrastructure) (ECLAC, 2010b). Other social protection mechanisms such as structural conditional transfers to strengthen disaster resilience have been adopted not only in the Caribbean but also in the whole region with almost 114 million beneficiaries. Structural conditional transfers contribute indirectly to household resilience by enabling the accumulation of assets to buffer disaster losses. Jamaica, the Dominican Republic and Trinidad and Tobago are some of the countries in the Caribbean who have adopted this instrument.

Mainstreaming gender perspectives into disaster risk reduction strategies is also of importance, as this ensures effective inclusion of women, who are affected differently by natural disasters partly because of social, economic and political inequalities. Studies have shown that gender roles and customs increase women's vulnerability to natural disasters. However, if women are trained in disaster risk reduction and early warning information reaches all of society, women will be better placed to prepare for and adapt to the effects of natural hazards and their aftermath. The empowerment of women in disaster risk reduction is particularly relevant as women head many households in the Caribbean (UNDP, 2009b).

C. STEPS FOR FURTHER IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT

The high-level segment of the five-year MSI review, held in September 2010, highlighted a number of issues to facilitate further implementation of the Barbados Programme of Action and the Mauritius Strategy with the assistance of the international community including, among other things (United Nations, 2010a), the need to:

- (i) “Enhance support for the efforts of SIDS to adapt to the adverse impacts of climate change, not least through the provision of dedicated sources of financing, capacity-building and the transfer of appropriate technologies to address climate change;
- (ii) Implement a preventive approach to natural disasters in SIDS, reducing risks and properly integrating risk management into development policies and programmes;
- (iii) Support the development and utilization of new and renewable sources of energy and foster energy efficiency and conservation via financing from all sources, technical assistance and capacity-building aimed at developing a sustainable energy sector;
- (iv) Strengthen implementation of integrated coastal zone management strategies and enhance scientific research capabilities;
- (v) Enhance support for agricultural production, productivity and sustainability and help to prioritize food security;
- (vi) Promote sustainable tourism;
- (vii) Enhance support for capacity-building for the development and further implementation of freshwater, sanitation and waste management programmes;
- (viii) Fully integrate SIDS into the multilateral trading system in accordance with the Doha mandate on small economies.”

Further to the issues identified above, a Secretary-General's report in August 2011 developed recommendations to ensure implementation by SIDS of the Barbados Plan of Implementation and the Mauritius Strategy, citing that the challenges facing SIDS are varied and extensive but not insurmountable (United Nations, 2011). Recommendations included the need for:

- (i) "Promoting climate change adaptation, especially when considering sea level rise, food insecurity, soil erosion and drought and environment-related migration";
- (ii) Strengthening disaster risk management capabilities in SIDS;
- (iii) Maintaining and conserving biodiversity;
- (iv) Addressing energy challenges, the economic structural disadvantages of SIDS and food security issues;
- (v) Promoting sustainable tourism;
- (vi) Achieving debt sustainability;
- (vii) Strengthening collection and dissemination of data on the sustainable development of SIDS;
- (viii) Providing an analytical framework for assessing vulnerability-resilience country profiles; and
- (ix) Improving access to financing.

In order to facilitate greater implementation of sustainable development in the region, the above issues and recommendations require further integration in development strategies in the region, along with sustained support from the international community.

Bibliography

- Barbados, Government of (2009), “National Report to the United Nations Commission for Sustainable Development (UNCSD). Cycle 18/19 (2009/2010): Sustainable Consumption and Production Patterns”, October [online] http://www.un.org/esa/dsd/dsd_aofw_ni/ni_pdfs/NationalReports/barbados/SCP.pdf.
- Binger, Al (2011), “Economic opportunities in waste management in small island developing States (SIDS)”, paper presented at the CSD-19 Intersessional Conference on Building Partnerships for Moving Towards Zero Waste, Tokyo, February [online] http://www.uncrd.or.jp/env/spc/docs/plenary1/PS1-g_SIDS_%20A1%20Binger.pdf.
- Brigety, Reuben and Natalie Ondiak (2009), *Haiti’s Changing Tide: A Sustainable Security Case Study*, Washington, D.C., Center for American Progress, September.
- Buss, Terry and Adam Gardner (2008), *Haiti in the Balance: Why Foreign Aid has Failed and What We Can Do about it*, Washington, D.C, Brookings Institution Press.
- Campbell, J.D. and others (2010), “Future climate of the Caribbean from a regional climate model”, *International Journal of Climatology* [online] http://precis.metoffice.com/Useful_Links/Publications/Campbell_et_al_2010.pdf.
- CARICOM (Caribbean Community) (2009), Liliendaal Declaration on Climate Change and Development, Georgetown [online] http://www.caricom.org/jsp/communications/meetings_statements/liliendaal_declaration_climate_change_development.jsp.
- CBD (Convention on Biological Diversity) (2010), “Global Biodiversity Outlook 3”, Montreal, May [online] <http://www.cbd.int/doc/publications/gbo/gbo3-final-en.pdf>.
- CCCCC (Caribbean Community Climate Change Centre) (2011), “Draft Implementation Plan for Regional Framework for Achieving Development Resilient to Climate Change”, March [online] <http://www.gcca.eu/usr/Executive-Summary-Draft.pdf>.
- CEPF (Critical Ecosystem Partnership Fund) (2010), *Ecosystem Profile: The Caribbean Islands Biodiversity Hotspot*, January.
- Chase, Vasantha (2008), “Water forum of the Americas. Report of the Caribbean sub-region” [online] http://www.waterforumoftheamericas.org/Docs/5FMA/WWF5_Caribbean_Eng.pdf.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2010a), Regional Climate Modeling in the Caribbean (LC/CAR/L.265), Port of Spain, ECLAC subregional headquarters for the Caribbean.
- _____ (2010b), Caribbean Regional Report for the Five-year Review of the Mauritius Strategy for Further Implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (MSI+5) (LC/CAR/L.258), Port of Spain, ECLAC subregional headquarters for the Caribbean.
- _____ (2010c), Report to the eighteenth session of the Commission on Sustainable Development of the United Nations. Sustainable Development in Latin America and the Caribbean: Trends, Progress, and Challenges in Sustainable Consumption and Production, Mining, Transport, Chemicals and Waste Management (LC/R.2161), Santiago, Chile, April.
- _____ (2008a), *Preliminary Overview of the Economies of Latin America and the Caribbean 2008*, (LC/G.2401-P) Santiago, Chile. United Nations publication, Sales No. E.08.II.G.2.
- _____ (2008b), Public debt sustainability in the Caribbean (LC/CAR/L.175), Port of Spain, ECLAC subregional headquarters for the Caribbean, September.
- _____ (2007), Overview of the Water Profile and the Capacity of National Institutions to Implement Integrated Water Resources Management (Antigua and Barbuda, Dominica, Grenada) (LC/CAR/L.143), Port of Spain, ECLAC subregional headquarters for the Caribbean, November.

- _____ (2006), Challenges in Implementing the Mauritius Strategy for Further Implementation of the Small Island Developing States Programme of Action (MSI) in the Caribbean (LC/CAR/L.101), Port of Spain, ECLAC subregional headquarters for the Caribbean, December.
- _____ (2004), The impact of hurricane Ivan in the Cayman Islands (LC/MEX/L.645/Rev.1), Mexico City, ECLAC subregional headquarters in Mexico, December.
- FAO (United Nations Food and Agriculture Organization) (2011), *State of the World's Forests 2011*, Rome.
- Greene, Edward (2009), "Perspectives on Water Security in Caribbean Small Island Developing States: Keynote address delivered by Dr. Edward Greene, Assistant Secretary-General, Human and Social Development, Caribbean Community Secretariat, to the United Nations High Level Symposium on Water Security", New York, 5 February [online] http://www.caricom.org/jsp/speeches/water_security_greene.jsp.
- Haiti, Government of/World Bank/Inter-American Development Bank (IDB)/United Nations/European Commission (2010), *Haiti Earthquake PDNA: Assessment of Damage, Losses, General and Sectoral Needs* [online] http://www.refondation.ht/resources/PDNA_Working_Document.pdf.
- HRI (The Haiti Regeneration Initiative) (2011), "What is the Côte Sud Initiative?" [online] <http://www.haitiregeneration.org/home>.
- ICS/CEHI/OAS (Impact Consultancy Services/Caribbean Environmental Health Institute/Organization of American States) (2002), *Water and Climate Change in the Caribbean* [online] <http://www.oas.org/cdwc/>.
- IDB (Inter-American Development Bank) (2008), "News Release IDB: Caribbean hardest hit by food and energy price shocks", 3 July [online] <http://www.iadb.org/NEWS/detail.cfm?lang=en&id=4681>.
- Insanally, Riyad (2007), "The Caribbean Sea: Our Common Patrimony", Port of Spain, Association of Caribbean States [online] http://www.acs-aec.org/About/SG/Girvan/Speeches/Caribbean_Sea.htm.
- IPCC (Intergovernmental Panel on Climate Change) (2007), *Fourth Assessment Report: Climate Change 2007*, Geneva, [online] http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#1.
- IUCN (International Union for Conservation of Nature and Natural Resources) (2011), "The IUCN Red List of Threatened Species. Summary Statistics", Cambridge [online] <http://www.iucnredlist.org/about/summary-statistics>.
- Ministry of Energy and Mining of Jamaica (2009), *Jamaica National Energy Policy 2009-2030. Securing Jamaica's Energy Future Advancing Competitiveness Promoting Sustainable Prosperity* [online] <http://ocs.mona.uwi.edu/public/conferences/12/schedConfs/11/energyPolicyOctober212009.pdf>
- PricewaterhouseCoopers (2007), *Sustainability Impact Assessment (SIA) of the EU-ACP Economic Partnership Agreements. Phase Two. Final Report* (revised) [online] http://trade.ec.europa.eu/doclib/docs/2007/march/tradoc_133936.pdf.
- Prip, Christian and others (2010), "Biodiversity planning: an assessment of national biodiversity strategies and action plans", Yokohama, United Nations University Institute of Advanced Studies (UNU-IAS), October [online] http://www.ias.unu.edu/resource_centre/UNU-IAS_Biodiversity_Planning_NBSAPs_Assessment_final_web_Oct_2010.pdf.
- Sampson, Cezley Dr. (2006), "Challenges in the electricity sector: Jamaica at the crosswords", paper presented at the Geological Society Exhibition, University of the West Indies [online] http://gsj.monainformatixltd.com/sampson_presentation.pdf.
- Smith, Ianthe (2010), "UNCSD Thematic Seminar on Waste Management", Kingston, Environmental & Engineering Managers Ltd., January [online] http://www.un.org/esa/dsd/susdevtopics/sdt_pdfs/meetings2010/ss0110/Presentation_Ianthe_Smith.pdf.
- Stern, Nicholas (2007), *Stern Review on the Economics of Climate Change*, Cambridge, Cambridge University Press, January [online] http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/stern_review_report.htm.

- Trotz, Ulric (2008), "Climate Change and Development in the Caribbean Sub-Region", Belize, Caribbean Community Climate Change Centre (CCCCC), January [online] <http://www.cyen.org/innovaeditor/assets/Trotz%20overview.pdf>.
- UN-OHRLLS (UN Office of the High Representative for the Least Developed Countries) (2002-2005) [online] <http://www.unohrlls.org/en/ldc/related/62/>.
- UNDESA (United Nations Department of Economic and Social Affairs) (2010a), "Trends in sustainable development: Small Island Developing States (SIDS)", Division for Sustainable Development, September [online] http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sids/Trends_in_Sustainable_Development_SIDS.pdf.
- _____ (2010b), Country Reports, [online] http://www.un.org/esa/dsd/dsd_aofw_ni/ni_index.shtml [date of reference: May 2011].
- _____ (2010c) Global Map of NSDS Implementation. Background Note [online] http://www.un.org/esa/dsd/dsd_aofw_nsds/nsds_pdfs/NSDS_map_bg_note.pdf [date of reference: May 2011].
- UNDP (United Nations Development Programme) (2010), "Losses and Damages Submission UNDP" (AWG-LCA/2010/L.7/26-29), Environment and Energy Group [online] <http://unfccc.int/resource/docs/2011/smsn/igo/109.pdf>.
- _____ (2009a), "Case Study on the Impact of Climate Change on Water and Sanitation in Jamaica", Barbados [online] <http://www.undp.org/cu/crmi/docs/crmi-gttfcstjamaica-bp-2009-en.pdf>.
- _____ (2009b), "Enhancing Gender Visibility in Disaster Risk Management and Climate Change in the Caribbean", Barbados [online] <http://www.undp.org/cu/crmi/docs/crmi-gttfstudyoverview-bp-2009-en.pdf>.
- UNDP Pacific Centre (2008), *The Mauritius Strategy: A Programme of Action*, June [online] http://www.undppc.org.fj/_resources/article/files/Mauritius_Strategy_Inserts.pdf.
- UNEP (United Nations Environment Programme) (2010), *Latin America and the Caribbean: Environment Outlook, GEO LAC 3*, Panama City, UNEP Regional Office for Latin America and the Caribbean.
- _____ (2008), *Climate Change in the Caribbean and the Challenge of Adaptation*, Panama City, UNEP Regional Office for Latin America/CARICOM, [online] http://www.pnuma.org/raiz/Climate_Change_in_the_Caribbean_Final_LOW20oct.pdf.
- _____ (1999), *Caribbean Environment Outlook*, Mexico City.
- UNEP (United Nations Environment Programme)/Ministry of the Environment of Haiti/Quisqueya University (2010), *Haiti State of the Environment Report 2010*, Panama City.
- UNFCCC (United Nations Framework Convention on Climate Change) (2008), "Physical and socio-economic trends in climate-related risks and extreme events, and their implications for sustainable development" (FCCC/TP/2008/9), November [online] <http://unfccc.int/resource/docs/2008/tp/03.pdf>.
- _____ (2007), *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries* [online] <http://unfccc.int/resource/docs/publications/impacts.pdf>.
- UNISDR (Inter-Agency Secretariat of the International Strategy for Disaster Reduction) (2009), *2009 Global Assessment Report on Disaster Risk Reduction. Risk and Poverty in a Changing Climate*, Geneva.
- United Nations (2011), Concrete recommendations to enhance the implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States and the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. Report of the Secretary-General (A/66/278), August.
- _____ (2010a), "Outcome document of the High-level Review Meeting on the Implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States", General Assembly resolution 65/2, October [online] http://www.sidsnet.org/msi_5/docs/res/res_65_2E.pdf.

- _____ (2010b), Towards the sustainable development of the Caribbean Sea for present and future generations. Report of the Secretary-General (A/65/301), August.
- _____ (2010c), Review of the implementation of the Mauritius Strategy. Report of the Secretary-General (E/CN.17/2010/9), New York, April.
- _____ (2009), “Towards the sustainable development of the Caribbean Sea” (A/RES/63/214), New York.
- _____ (2005a), Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, January [online] http://www.un.int/mauritius/Documents/AOSIS/Prepcom%20Reports/Mauritius_Strategy_latest_version.pdf.
- _____ (2005b), “International Meeting for the 10-year Review of the Barbados Programme of Action”, Port-Louis, Mauritius, January [online] <http://www.un.org/smallislands2005/>.
- _____ (2002), United Nations Convention to Combat Desertification [online] <http://www.unccd.int/cop/officialdocs/cric1/pdf/4add1eng.pdf>.
- _____ (1994), Report of the Global Conference on the Sustainable Development of Small Island Developing States, Bridgetown, Barbados, 25 April-6 May (A/Conf.167/9) [online] <http://www.un.org/documents/ga/conf167/aconf167-9.htm>.
- _____ (1993), Earth Summit: Agenda 21 The United Nations Programme of Action from Rio (A/CONF.151/26/Rev.1), New York, April [online] <http://www.un.org/esa/dsd/agenda21/>. United Nations publication, Sales No. E.93.I.11.
- _____ (1992), “Convening of a global conference on the sustainable development of small island developing States”, General Assembly resolution 47/189, December [online] <http://www.un.org/documents/ga/res/47/a47r189.htm>.
- Williams, Michelle Anne (2007), “Antecedentes sobre la gestión de depósitos de plaguicidas obsoletos en el Caribe” [online] <http://www.oas.org/dsd/Caribbean/Antecedentes%20sonbre%20la%20gesti%C3%B3n%20de%20plaguicidas%20obsoletos%20en%20el%20Caribe.pdf>.
- Wong, P.P. and others (2005), “Island Systems”, *Millennium Ecosystem Assessment: Current State and Trends Assessment*, Washington, D.C., Millennium Ecosystem Assessment, chapter 23 [online] <http://www.maweb.org/documents/document.292.aspx.pdf>.
- World Bank (2011), *Migration and Remittances Factbook 2011*, Washington, D.C. [online] <http://siteresources.worldbank.org/INTLAC/Resources/Factbook2011-Ebook.pdf>.
- _____ (2010), *World Development Report (WDR) 2010: Development and Climate Change*, Washington, D.C.
- Zapata, Ricardo and Benjamín Madrigal (2009), “Economic impact of disasters: evidence from DALA assessments by ECLAC in Latin America and the Caribbean”, *Estudios y perspectivas series*, No. 117 (LC/L.3172-P), Mexico City, ECLAC subregional headquarters in Mexico. United Nations publication, Sales No. E.09.II.G.146.

Chapter V

INTERNATIONAL COOPERATION, TRADE, SCIENCE AND TECHNOLOGY

Two key elements of the 1992 Rio Declaration are the principle of common but differentiated responsibilities (principle 7) and recognition of the importance, for sustainable development, of an international system that is fair and respects international trade law (principle 12). Principle 9 of the Rio Declaration says that States should cooperate to strengthen capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies. These principles underpin subsequent international agreements, such as the commitment to promote a global partnership for development as reflected in Millennium Development Goal 8. This chapter describes progress and shortcomings in the essential components of such a global partnership for development and in the aforementioned principles of financing for development, trade and technology transfer.

PRINCIPLES OF THE RIO DECLARATION OF ENVIRONMENT AND DEVELOPMENT

- | | |
|----|--|
| 7 | States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command. |
| 9 | States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies. |
| 12 | States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus. |

A. FINANCING

Financing for sustainable development is a central theme of the Rio Declaration on Environment and Development, Agenda 21, the Programme for the Further Implementation of Agenda 21, the Millennium Summit, the Declaration of the World Summit on Sustainable Development and the Johannesburg Plan of Implementation, the Monterrey Consensus adopted at the International Conference on Financing for Development and the Doha Declaration on Financing for Development, as well as the sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity and the United Nations Convention to Combat Desertification.

As for financing gaps, the Committee of Experts created by the Leading Group on Innovative Financing for Development has estimated that, if the resources needed to meet the Millennium Development Goals by 2015 were added to the target 0.7% of GDP for official development assistance (ODA) plus the resources needed to address climate change, the resource shortfall would be between US\$ 324 billion and US\$ 336 billion between 2012 and 2017 (roughly US\$ 156 billion for climate change and between US\$ 168 billion and US\$ 180 billion for ODA). In comparison, the International Monetary Fund (IMF) has estimated that the net direct cost of the assistance provided to the advanced economies to cope with the recent financial crisis, which was the outcome of a long process of systemic deregulation, amounted to US\$ 862 billion. This is the equivalent of 2.7% of the GDP of these countries; the cost could increase further as Western Europe's sovereign debt crisis unfolds (Leading Group on Innovative Financing for Development, 2010).

The shortfall in financing for sustainable development and the inescapable challenges posed by environmental issues should be seen in the broader context of the international community's inability to finance global public goods, now compounded by the after-effects of an economic and financial crisis that is, in this decade, causing countries of the Organization for Economic Cooperation and Development (OECD) to run budget deficits and public debt at levels not seen since the post-World War II era.

International financing for development has several different components, including ODA, private international financial flows, contributions from financial institutions and other international agencies, and international loans. Innovative financing mechanisms and south-south cooperation are also gaining ground.

1. Official development assistance

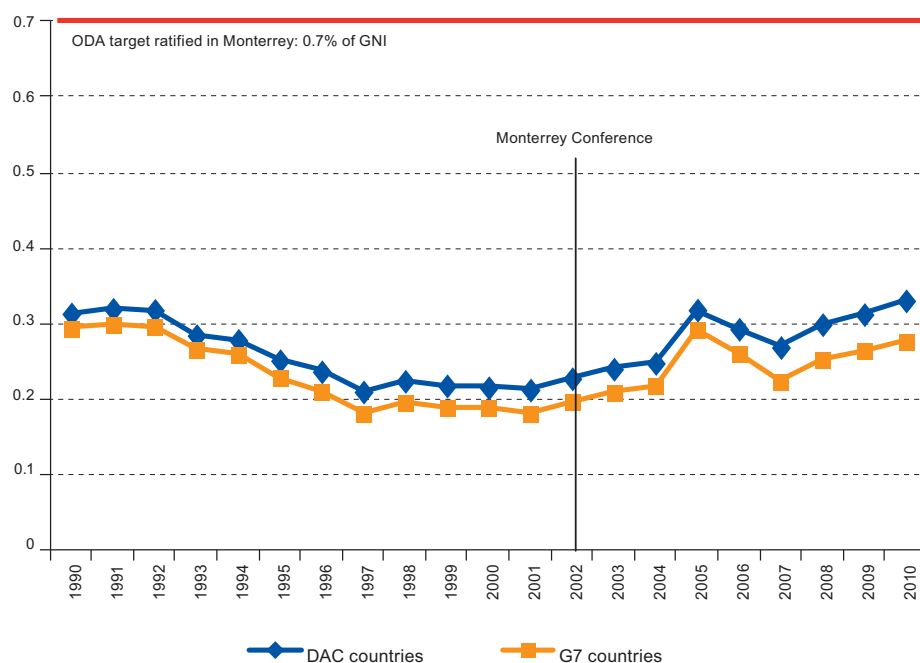
In 1970, United Nations General Assembly Resolution 2626 (XXV) proposed the objective of increasing ODA to at least 0.7% of developed countries' gross national income (GNI) at market prices. The developed countries have reaffirmed this commitment on several occasions, including at the United Nations Conference on Environment and Development (1992) and at subsequent summits¹ (United Nations, 2010a). In 2005, at the Millennium +5 Summit and the Group of Eight (G8) summit at Gleneagles, it was agreed to increase assistance from US\$ 80 billion in 2004 to US\$ 130 billion in 2010 (at constant 2004 prices) (United Nations, 2010b).

Nonetheless, between 1992 and 2010, net ODA fell far below the commitment made in Rio de Janeiro. In 2010, ODA provided by developed countries amounted to 0.33% of their GNI, less than half of the percentage target agreed upon, and below the trajectory envisaged in Gleneagles² (see figure V.1), despite an increase since 2004 (see table V.1). In absolute terms, only five countries (Sweden, Norway, Luxembourg, Denmark and the Netherlands) have met the 0.7% target. Most other donor countries are well below their commitment. Given the developed countries' still fragile recovery from the recent economic and financial crisis, compounded by the persistent threat of worldwide recession, the size of future flows remains uncertain.

¹ Including the Millennium Summit of 2000 and the International Conference on Financing for Development of 2002.

² According to figures from the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD).

Figure V.1
**OFFICIAL DEVELOPMENT ASSISTANCE GRANTED BY COUNTRIES OF THE
 DEVELOPMENT ASSISTANCE COMMITTEE (DAC), 1990-2010**
(Percentages of gross national income of donor countries)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organization for Economic Cooperation and Development (OECD) statistics, Evolution on official development assistance (ODA) and World Bank, World Development Indicators for gross national income [date of reference: January 2012].

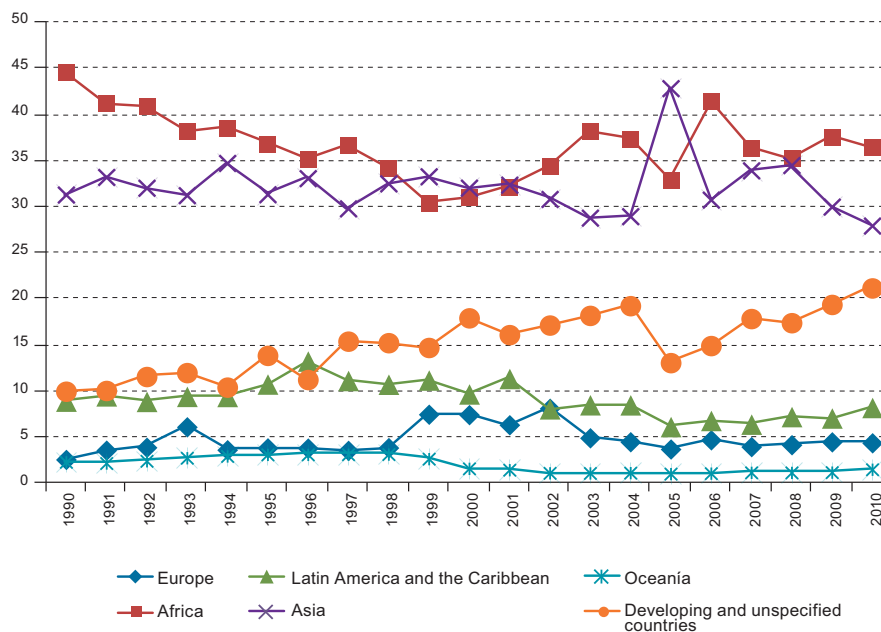
Table V.1
**DISBURSEMENTS OF NET OFFICIAL DEVELOPMENT ASSISTANCE (ODA) TO DEVELOPING
 COUNTRIES AND LATIN AMERICA AND THE CARIBBEAN, 1990-2010**
(Millions of dollars at current prices and percentages)

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Developing countries	58 548	59 142	49 776	52 388	62 033	71 742	80 121	108 650	107 339	108 494	127 916	126 968	131 087
Latin America and the Caribbean	5 233	6 384	4 838	5 970	5 026	6 129	6 838	6 708	7 340	6 987	9 288	9 022	10 812
Of which													
Bilateral aid provided by countries of the Development Assistance Committee (DAC)	4 188	4 811	3 858	4 470	3 901	4 580	5 134	4 855	5 276	4 832	7 008	6 573	7 885
Multilateral	1 032	1 543	941	1 469	1 069	1 519	1 685	1 828	2 050	2 109	2 257	2 429	2 895
ODA as a percentage of gross national income (GNI)	0.49	0.37	0.24	0.31	0.29	0.33	0.32	0.26	0.24	0.19	0.22	0.23	0.22
Share of world total	8.9	10.8	9.7	11.4	8.1	8.5	8.5	6.2	6.8	6.4	7.3	7.1	8.2

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of figures issued by the Organization for Economic Cooperation and Development (OECD), OECD Stat database [date of reference: 16 January 2012].

This assistance has been distributed unequally between regions and countries. In recent years, Latin America and the Caribbean, which accounts for approximately 8.5% of the world population and 10% of the population living in developing countries,³ received about 7% of global ODA. Its share has been shrinking steadily (see figure V.2).

Figure V.2
REGIONAL SHARES OF TOTAL NET OFFICIAL DEVELOPMENT ASSISTANCE (ODA), 1990-2010
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organization for Economic Cooperation and Development (OECD), OECD.Stat database [date of reference: 16 January 2012].

Note: “Developing and unspecified countries” refers to the financing of activities benefiting more than one region.

The volume of official assistance received by Latin America and the Caribbean declined from 0.5% of regional GNI in 1990 to just over 0.2% in 2010 (see table V.1), representing some US\$ 18 per capita.

No Latin American or Caribbean country has been among the 10 leading ODA recipients. The distribution of ODA in the region has been similar to the pattern worldwide, so low- and lower-middle income countries have received larger amounts of ODA as a percentage of their income than upper-middle income countries. Haiti, Colombia, Nicaragua and the Plurinational State of Bolivia have been the main recipients of assistance in the region over the last three years, accounting for 40% of all disbursements.

It is important to note that several small island developing states (see chapter IV) are highly vulnerable to extreme climate events that cyclically destabilize the development path of many of those countries. This is compounded by pressures generated from the small size of their economies, for which reason assistance is crucial for them. In addition, some upper-middle income countries that receive a negligible share of ODA are facing major challenges in terms of persistent inequality and poverty, usually concentrated in certain segments of the population.

³ Data from the United Nations (2011b).

The region's lower-middle income countries, which have received large amounts of ODA in relative terms, include some that are also classified as heavily indebted poor countries (HIPC), such as the Plurinational state of Bolivia, Guyana, Honduras, Nicaragua, and, more recently, Haiti. This means that, in some cases, a significant share of the ODA received has been in the form of actions on their external debt (forgiveness and other measures), rather than “new money” targeting other sectors.

The allocation of ODA has changed in line with the Millennium Development Goals (MDGs). In terms of total assistance, there has been a slight upward trend in amounts targeting the social service sectors and social infrastructure; and the preference for grants rather than loans in total official development assistance has persisted. General assistance for environmental protection in the region remained virtually unchanged throughout the last decade, accounting for about 4% of the total (United Nations, 2010b).

Using the so-called “Rio markers”, which are indicators used to identify official development assistance activities for meeting the goals of the three Rio conventions (the United Nations Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification), shows that there is a rising trend in bilateral disbursements of assistance, from about 2% in the middle of the decade to levels around 10%, with positive implications from the standpoint of those environmental conventions.

Against this backdrop, the region is facing the challenge of preventing assistance that targets internationally-agreed development goals, including the MDGs, which is still highly necessary, from being replaced by assistance aimed at generating global goods and services, in which the region has major potential as a supplier (for example, activities to mitigate climate change). The latter should be subject to the additionality commitments of traditional ODA, since it directly benefits the developed countries, in which, for example, certain mitigation measures could be prioritized as a target for assistance.

2. Private international financial flows

Private financial flows have been a fundamental component of total external financing received by Latin American countries; and, although their volume has fluctuated, on average they have tended to easily outweigh other capital flows.

For example, in the period 1990-2009, net private financial flows entering the region—including both portfolio investment and foreign direct investment (FDI)—averaged US\$ 48.2 billion per year, far outweighing the ODA received by the region in the same period, which averaged US\$ 6.3 billion per year.⁴

Foreign direct investment is an increasingly important component of financial flows for the region, as Latin American and Caribbean have increased their share as recipients of global FDI (from 5% to 10% over the last four years) (see figure table V.2). The FDI received by the region increased fivefold in the period 1992-2010, growing from US\$ 12.8 billion to US\$ 113 billion (see figure V.3), outpacing both the global average and the average of developing countries, but with different subregional trends (United Nations, 2010b). Flows into South America grew on average by 12% per year between 1992 and 2010, double the rate in Mexico, Central America and Caribbean. The leading FDI recipients over the last five years have been Brazil, Mexico and Chile; but, in terms of the relative weight of the recipient economy, foreign investment is more important in the Caribbean countries.

⁴ Data on private capital flows are based on the World Economic Outlook (WEO) database of the International Monetary Fund. ODA figures were obtained from the OECD statistics system.

Table V.2
**FLOW, VARIATION AND SHARE OF GLOBAL NET FOREIGN DIRECT INVESTMENT,
 BY REGION, 2007-2010**

Regions	Investment flows (billions of dollars)				Rate of variation (percentages)			Share (percentages)			
	2007	2008	2009	2010 ^a	2008	2009	2010 ^a	2007	2008	2009	2010 ^a
World	2 100	1 771	1 114	1 122	-16	-37	1	100	100	100	100
Developed economies	1 444	1 018	566	527	-29	-44	-7	69	57	51	47
South-Eastern Europe and the Commonwealth of Independent States ^b	91	123	70	71	35	-43	2	4	7	6	6
Developing economies	565	630	478	525	12	-24	10	27	36	43	47
Latin America and the Caribbean ^c	114	134	80	113	18	-40	40	5	8	7	10
Africa ^c	63	72	59	50	14	-19	-15	3	4	5	4
Asia and Oceania ^c	338	375	303	334	11	-19	10	16	21	27	30

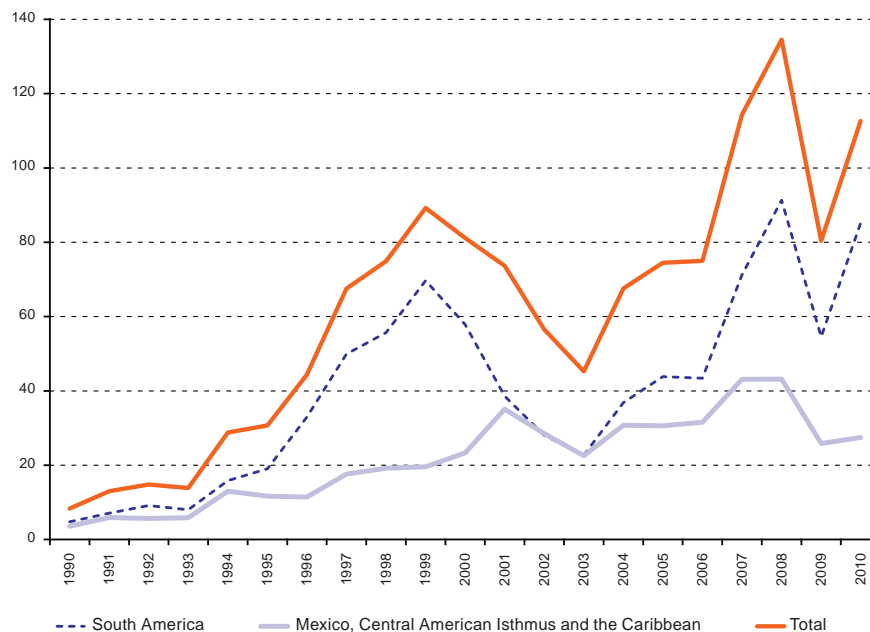
Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Foreign Direct Investment in Latin America and the Caribbean, 2010* (LC/G.2447-P), Santiago, Chile, May 2011. United Nations publication, Sales No. E.11.II.G.4.

^a Estimates.

^b Includes the Russian Federation.

^c The sum of the FDI volumes shown for Latin America and the Caribbean, Africa, and Asia and Oceania does not agree with the total FDI figure shown for developing countries, because the FDI figures used for Latin America and the Caribbean correspond to ECLAC data obtained from official sources and not to the estimates of the United Nations Conference on Trade and Development (UNCTAD).

Figure V.3
**LATIN AMERICA AND THE CARIBBEAN: FOREIGN DIRECT INVESTMENT INFLOWS
 BY SUBREGION, 1990-2010**
 (Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Foreign Direct Investment in Latin America and the Caribbean 2010*, (LC/G.2447-P), Santiago, Chile, May 2011. United Nations publication, Sales No. E.11.II.G.4.

FDI destination sectors vary depending on the receiving subregion. In South America, the major receiving sectors have been natural resources (essentially, mining and hydrocarbons) and services (see figure V.4). Unlike 2005-2009, a growing share of more recent investments is going to the primary sectors. This stands in contrast with Mexico, Central America and the Caribbean, where more of the investments are in manufacturing (whose proportion has increased over the past few years) and services (ECLAC, 2011).

Figure V.4
LATIN AMERICA AND THE CARIBBEAN: FOREIGN DIRECT INVESTMENT DESTINATION SECTORS BY SUBREGION, 2005-2010
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates.

In addition to their implications in terms of financial flows, the presence of transnational enterprises has an impact on the conditions (technological, management practices and others) under which the economic activity of key sectors unfolds. The relation between FDI and the region's development is complex and has both positive and negative aspects. Nonetheless, owing to productive development patterns in the region (see chapter I), the most salient feature is that, in general, the type of investment undertaken, which also reflects conditions prevailing in the host countries, has not fostered productive linkages or other favourable spillovers that could turn FDI into an engine for more sustainable productive development (see ECLAC, *Foreign Direct Investment in Latin America and the Caribbean*, several years). Moreover, sustainability—especially environmental sustainability—has not been a benchmark for strategies to attract and encourage investment.

3. Contributions from international financial institutions and other sustainable development organizations

Latin America and the Caribbean has access to a network of regional development banks committed to promoting environmentally sustainable growth and poverty reduction, such as the Inter-American Development Bank (IDB), and to subregional institutions such as the Andean Development Corporation (CAF), the Central American Bank for Economic Integration (CABEI), the Caribbean Development Bank (CDB), and the recently created Bank of the South. National and international development finance institutions have been weaving the concept of sustainable development into their operations. Financing for climate change mitigation projects has become a priority for multilateral development banks (MDBs) over the last five years, and multilateral financing for these purposes is forecast to grow from US\$ 17 billion in 2009 to US\$ 21 billion in 2012.⁵

The main international sources of non-loan financing, including for climate change, are the Global Environment Facility (GEF); the Multilateral Fund for the Implementation of the Montreal Protocol, the Clean Development Mechanism (CDM) of the Kyoto Protocol of the United Nations Framework Convention on Climate Change, and the more recently created Climate Change Adaptation Fund.

Between 1991 and 2009, Latin America and the Caribbean received about 21% of the roughly US\$ 9 billion channelled through the GEF, not counting global projects or those encompassing several regions—with biodiversity the main target sector, followed by climate change. The remainder was destined for transboundary water, land degradation, depletion of the ozone layer, and persistent biological pollutants (GEF, 2010). The GEF is responsible, with others, for managing the Special Climate Change Fund (SCCF), which has US\$ 218 million (23% of the US\$ 128 million in approved projects is allocated to the region), and the Least Developed Countries Fund (LDCF), which has US\$ 415 million (the region has only received 5% of the US\$ 177 million in approved projects, although the equivalent figure is around 22% in the case of small island States).

The Multilateral Fund for the Implementation of the Montreal Protocol, which operates through the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), United Nations Industrial Organization (UNIDO) and the World Bank, has approved investments totalling over US\$ 2.8 billion since 1991, and has developed over 6,875 projects, of which about 25% targeted in Latin America and the Caribbean (UNEP, 2010b). The Climate Change Adaptation Fund has a target of reaching US\$ 100 million by 2012, with financing obtained from a 2% levy on the value of certified emission reductions (Climate Change Adaptation Fund, 2010). To date, the region has approved projects amounting to US\$ 18.6 million.

⁵ See Climate Funds Update [online]: www.climatefundsupdate.org.

There are also other initiatives, such as the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), set up jointly by the Food and Agriculture Organization of the United Nations (FAO), UNDP and UNEP, and the MDG Achievement Fund (MDG-F), established under an agreement between UNDP and Spain, in which climate change is one of the thematic areas.

National development finance institutions have also deployed instruments for supporting environmental and sustainable development projects (see ALIDE, 2011). Putting the Brazilian National Bank for Economic and Social Development (BNDES) in charge of managing the Amazon Fund in 2008 helped boost BNDES environmental operations. The Amazon Fund finances projects to reduce CO₂ emissions caused by deforestation. It is authorized to raise funding proportional to emissions reductions achieved. The first donors were Norway, Germany and Petrobras (see [online] www.fundoamazonia.gov.br).

4. International loans

Owing to commitments arising from their high levels of external debt, many developing countries are facing constraints when formulating sustainable development strategies and allocating resources to environmental protection.

Countries that have a high level of external debt in relation to their capacity to generate export earnings thus have limited capacity to attract new financing, and this could have a negative impact on domestic investment (ECLAC, 2001).

Although the region's external debt rose from US\$ 470 billion in 1992 to nearly twice that amount in 2009 (ECLAC, 2010a), total debt as a percentage of goods and services exports declined sharply, from 245% in 1992 to 102% in 2010, thanks to its robust export performance.⁶

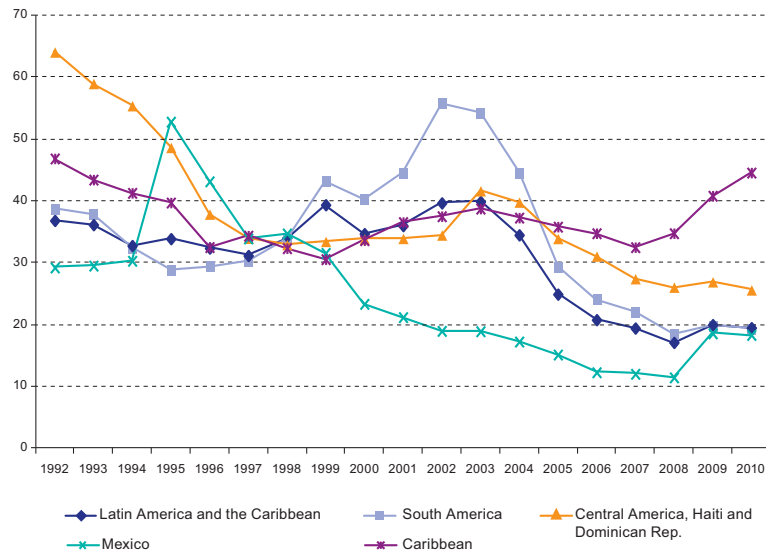
The region's debt-to-GDP ratio also improved during that period, as a result of GDP growth, dropping sharply from 37% in 1992 to 19% in 2010 (see figure V.5).

Countries (mostly in South America) that export hydrocarbons and mining products benefited from the rising trend of international commodity prices starting in 2003. Those countries have seen a sustained reduction in their external debt-to-GDP ratios since the start of the price upswing in 2002, due to the buoyancy of regional GDP in this phase.

The external price cycle over the past decade did not translate into a similar terms-of-trade improvement for Central American and Caribbean countries. Nonetheless, Central America has obtained a sustained reduction in its relative indebtedness —as a result of the Heavily Indebted Poor Countries (HIPC) initiative in the cases of Honduras and Nicaragua, among others, and the maintenance of low external debt levels in the cases of Costa Rica and Guatemala. In contrast, the Caribbean is not yet showing a clear debt reduction trend. In fact, both the debt-to-GDP ratio and the interest payments to exports ratio began to rise steadily at the end of the 1990s. This subregion is the most vulnerable one in this respect (see figure V.6) (United Nations, 2010a).

⁶ World Bank data, *World Development Indicators*.

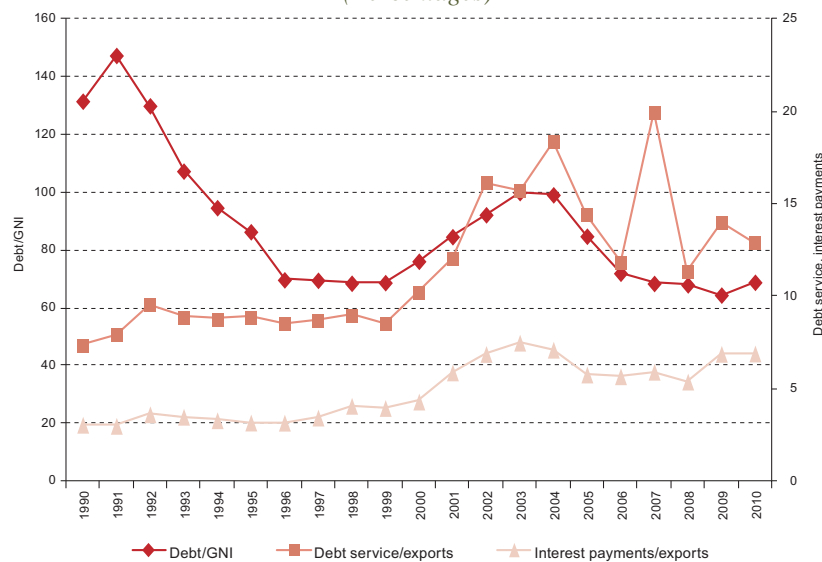
Figure V.5
LATIN AMERICA AND THE CARIBBEAN (27 COUNTRIES): DEBT/GDP RATIO, 1992-2010
 (Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Statistical Yearbook for Latin America and the Caribbean 2011* (LC/G.2513-P/B), Santiago, Chile, 2011. United Nations publication, Sales No. E/S.12.II.G.1.

Note: South America includes Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Paraguay, Peru, Plurinational State of Bolivia and Uruguay; included under Central America, Dominican Republic and Haiti are Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama; the Caribbean includes Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines.

Figure V.6
THE CARIBBEAN (8 COUNTRIES): EXTERNAL DEBT INDICATORS, 1990-2010^a
 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators database.

^a The Caribbean includes Belize, Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines and Saint Lucia.

In Central America and the Caribbean in 2010, debt-to-GDP ratios reached high levels in some countries, such as Jamaica (104%), Grenada (99%), Belize (80%), Nicaragua (77%) and Dominica (73%), limiting their capacity to allocate resources for social and environmental purposes.

Medium-to-long-term actions on the external debt are needed to enable countries to design sustainable development strategies, and not fall hostage time and again to the constraints of available resources for environmental and social protection. Debt-for-nature swaps have been implemented in this context,⁷ albeit with faltering intensity since 2002. Although this type of swap has done little to alleviate the debt of developing countries, in some cases the amounts forgiven have been significant and have allowed more national resources to be allocated to conservation. For example, the nominal value of a swap made between El Salvador and the United States in 1992 represented 5% of El Salvador's GDP, and made it possible to allocate resources equivalent to 0.5% of GDP to the environment.

5. Innovative mechanisms

The Monterrey Consensus recognized the “value of exploring innovative sources of finance” (United Nations, 2002, paragraph 44) thereby giving rise to what has become a broad-scope initiative to conceive and implement new mechanisms to help countries of different development levels attain the Millennium Development Goals. The experimental phase of that initiative can be considered concluded.

Such financing sources currently include initiatives ranging from voluntary contributions and market mechanisms to loan guarantees, in addition to various proposals for new taxes. A second group of initiatives includes mechanisms that aim to use available resources in an innovative way, improving allocative efficiency, participation, transparency, and capacity to be held accountable for use.

A third and broader category includes initiatives to obtain resources from innovative sources and also use them with mechanisms that depart from more traditional financial practices, by combining with service provision and, at times, the supply and distribution of goods. Some of the initiatives already underway are stable and long-term, and at the same time make it possible to supplement official public assistance, with the stated purpose of distributing the benefits of globalization more widely (United Nations, 2009).

The rapid spread of the concept of innovation in this area is making it applicable to different entities, such as thematic trust funds, public guarantee mechanisms (both shared and solidarity-based), insurance and risk-transfer mechanisms, proposals for international cooperation on tax mechanisms, the issuance of securities and bonds linked to growth or the reduction of greenhouse gases, countercyclical lending and microfinance, among others.

One of the main characteristics of innovative financing is its emphasis on developing broad participation by entities other than national governments, and on addressing market failures, for which the International Finance Facility for Immunization (IFFIm) is an example.

⁷ The most recent of these swaps have been signed between Colombia and the United States, The Nature Conservancy (TNC), and the World Wide Fund for Nature (WWF) in 2004; between Paraguay and the United States in 2006; between Ecuador and Spain in 2005; and between Guatemala, the United States, Conservation International and the TNC, for conservation of the Guatemalan tropical forest, in 2006.

Innovative financing mechanisms for sustainable development currently include the following: rents and special drawing rights associated with climate-change mitigation; taxes on monetary transactions; auctions of emission rights, and carbon taxes.

Other current mechanisms include the Clean Development Mechanism (CDM); the Climate Change Adaptation Fund; payment for environmental services and, in general, trust funds, such as the REDD Investment Fund of Guyana; the Green Bond (*Bono Verde*) of Costa Rica; the National Climate Change Fund of Brazil; and the Yasuni ITT Trust Fund of Ecuador.

Mechanisms specifically associated with the health sector also include the International Drug Purchase Facility (UNITAID) (an air ticket solidarity contribution); the Global Fund to Fight AIDS, Tuberculosis and Malaria (GF); the International Finance Facility for Immunization (IFFIm); the advance market commitment; and the Debt2Health initiative.

6. Emerging cooperation and South-South financing

South-south cooperation is one of the most attractive features of the recent trend in mobilizing possible funds to adopt sustainable development paths.

This type of cooperation is steadily growing in importance although it does not yet account for 10% of global assistance flows (United Nations, 2011). It differs from traditional development assistance channels in that it has no political conditionalities, establishes horizontal linkages and, frequently, has a high level of complementarity between the cooperating parties.

Over 90% of south-south cooperation still targets project financing, although budgetary support and debt sterilization are starting to account for an increasing share of the total. There are also philanthropic activities, aimed mainly at social and rural development and micro-financing. Technical cooperation is also gaining ground, as is humanitarian assistance, which is starting to expand rapidly.

7. Remittances

Remittances are a major source of financing in the region (see map V.1), and are essential for the most deprived domestic economies. In 2010, total remittances stabilized at US\$ 58.9 billion, after falling sharply in 2009 in the wake of the crisis that erupted in late 2008 and affected the main countries that host Latin American emigrants (Hall, 2010). This episode put a brake on the continuous growth of remittance flows over the last decade, which had increased from US\$ 23.4 billion in 2001, in other words four times the amount of net ODA received by the region in that year, to a maximum of US\$ 69.2 billion in 2008, equivalent to 7½ times ODA received.

At the present time, the greater difficulty of finding employment and the lower wages in migrant-receiving countries, which affect the flow of remittances sent home, has been compounded by currency appreciation, particularly in relation to the dollar, in the migrants' home countries. This is aggravated further by local inflation, which reduces the purchasing power of the remittances sent to the region still further (Maldonado, Bajuk and Hayem, 2011). On the other hand, whereas prior to 2000 the average cost of sending remittances to Latin America and the Caribbean was about 15% of the value of the transaction, today it is roughly 5.6% (Hall, 2010) —a figure which, although it may seem acceptable, amounts to 36% of the ODA received in the region in 2009.

Map V.1
LATIN AMERICA AND THE CARIBBEAN: REMITTANCES RECEIVED, 2010
(Millions of dollars)



Source: R. Maldonado, N. Bajuk and M. Hayem, *Las remesas en América Latina y el Caribe durante el 2010: estabilización después de la crisis*, Washington, D.C., Multilateral Investment Fund/Inter-American Development Bank, 2011.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

B. TRADE

Principle 12 of the Rio Declaration says that States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries. The premise on which this statement is based, as proposed both in Agenda 21 and in the Johannesburg Plan of Implementation, is that trade could play an important role in achieving development and eradicating poverty. This is also reflected in the Millennium Development Goals, in which target 8-A is to “Develop further an open, rule-based, predictable, non-discriminatory trading and financial system (...)”. In this context, the following indicators linked to market access were defined:

- 8.6 Proportion of total developed country imports (by value and excluding arms) from developing countries and least developed countries, admitted free of duty
- 8.7 Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries

8.8 Agricultural support estimate for OECD countries as a percentage of their gross domestic product

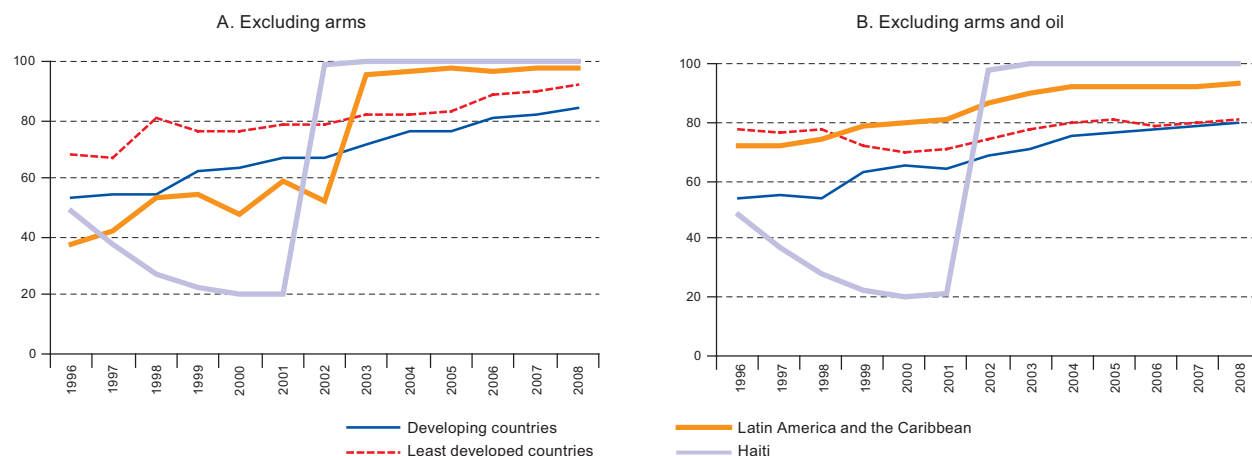
8.9 Proportion of ODA provided to help build trade capacity

1. Duty on Latin American and Caribbean export products

Most Latin American and Caribbean exports enter developed-country markets duty-free. In 2008, the latest year for which there is information, the proportion in question was 98%, excluding arms, and 93% if oil is also excluded.⁸ These percentages are higher than those corresponding to developing countries as a whole, and even those corresponding to least developed countries (LDCs).⁹ Haiti, the only LDC in the region, has enjoyed duty-free access for all of its exports to developed countries since 2003 (see figure V.7).

Figure V.7

LATIN AMERICA AND THE CARIBBEAN (SELECTED COUNTRIES): PROPORTION OF TOTAL DEVELOPED COUNTRY IMPORTS (BY VALUE) FROM DEVELOPING AND LEAST DEVELOPED COUNTRIES, ADMITTED FREE OF DUTY, 1996-2008 (Percentages)



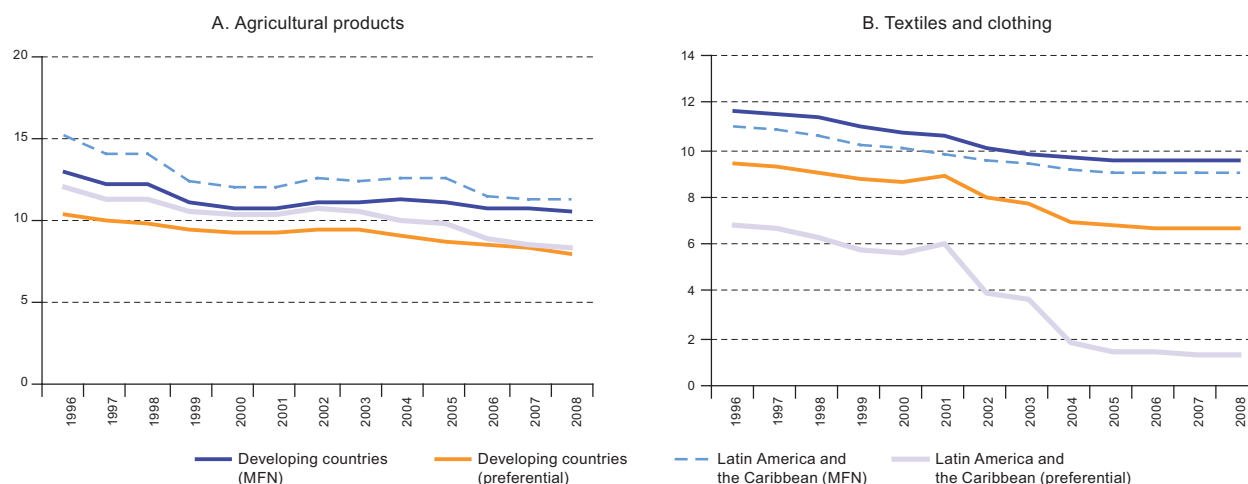
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of figures from the International Trade Centre (ITC)/United Nations Conference on Trade and Development (UNCTAD)/World Trade Organization (WTO) database [online] <http://www.mdg-trade.org>.

⁸ These figures overestimate (probably significantly) the real proportion of imports from Latin America, and from developing countries generally, that enter the market in developed countries duty-free. This is because the figures correspond to the percentage of total imports that are subject to preferences (unilateral or reciprocal) in those markets, and not to the percentage of total imports that are effectively covered by those preferences. As the latter information is not available in all developed countries, full use of the preferences is assumed. Nonetheless, in practice this is often not the case, for example because exporters in developing and least developed countries cannot satisfy the rules of origin attached to the preferences (ITC/UNCTAD/WTO, 2006).

⁹ There are currently 49 countries designated by the United Nations as “least developed countries” (LDCs). The Economic and Social Council reviews the list of these countries every three years. The criterion for defining a country as an LDC takes the following into account: low income, weak human resources and low level of economic diversification.

The high proportion of Latin American and Caribbean exports entering developed-country markets duty-free mainly reflects the fact that the main products exported by the region to those countries are raw materials or natural resource-based manufactures, although there are pockets of protection in sectors of special interest for the region. Since 2000, preferential tariffs have trended downwards more sharply in all of these sectors, partly owing to the trade agreements signed between developed and developing countries (see figure V.8).

Figure V.8
LATIN AMERICA AND THE CARIBBEAN (SELECTED COUNTRIES): AGRICULTURAL, TEXTILE AND CLOTHING PRODUCTS SUBJECT TO AVERAGE CUSTOMS DUTIES, MOST-FAVOURLED-NATION (MFN) TREATMENT AND PREFERENTIAL TARIFFS APPLIED BY DEVELOPED COUNTRIES, 1996-2008
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of figures from the International Trade Centre (ICT)/United Nations Conference on Trade and Development (UNCTAD)/World Trade Organization (WTO) database [online] <http://www.mdg-trade.org>.

Comparing the situation of the region with that of developing countries as a whole, average tariffs are very similar in the case of agriculture, (see figure V.8). In contrast, the region has a much greater margin of preference than developing countries generally in the case of textile products and garments. This is because the latter group includes major exporters in those sectors, mainly Asian countries (for example China, India, Pakistan and Indonesia). As exports from those countries represent direct competition in certain segments (generally those of lesser value-added) of the textile and garment industries in industrialized countries, they face higher tariffs than Latin America and the Caribbean in those markets.

The region still relies on a small group of products as a stable source of export earnings, and thus faces the challenge of developing a long-term strategy to diversify both its export basket and destination markets, to reduce dependency on, and vulnerability to, fluctuating export earnings (ECLAC/FAO/IICA, 2010).

2. Agricultural subsidies

Most agricultural subsidies in industrialized countries are price-support programmes and payments related to output levels or the use of certain inputs. All subsidies of this type generate incentives for the overproduction of various crops, pushing down their international prices and making it more difficult for farmers in developing countries to compete. For that reason, the World Trade Organization (WTO) considers them trade distorting, and their reduction is currently being negotiated in the framework of the Doha Round (see section 4). The total assistance granted by developed countries to the agriculture sector, including protection through tariffs, quotas and other barriers declined from 1.2% of GDP in 2000 to 0.9% of GDP in 2009. Nonetheless, this assistance remains at high levels, worth over US\$ 350 billion per year since 2004, and in 2009 represented three times the total amount of development assistance provided by those same countries.

Apart from their impact on agricultural trade, subsidies linked to prices, output levels and input use have been classified by the OECD as having the greatest negative impact on the environment, among the different types of agricultural subsidy (OECD, 2002). Such impacts can occur through various channels, including: incentives for greater use of fertilizers and pesticides, with consequent damage to soils and water; the incorporation of land that could be used for conservation purposes into cultivation areas, and reductions in biodiversity stemming from subsidies to plant certain crops rather than others that do not receive subsidies.

A reduction of distorting agricultural subsidies in industrialized countries would create a more level playing field for developing-country producers, and reduce incentives for overproduction in the industrialized countries themselves, with consequent environmental benefits for them. It is harder to predict the environmental effect of such reductions in developing countries. The net impact on the environment will be different in each country, depending on the individual impacts of the expansion of certain crops and the contraction of others, in response to new price signals generated by a reduction of subsidies in industrialized countries. In this context, it becomes extremely important for developing countries to implement national agricultural sustainability programmes, irrespective of the outcome of the current negotiations in the WTO (La Vina and others, 2006).

3. Aid for trade

Latin American and Caribbean countries still face significant internal constraints that prevent them from participating more competitively in international trade flows. These include the following: lack of information on trade opportunities; excessive export/import formalities; inadequate financing for SMEs and infrastructure problems. It is therefore very important for the region to fully exploit the opportunities provided by aid for trade, such as those of the Aid for Trade Initiative launched during the Ministerial Conference of WTO in Hong Kong (Special Administrative Region of China) in December 2005. (OECD/WTO, 2010). Nonetheless, the region receives a small proportion of aid-for-trade flows: roughly 7%, which nevertheless accounts for slightly more than a fifth of the ODA flowing into Latin America and the Caribbean during the second half of the 2000s.

The countries of the region could increase their share of aid-for-trade flows by defining priorities, and identifying and presenting relevant projects that enable them to obtain new resource flows, in accordance with the principles of additionality, sustainability and aid effectiveness. In addition, priority should be given to securing funds for projects that involve several countries and include a clear trade-facilitation component. A greater flow of funds to the region could not only help improve its international participation but also contribute to its sustainable development by incorporating specific actions.

4. The Doha Round and sustainable development

The Doha Round of trade talks in the framework of WTO, launched in November 2001, represents the main effort so far to incorporate the dimension of sustainable development into the agenda of the multilateral trading system. Paragraph 6 of the Doha Ministerial Declaration states that “the aims of upholding and safeguarding an open and non-discriminatory multilateral trading system, and acting for the protection of the environment and the promotion of sustainable development can and must be mutually supportive.” The Doha Round reaffirms the right of all countries to adopt measures to protect human, animal or plant life or health, or the environment at the levels it considers appropriate —provided they are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or as a disguised restriction on international trade, and are otherwise in accordance with the provisions of the WTO Agreements (WTO, 2001).

The Doha Round has the potential to achieve results that promote sustainable development in various fields. The Doha Round negotiating agenda links several issues to sustainable development. One of these is agriculture, where: (i) agreement in principle has been reached to phase out all forms of export subsidies (which for manufactured products have been banned since 1958); (ii) substantial reductions are expected to be achieved in authorized trade-distorting domestic support granted by industrialized countries; and (iii) also substantial reductions are expected to be achieved in market access barriers, through a formula whereby the highest tariffs have to be cut most in percentage terms. This would benefit developing countries by enabling them to take better advantage of their comparative advantages in agriculture; and it would promote sustainable development by reducing the environmental costs associated with overproduction in industrialized countries.

Secondly, the agenda includes specific negotiations on trade and the environment, focusing on three issues: (i) reducing (or eventually eliminating) barriers to trade in environmental goods and services; (ii) clarifying the relation between WTO regulations and multilateral agreements on the environment, particularly those that contain “specific trade obligations”; and (iii) strengthening cooperation between the WTO Secretariat and the secretariats of multilateral environmental agreements.

Thus far, WTO members have not reached consensus on the range of products for which tariff and non-tariff barriers should be reduced. Part of the reason for this is the lack of a universally accepted definition of “environmental good”. Nonetheless, the main reason is the apparent conflict between the different interests at stake. Industrialized countries, which are currently the main producers of environmental technologies, are striving for the most ambitious outcome possible, to thus maximize their export opportunities; while a large number of developing countries are seeking to promote their capacity to produce these technologies locally, so they are reluctant to reduce their import barriers.¹⁰

The Doha Round also includes negotiations on fishery subsidies. According to World Bank estimates, in 2000, about US\$ 10 billion were disbursed worldwide in subsidies to increase the catch capacity of fishing fleets; about 80% of that amount was granted to industrialized countries (FAO/World Bank, 2008). Their main beneficiaries are the European Union and a number of Asian economies, particularly Japan, the Republic of Korea and Taiwan Province of China. Of all subsidies, the most important were on fuel (63.5%) and for the construction, renewal and modernization of fishing fleets

¹⁰ Compounding this is the fact that the willingness of certain developing countries to lower tariffs on environmental goods and services will depend heavily on the gains they perceive in other areas of priority interest within the Doha Round, such as agriculture.

(18.9%).¹¹ Fishery subsidies have contributed to an excess fishing capacity in the world, which has led in turn to overfishing. In this context, the ongoing Doha negotiations have given majority support to prohibiting certain forms of subsidy that promote excess capacity and consequent overfishing, as well as ensuring special and differential, appropriate and effective, treatment, for developing and least developed countries. The latter is important, given the importance of fisheries, including small-scale non-industrial fishing, as a source of employment and means of subsistence in many developing countries.

There are several issues that have important implications for sustainable development in the next few years. These include the treatment of fossil-fuel subsidies; prohibitions and restrictions on exports of agricultural products and other raw materials; and the different policy instruments that countries and firms can use to combat climate change which have an impact on trade.

5. Negotiations on climate change and international trade

The ongoing negotiations within the United Nations Framework Convention on Climate Change (UNFCCC), aim to define a new regime for reducing greenhouse gases (GHGs) when the first period of implementation of the Kyoto Protocol expires in 2012. As industrialized and developing countries approach the issue of climate change from different standpoints, there are major difficulties in the negotiations. It is a challenge to secure effective commitments from all of the members of the Convention that take their special situations into account by granting special and differential treatment, including appropriate and timely access to financial and technological resources to enable them to contribute to the reduction of global warming, without compromising their development strategies, and without suffering the effects of environmental protection policies based on protectionist elements.¹²

In relation to international trade, the current UNFCCC negotiations aim to define clear policies that are consistent with the basic principles of international trade, in particular non-discrimination. As mitigation and adaptation measures would be applied in sectors open to international trade, the rules of the multilateral trading system will need to be adjusted; and this will generate tensions between the rules of the multilateral trading system and climate change mitigation measures that have an impact on trade—for example, “production and processing methods” (PPMs) and the implementation of trade measures based on a product’s carbon footprint.¹³

Latin American and Caribbean exports would be vulnerable to adaptation and mitigation measures adopted in industrialized countries if they included trade restrictions, owing to the distances and prevailing export structure with industries that make intensive use of energy and capital and are highly polluting. Up to 17% of the region’s exports consist of products considered “environmentally sensitive”, such as commodities and natural resource-based manufactures,¹⁴ which have a greater impact on the

¹¹ According to WTO estimates, these subsidies fluctuate between US\$ 14 billion and US\$ 20.5 billion per year (WTO, 2011).

¹² OECD countries currently emit 77% of total GHGs, but emissions by developing countries are growing. For example, it is forecast that, for the period 2005 to 2030, while the volumes of greenhouse gases emitted by OECD countries will grow by an annual average of 0.5%, emissions by developing countries are expected to increase by 2.5% per year (WTO/UNEP, 2009).

¹³ Current GATT regulations (which mostly date back to the late 1940s) and those of the WTO, were not designed to address problems related to climate change (Low, Marceau and Reinaud, 2011).

¹⁴ Environmentally sensitive industries (ESIs) —a classification used in some studies— are defined as: (a) those that have spent most on controlling and reducing pollution; and (b) those with the highest intensities of emissions into different media (air, water, soil). There are 40 industries (Standard International Trade Classification (SITC)

environment, and are thus more affected by any regulations to combat climate change. A number of OECD countries are adopting climate-change measures that have trade impacts, such as border adjustment measures, subsidies and technical standards or regulations.

With a view to creating a favourable global economic and trade framework for combating climate change and ensuring global economic growth and welfare, it is necessary to avoid conflict between the international-trade and climate-change agendas; and for that purpose it is essential to design climate-change actions that are consistent with the rules of the multilateral trading system. Otherwise, disputes over climate change will proliferate in the WTO, which will weaken the international cooperation needed in climate-change policies.

The most immediate risk in initiatives affecting exports is the increasing tendency of the private sector to demand products with a low environmental impact, which in some sectors is also an opportunity to place clean products on markets. Life-cycle analysis of tradable products and services would require life-cycle emissions of products and services to be included in their carbon footprint, for which there is not yet an international standard or single methodology. For Latin America and the Caribbean, the outcome is very important, because the region's exports may gain or lose competitiveness in relation to other regions, depending on the methodology used.

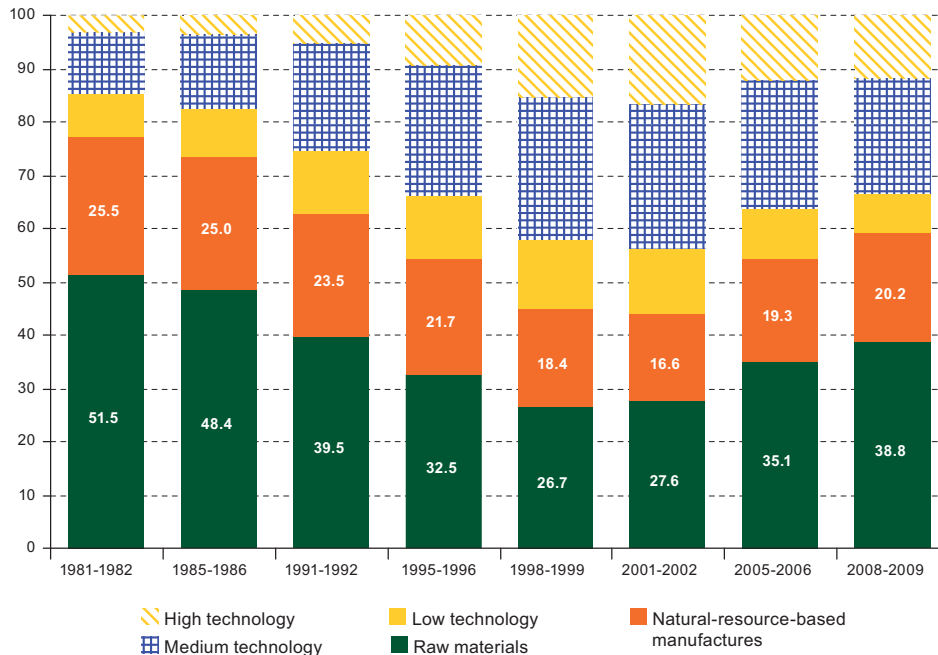
As consumers become more environmentally aware, and firms strive to become more energy efficient and enhance their environmental profiles, private initiatives to measure the carbon footprint and other parameters of environmental impact have proliferated. One study discovered over 330 eco-labels of various levels of complexity, covering 40 industrial sectors in 211 countries (WRI/Big Room Inc., 2010). Examples of firms now requiring some form of eco-labelling in their products are Patagonia, Timberland, Tesco, Wal-Mart and Casino (Brenton, Edwards-Jones and Friis, 2009; Ball, 2009).

The process of "reprimarization" of the region's export basket has been ongoing since the late 1990s, largely owing to the rise in international commodity prices fuelled by burgeoning global demand (see figure V.9), and is accentuating the risk of greater regulation of trade on environmental grounds, because commodities and natural-resource-based manufactures largely coincide with products defined as environmentally sensitive.

The best way to reduce the risk that industrialized countries will adopt unilateral measures is to reach a sound multilateral agreement that distinguishes between development levels and links the commitments of developing countries to the provision of financial assistance and technology transfer. The key challenge is preparedness to meet the challenges of a new low-carbon global economy. Governments in the region need to coordinate their position on these issues as soon as possible in the various forums that discuss the nexus between trade and sustainable development; and they should take steps to apply the principles promoted in international forums at the national and regional levels. Regional cooperation has broad scope for progress on these issues; but if each country in the region addresses these issues in isolation, collaboration synergies and economies of scale will be lost. It is essential to act regionally and on a coordinated basis in this area, based on specific and adequately financed projects.

at the three-digit level) which incur the highest pollution reduction and control costs (over 1% of their total sales), including the following: iron and steel; non-ferrous metals; industrial chemicals; wood pulp and paper, and non-metallic minerals. In addition to being highly polluting, these industries make intensive use of capital, energy and land (Murillo, 2007, pp. 27-28; Low and Yeats, 1992).

Figure V.9
LATIN AMERICA AND THE CARIBBEAN: STRUCTURE OF GLOBAL EXPORTS
SINCE THE EARLY 1980s
(Percentages of the total by value)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Latin America and the Caribbean in the World Economy, 2009-2010* (LC/G.2467-P), Santiago, Chile, 2010. United Nations publication, Sales No. E.10.II.G.5.

6. Property rights and trade rules

In the two decades since the Rio Conference, the protection of intellectual property rights has firmly claimed its place on the international-trade agenda. In 1995, as a result of the GATT Uruguay Round, the Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPS Agreement) entered into force. This is the most important multilateral agreement negotiated on this subject to date, and introduces the concept of minimum protection standards for different categories of intellectual property (trademarks, patents, copyrights, industrial designs, and so forth). Since then, industrialized countries have systematically included intellectual property on the agenda of their free-trade agreements, including those signed with developing countries. These agreements usually involve even greater protection levels than those established in the TRIPS Agreement itself (Roffe and Santa Cruz, 2010).

The inclusion of intellectual property in international trade rules mainly serves the interests of certain knowledge-intensive industries (such as the chemical, pharmaceutical, entertainment and information technology industries) in developed countries. Nonetheless, the issue is not entirely straightforward. Many countries that are industrialized today used intellectual-property protection systems in the past that included exceptions to patentability. This enabled them to develop their industry locally, by facilitating imitation, adaptation and reverse engineering (practices that are now restricted by multilateral rules) (United Nations, 2010b).

The benefits for environmental sustainability of a multilateral, regional or bilateral system of intellectual-property protection are not automatic, but will depend on a balanced consideration of environmental, social and economic interests. In response to environmentally harmful products or processes, the development of more environmentally benign alternatives will generate corresponding intellectual property rights. That is to say, insofar as the answer to environmental problems lies in technological innovation, the current structure of the intellectual property regime and international trade rules can provide significant opportunities to innovators, by guaranteeing them the right to capture a proportion of the rents arising from improved environmental performance (United Nations, 2010b).

Nonetheless, the dissemination of new technologies is in practice limited by the expanding scope of the international intellectual property regime and lengthening of the period of protection specified in bilateral free-trade agreements on this issue. In fact, trade provisions on intellectual property restrict traditional methods of reverse engineering and other forms of imitative innovation; restrict exceptions to patentability, which particularly affects pharmaceutical and food products; and reduces forms of compulsory licensing (Schaper, 2007). All of this could obstruct efforts by Latin American and Caribbean countries to improve their technological development levels, and to modernize and promote a sustainable development process. At the same time, insofar as some developing countries gradually start to produce more innovation and scientific research with commercial applications, they could also benefit from higher levels of protection for their creations.

At the Latin American and Caribbean Regional Meeting Preparatory to the United Nations Conference on Sustainable Development (Rio+20), the countries indicated the need for commitments to achieve “effective access to and transfer of safe and appropriate technologies, without conditionalities and on preferential terms for developing countries” and “the promotion of a global intellectual property rights regime that facilitates the transfer of such technologies, in keeping with the commitments undertaken by each country” (ECLAC, 2011b).

C. SCIENCE, TECHNOLOGY AND TECHNOLOGY TRANSFER

After the Earth Summit in 1992, the World Conference on Science (WCS) was held in Budapest in 1999, convened by UNESCO and the International Council for Science (ICSU). The two final documents produced by the conference laid foundations for formulating a new social contract for science. First, the Declaration on Science and the Use of Scientific Knowledge focuses on solving problems within science, technology and society. Second, the Science Agenda: Framework for Action is a guide to promoting joint activities in science and technology to further sustainable human development, in harmony with the natural environment. Both documents were adopted by consensus among all participants at the World Science Conference, and also by the General Conference of UNESCO and the International Council for Science.

Participation by Latin American and Caribbean countries in the World Conference on Science was based on the Santo Domingo Declaration: Science for the Twenty-first Century: A New Vision and a Framework for Action (UNESCO, 1999). This stated the need to strengthen support for science and technology; break down barriers between the natural sciences and social science; and improve education on science and technology to integrate them into general culture and strengthen international scientific cooperation. The Declaration explicitly states the need to formulate a new social contract for science and technology.¹⁵

¹⁵ See the Santo Domingo Declaration [online] http://www.unesco.org/science/wcs/meetings/lac_santo_domingo_s_99.

1. Science and technology in Latin America and the Caribbean

More than a decade on from Budapest, many of the targets proposed in the WCS documents are still far from being attained, as shown by consultations between UNESCO member States and associate members in Latin America and the Caribbean. The generation and absorption of scientific-technological knowledge remain almost exclusively concentrated in developed countries, and the technological gap separating them from developing countries has widened. The intensification of globalized relations and the internationalization of scientific and technological production continues to be hampered by restrictions on the circulation and dissemination of the knowledge produced.

The Latin American and Caribbean technological innovation system underwent a transformational change in the 1990s, as a result of common macroeconomic policies implemented throughout the region and the consequent changes (see chapter I). The barriers to national technological development increased as a result of the adoption of foreign technological packages, an increase in FDI, a reduction in the importance of public enterprises and their research and development departments, and an increase in the market share of foreign firms. At the same time, the gap between regional technological processes and achievements at the innovation frontier is widening in many cases, as a result of rapid progress worldwide in the fields of biotechnology, new materials, energy sources, information technology and telecommunications.

In Latin America and the Caribbean, investment in science and technology and in research and development is generally small, heavily concentrated in the larger countries and mainly dependent on the public sector (see figure V.10). The challenges facing technological development include insufficient financing and poor links between the productive sector and academic institutions operating with public funds (ECLAC, 2010b; UNESCO, 2010a). Nonetheless, in recent years policies and strategies have been implemented to overcome these difficulties. These instruments place great importance on environmental issues (see box V.1).

The gap between developed and developing countries in terms of expenditure on research and development (R&D) remains wide. Moreover, technological achievements vary greatly between developing countries themselves and even between different sectors of activity within each country.

The challenge of closing this gap is becoming increasingly demanding, because the region does not invest enough in innovation or use all of its resources efficiently. Although R&D investment in the region has grown, it is still inadequate to needs. In 2007, R&D investment amounted to approximately US\$ 19 billion at constant 2000 prices, almost triple the 1990 level, and constituted just over 2% of the global total (UNESCO, 2010a).

With the exception of Brazil, Latin American and Caribbean countries invest less in R&D than other countries of similar income levels (UNESCO, 2010a), which partly explains their low total productivity, compared to the “Asian tigers” for example. If R&D is measured as a percentage of GDP, not even the most advanced countries in the region have attained the level of European countries, the United States or Japan, which range from 2% to 3.6% of GDP (ECLAC, 2010b), compared to no more than 0.5% of GDP in many Latin American countries.

Box V.1

**REFERENCES TO THE ENVIRONMENT IN SCIENCE AND TECHNOLOGY POLICIES OF
LATIN AMERICAN AND CARIBBEAN COUNTRIES**

Latin American and Caribbean countries are implementing a variety of national policies to overcome science and technology constraints. Most of them place great importance on environmental issues.

Argentina: The National Strategic Plan for Science, Technology and Innovation (2006-2010) provides for the creation and application of knowledge for the responsible exploration of natural resources and for the protection of the environment as a strategic objective.

Bahamas: The Bahamas Environment, Science and Technology (BEST) Commission is linked to the Ministry of Health and Environment. Climate change and biological diversity are priority spheres.

Barbados: Inter-sectoral efforts are being made to develop local scientific capacity; and support provided to science and technology is focused on energy (especially solar energy) and biotechnology (tissue growth, in particular).

Bolivia (Plurinational State of): Biodiversity and traditional resources are two of four priority areas for scientific and technological development, which is funded by a tax on fossil fuels.

Brazil: The 2007-2010 Plan of Action on Science, Technology and Innovation for National Development identifies bio- and nanotechnology, biofuels, renewable energy, biodiversity and natural resources, development of the Amazon and semi-arid regions, and climate change among its strategic areas. In Brazil's productive development policy, launched in 2008, sustainable production is identified as a strategic priority that cuts across 23 industrial sectors. The main issues considered are clean energy sources and other emissions reduction measures, sustainable agribusiness production, better ecological and energy performance of industry, and infrastructures (see [online] www.pdp.gov.br).

Chile: The National Innovation Policy defines four cross-cutting spheres related to the technological development and innovation clusters. Three of these areas are related to environmental sustainability: biotechnology; water and environment; and energy (non-conventional renewables, biofuels and efficiency) (CNIC, 2010).

Colombia: Energy, natural resources and biotechnology have been identified as strategic areas for the long term under the National Policy on Science, Technology, and Innovation (CONPES, 2009).

Costa Rica: The National Science and Technology Plan, 2002-2006, included renewable energy and biodiversity/biotechnology among its four priority areas.

Cuba: Biotechnology, the environment and energy are among its priorities.

Ecuador: The National Policy for Science, Technology and Innovation, 2007-2010, establishes sustainable agriculture, environmental management for development, energy diversification and renewables, and biotechnology among its priority areas.

El Salvador: The National Policy on Science and Technology, established in 2007, identifies biotechnology, energy (including biofuels and other renewables), fishing, the environment, land-use policies and urban management among its priority areas.

Guatemala: Forest and hydro-biological resources, urban and rural development and biotechnology are among the priority areas in Guatemala's National Science and Technology Plan (2005-2014).

Panama: The Strategic Plan for the Development of Science, Technology and Innovation, 2006-2010, defines environmental sciences as one of its priority areas.

Paraguay: The National Science and Technology Policy (2002) defines the environment, natural resources and clean technologies as priority areas.

Peru: The National Strategic Plan for Science, Technology and Innovation for Competitiveness and Human Development, drafted in 2006, includes life sciences and biotechnology and environmental technologies among its key areas.

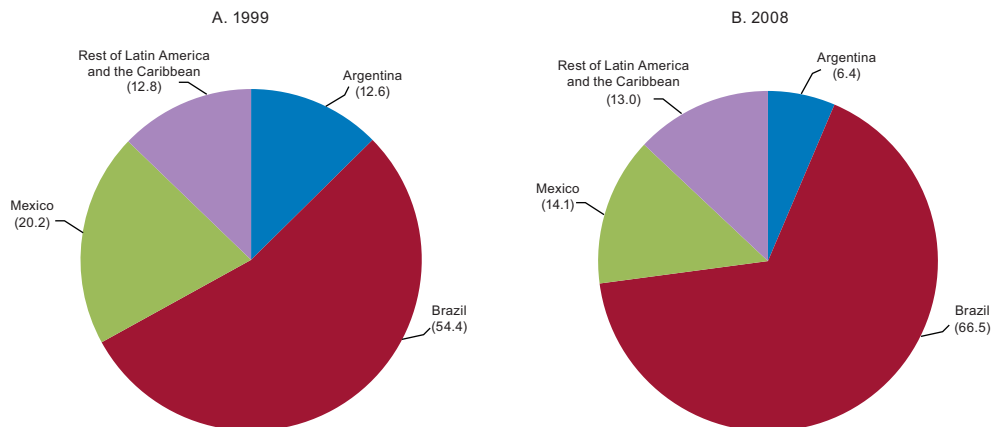
Uruguay: In the process leading up to the development of the National Strategic Science, Technology and Innovation Plan, the environment, energy and biotechnology have been identified as priority areas.

Venezuela (Bolivarian Republic of): The National Plan for Science and Technology, 2005-2030, includes the environment, sustainable development and biodiversity among its priority areas.

The priority areas of the Caribbean Council for Science and Technology (CCST): include renewable energy, the environment and water management.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the Science and Technology Database [online] <http://www.eclac.org/iyd/>, and official documents.

Figure V.10
**LATIN AMERICA AND THE CARIBBEAN: DISTRIBUTION OF INVESTMENT IN R&D,
 1999 AND 2008 (OR LATEST FIGURE AVAILABLE)**
(Percentages)



Source: Ibero-American Network of Science and Technology Indicators (RICYT), *El estado de la ciencia en imágenes*, 2010.

In Latin America and the Caribbean, the behaviour pattern of R&D investment differs from that of the more developed economies, in terms of both the sources of financing used and the sectors in which the investment is undertaken.

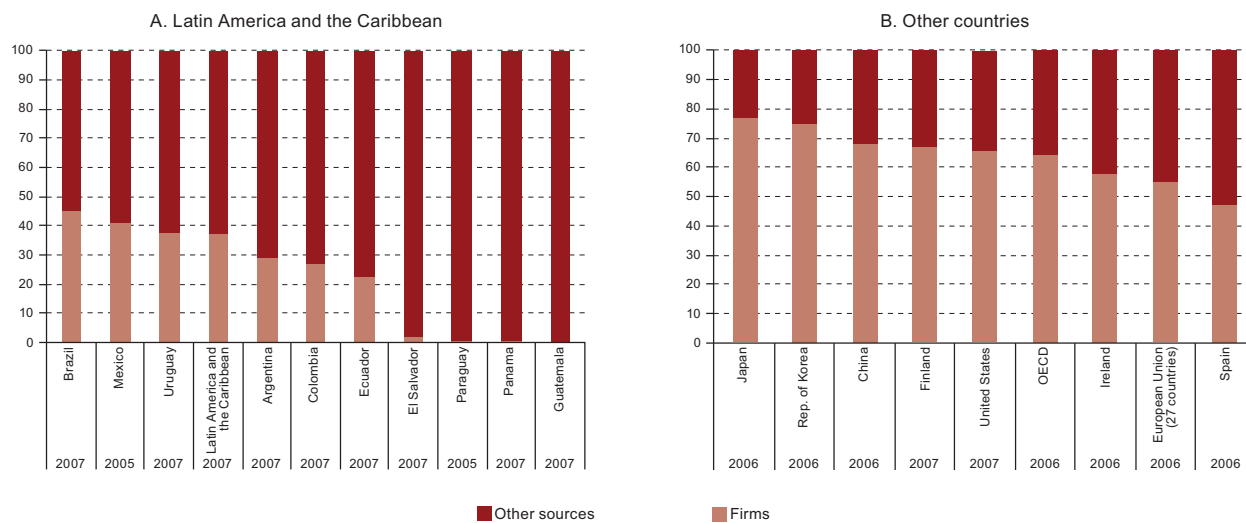
While the private sector produces the greater part of GDP in the region, the public sector continues to make the largest contribution to financing R&D, accounting for over 60% of the total (UNESCO, 2010b). In contrast, in other more developed economies, the main agent financing and implementing science and technology activities is the private sector. In the United States, for example, the private sector accounts for 65% (ECLAC, 2008). In addition, in Latin America and the Caribbean, publicly funded development of science and technology tends to put greater emphasis on conceptual aspects than innovation applied to processes.

Nonetheless, as shown in figure V.11, R&D investment by firms has increased in some countries, such as Brazil, Mexico and Uruguay.

Moving towards a green economy in the context of sustainable development and poverty eradication—the theme of Rio +20— will require not only an increase in regional R&D investment, but also mechanisms to transfer funds and technologies, along with capacity building.

Instruments such as a royalty levied on the extraction of non-renewable natural resources could play a key role in obtaining resources to foster innovation and promote apprenticeship policies, together with R&D investments aimed at creating new and different productive activities that make it possible to ensure the long-term sustainability of economic activity based on the extractive industries, and the transfer of wealth to future generations. The paradigm in this context is the mining royalty established in Chile since 2005, which finances a fund to provide incentives for national technological development (the Innovation for Competitiveness Fund-FIC).

Figure V.11
EXPENDITURE ON RESEARCH AND DEVELOPMENT BY FINANCING SOURCE, 2007
(OR MOST RECENT YEAR AVAILABLE)
(Percentages)



Source: Inter-American Development Bank (IDB), *La necesidad de innovar: el camino hacia el progreso de América Latina y el Caribe*, Washington, D.C., 2010.

The long-range scientific strategy should form the basis for creating a model for generating, disseminating and adopting technology aimed at environmental sustainability. The main challenges facing scientific strategies and policies in Latin America and the Caribbean include new and more in-depth research into natural wealth, to gain a thorough knowledge of the attributes and functioning of ecosystems, because there are many gaps in scientific knowledge that remain to be filled. There is also a need for research into alternative development models that promote new ways of using natural resources that foster a more harmonious relationship between society and its surroundings.

Another need is to develop mechanisms to stimulate local research, making it possible to promote each country's regions and recognizing local identities based on their specific conditions. This means directing the work of researchers and technologists towards solving problems related to specific needs, particularly in the most neglected segments of society. It also means stimulating research into local natural resources and incorporating the traditional empirical-science-based knowledge of the region's own cultures.

Latin American and Caribbean countries also require an instrument for financing R&D projects of intra-regional cooperation, to promote integration and the search for scientific-technological solutions to specific sustainable development problems. This financing platform should be founded on adequate sources of information for decision-making on the subject,¹⁶ greater training opportunities for science and technology managers, and adequate regional reflection on the challenges of science, technology and innovation policy in the region for the future.

¹⁶ Science Policy Information Network (SPIN) of UNESCO, see [online] <http://spin.unesco.org.uy>.

2. Scientific capacities and technology transfer

The scientific output of Latin America and the Caribbean, measured by the number of scientific publications, doubled between 1987 and 2006, and accounted for 4.9% of the world's total in 2008 (UNESCO, 2010b). Nonetheless, a review of the distribution of knowledge by field reveals a relative specialization in agricultural sciences. The R&D sector contributes less to technological development and innovations with industrial application, which is reflected in the small number of patents granted compared to developed countries. This is explained by a combination of factors, including lower efficiency and an orientation towards adapting and importing technology.

Scientific capacities are unequally distributed across the region, and the large scientific facilities are mainly in Argentina, Brazil and Chile (UNESCO, 2010a). According to data from the UNESCO Institute for Statistics,¹⁷ human resources dedicated to R&D in the region in 2007 amounted to 252,000 researchers and technologists. There is a general shortage of newly trained personnel, while insufficient resources in the R&D sector means little demand for scientists and technicians, thereby making it impossible to promote scientific work. The geographic distribution of human resources reveals the heterogeneity of the region and a concentration in the wealthier countries. Argentina, Brazil, Chile and Mexico account for 90% of this highly skilled population (especially researchers and technologists). Some small countries, such as Cuba, do, however, have a large number of researchers and technologists in relation to their population (RICYT, 2008) (see also chapter III).

In the specific area of environmental sustainability, technological development strategies have prioritized the introduction of state-of-the-art technologies, such as the new biotechnologies and nanotechnologies. Environmental agencies in most of the region's countries have given preference to the introduction of de-contamination technologies for the treatment of urban, industrial and mining waste, while leaving new technologies for other economic sectors.

Little is being done with technology that alters the natural structure of ecosystems for the purpose of agricultural development, which has had a high environmental cost in the region. The structure of R&D expenditure in agriculture, financed mostly by the public sector, reveals a concentration on technology and, to a lesser extent, on sustainable land use and the control and protection of the environment. On this latter point, R&D targets issues such as the identification and analysis of sources of pollution, its dispersion in the environment, effects on mankind and species, and the development of pollution-measurement facilities.

Transnational corporations are one of the key players in the creation, development and deployment of advanced technologies (see chapter III), so potentially they have an important role in reducing the technology gap, since their research and development capacities are crucial in high-technology activities and in the provision of knowledge packages. Nonetheless, this does not always lead to the dissemination of innovation, which remains concentrated in the beneficiary countries and sectors. In Latin America and the Caribbean, transnational corporations are concentrated in sectors of low-technology content, and the individual countries display a low technology-absorption capacity.

These aspects highlight the fact that technological changes in Latin America's productive structure have been limited and inadequate to the challenges posed by a more open productive structure integrated into international trade (see chapter I). This situation could become more complex in an international setting in which technologies and production modalities are constantly changing, as a

¹⁷ See [online] <http://www.uis.unesco.org> [date of reference: 15 June 2011].

consequence of the increasing use of information and communication technologies (ICTs) in productive processes, or in a transition towards a more environmentally friendly economy.

3. Information technologies and knowledge societies

Over the last few years, Latin American and Caribbean countries have increased their ICT use in various fields. Access to these tools is positive for environmental administration and management, since they improve processes for generating, managing, integrating and exchanging information as a basis for decision-making in different spheres.

Such progress raises new social and ethical responsibilities for scientists, technologists and decision-makers, to ensure that the technologies in question are applied in strengthening efforts to achieve sustainable development targets. According to chapter 34 of Agenda 21, achieving these targets requires available scientific knowledge and environmentally sensitive technologies to be applied to eradicate poverty and maintain economic development, while at the same time addressing social priorities and protecting the environment.

In the environmental domain, ICTs have major potential on issues such as knowledge of ecosystems and natural resources, monitoring of land-surface changes, land management, prevention and management of disaster risk, or planning for infrastructure.

The natural disasters that have occurred in the region in recent years have resulted in the formation of organizations that use spatial data infrastructures (SDIs) and innovations in remote sensing technologies, to generate and distribute data regionally, nationally and locally —with a clear focus on prevention or mitigation of the effects of natural phenomena, events caused by human action, or global changes. These include the Central American Geographic Information Project, the Regional Programme for the Reduction of Vulnerability and Environmental Degradation (PREVDA), and the Central American Probabilistic Risk Assessment project, along with the Andean countries' project Support for Disaster Prevention in the Andean Community (PREDECAN), among others. Paving the way for other similar initiatives requires better access to ICTs together with specialized professional and technical personnel.

As the public sector increases its use of ICTs, the supply of information and services improves. In the case of the environment, this helps to increase the production of public information on the environment and improve access to that information, which encourages greater citizen participation in controlling the implementation of public policies, and greater exchange between governments (UNEP, 2010a).

The development of ICTs and their role in the sociocultural aspects of globalization gave birth to the concept of the information society. Then, over the last few years, the idea was overtaken by the concept of knowledge societies, which encompass other social, ethical and political dimensions, because they refer to a society that thrives on its diversities and capacities, while recognizing the importance of the plurality of knowledge. Use of the word “societies” in the plural means that the concept rejects the idea of a unique “ready-to-use” model that takes insufficient account of cultural and linguistic diversity.

4. Knowledge plurality

Rural populations and indigenous peoples have their own knowledge, practices and representations of the natural world, along with their own conceptions of how human interactions with nature should be managed. These cognitive systems have been maintained and developed through historical interaction with the natural environment, and form a holistic entity that encompasses language, cultural roots in a given place, spirituality, and “cosmic vision”. For many cultures, what is “rational” or “objective” cannot be separated from what is “sacred” or “intuitive”, but is interwoven in the global perspective of local and indigenous knowledge.

By adopting the UNESCO Universal Declaration on Cultural Diversity in 2001, the international community demonstrated its commitment by recognizing the “contribution of traditional knowledge, particularly with regard to environmental protection and the management of natural resources, and fostering synergies between modern science and local knowledge” (UNESCO, 2001, paragraph 14). This is reinforced by the UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions, which recognizes “the importance of traditional knowledge as a source of intangible and material wealth, and in particular the knowledge systems of indigenous peoples, and its positive contribution to sustainable development, as well as the need for its adequate protection and promotion.” This is still far from being materialized in formal intellectual protection systems.

In addition, the Convention for the Safeguarding of the Intangible Cultural Heritage, adopted in 2003, represents major support for traditional knowledge as a factor of sustainable development. Under this convention, the Representative List of the Intangible Cultural Heritage of Humanity recognizes 31 expressions of Latin America and the Caribbean, of which nine are in the category of “knowledge and practices concerning nature and the universe” (UNESCO, 2003).¹⁸

In short, there is a set of international conventions and declarations¹⁹ regarding local and indigenous knowledge, several of which have been ratified by the 33 countries of Latin America and the Caribbean; and, although ratification by each country follows its own strategy and proceeds at its own pace, it is notable that there is a shared international framework of law to guide scientific development and technology transfer with broad recognition and support for the link between sustainable development and traditional knowledge of their peoples.

¹⁸ Art.2.2: “Nonmaterial cultural heritage [...] is manifested in particular in the following domains: [...] d) knowledge and uses concerning nature and the universe (UNESCO, 2003).

¹⁹ Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005); Convention for the Safeguarding of the Intangible Cultural Heritage (2003); Indigenous Peoples Kyoto Water Declaration (2003); Plan of Implementation of the World Summit on Sustainable Development (2002); UNESCO Universal Declaration on Cultural Diversity (2001); Declaration on Science and the Use of Scientific Knowledge (1999); United Nations Convention to Combat Desertification (1994); Convention on Biological Diversity (1992).

Bibliography

- Adaptation Fund (2010), “Financial status of the Adaptation Fund Trust Fund: As at 31 July 2010”, September [online] http://www.adaptation-fund.org/system/files/AF_Financial_Status_Report_Jul%2031%202010%20-%20Final.pdf.
- ALIDE (Latin American Association of Development Financing Institutions) (2011) *Líneas y programas de financiamiento medioambiental de las instituciones financieras de desarrollo*, General Secretariat, September.
- Ball, Jeffrey (2009), “Six products, six carbon footprints”, *The Wall Street Journal*, 1 March [online] <http://online.wsj.com/article/SB122304950601802565.html>.
- Biagini, Bonizaella and Bob Dixon (2010), *Least Developed Countries Fund and Special Climate Change Fund*, Washington, D.C.
- Brenton, Paul, Gareth Edwards-Jones and Michael Friis Jensen (2009), “Carbon labelling and low-income country exports: a review of the development issues”, *Development Policy Review*, vol. 27, No. 3, May.
- CNIC (National Council for Competitiveness Innovation) (2010), “Agenda de Innovación y Competitividad 2010-2020”, Santiago, Chile, March.
- CONPES (National Council for Economic and Social Policy) (2009), “Política Nacional de Ciencia, Tecnología e Innovación”, *Documento Conpes*, No. 3582, Bogota, National Planning Department, April
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011a), *Foreign Direct Investment in Latin America and the Caribbean 2010* (LC/G.2494-P), Santiago, Chile. United Nations publication, Sales No. E.11.II.G.4.
- _____ (2011b), Report of the Latin American and Caribbean Regional Meeting Preparatory to the United Nations Conference on Sustainable Development, Santiago 7-9 September 2011, (LC/L.3432), December.
- _____ (2010a), *Statistical Yearbook for Latin America and the Caribbean, 2010* (LC/G.2483-P/B), Santiago, Chile, December. United Nations publication, Sales No. E/S.10.II.G.1.
- _____ (2010b), *Time for equality: closing gaps, opening trails* (LC/G.2432 (SES.33/3)), Santiago, Chile, May.
- _____ (2010c), *Latin America and the Caribbean in the World Economy 2009 - 2010* (LC/G.2467-P), Santiago, Chile.
- _____ (2008), *Structural Change and Productivity Growth - 20 Years Later. Old problems, new opportunities* (LC/G.2367(SES.32/3)), Santiago, Chile.
- _____ (2001), *Report of the Regional Preparatory Conference of Latin America and the Caribbean for the World Summit on Sustainable Development* (LC/G.2173(CONF.90/5)), Santiago, Chile.
- ECLAC/FAO/IICA (Economic Commission for Latin America and the Caribbean/Food and Agriculture Organization of the United Nations/Inter-American Institute for Cooperation on Agriculture) (2010), *The Outlook for Agriculture and Rural Development in the Americas: A Perspective on Latin America and the Caribbean*, Santiago, Chile.
- FAO (Food and Agriculture Organization of the United Nations)/World Bank (2008), *The Sunken Billions. The Economic Justification for Fisheries Reform*, Washington, D.C.
- GEF (Global Environment Facility) (2009), *GEF Annual Report 2009*, Washington, D.C. [online] http://www.thegef.org/gef/sites/thegef.org/files/publication/2009_GEF-AnnualReport.pdf.
- Hall, J. (2010), “Diez años de innovación en remesas: Lecciones aprendidas y modelos para el futuro. Evaluación independiente de la cartera de proyectos de remesas del Fondo Multilateral de Inversiones, miembro del grupo BID. Proyectos, estudios y actividades de diseminación del Fondo Multilateral de Inversiones del 2000–2009”, Washington, D.C., Inter-American Development Bank (IDB).

- IDB (Inter-American Development Bank) (2010), “La necesidad de innovar: el camino hacia el progreso de América Latina y el Caribe”, paper prepared for the sixth Summit of Heads of State and Government from Latin America and the Caribbean and from the European Union, Madrid, 17-19 May.
- ITC/UNCTAD/WTO (International Trade Centre/United Nations Conference on Trade and Development/World Trade Organization) (2006), “The Millennium Development Goals. Goal 8: Market Access Indicators by ITC, UNCTAD and WTO” [online] <http://www.mdg-trade.org/Metadata38.aspx>.
- La Vina, A. and others (2006), *Reforming Agricultural Subsidies: “No Regrets” Policies for Livelihoods and the Environment*, Washington, D.C., World Resources Institute (WRI), September.
- Leading Group on Innovative Financing for Development (2010), *Globalizing Solidarity: The Case for Financial Levies, Report of the Committee of Experts to the Taskforce on International Financial Transactions and Development* [online] http://www.leadinggroup.org/IMG/pdf_Financement_innovants_web_def.pdf.
- Low, G., G. Marceau and J. Renaud (2011), “The interface between the trade and climate change regimes: scoping the issues”, *World Trade Organization Staff Working Paper*, ERSO 2011, 1 January.
- Low, Patrick and Alexander Yeats (1992), “Do ‘dirty’ industries migrate?”, *International Trade and the Environment*, Washington, D.C., World Bank.
- Maldonado, R., N. Bajuk and M. Hayem (2011), *Las remesas en América Latina y el Caribe durante el 2010: estabilización después de la crisis*, Washington, D.C., Multilateral Investment Fund/Inter-American Development Bank (IDB).
- Mayrand, K. and others (2003), *The Economic and Environmental Impacts of Agricultural Subsidies: An Assessment of the 2002 US Farm Bill & Doha Round*, Montreal, Unisféra International Centre.
- Murillo, David Romo (2007), “La competitividad exportadora de los sectores ambientalmente sensibles y la construcción de un patrón exportador sostenible en América Latina y el Caribe”, *Project document*, No. 148 (LC/W.148), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- OECD (Organization for Economic Cooperation and Development) (2002), *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, Paris.
- OECD/WTO (Organization for Economic Cooperation and Development/World Trade Organization) (2010), “Aid for Trade: Is it working?” [online] http://www.wto.org/english/res_e/booksp_e/a4t_oecd_e.pdf.
- RICYT (Ibero-American Network of Science and Technology Indicators) (2010), *El estado de la ciencia 2010: Principales indicadores de ciencia y tecnología iberoamericanos/interamericanos 2010*, Buenos Aires.
- _____ (2008), *El estado de la ciencia 2008: Principales indicadores de ciencia y tecnología iberoamericanos/interamericanos*, Buenos Aires.
- Roffe, P. and M. Santa Cruz (2010), “Aspectos controversiales de los capítulos sobre propiedad intelectual de los acuerdos de libre comercio celebrados principalmente por los Estados Unidos”, *Temas controversiales en negociaciones comerciales Norte-Sur*, Libros de la CEPAL, No. 106 (LC/G.2417-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC). United Nations publication, Sales No. S.09.II.G.94.
- SCCF (Special Climate Change Fund) (2010) “Global Environment Facility, investing in our planet” [online] <http://www.thegef.org/gef/SCCF>.
- Schaper, Marianne (2007), “Los desafíos del desarrollo sostenible en las economías abiertas de América Latina y el Caribe”, *Pensamiento iberoamericano*, No. 0.
- UNEP (United Nations Environment Programme) (2010a), *Environment Outlook: Latin America and the Caribbean*, Panama City.
- _____ (2010b), “Tratados internacionales para la protección a la capa de ozono”, November [online] <http://www.pnuma.org/ozono/Documentos/DiaOzono/tratados%20internacionales%20ozono.pdf>.

- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2010a), “Sistemas nacionales de ciencia, tecnología e innovación en América Latina y el Caribe”, Montevideo, [online] <http://www.unesco.org.uy/institucional/fileadmin/ciencias%20naturales/Políticas%20Científicas/EYDPCALC-Vol-1.pdf>.
- _____ (2010b), *Science Report 2010: The Current Status of Science around the World*, Paris.
- _____ (2003), Convention for the Safeguarding of the Intangible Cultural Heritage [online] <http://www.unesco.org/culture/ich/index.php?pg=00006>.
- _____ (2001), Plan of action of the Universal Declaration on Cultural Diversity [online] http://www.unesco.org/new/en/culture/themes/dynamic-content-single-view/news/plan_of_action_of_the_unesco_universal_declaration_on_cultural_diversity/.
- _____ (1999), Santo Domingo Declaration. Science for the Twenty-first Century: A new vision and a framework for action [online] <http://unesdoc.unesco.org/images/0013/001383/138332mb.pdf>.
- United Nations (2011a), *World Economic Situation and Prospects 2011*, New York. United Nations publication, Sales No.E.11.II.C.2.
- _____ (2011b), *Demographic Yearbook 2009-2010* (ST/ESA/STAT/SER.R/40), Nueva York, Department of Economic and Social Affairs. United Nations publication, Sales No. B.12.XIII.1 H.
- _____ (2010a), *Achieving the Millennium Development Goals with Equality in Latin America and the Caribbean: Progress and Challenges* (LC/G.2460), Santiago, Chile, Economic Commission for Latin America and the Caribbean.
- _____ (2010b), *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428.P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- _____ (2009), Progress report on innovative sources of development finance. Report of the Secretary-General (A/64/189), New York.
- _____ (2002), *Report of the International Conference on Financing for Development*. Monterrey México, 18-22 March (A/CONF.198/11), New York. United Nations publication, Sales No. E.02.II.A.7.
- World Bank (2008), *Global Economic Prospects. Technology Diffusion in the Developing World*, Washington, D.C.
- WRI (World Resources Institute)/Big Room Inc. (2010), *2010 Global Ecolabel Monitor: Towards Transparency* [online] http://pdf.wri.org/2010_global ecolabel_monitor.pdf.
- WTO (World Trade Organization) (2011), “Introduction to fisheries subsidies in the WTO” [online] http://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_intro_e.htm.
- _____ (2001), Doha Ministerial Declaration [online] http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm.
- WTO/UNEP (World Trade Organization/United Nations Environment Programme) (2009), *Trade and Climate Change: a report by the United Nations Environment Programme and the World Trade Organization*, Geneva.

Chapter VI

GUIDELINES FOR ACHIEVING SUSTAINABILITY**A. PERSISTENT GAPS IN THE IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT AND THE WAY FORWARD**

Despite the undeniable, noteworthy advances mentioned in the previous chapters of this report, the Latin American and Caribbean region is still facing significant challenges in achieving social inclusion and equality, eradicating poverty and protecting the environment. It is increasingly clear that environmental degradation—at both the local and global levels—has a more severe impact on disadvantaged groups, which are more vulnerable to diseases related to environmental deterioration (such as air and water pollution and changes in the patterns of vector-borne diseases); disasters caused by extreme weather events; and livelihood loss due to the degradation of ecosystems and natural resources. The challenges facing the region to grow with equality and make headway in eradicating poverty will be exacerbated by climate change, which presents new problems or intensifies existing ones. Overcoming these problems will require strengthened public policies and budgets and greater commitment by civil society and the private sector. Climate change is also making it more urgent to eliminate factors causing vulnerability, such as poverty and lack of access to basic services, and to strengthen governance mechanisms as a condition for the effective management of sustainable development. In summary:

- (i) Global patterns of production and consumption continue to be generally unsustainable. Combined with inequalities and the unmet needs of disadvantaged groups, this is making a shift in the development model increasingly challenging. The region has been unable to close the productivity gap with developed countries or transform its production structure.
- (ii) Since 1992, the countries of Latin America and the Caribbean have invested heavily in developing environmental legislation and institutions. The concept of sustainability has been taken on board by public and private organizations. However, the efforts being made are hampered by poorly coordinated public action and the limited visibility of the effects of environmental degradation. Governments and other institutions—public and private, and local, national and international—are promoting sustainable development and protection of the environment while maintaining practices that contradict this paradigm. In the absence of appropriate institutional, legal and economic mechanisms, the cost of environmental degradation is absorbed by groups of people not involved in decision-making—especially the disadvantaged—and by future generations.
- (iii) Many countries have yet to enact legislation to facilitate implementation of principle 10 of the Rio Declaration on Environment and Development, which addresses access to information and environmental justice, and public participation, while others are encountering implementation difficulties. A lack of available information, including environmental statistics, impedes effective public action and the full participation of civil society in decisions.

- (iv) Conceptual shortcomings and technical, scientific, technological and productive constraints in the region are hindering progress towards a model of productive development that is more inclusive, cleaner and less dependent on natural resources, as well as hindering the use, design and implementation of suitable solutions.
- (v) The failure to fully meet international cooperation commitments —on market access and financial and technological matters— plays a critical part in perpetuating the persistent gaps in implementing sustainable development commitments, especially in the smallest, least developed and heavily indebted States.

Experiences in the region in the past 20 years have highlighted the importance of strengthening the State and establishing strong, coordinated public policies in order to make progress with development, eradicate poverty and overcome the deep inequalities that characterize Latin America and the Caribbean (ECLAC, 2010). The region urgently needs to tackle the dual, cross-cutting challenge of ensuring that development is environmentally sustainable and building physical and economic resilience to the effects of environmental degradation, especially climate change in addition to macroeconomic challenges and others relating to social protection, education, access to basic services, labour policies, productive development and territorial development policies. The preceding analyses shows that investment in improving environmental legislation and institutionality is not enough and, as in other regions of the world, the greatest challenge lies in ensuring that the institutions devoted to the three pillars of development work in a comprehensive, coherent manner towards sustainability.

In urban areas, improving quality of life entails comprehensively tackling housing, employment and income needs, basic services and infrastructure, public spaces and secure tenure issues. In the past two decades the region has adopted a housing approach involving policies and programmes focused purely on the provision of housing without considering the other, broader components of urban development.

Section B presents seven cross-cutting guidelines intended to help governments in the region (and in some cases subnational governments) make progress in integrating the three pillars of sustainable development: environmental, social and economic. Section C focuses on small island developing States. Section D covers the international conditions for narrowing gaps in the implementation of sustainable development commitments, while section E presents the closing remarks.

The guidelines are closely related to the two themes for the United Nations Conference on Sustainable Development (Rio+20), which were established in resolution 64/236 adopted by the United Nations General Assembly: (i) a green economy in the context of sustainable development and poverty eradication; and (ii) the institutional framework for sustainable development. Guidelines 4 and 6 refer mainly to the institutional framework for sustainable development, whereas guidelines 1, 2, 3 and 7 concern the green economy. It is acknowledged, however, that the countries in the region have not yet reached agreement on the meaning of the term “green economy”. As a result, the concept will take on different connotations in line with the priorities and particular characteristics of each region and country and cannot be seen in isolation from the objectives of sustainable development and poverty eradication. Guideline 5 is related to both these objectives.

B. GUIDELINES FOR THE INTEGRATION OF THE THREE PILLARS OF SUSTAINABLE DEVELOPMENT

The guidelines proposed below are designed to bring together the environmental, social and economic dimensions of development by means of institutional, legal and economic instruments, information and capacity-building. They do not follow the traditional sector-based approach. Instead they seek to close persistent gaps in the implementation of sustainable development by means of cross-cutting proposals that have an impact in more than one sector. Moreover, although the heterogeneity of the region precludes a blanket approach, these cross-cutting guidelines concern characteristics generally seen throughout the region.

Certain basic principles underlie the guidelines, including respect for human rights and priority consideration of the interests of groups who are at a potential disadvantage, including women, indigenous peoples, Afro-descendants, older persons, children and persons with disabilities in relation to discrimination, poverty, health and socioeconomic inequality (see introductory chapter).

Guideline 1

Create synergies among inclusion, social protection, human security, empowerment of people, disaster risk reduction and environmental protection

Investment can have a very positive impact on both well-being and social inclusion, as well as on the environment. In this context, unmet social demands, such as expanding the coverage of basic services, generating markets for care services (the care economy) and investment in infrastructure, quality public transport and services relating to disaster risk reduction can create new sources of economic growth, encourage the creation of decent work with a very low —or even positive— environmental impact and promote broad social inclusion.

The poor are most likely to bear the costs of environmental degradation. This creates a vicious circle as poverty is perpetuated, often over generations. The cycle can only be broken by means of complementary systemic policies tackling: (i) social protection (in a broad sense, including policies on minimum wage, pensions, access to health care, education and other basic services) and environmental protection; and (ii) the empowerment of people to increase their resilience and enable them to develop their potential and participate fully in decision-making.

The human security approach provides a strong policy framework which combines protection and empowerment and is based on five principles: it is people-centred, multi-dimensional, comprehensive, context-specific and prevention-oriented.¹

The following actions are suggested under this guideline:

¹ See OCHA (2009), quoted in UNCRD (2010).

- (a) **Implement mechanisms such as public investment, regulation and public-private partnerships to expand services that can contribute to simultaneously overcoming social and environmental deficits, adaptation to climate change and disaster risk reduction, with an emphasis on the creation of decent jobs**

Examples include:

- (i) expanding and improving the quality of public transport;
- (ii) implementing formal systems for the collection, sorting, recycling and treatment of waste. In Brazil, for example, the recycling of aluminium cans provides employment for nearly 170,000 people and 28,000 formal jobs are associated with paper recycling (United Nations, 2010);
- (iii) investing in the implementation of strategies for disaster risk reduction and adaptation to climate change;
- (iv) research and development of alternatives to polluting technologies and the use of biological resources;
- (v) using environmental conditional transfers following the examples in the social sphere;
- (vi) capacity-building for monitoring resource management and compliance with regulations.

Investment is also needed to break the cycle of poverty, vulnerability and the effects of environmental degradation. The links between these three factors need to be analysed to ensure optimum allocation of public resources and promote cooperation, including South-South cooperation, with a view to replicating successful strategies. Examples of these links include:

- (i) air pollution and respiratory diseases (including the costs for public health-care systems) (see chapter I);
- (ii) the treatment of wastewater and gastrointestinal diseases (including the costs for public health-care systems) (see chapter I);
- (iii) the expansion and upgrading of public transport and its effects on pollutant emissions and labour market access (see chapter I);
- (iv) the impact on the environment and on the incomes of the poorest of programmes on energy efficiency and access to clean energy sources (such as the “Electricity for all” programme in Brazil) and on access to drinking water (such as the “Water for all” programme in Peru) (see chapter I);
- (v) the impact of family farming policies on the environment and food security (see chapter III).

Government budgets should reflect the analytical soundness of these “triple dividend” solutions (improved economic performance, greater social inclusion and enhanced quality of life, and reduced environmental impact of production activities).

(b) Strengthen policies designed to empower people and promote human security

People should be provided with the means, material resources and education to achieve empowerment and self-reliance, realize their potential and participate fully in decision-making. They need to be resilient enough to prepare for, withstand and recover from events that critically threaten their security. Their most essential needs should be met and their subsistence and dignity guaranteed.

To that end, it is essential that national social protection systems be strengthened. A protection and empowerment strategy requires concerted efforts to establish legal frameworks, processes and institutions that systematically tackle human security issues, protect people against critical, widespread threats and foster suitable environments in which they can satisfy their needs and obtain appropriate, sustainable livelihoods.

(c) Implement disaster risk reduction strategies that include the expansion of social protection mechanisms such as conditional transfers, temporary job creation schemes and microinsurance, and incorporate the nutritional dimension

National governments and subregional and regional intergovernmental organizations, such as the Central American Integration System and the Andean Community, have established multi-stakeholder (at the community, national and regional levels) policy frameworks conducive to making progress towards reducing the risks of disasters and adapting to climate change. These initiatives should, moreover, focus on food security, nutrition and social protection and should target children under two years of age, pregnant or breastfeeding women and other groups at a potential disadvantage. More attention also needs to be paid to the link between disaster risk reduction and adaptation to climate change and small-scale farming.

National stakeholders and the international community should work together to support the development of a multisectoral approach to integrate social protection and local production strategies with food security, nutrition, disaster risk reduction and adaptation to climate change.

(d) Promote a social and fiscal covenant to facilitate the above measures

A social and fiscal covenant is required to finance the above measures. Such a covenant should include a reform of tax regimes designed to broaden social protection and internalize environmental and health-related costs at the national level (see guideline 3). This reform may be achieved by shifting tax burdens from labour and investment towards the environment and natural resources.

Guideline 2
Measure the sustainability of development

The indicators usually used to measure economic activity, such as GDP, are used as an approximate measure of well-being. But they do not reflect the negative impact of economic activity on natural or social heritage. Moreover, they do not take into account critical factors for the survival and well-being of various groups of people and future generations. As a result, leaders and decision makers pursue only partial objectives. Remedying this entails heightening the visibility of the environmental and social costs and therefore making headway in measuring heritage, which includes human and natural capital.

The following actions are suggested under this guideline:

(a) Assign values to both wealth and heritage assets, including countries' natural and cultural heritage

Measurements that could be adopted include the green net domestic product (which is calculated in Mexico based on an adjustment of GDP) or the more general United Nations System of Integrated Environmental and Economic Accounting (SEEA) (see chapter III).

A change in this respect would make the consequences of the various forms of development visible. This would prevent undervaluation of different types of national asset, put a stop to the transfer of costs and losses to future generations and alleviate the burden that they place on today's generations and especially on the disadvantaged.

(b) Improve the knowledge and analytical capacities of decision makers in the executive, legislative and judicial authorities regarding the economic and social importance of the environment as part of a country's heritage

The following actions are recommended:

- (i) Carry out training on the concept of sustainable development, the challenges in each administrative area and the use of analysis and evaluation tools.
- (ii) Develop and expand the use of analysis methodologies that show the multisectoral impacts of decisions, in order to support comprehensive development planning that encompasses the economic, social and environmental dimensions of sustainable development. Examples include system dynamics models (see chapter III), multicriteria analysis, econometric projections, computable general equilibrium models and action impact matrices.
- (iii) Quantify the costs of environmental damage and prepare reports evaluating the links between health and the environment. An economic analysis of climate change in Latin America is essential not only to identify the main channels of transmission, the magnitude of the effects of climate change and the best ways of adapting to new weather conditions, but also to devise a long-term sustainable development strategy based on low emissions, resilience to climate change and social inclusion.²
- (iv) Adopt other tools and indicators to assess resource use efficiency, such as the ecological footprint and a decoupling analysis.³ In the region, the sectors contributing most to the ecological footprint are the agricultural sector (food production) and transportation. Exports

² ECLAC is conducting regional studies on the economics of climate change in various countries in the region in order to analyse the socioeconomic consequences of climate change and propose mitigation and adaptation policies. See [online] www.cepal.org/dmaah.

³ The ecological footprint is a tool used to analyse the use of resources and is designed to provide a simple measure of sustainability. It measures the amount of land and water required by a population to produce what it needs for its consumption and to absorb the waste generated using current technologies (Wackernagel and others, 1996, in UNEP/MERCOSUR Network, 2011). A decoupling analysis assesses sustainability by analysing whether there is a trend towards "dematerialization" or decoupling of environmental pressures from economic growth. The term "decoupling" refers to breaking the link between "environmental bads" (emissions) and "economic goods" (economic growth or development) (UNEP/MERCOSUR Network, 2011: p. 52).

from these sectors could suffer given that consumers from developed countries are increasingly aware of the environmental impact of the goods they purchase (UNEP/MERCOSUR Network, 2011).

- (v) Promote studies and measures to value the economic contribution of biodiversity and ecosystem services, using methodologies already available. Valuation does not imply that all ecosystem services must be privatized or traded and it is acknowledged that this option entails a range of issues including equity for the current users of common resources and future generations, as well as considerations of economic efficiency (TEEB, 2010). Despite these limitations, however, experiences indicate that the use of market-based mechanisms for biodiversity conservation may be appropriate in certain circumstances. The *Economics of Ecosystems and Biodiversity* (TEEB) study provides several examples in the region. The challenge for decision makers is to assess when market-based solutions to biodiversity loss are likely to be culturally acceptable, as well as effective, efficient and equitable.

Guideline 3

Internalize the environmental and social costs and benefits of public and private economic decisions

Principle 16 of the Rio Declaration states that “national authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment”. In addition to internalizing costs, the benefits of environmental protection should be internalized, for example, by increasing the profitability of activities, sectors and technological choices that have a smaller environmental impact or positive externalities.

The following actions are suggested under this guideline:

- (a) **Adopt regulatory measures and economic instruments (such as fiscal tools, public investment and credit, and government procurement, among others) which attribute value to externalities (both positive and negative) and enable agents to calculate the overall costs and benefits of their activities**

The pricing of activities that pollute or cause environmental degradation should reflect the social cost of the externalities in question.

Public investment decisions and the policies of development finance institutions should be based on a book value assigned to environmental damage and health costs, risk management and the application of appropriate long-term discount rates, so that a proper comparison of the various investment options can be made. The high discount rate used to arrive at public investment decisions interferes with or precludes the use of options that could create synergies among economic growth, quality infrastructure and reduced environmental and social impacts over the medium and long terms (Ocampo, Cosbey and Khor, 2011). This practice should be revisited based on the methodology related to social discount rates.

The concept of eco-efficiency could also serve as a useful frame of reference for incorporating sustainability criteria in the evaluation of investments (see chapter I).

- (b) **Allocate financial, human and technological resources to strengthen the enforcement of environmental laws and regulations and increase the costs of non-compliance**
- (c) **Increase the profitability of activities, sectors and technological choices that have a smaller environmental impact and create or enhance incentives to promote them. Eliminate direct or indirect subsidies for activities or technologies that damage the environment**

Environmental criteria can be applied to public and private investment decisions, government procurement, the emission of pollutants and access to natural resources, whether in the form of laws or regulations or in the form of the costs of pollution and environmental degradation (charges for pollution rights, access rights or royalty fees).⁴ This would bring private or market costs more closely into line with social or economic costs, thereby sending correct market or normative signals.

- (d) **Encourage environmental and ecosystem protection by generating economic alternatives for communities located in areas prone to degradation, in accordance with the cultural values of each country and community**

The social benefits of protecting the environment and biodiversity are generally greater than those actually perceived by the private agents responsible for deciding whether to conserve or degrade the environment. Environmental protection can be promoted by undertaking new activities that are based on better knowledge and greater capacity for managing ecosystems. In the region, for example, countries such as Costa Rica and Brazil have implemented systems of payment for environmental services.

Promoting sustainable tourism as part of a broader poverty-reduction and job-creation strategy which includes training and targets women and young people in particular can also help to create a virtuous circle between protection of the environment and ecosystems and job creation.

Special attention should be paid to establishing a system for accessing and distributing the benefits arising from the use of genetic resources and relevant technologies given that the possession of traditional knowledge is an income source for populations that conserve forests and related biological diversity (United Nations, 2010).

- (e) **Create or adjust mechanisms such as royalties to channel resources into human capital training and other sources of competitiveness to facilitate transformation of the production structure**

In a region that is highly dependent on non-renewable natural resources, public policy should seek to increase the capital available for its citizens. The loss of natural capital without a corresponding increase in human capital, infrastructure and innovation will have an adverse impact on the well-being of future generations. This is especially relevant in the mining and oil extraction sectors (see chapter I).

⁴ This can be accomplished, for example, by calculating the book values of pollutants. At the investment evaluation stage, this would alter a project's estimated profit ratio by providing an increasingly accurate indication of its social and environmental costs.

(f) Send proper signals to essential sectors, especially energy, in order to encourage more sustainable patterns of production and consumption

The measures in the energy sector should include:

- (i) Overhauling policies on subsidization and re-directing expenditure in order to target the lowest-income groups and the disadvantaged more effectively with initiatives for increasing their access to high-quality sources of energy and steering them in the direction of less polluting sources. Eliminating, in particular, untargeted fuel subsidies, which are highly regressive, do not promote rational energy use, contribute to global warming and to pollution at the local level and encourage dependent patterns of fossil fuel production and consumption. This dependence can, in turn, give rise to economic risks in countries importing hydrocarbons and hydrocarbon-intensive products.
- (ii) Promoting energy efficiency by removing barriers for energy service companies working to coordinate energy-efficient projects for large numbers of users/consumers (for example, small- and medium-sized enterprises).
- (iii) Implementing ongoing, sustainable public-sector procurement programmes that reward energy efficiency and reductions in emissions of pollutants such as greenhouse gases.
- (iv) Developing a framework that will promote reductions in carbon footprints through efficient energy use and encouraging the use of renewable energy sources by removing existing economic, regulatory, cultural, social, technical and financial barriers.

Guideline 4

Improve the coordination and consistency of public action in relation to sustainable development policies

Over the last two decades it has become clear that sustainable development cannot be achieved through the actions of environmental institutions alone. Policy decisions must be consistent and different government departments should not send contradictory messages. On occasion, major environmental protection efforts can be negated by other parallel economic incentives. For example, fossil fuel subsidies—which are used in several countries in the region to regulate inflation or to ensure access to energy—can cancel out investment in and environmental and development policies on low-carbon solutions.

Incentives to promote sustainable development in public action can be effectively incorporated through practical action, though this is a long and complex process involving various sectors and levels of government and requiring the alignment of public policies under one guiding strategic vision. Sustainability, like other key areas of development in Latin America and the Caribbean, will not come about as a result of inertia or market forces. The market and private-sector agents play an essential role, but they need a strategic framework in the form of clear legal and economic instruments, defined by the State in a democratic fashion with the participation of society. In order to achieve sustainable development in Latin America and the Caribbean, the State's capacity to play a guiding role must be boosted so that it can lead the way among the network of public and private agents involved in development (ECLAC, 2010). A fiscal and social pact for sustainable development (see guideline 1) can be reached only by carrying out a thorough exercise in coordination and coherence in public action and encouraging participation at all levels.

In addition to that challenge, environmental management problems arise from the fact that, unfortunately, territories that are connected physically by catchment areas or ecosystems rarely coincide with political or administrative divisions. Development strategies should therefore incorporate a territorial focus to ensure that policies are designed and executed to consider the alignment and interrelation of the different components of each territory, for example, cities and rural areas. By applying a territorial focus, public action can be coordinated among different authorities, sectoral areas and administrative levels (see box VI.1).

Box VI.1

BUILDING TECHNICAL AND INSTITUTIONAL CAPACITY FOR THE TERRITORIAL DEVELOPMENT OF THE BOGOTA-CUNDINAMARCA REGION

The region encompassing the Capital District of Bogota and the Department of Cundinamarca (with 116 municipalities), which has a population of nearly 9 million and accounts for one third of Colombia's GDP, is highly interdependent in terms of water, energy, food supplies and services. For example, 100% of the water supply for Bogota comes from reservoirs in Cundinamarca, and at least 10 municipalities in the Colombian savannah would have no drinking water if it were not for Bogota's water treatment plants. Some 65% of the food consumed by residents of Bogota comes from Cundinamarca, and Bogota is the main buyer of that department's output. Two-way migration is also sharply on the rise. The region faces serious threats to human security and safety and to the environmental integrity of its land resources due to high levels of poverty, violence and crime. It also suffers from sharp disparities between different socioeconomic groups in terms of income levels, access to land and property rights, along with unequal access to employment and basic social services. The various provinces, municipalities and rural and urban sectors also differ in terms of the development of infrastructure, income levels and institutional capacity.

The Capital District, the Department of Cundinamarca and its various municipalities are administratively autonomous districts, however, and lack the necessary institutional structures to deal with inter-jurisdictional issues. In response to this situation, the Bogota-Cundinamarca Regional Planning Board was created under an agreement entered into by the Mayor of Bogota, the Departmental Government of Cundinamarca and the Autonomous Environmental Corporation of Cundinamarca (CAR). This body provides expertise and an inter-agency forum for participatory consensus-building that seeks to strengthen the capacities of the stakeholders that take part in territorial development efforts on a day-to-day basis. The Board has arrived at a shared vision of the area's land management model over a 20-year time horizon. Based on assessments of the safety and security situation in 116 municipalities and in Bogota, work has begun on a plan to harmonize the land management plans of Bogota and 25 nearby municipalities, and agreement has been reached as to which aspects of those plans should be dealt with on a joint, region-wide basis. Principles, guidelines and policy tools have been agreed upon at the political level and have been outlined in a charter for the capital region. This charter includes seven overarching principles: the region's common heritage; equitable development; coordinated, consensus-based, participatory development; sustainable development; security for people and for land; lasting economic development; and strategic development.

Source: United Nations Centre for Regional Development (UNCRD)/Mesa de Planificación Regional Bogotá – Cundinamarca, "De las ciudades a las regiones: Desarrollo regional integrado en Bogotá Cundinamarca", December 2005; UNCRD, *Seguridad humana y desarrollo regional en Bogotá y Cundinamarca*, 2010; and UNCRD/International Urban Development Association (INTA), "Panel Internacional para el Fortalecimiento de la Dimensión Regional, Fiscal y Tributaria en el Ordenamiento Territorial de la Región Capital Bogotá-Cundinamarca, Informe final (working paper)", September 2010 [online] <http://es.scribd.com/doc/38701537/Reporte-Panel-Region-Capital-UNCRD-InTA>.

The following actions are suggested under this guideline:

- (a) **Create bodies to coordinate public action among different authorities, sectoral areas and levels of government to identify and discuss reforms in favour of sustainable development and their practical implications**

Bodies can be set up to deal with specific issues, such as the Executive Committee of the Action Plan for Prevention and Control of Deforestation in the Legal Amazon (PPCDAM) in Brazil (see chapter II), or permanent inter-ministerial committees to coordinate the action of various government entities, such as those in Mexico and Chile on climate change and sustainable development, respectively (see box VI.2). Such bodies should be at the highest institutional level possible and be responsible for reviewing inconsistencies in policies and evaluating potentially conflicting incentives and disincentives.

Box VI.2

INTER-MINISTERIAL COORDINATION FOR SUSTAINABLE DEVELOPMENT

Inter-Ministerial Commission for Climate Change (CICC) of Mexico: This body coordinates the work of various federal agencies involved in policymaking and implementation of national measures to prevent and mitigate greenhouse gas emissions and climate change. It is also responsible for promoting programmes and strategies for fulfilling the commitments assumed by the country under the United Nations Framework Convention on Climate Change. As such, it is the authority that approves clean development mechanism (CDM) projects under the terms of the Kyoto Protocol. CICC is made up of 10 secretariats, has 6 special working groups and has a consultative council on which civil society, academia and subject experts are represented. It has been working on and coordinating climate change policies since 2005. It also served as the coordinating body for the preparation of the National Strategy on Climate Change and drew up the Special Climate Change Programme for 2009-2012 as part of the National Development Plan for 2007-2012, among many other achievements.

Council of Ministers for Sustainability of Chile: Act No. 20.417 of 26 January 2010 provided for the establishment of the Ministry of the Environment and, within that framework, the creation of this council. The Council of Ministers for Sustainability is presided over by the Ministry of the Environment and is composed of the Minister of Agriculture, the Minister of Finance, the Minister of Health, the Minister of Economic Affairs, Development and Reconstruction, the Minister of Energy, the Minister of Public Works, the Minister of Housing and Urban Development, the Minister of Transport and Telecommunications, the Minister of Mining and the Minister of Planning. Its task is to submit policy proposals to the President for the sustainable management, use and development of natural resources. While it is still too early to assess the Council's work as such, it was created to increase the coordination and coherence of various State policies and to ensure that they support sustainable development.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official documents.

With regard to coordination among different political entities, some mechanisms already in use in the region include municipal consortia, territorial integration committees, regional planning boards (see chapters I and III) and committees on catchment areas.

- (b) **Plan for sustainable development**

Within the framework of development planning, which is experiencing a resurgence (see chapter I), sustainability must be mainstreamed as a central element, both conceptually and in terms of concrete action. Sustainability must include environmental issues, the sustainable management of natural resources, climate change adaptation strategies and disaster risk reduction, among others. This is particularly important because environmental problems and sustainable development, which require long-term solutions and strategic visions, are often at odds with short political and administrative cycles.

Planning exercises can enable stakeholders to reach broad consensus and development can be oriented towards the aspirations of society as a whole. When defining key points for planning in priority areas, decision makers should include a gender dimension in order to analyse the impact of action taken on the lives of men and women.

Likewise, development planning should incorporate risk management (including climate change adaptation) in order to formulate actions that protect life, promote human security and build up the region's resilience.

(c) Conduct land-use planning in regions and cities

Land-use planning and strategic management in both rural and urban areas are key to integrating the three pillars of sustainable development —environmental, social and economic— into activities in those areas, in accordance with the intended use of the land and its limitations, with a view to preventing or mitigating the risks involved for human security. Such planning should be carried out at the national, regional and local levels of government with the involvement of the private sector and civil society.

(d) Carry out strategic evaluations of sectoral policies (on energy, agriculture, infrastructure, integration, urban development and fiscal matters, for example) to ensure that such policies are not working at cross-purposes and to identify possible unwanted effects

Certain methodologies, such as the strategic environmental assessment, ensure that environmental considerations are taken into account in strategic decision-making (policies, strategies, plans and programmes). The region's countries have recently begun to incorporate the strategic environmental assessment into their legal frameworks. In Chile, for example, under Act No. 20.417, promulgated in January 2010, strategic environmental assessments must be carried out when drafting regional land-use plans and regulatory plans at the municipal level, as well as other general normative policies and plans that could have an impact on the environment or sustainability, for example, infrastructure and fiscal plans.

(e) Adopt sustainable development goals

Establishing a series of clear, simple and widely disseminated goals could help to steer public and private sectors towards taking action in line with set priorities and within a clear time frame. Detailed goals could be defined at the international, regional, national and even local levels. International or regional goals would have the advantage of being internationally recognized and would have the potential to generate shared learning experiences and prevent competitive imbalances. National goals, on the other hand, could be more specific and give priority to the aspects of the international goals that are relevant at the country level.

In order to be feasible, the goals must be clearly defined and simple, easy for the general public to understand and based on indicators that can be monitored effectively. That will necessitate a solid statistical base, as addressed under guideline 5 below. If the goals are to be fully accepted, various stakeholders must be involved in their formulation and monitoring.

It is vital that public institutions at all levels, development banks and other financial institutions, as well as civil society organizations and the private sector, take on these goals, which will require a concerted awareness-raising effort.

As part of the preparatory process for Rio+20, the idea of establishing a new set of goals on sustainable development was put forward by Colombia, Guatemala and Peru. Their proposal was to establish sustainable development objectives that would serve as a concrete reference for achieving the convergence of and linkages between the three pillars of sustainable development. Similar to the Millennium Development Goals, the sustainable development goals would be defined at the international level and would serve to compare outcomes and identify opportunities for cooperation, including South-South cooperation.⁵ As was the case for the Millennium Development Goals, the objectives identified to determine compliance with the sustainable development goals would have to be measurable. While sectoral objectives (such as water, energy, food, housing and poverty, among others) could be more common, they could also be transversal, such as improving national accounts, eliminating counterproductive subsidies, promoting innovation and introducing legislation to improve access to information, participation and justice in relation to environmental matters. Issues such as gender equality and empowerment of women should be covered on two counts: as sectoral matters (in their own right) and as cross-cutting concerns (necessary for the achievement of all other goals).

Guideline 5

Produce and disseminate statistics and information on the environment and sustainable development

It is difficult for economic decisions and public policies to support sustainable development and for civil society to adopt an informed position in the decision-making process if the market sends no information or signals with respect to the environmental and social costs of these decisions and policies. Market silence also encourages a preference for short-term solutions that disregard future costs or the costs for those without power to influence the decisions.

Decision-makers must have the tools and information they need to compare alternative courses of action and monitor outcomes. The judicial system must have information on true environmental costs in order to enforce justice in a proportional manner. Social stakeholders also need information in order to lobby for better public policies and make informed choices.

The following actions are suggested in this connection:

(a) Strengthen environmental information systems

Environmental information systems generate, systematize and make available statistics and indicators that are indispensable to decision-makers and the general public for analysing and monitoring public policies. While electronic platforms enable users to access these data from a single point of access, their value obviously depends on the quality of the information they provide (see point (b)).

Although most countries in the region already have environmental information systems, they vary in terms of coverage and quality. Building up those systems will require stronger national and regional systems for compiling, monitoring and analysing data related to the environment, with a view to guaranteeing the availability of structured and comparable official information, using the international recommendations on environmental statistics adopted by the United Nations Statistical Commission as a conceptual and methodological framework.

⁵ See the initial proposal presented at the Latin American and Caribbean Regional Meeting Preparatory to the United Nations Conference on Sustainable Development, held in Santiago, Chile, in September 2011 (ECLAC, 2011) and Colombia's input to the Rio+20 compilation document sent to the Conference Secretariat in October 2011 [online] www.uncsd2012.org/rio20/index.php?menu=115.

Within the framework of their environmental information systems, countries should take steps towards consolidating methods and mechanisms for periodic reporting on the impact of industrial activities by both private and public enterprises. In that regard, pollutant release and transfer registers (PRTRs) must continue to be kept and should be easily accessible to the general public.

As mentioned in chapter III, in the past two decades, visible progress has been made in terms of technologies that could contribute to environmental protection. However, these technologies have yet to be applied in much of the region, mainly owing to a lack of resources and technical capacity. In this area international cooperation is fundamental.

(b) Enhance the integration of economic, social and environmental information systems

In parallel with the recommendations under guideline 2, it is fundamental to create or strengthen information systems and indicators that cover the three pillars of sustainable development. From indicators that decouple economic activity from environmental implications, to integrated environmental and economic accounts systems, to sustainable development indicator systems, there are numerous tools that should be developed and put to use in support of public policy.

The information systems on natural disasters and the potential impacts of climate change must be supplied with constantly updated economic, social and environmental information. For example, historical records of losses and damage caused by disasters (the direct consequence of vulnerable conditions, exposure and environmental degradation) help to establish a base line for evaluating the potential impact of climate change in the countries of the region.

(c) Foster a territorial focus in gathering information for sustainable development

Urban and subregional or territorial perspectives should be taken into account in the management of data and indicators. Data for urban agglomerations are scarce (and those that are available are often not comparable) and most of the established indicators do not reflect urban-quality or local-economy issues (for instance, local GDP, urban transport, public spaces, security, growth models and urban services).

(d) Increase human and financial resources to boost the production, processing and dissemination of environmental and sustainable development statistics and indicators and develop awareness-raising strategies to expand their use

Designing development and sectoral policies that effectively incorporate the three pillars of sustainable development requires a solid statistical base that includes demographic and economic data, as well as information on human settlements and natural and human capital. Where applicable, statistics should be georeferenced and disaggregated by sex, race, ethnicity and age. Issues such as gender equality and the empowerment of women —the cornerstones of economic and sustainable development— need to be directly reflected in any new measurement system. Key concepts, such as poverty, capital and wealth, will have to be redefined and new measures and indicators will have to be introduced to capture the broader, multidimensional sense of those concepts.

As they progress in the generation of statistics, countries must meet the quality criteria laid down by international standards and constantly strive towards greater statistical harmonization and reconciliation. Several countries in the region have taken part in statistical conciliation exercises within the framework of the Millennium Development Goals.⁶

⁶ See ECLAC, Millennium Development Goals in Latin America and the Caribbean [online] <http://www.eclac.cl/mdg/default.asp?idioma=IN>.

Indicators can help to raise awareness of the statistical information available to support decision-making and draw attention to remaining gaps. In this instance, the region's countries can draw on their experiences in developing the indicators for the Millennium Development Goals and in formulating regional sustainable development goals and follow-up indicators (see guideline 4, point (e)) under the Latin American and Caribbean Initiative for Sustainable Development (ILAC), which was organized under the auspices of the ministries of environmental affairs in the countries of Latin America and the Caribbean, the United Nations Environment Programme (UNEP) and ECLAC.

Investments must be made in disseminating information, with a view to creating resources that serve the purposes of different users, through reports, compilations and other materials, and that make use of a variety of media, including the Internet. Examples of how this can be done include the comprehensive environmental evaluations in the Global Environmental Outlook reports published by UNEP and the steps taken by ECLAC to expand statistical capacity and make data available to the public through the CEPALSTAT database.

The use of the Internet has helped significantly to make environmental information systems accessible to a wider public, but additional efforts are needed to reach disadvantaged groups, rural populations and indigenous communities with limited access to the Web.

Guideline 6

Formulate better policies based on a more informed, participatory process

As mentioned in chapter III, the region has made great strides towards establishing legal and institutional frameworks to guarantee citizens' access to information and justice and to mechanisms for citizen participation in decision-making on the natural resources sustaining their communities. Nevertheless, challenges remain.

For citizens to participate in an informed manner in such decision-making, countries must, as established under guidelines 2 and 5, strengthen their capacity to produce, process and disseminate environmental and sustainable development statistics and indicators at the national level. However, it is not enough to extend the supply of strategic environmental information solely among decision-makers; demand also has to be built up at a strategic level in each strata of society in order to guarantee the use of the environmental information outputs (Quiroga, 2005). Education therefore plays a key role in developing citizen demand for more and better information and participation (see guideline 7). Promoting leadership can also help to encourage citizens to demand their right to participate in decision-making processes. In this context, encouraging women, indigenous and young persons to take on leadership roles is therefore key to ensuring the development of inclusive policies that respond to the needs of groups that are typically excluded from decision-making processes.

Providing access to information on the responsible use of resources, such as water, is the first step towards raising public awareness and thus facilitating participation in resource management in line with principle 10 of the Rio Declaration. In order to do so, reliable, relevant, objective, up-to-date information has to be compiled and made readily accessible to ensure transparency. Such information helps people to understand the issues and thus contributes to more effective management. Educating the public in this respect can promote environmental values and help to strengthen public participation, which will, in turn, contribute to priority-setting and the adoption of measures needed to achieve a sustainable form of natural

resource management. The countries of the region should redouble their efforts to improve their knowledge base in this area and, when possible, undertake research on future trends.

One cross-cutting element that is applicable to all of the actions suggested under this guideline is the need to strengthen capacities of those who are traditionally underrepresented in participatory processes, including women and indigenous and Afro-descendent populations and communities, thus ensuring that the region's diverse languages and cultures are recognized. Citizen participation cannot be restricted to one language in multicultural countries or to one medium, such as the Internet, which has serious deficiencies in coverage. The State must guarantee citizen participation in decision-making, paying special attention to underrepresented groups by taking specific enabling measures (such as the provision of child-care services and technical capacity-building), introducing affirmative action policies (such as quotas in decision-making forums) and conducting studies into the social impact of projects, policies, plans and programmes in order to ensure that the particular needs of disadvantaged groups are being met.

Institutional mechanisms must be created or improved to ensure that those who will be directly affected by the environmental or social consequences of decisions are involved in the corresponding decision-making processes. Where infrastructure projects or mining activities could be detrimental to the economic or social livelihoods of certain populations (often indigenous communities), certain steps which are compatible with the culture of those populations should be taken when seeking their consent and could include public hearings, training and the introduction of economic and social development policies.

As part of the Three Demands campaign led by The Access Initiative, civil society organizations have demanded, among other things, the establishment of public funding sources to support citizen participation and representation in legal cases of public interest, including, for example, pretrial assistance to gather evidence.⁷

The following actions are suggested under this guideline:

- (a) **Establish an international agreement to take steps towards the effective implementation of principle 10 of the Rio Declaration, guaranteeing access to information, citizen participation and justice in decision-making on environmental issues, especially to disadvantaged persons as a result of discrimination, poverty or poor health**

Within the framework of the discussions on Rio+20, Governments of the region and civil society have raised the issue of the need to improve mechanisms for access to information, participation and justice in decision-making and have suggested three options in this regard. The first proposal is to establish a regional legal instrument guaranteeing the rights enshrined in principle 10 of the Rio Declaration. This could be based on lessons learned from the European experience regarding the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention).⁸ A second alternative suggest the drafting of a new international instrument and, a third option is that the countries of the region could accede to the Aarhus Convention, which is open for signature by other member States of the United Nations, despite being a convention of the United Nations Economic Commission for Europe.

⁷ For more information on The Access Initiative and the Three Demands campaign, see [online]: <http://www.accessinitiative.org>.

⁸ Adopted at Aarhus, Denmark, in June 1998. It entered into force on 30 October 2001. By August 2010 it had been signed by 40 countries, principally from Europe and the European Union. See [online] <http://live.unece.org/env/pp/ratification.html>.

All of these initiatives seek to promote the implementation of principle 10 in the region, ensuring not only that legislation is passed, but also that it is enforced and that there is a constant improvement in citizen participation and government transparency. Box VI.3 contains the proposals of the countries of the region in this regard, submitted to the Conference secretariat between October and November 2011 in their inputs for the Rio+20 compilation document.

Box VI.3

LATIN AMERICA AND THE CARIBBEAN: COUNTRY PROPOSALS ON ACCESS TO INFORMATION, PARTICIPATION AND JUSTICE IN DECISION-MAKING ON ENVIRONMENTAL MATTERS, WHICH FORM PART OF THEIR CONTRIBUTIONS TO THE NEGOTIATING DOCUMENT FOR THE UNITED NATIONS CONFERENCE ON SUSTAINABLE DEVELOPMENT (RIO+20)

As part of the preparations for Rio+20, the Conference secretariat issued an open invitation for submissions to the negotiating document. Presented below are some of the proposals received from the countries of the region with regard to access to information, participation and justice in environmental matters.

Argentina: The inclusion in recent years of topics proposed by civil society in the political agenda demonstrates the importance of mechanisms for citizen participation in democracy. Institutionalized mechanisms for citizen participation provide transparent, horizontal and open channels for the development of synergies between stakeholders. They allow citizens to have a bigger part in decision-making and in the adoption of concrete measures in keeping with their own interests. The social dynamic as expressed by community stakeholders and supported by the media is a central factor in the development of the collective solutions required. Debate is of added importance for the enhancement of public policy coordinated at the municipal, provincial and national levels. More specifically, environmental issues lend themselves to increased citizen participation. Rooted in the relationship between civil society and the State, such participation calls for a space in which citizens can feel comfortable, a space that heightens the sense of belonging individuals need to assert themselves and exercise their rights.

Brazil: Negotiations should be launched on an international convention on access to information, public participation in decision-making and justice in environmental matters. Support is proposed for setting in motion a negotiation process at Rio+20 for an international convention that would ensure implementation of principle 10 of the Rio Declaration. Principle 10 is already the subject of regional instruments designed to increase opportunities to access environmental information and ensure the transparency and reliability of procedures. Such mechanisms help improve environmental governance by creating mutual trust between civil society and governments, including the decision-making bodies of subnational authorities. All sectors of civil society and all spheres of government should participate in the process of developing an instrument of this kind.

Chile: Chile considers that the rights of environmental access, participation and justice embodied in principle 10 of the Rio Declaration must be fully implemented. Chile is also in favour of signing regional agreements for the adoption of principle 10. Similarly, Chile advocates greater participation of local communities in decision-making processes, improving instruments for environmental oversight and justice without compromising the sovereignty of each country, and solutions to environmental damage at the international level as in the case of territories that are not subject to national jurisdiction.

Costa Rica: With regard to monitoring and participation, efforts to establish and consolidate permanent mechanisms for grass-roots dialogue and consensus-building should be facilitated through international cooperation. This will ensure that the major groups, as key stakeholders, participate in the commitment to sustainable growth and development, respecting and valuing ecosystem services as part of the domestic economy. These mechanisms should, inter alia, constitute a tool for promoting implementation of Rio+20 and, in the long term, evaluating the outcomes.

Jamaica: In terms of access to information, Jamaica already has legislation in place to deal with access to information and conducting environmental impact assessments, and has drafted legislation on pollutant release and transfer registers and third party rights of appeal, among other matters. Notwithstanding concerns over the growing number of treaties, Jamaica considers that a regional agreement on principle 10 of the Rio Declaration, based on the Aarhus Convention, would enhance public participation in the decision-making process.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of country submissions available at [online] <http://www.uncsd2012.org/rio20/index.php?menu?115>.

- (b) **Improve or establish clear national legal frameworks and procedures for obtaining environmental information, with the necessary oversight mechanisms and procedures for providing access to disadvantaged groups and groups who have traditionally been under-represented politically, such as women, young people, indigenous people and Afro-descendants**
- (c) **Expand citizen participation in the adoption of State policies, plans and programmes, establishing clear and transparent mechanisms to consider citizens' views**

The difference between the public's perception of what participation means and what is laid down in legislation and regulatory frameworks is sometimes a source of frustration and mistrust when it comes to real opportunities to influence environmental decision-making. Setting forth the way in which the received views will be considered and making this transparent lends more credibility to the processes and helps prevent potential conflict. Citizens' role, contribution and participation should be extended to international forums and negotiations as well.

(d) Consider creating judicial bodies specialized in environmental matters

As suggested by The Access Initiative (2011), environmental courts may be a cheaper dispute settlement option than traditional courts. They could be a faster and less expensive solution to environmental claims brought by the public, since they would offer specialized attention and superior knowledge of environmental legislation and science. The courts would need to be evenly distributed across territories to provide access to those living in remote areas or who suffer from discrimination because of their sex, race or ethnic origin.

- (e) **Establish standards for the adoption of eco-labelling and other information mechanisms that convey commitment by corporations to the principles of sustainability and which inform and educate consumers**
- (f) **Improve or establish transparency and accountability laws applicable to national and subnational public bodies**

An accountability policy not only requires that the public be given a louder voice in the political sphere, but also that governance reforms be carried out to give public institutions the incentives, experts, information and procedures they need to meet the public's specific needs.

Guideline 7

Strengthen education, culture, science and technology in order to build human capital for sustainability

In line with Agenda 21, chapter 36, the following action must be taken to build human capital for sustainability:

- (a) **Reform curricula to include education for sustainable development at all educational levels, adopting measures to institutionalize, finance and sustain it based on research, capacity-building and the exchange and systematization of experiences**

At the professional level, this includes developing skills to identify and reduce environmental and health-related costs in various professional fields, especially those relating to design, construction, land use, infrastructure, machinery and equipment, and regulatory frameworks.

- (b) **Address pre-existing needs, such as retaining children and young people in the education system, improving the skills and recognition of teachers in public education, mainstreaming information and communication technologies (ICTs) in education, and better management of schools and centralized and decentralized bodies**

The school day needs to be lengthened and the curriculum expanded proportionally, and pre-university education must be made available for all.

- (c) **Promote and encourage education for sustainable development outside the formal system**

This could be achieved, for example, by supporting the work of non-governmental organizations (NGOs) that run environmental, popular education and human rights programmes for women and indigenous and Afro-descendent communities (among other groups) in the region in their own languages. This approach includes democratizing and using ICTs as vehicles for raising broader environmental awareness.

- (d) **Raise awareness of environmental issues and sustainable development among the general public, seeking cultural change and paying special attention to building technical capacity among disadvantaged and underrepresented groups, such as women, indigenous people and Afro-descendants**
- (e) **Finance education, especially among the poor, young people and women, on sexual and reproductive rights, that including a comprehensive sex education that deals from early childhood with gender equality and self-care issues, in order to help reduce gender violence, unwanted pregnancies, maternal mortality and the spread of sexually transmitted diseases such as HIV/AIDS**
- (f) **Reform science and technology systems in order to improve their management and encourage innovation and knowledge generation, with a view to boosting competitiveness in knowledge-intensive and environmentally friendly sectors and thus enable a transition to more sustainable development (see box VI.4)**
- (g) **Finance cross-disciplinary research that encourages the generation of new technologies aimed at meeting the needs of the countries of the region and, in particular, disadvantaged groups**

Box VI.4

THE SCIENCE POLICY INFORMATION NETWORK (SPIN)

The Science Policy Information Network (SPIN) (see [online] <http://spin.unesco.org.uy>) was developed by the UNESCO Regional Office for Science and Technology for Latin America and the Caribbean as a deliverable of a mandate handed down by the meetings held between 2009 and 2011 of the Latin American and Caribbean Regional Forum on Science, Technology and Innovation Policies: Towards a New Social Contract for Science.

SPIN provides up-to-date, high-quality information for science policy decision makers in Latin America and the Caribbean. It provides real-time access to information disaggregated by country and supports the dynamic combination of variables to generate specific profiles by subregion and for the region overall. SPIN consists of six databases containing:

- Over 450 time series on science, technology, innovation, economy, environment, social and gender affairs, governance and ICTs, which support geo-referenced and dynamic analysis.
- The composition of each national system of science, technology and innovation in Latin America and the Caribbean.
- Legislative frameworks for science, technology and innovation in each country.
- No less than 900 scientific policy instruments implemented by Latin American and Caribbean countries.
- Details on programmes run by agencies for technical and financial cooperation on science and technology.
- As many as 800 titles produced by UNESCO on science, technology and innovation.

Source: UNESCO Regional Office for Science and Technology for Latin America and the Caribbean.

- (h) Promote South-South cooperation to link and coordinate common actions between different countries, in order to provide local, scientific and technological solutions for development problems, emphasizing strengths and focusing on exploiting the opportunities identified**

Countries in the region should develop regional research programmes, through academic and institutional integration. Countries cannot afford to set up scientific institutions with such scarce resources and lacking proper integration, either institutionally or in the form of networks.

- (i) Create an educational programme on sustainable development in a context of climate change, the key elements of which are to generate resilience, reduce the ecological footprint and boost future professionals' knowledge of the challenges and opportunities presented by sustainable development**
- (j) Direct resources to the development of information technologies that generate spatial data infrastructure and innovation in remote sensing technologies, in particular for regional, national and local climate monitoring**
- (k) Direct resources to the development of renewable energy technologies, technologies for sustainable water, management, alternative agriculture and cleaner production technologies, among others**
- (l) Create mechanisms for disseminating traditional knowledge and that of entities such as local universities, in order to integrate it into knowledge networks**

The following actions are suggested in this connection:

- (i) Support and strengthen regional experiences of recovering traditional knowledge and use of biodiversity.**

- (ii) Support initiatives to forge closer ties between the productive sector and publicly funded academic institutions in order to foster research that promotes sustainable development in the region.
- (iii) Direct the work of researchers and technical staff towards solving problems related to specific needs, incorporating traditional knowledge from the region's own cultures.

C. KEY ISSUES FOR THE SUSTAINABLE DEVELOPMENT OF CARIBBEAN SMALL ISLAND DEVELOPING STATES

The guidelines for integrating the three pillars of sustainable development, and much of the analysis relating to the other countries of the region, are also applicable to the small island developing States of the Caribbean.⁹ They have their own particular vulnerabilities, however, which make the transition to sustainable development especially challenging: their populations' size, their remote and isolated position, and the human, financial and technical constraints they face, in addition to their dependence on scarce natural resources. Their marine and coastal ecosystems are especially vulnerable to natural disasters and the impact of climate change and their economies are especially reliant on international trade. They are particularly vulnerable to adverse global developments and high transport and communications costs and some have weak and inefficient infrastructure and public administration. For all these reasons, international financing is vital for these economies if they are to make headway towards sustainable development and implement the policies and instruments proposed.

As noted in the assessment, the priority issues for the small island developing States of the Caribbean include reducing the risk of disasters; adapting to climate change; reducing dependence on fossil fuels; creating stronger incentives for proper waste and chemical management; protecting marine, coastal and freshwater resources and biodiversity; and ensuring that the tourism industry is compatible with sustainable development.

In order to adapt to climate change, Caribbean countries need economic development and fiscal policies capable of capturing the additional costs associated with the impact of climate change on infrastructure, public health, biodiversity and water resources, among others due to the effects of variations in rainfall, temperature and sea level and, especially, of the heightened destructive power of extreme weather events. If actions to promote adaptation to climate change are to be sustainable, they must include disaster risk reduction strategies.

Given these challenges, the costs of disaster risk reduction measures need to be internalized in development planning. Vulnerabilities must be mapped, along with their differentiated impact on disadvantaged groups, both in urban and regional planning and in building codes and legislation. Coverage against the risks of climate change must be diversified through new or broadened insurance mechanisms or financing for prevention and reconstruction.

These States' heavy dependence on imported fossil fuels means that fiscal (subsidies and taxes) and credit incentives need to be realigned to promote energy efficiency, renewable energies and capacity-building in the sector. This includes adopting more efficient forms of transport.

⁹ As mentioned in Chapter IV, the Caribbean small island developing States considered here are: Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

Given the size of their economies, waste management in these countries needs regional cooperation to create shared infrastructure on an appropriate scale for dealing with waste and dangerous pollutants and to explore possibilities for generating clean, low-carbon energy from waste.

If marine and coastal resources and biodiversity are to be properly managed, the economies must internalize the costs of coastal and marine degradation, especially that caused by land-based pollutants. Local economic incentives and disincentives are therefore crucial, as is subregional maritime transport, including for tourism. Regional cooperation can also help to generate economies of scale in the management and use of shared resources (such as fisheries) and in the protection of critical ecosystems, particularly in transboundary or multinational marine and coastal conservation areas.

Regulatory issues are crucial to the sustainability of the tourism industry. The rules applicable to tourism must be harmonized across the subregion to maintain competitiveness and capital mobility. Areas such as energy and telecommunications can benefit from regional coordination for similar reasons.

D. INTERNATIONAL CONDITIONS FOR MOVING FORWARD WITH THE CROSS-CUTTING GUIDELINES

International cooperation (in the form of financing or technology transfer) and the terms of international trade are not sufficient, either in relation to commitments made or the region's needs. The region still faces international market barriers to its products, especially those of higher value added. With a few notable exceptions, developed countries have not honoured their commitments to provide financial assistance, or shown leadership in alleviating global public bads such as climate change. There are some examples of successful technology transfer in specific areas, in particular under multilateral environmental or trade agreements, but technological weaknesses and the world intellectual property system limit those transfers. On the trade front, the outcome of the Doha Round is still pending. The current state of multilateral governance has been incapable of addressing the pressing challenge of achieving greater consistency between the conditions arising from global mechanisms and forums and the real needs of countries of the region.

In this regard:

- (a) **Developed countries must comply with the objective, proclaimed under General Assembly resolution 2626 (XXV), of devoting 0.7% of their gross national income (GNI) at market prices to official development assistance (ODA). This commitment was reaffirmed by the developed countries at the United Nations Conference on Environment and Development (1992) and at subsequent summits**

The shortfall today is close to 50% of that commitment (see chapter V), and more systematic and transparent monitoring of these flows is therefore needed at the international level. If the commitment contained in resolution 2626 (XXV) were fully realized, the additional funding for the Latin American and Caribbean region would amount to US\$ 9 billion, assuming its share in the world total remained constant. Accordingly, it would be advisable to reach a regional agreement on the priorities for using these resources. In addition, assistance for generating global goods and services must be differentiated from traditional official development assistance.

(b) For Latin America and the Caribbean, the Doha Round must be concluded to expand market access

Measures must be taken to eliminate the unfavourable tariff treatment of higher-value-added products and the trade-distorting agricultural subsidies in industrialized countries. This would create fairer conditions for competition for developing countries. For their part, the latter should develop national agricultural sustainability agendas to ensure that expanded production—in response to the reduction of distortions in developed countries—does as little environmental damage as possible. The Latin American and Caribbean countries need to act in a coordinated manner in adopting carbon-footprint-related trade rules, within the principle of common but differentiated responsibilities and the principle that trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided.¹⁰ The region must, as well, try to develop a broader range of low-carbon transport options in order to minimize the risk of its exports suffering discrimination, especially in industrialized countries. The Aid-for-Trade Initiative could provide some leverage in this regard (see chapter V).

(c) Consistency must be ensured between efforts to develop a global partnership for development (Millennium Development Goal 8) and the negotiations and commitments undertaken in international forums (on trade, climate, environment and finance, among others)

Multilateral financial institutions should be moving in the same direction, with the incorporation of environmental and health considerations into their operations (whether by means of regulations or by the inclusion of those costs). This would allow a more accurate economic value to be assigned to investments that have greater or lesser impact, with the result that their economic viability would gradually be brought into line with their environmental performance. In order to accomplish this, the directives or signals that financial institutions receive from country representatives need to be consistent. Just as importantly, the same type of policy coherence is required from the United Nations system, the Bretton Woods system, the World Trade Organization (WTO) and regional banks.

(d) Changes must be made to the international governance for sustainable development so that there is greater consistency among organizations working in development and associated with various international agreements

The agreements arising from Rio+20 regarding the institutional framework for sustainable development must ensure better coordination between the institutions of the United Nations system associated with the three pillars of sustainable development.

Both the concept of sustainable development and the mechanisms for putting it into practice must be mainstreamed in all bodies of the United Nations system.

Progress must also be made in creating synergies between the conventions on development, aiming for greater convergence between agendas so that parties can participate effectively, and joint secretariats could be considered in cases where economies of scale may be possible. Examples in this regard include the decision made by the Basel, Stockholm and Rotterdam conventions on chemical products to cooperate and coordinate with one another and share services in areas such as administration and finance, information and dissemination, and legal matters. It has been suggested that the three conventions should hold simultaneous meetings.

¹⁰ Principle 12 of the Rio Declaration.

- (e) **Governments must be encouraged to ratify and implement international instruments protecting the rights of disadvantaged groups, in particular children under two years, women and indigenous peoples, especially the Convention on the Elimination of All Forms of Discrimination against Women, the Beijing Platform for Action and the United Nations Declaration on the Rights of Indigenous Peoples, and align with the international framework of the Scaling Up Nutrition (SUN) Initiative**
- (f) **It is essential to work towards region-wide cooperation and agreements to gradually internalize environmental costs**

Unilateral measures in this area are likely to carry heavy competitiveness-related costs for countries. Accordingly, regional (and ideally global) commitments are needed to drive headway in the preparation of integrated natural capital accounts and other instruments such as economic standards and measures with early implementation deadlines. Regional cooperation on technical assistance, capacity-building and knowledge exchange, among other goals, are also necessary.

Another useful measure would be to create global market incentives for the conservation and sustainable management of biodiversity, including the reduction of barriers to trade in biodiversity-based higher-value-added products.¹¹

A multilateral agreement on climate change that includes the main emitting countries must be reached as soon as possible. Until consensus is achieved on a regime to follow the first commitment period of the Kyoto Protocol, countries will continue to stall and certain organizations will continue to broadcast different opinions on what the multilateral system could and should be doing, and this will make it more likely that the industrialized countries will introduce unilateral measures that will restrict the region's access to their markets. At the regional level, it is important to review the best options for integrating infrastructure for energy, communications and transport, in order to prevent development paths from becoming locked into a high-carbon trajectory.

- (g) **Rules must be defined on access to new technologies**

Technology transfer is an acknowledged must if developing countries are to meet their international commitments on the environment. Among the most important issues for development partnerships to address are trade rules as they relate to intellectual property rights, biotechnology in biodiversity and information and communication technologies (ICTs).

E. CLOSING REMARKS

The information presented in this document describes a pressing and highly uneven environmental, social, economic and institutional situation, against the backdrop of various crises at all levels, including the global level. But, above all, it points to vast room for improvement in economic governance in terms of making it more comprehensive and consistent with a higher concept of development. Rio+20 represents an opportunity to redefine the future development vision to which countries aspire, with human beings at the centre and set within the current global context. The proposals made here, together with other similar

¹¹ Tools that could be explored in this connection include financial securities for biodiversity conservation and mutual recognition of sustainable practices in biodiversity-based production for international trade.

initiatives, are intended to nourish these visions. Yet the challenge of sustainable development lies ultimately at the doors of the main actors—States, the private sector and civil society—who must choose the values on which to base their action. States, through Governments and the public apparatus, must guarantee citizens equal and equitable possibilities and potential. The private sector must look beyond short-term gain as the sole motivation for their activities and provide leadership in the championing of sustainability as one of their principles: economic activity must refocus on meeting human needs, in a context of respect for the environment and for people. Civil society must have the freedom to develop creatively and responsibly in the areas of health, education, culture and spirituality.

The degree of globalization and undeniable interdependence that now exists between countries, sectors and ecosystems calls for coordinated action between the countries of the region and the developed economies within the framework of principle 7 of the Rio Declaration regarding common but differentiated responsibilities. Here, progress must be made in making the conditions arising from global mechanisms and forums more consistent with the real needs of countries. As a matter of urgency, a common effort must be forged between the developing and developed countries within an effective global partnership for development, with a view to achieving substantive progress towards development sustainability.

The establishment of regional or global agreements or shared commitments based on previously agreed sustainable development indicators could help to drive a faster transition towards full internalization of environmental costs, as well as the creation of compensation mechanisms for the sectors most disadvantaged in the short or medium terms by the relative price shifts arising from the recognition of environmental costs.

Bibliography

- Bárcena, Alicia (2009), “La nueva institucionalidad multilateral frente a un mundo en transición”, *Revista Foreign Affairs Latinoamérica*, vol. 9, No. 3.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2011), *Report of the Latin American and Caribbean Regional Meeting Preparatory to the United Nations Conference on Sustainable Development* (LC/L.3432), Santiago, Chile.
- _____ (2010), *Time for equality: closing gaps, opening trails* (LC/G.2432(SES.33/3)), Santiago, Chile.
- IPAM (Amazon Environmental Research Institute) (2011), “A região da Transamazônica rumo á economía de baixo carbono: Estratégias integradas para o desenvolvimento sustentável”, Brasília [online] <http://www.ipam.org.br/biblioteca/livro/A-Regiao-da-Transamazonica-rumo-a-economia-de-baixo-carbono-estrategias-integradas-para-o-desenvolvimento-sustentavel/576>.
- Ocampo, J., A. Cosbey and M. Khor (2011), “The transition to a green economy: benefits, challenges and risks from a sustainable development perspective. Report by a panel of experts to Second Preparatory Committee Meeting for United Nations Conference on Sustainable Development”, United Nations Department of Economic and Social Affairs/United Nations Environment Programme (UNEP)/United Nations Conference on Trade and Development (UNCTAD).
- Quiroga, Rayén (2007), “Indicadores ambientales y de desarrollo sostenible: Avances y perspectivas para América Latina y el Caribe”, *Manuales series*, No. 55 (LC/L.2771-P), Santiago, Chile, December. United Nations publication, Sales No. S.07.II.G.108.
- _____ (2005), “Estadísticas del medio ambiente en América Latina y el Caribe: Avances y perspectivas para América Latina y el Caribe”, *Manuales series*, No. 43 (LC/L.2348-P), August. United Nations publication, Sales No. S.05.II.G.110.
- TEEB (The Economics of Ecosystems and Biodiversity) (2010), *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature. A Synthesis of the Approach, Conclusions and Recommendations of TEEB*, [online]: http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&tabid=1278&mid=2357.
- UNCRD (United Nations Centre for Regional Development) (2010), *Seguridad humana y desarrollo regional en Bogotá y Cundinamarca*, Bogota, Bogota-Cundinamarca Regional Planning Board.
- UNEP (United Nations Environment Programme) (2011), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers*, St-Martin-Bellevue.
- UNEP (United Nations Environment Programme)/Red MERCOSUR (2011), *Resource Efficiency in Latin America: Economics and Outlook. Case Studies: MERCOSUR, Chile and Mexico*, Panama City [online] <http://www.pnuma.org/reoo/>.
- United Nations (2010), *Millennium Development Goals: Advances in Environmentally Sustainable Development in Latin America and the Caribbean* (LC/G.2428-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).

This report describes the progress achieved in relation to sustainable development since 1992 and the gaps still remaining. It draws attention to a pressing environmental, social, economic and institutional situation. Above all, however, it highlights the vast potential for advancing economic management towards a more comprehensive model in keeping with the notion of inclusive and sustainable development. The guidelines proposed aim to seize the opportunity Rio+20 offers to redefine the vision of future development to which the countries aspire.

“Both science and economics tell us our current path is unsustainable. Ecosystems are under stress. Economies are faltering. The human appetite for resources keeps growing. We need to chart a new, more sustainable course for the future, one that strengthens equality and economic growth while protecting our planet. Sustainable development offers our best chance to change course.”

Remarks by the Secretary-General of the United Nations, Ban Ki-moon, at the launch of the Global Sustainability Panel Report, “Resilient People, Resilient Planet: A Future Worth Choosing” (A/66/700) (Addis Ababa, 30 January 2012).

