

The DAC Guidelines

**Integrating the
Rio Conventions
into Development
Co-operation**



OECD



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Integrating Rio Conventions into Development Co-operation



ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Foreword

This publication is primarily intended for decision-makers and development policy experts in donor organisations. It aims to clarify the linkages between the Rio Conventions and sustainable development, and provide insights as to how development co-operation agencies can help developing countries respond to global environmental threats. The objective is to identify development co-operation approaches which can address development and poverty reduction concerns in the context of global environmental issues. Climate change, biodiversity loss and desertification, to name but a few, are major factors which threaten developing countries' development prospects. The document should also be of benefit to policy makers and development planners in developing partner countries by helping them to identify appropriate adaptation and protection strategies and to integrate them into their development agendas.

The publication contains four components:

- **The Policy Statement**, which highlights priorities for actions, was endorsed at the OECD Development Assistance Committee's High Level Meeting on 16 May 2002.
- **The Executive Summary** is intended primarily for decision-makers and senior management. It describes key policy messages and priority actions for development co-operation.
- **The Main text** is intended for policy makers and staff of development co-operation organisations and counterparts in partner countries. It provides an analysis of the linkages between environment, poverty and development, and a justification for helping to integrate the global environmental challenges into the development agenda of partner countries. The last section provides recommendations for donors.
- **The Annexes** include "*Conventions Tip-Sheets*" which summarise the key issues, concepts and terms relevant to each of the Rio Conventions, and an overview of the links between the global environmental issues and development.

A "**Busy reader's guide**" is provided on page 20.

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This document is the result of work undertaken by the OECD DAC Working Party on Development Cooperation and Environment (WP/ENV). Members of the Working Party are Australia, Austria, Belgium, Canada, Denmark, the European Commission, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Spain, Sweden, Switzerland, the United Kingdom and the United States. The International Monetary Fund, the World Bank and the United Nations Development Program participate as permanent observers. The Club Du Sahel, Development Center, International Institute for Environment and Development, International Institute for Sustainable Development, United Nations Environment Program, World Conservation Union and World Resources Institute participate regularly in the work of the Working Party.

The Guidance was prepared by an “Expert Group on the Rio Conventions”, led by the Netherlands (M. Peter de Koning, of DML) and Germany (Mr. Josef Gamperl of KfW). Ms. Christine Elias, of the World Resources Institute, as well as Remy Paris and Georg Caspary of the OECD Secretariat, provided substantive [and administrative] support to the Expert group, while Maria Consolati provided invaluable secretarial assistance. Ms. Ingrid Hoven of Germany, as Chair of the WP/ENV, provided guidance and advice throughout the exercise.

Table of Contents

FOREWORD	3	2.3.1. Human activities put pressures on ecosystems	27
POLICY STATEMENT BY THE DAC HIGH LEVEL MEETING, 16 MAY 2002	9	2.3.2. Underlying drivers of global environmental problems	28
EXECUTIVE SUMMARY	13	2.4. Climate change, biodiversity loss, desertification: impacts on sustainable development	29
I. Why integrate the Rio Conventions into development policy?	13	2.4.1. Climate change will threaten human livelihoods in various ways	29
II. The global environment and the development agenda: understanding the linkages	14	2.4.2. Loss of biodiversity threatens ecosystems' services important for small- and large-scale agricultural production	29
III. The Rio Conventions: international responses to global environment issues	15	2.5. Interaction between global environmental threats	32
IV. Entry points and instruments for integration	17	2.6. Addressing global environmental problems: hard choices and win-win options	33
V. Win-win development strategies and global environmental issues: agriculture, sustainable forest management and energy sectors	18	2.6.1. Short term <i>versus</i> long-term priorities	33
VI. Integrating global issues into development policies and development co-operation: priority areas for action	19	2.6.2. Win-win approaches	34
		2.6.3. Dealing with hard choices	34
BUSY READER'S GUIDE TO THIS DOCUMENT	20	3. THE RIO CONVENTIONS: INTERNATIONAL RESPONSES TO GLOBAL ENVIRONMENTAL ISSUES	37
1. THE GOALS OF THE GUIDANCE	21	3.1. The Rio Conventions and sustainable development	37
1.1. Addressing global environmental issues is key to sustainable poverty reduction	21	3.2. The Conventions provide specific response instruments and mechanisms	37
1.2. The goals of the guidance	22	3.2.1. Financial instruments	38
2. THE GLOBAL ENVIRONMENT AND THE DEVELOPMENT AGENDA: UNDERSTANDING THE LINKAGES	25	3.2.2. Benefit sharing, traditional knowledge	39
2.1. Ecosystems and human livelihoods	25	3.2.3. Technology transfer	40
2.2. Global environmental issues, ecosystems, and sustainable development	25	3.2.4. Capacity development	41
2.3. Driving forces underlying global environmental problems	27	3.3. Complementarities among the Conventions	42
		3.3.1. Complementarities through scientific assessments, reporting and policy formulation	42
		3.3.2. Synergies through international negotiation processes	42

3.3.3. Complementarities through the Conventions' Secretariats and national-level Conventions focal points	42
--	----

3.4. Integrating convention implementation into "mainstream" national planning processes 43

3.4.1. The "action plans" called for by the Conventions	43
3.4.2. Integrated capacity development	44
3.4.3. Key challenges of integration	44

4. INTEGRATING GLOBAL ENVIRONMENTAL ISSUES INTO THE DEVELOPMENT AGENDA: APPROACHES, ENTRY POINTS AND INSTRUMENTS 47

4.1. Key entry points: sustainable development strategies (SDS) 47

4.1.1. Sustainable development strategy: a generic concept and not a "model"	47
4.1.2. SDS: Dynamic processes focussing on integration	47
4.1.3. Building blocks of sustainable development strategies	48

4.2. Poverty reduction strategies 49

4.2.1. "Action plans" developed in response to the Rio Conventions	50
--	----

4.3. Approaches and instruments for integration 51

4.3.1. Ecosystem-based approaches: matching development strategies with countries' physical and ecological conditions	53
4.3.2. Spatial planning and land use management	53
4.3.3. Assessing the impact of development policies and plans: Strategic Environmental Assessment (SEA)	54
4.3.4. Project-level Environmental Impact Assessment (EIA)	54
4.3.5. Community-Based Natural Resource Management (CBNRM)	55
4.3.6. Integrated capacity development	56

5. SECTORAL DEVELOPMENT STRATEGIES AND GLOBAL ENVIRONMENTAL ISSUES: SYNERGIES AND HARD CHOICES 59

5.1. Development-global environment: "win-win" options and hard choices 59

5.2. Agricultural development and global environmental issues 60

5.2.1. Basic approach: increasing agricultural production	60
5.2.2. Policy instruments available for steering the agricultural sector	60
5.2.3. Agriculture-biodiversity linkages	61
5.2.4. Agriculture-desertification linkages	62
5.2.5. Agriculture-climate change linkages	62
5.2.6. Win-win options agriculture-biodiversity-desertification	63

5.3. Forest development and global environmental issues 66

5.3.1. Basic approach: reconciling the multiple functions of forests	66
5.3.2. The multiple threats to forests	66
5.3.3. Forest-biodiversity-climate change-land degradation: linkages	67
5.3.4. Development and the global environment: hard choices	67
5.3.5. "Win-win" policy approaches	69
5.3.6. Protecting forests through the clean development mechanism?	70

5.4. Energy development and global environmental issues 70

5.4.1. Energy use in developing countries: basic facts	70
5.4.2. Policy instruments available for steering the energy sector	71
5.4.3. Energy-global environment linkages	73
5.4.4. Energy-global environment: "win-win" options and hard choices	74

6. INTEGRATING GLOBAL ISSUES INTO DEVELOPMENT POLICIES AND DEVELOPMENT CO-OPERATION: PRIORITY AREAS FOR ACTION	77		
6.1. Actions at the international level: enhance global governance for sustainable development	77		
6.1.1. Promoting coherent approaches through the Convention negotiation processes	77	6.3.3. Sector-wide approaches	83
6.1.2. Enhancing collaboration among the Conventions' Secretariats and with relevant UN and other Agencies	78	6.3.4. Enhancing donor co-ordination mechanisms	84
6.1.3. Helping raise awareness of global environmental issues in relevant international fora	78	6.3.5. Building on ongoing projects and programmes	84
6.1.4. Harmonising the reporting of DAC Members' efforts	78	6.3.6. Fostering policy integration through capacity development	85
6.2. In development agencies' headquarters	78	6.3.7. Integrating at the project level: building on existing "safeguard" procedures	86
6.2.1. Making a clear commitment to integrating global environmental issues	78		
6.2.2. Intensifying links with other ministries and agencies involved in global environmental and other relevant issues	79	ANNEX 1A: SELECTED IMPACT OF GLOBAL ENVIRONMENT ON SECTORS	87
6.2.3. Increasing the understanding of linkages with poverty reduction	79	ANNEX 1B: (MIRROR) IMPACT OF SECTORS ON GLOBAL ENVIRONMENT	88
6.2.4. Strengthening agencies' analytical and policy formulation capacities	80	ANNEX 2: CONVENTIONS TIP-SHEETS	89
6.2.5. Integration in sectoral policies	80	Convention on Biological diversity (CBD)	89
6.2.6. Reconsidering sectoral responsibilities for global environmental issues	81	United Nations Framework Convention on Climate Change (UNFCCC)	91
6.2.7. Establishing special funds or "pilot projects"	81	United Nations Convention to Combat Desertification (UNCCD)	94
6.2.8. Stocktaking of current relevant activities across institutions	81		
6.3. At the partner country level	81	ANNEX 3: TECHNOLOGY CO-OPERATION: KEY LESSONS FROM DONORS' EXPERIENCE	97
6.3.1. Raising global environmental issues in country programming processes	82	BIBLIOGRAPHY	99
6.3.2. Integrating into country-level planning frameworks	82	TABLE	
		1. Global environmental issues and impacts on national sustainable development	26
		FIGURE	
		1. Linkages among food production and global environmental issues	32

BOXES		
1. Global ecosystems are threatened	26	
2. What are the environmental issues addressed by the “Rio Conventions”?	27	
3. Unnatural disasters, economic impacts	28	
4. Impacts of climate change on human livelihoods	30	
5. The socio-economic impacts of biodiversity loss	31	
6. Impacts of desertification on socio-economic development	31	
7. Desertification, biodiversity and climate change: some linkages	33	
8. What do the conventions say?	38	
9. Implementing the Rio Conventions: capacity development needs	40	
10. Capacity development for the Rio Conventions	41	
11. Climate change “adaptation” and “mitigation”	43	
12. Key principles underlying sustainable development strategies	48	
13. Integrating the biodiversity conservation strategy within the PRS: the case of Bolivia	51	
14. Ecological considerations in poverty reduction strategies	52	
15. Key features of an ecosystem-based approach	52	
16. Global – local linkages: local participation	56	
17. Capacity development and capacity building	57	
18. Policies for biodiversity-friendly agriculture	62	
19. Agricultural intensification can in some cases fuel deforestation	64	
20. Deriving financial benefits from biodiversity: approaches and instruments	65	
		21. Forests and biodiversity in the climate change negotiations
		68
		22. Why is energy use so inefficient in developing countries?
		71
		23. Protecting the poor from the impacts of energy subsidy reform
		72
		24. Demand-side management in the energy sector
		73
		25. Reducing greenhouse gas emissions in China through subsidy reduction
		74
		26. The Clean Development Mechanism (CDM)
		74
		27. Illustrative examples of special funds
		81
		28. Integrating global environmental issues into PRSs: examples of emerging good practice
		82
		29. Sector-wide approach: clarifying the role of donors
		83
		30. Donor co-ordination in Uganda
		84
		31. Catalysing policy review and reform through capacity development
		86
		32. Article 3
		93

INTEGRATING THE “RIO CONVENTIONS” IN DEVELOPMENT CO-OPERATION

**Policy Statement by the DAC High Level Meeting,
16 May 2002**

Nearly a billion households, particularly the rural poor, rely directly on natural resources for their livelihoods. But global environmental threats are undermining this resource base. Biodiversity loss is proceeding at a rapid rate in many countries, as is the build-up of toxic chemicals. Desertification and drought are problems of global dimensions, affecting all regions. Greenhouse gas emissions pose risks to the world's climate and developing countries are likely to be the most vulnerable to the impacts. Three UN Conventions, on Climate Change, Biological Diversity and Desertification - closely associated with the “Earth Summit”, held in Rio in 1992 - address these threats, which could undermine collective efforts to eradicate poverty and foster sustainable development worldwide.

We recognise that OECD countries bear a special responsibility for leadership on sustainable development worldwide, historically and because of the weight they continue to have in the global economy and environment. We also recognise the need to help developing countries address sustainable development issues as well as the need for further work on global and “mixed” public goods. These issues include those related to a clean atmosphere and the control of infectious diseases such as malaria and HIV/AIDS. Tackling these complex challenges will require better coherence in a wide range of policy areas, such as energy, trade, health, agriculture, investment and development co-operation. These issues and responsibilities are addressed in the Report prepared by the OECD Secretariat for the World Summit on Sustainable Development.

This Statement, and the detailed Guidelines that underlie it, spell out the role of our agencies in integrating global environmental challenges in development co-operation.

Although all countries are affected, the poorest are the most threatened because they have fewer resources to address the root causes of environmental threats and adapt to their impacts, and because their populations are highly dependent on natural resources for their livelihoods. Sustainable poverty reduction, a central priority on the development agenda, is therefore closely linked to sound environmental management at the local, national, regional and global levels.

We are concerned about the high vulnerability of many of the poorest countries to desertification and biodiversity loss and to the impacts of

Addressing global environmental issues is key to sustainable poverty reduction

Global environmental threats hurt the poor most

climate change. These environmental threats impact on rural livelihoods, food security and health, while exacerbating natural disasters such as floods and droughts. This vulnerability risks intensifying competition and conflict over already strained land and water resources and undermining efforts to reduce poverty. For many countries, these represent near-term threats requiring urgent responses.

Global environmental threats must be dealt with as part of the development agenda

Integrating environmental concerns in poverty reduction strategies and other national planning processes is a priority. Global environmental threats, and issues of global importance such as desertification and drought, present us with particular challenges in this respect. Their causes and consequences respect no national boundaries, but they call for responses at the international, regional, national and local levels. Addressing the causes and impacts of biodiversity loss, climate change and desertification require measures in sectors such as agriculture, forestry and energy. Development co-operation agencies, which provide assistance in many of these areas, can play an important role in assisting with capacity building in developing countries to improve the integration of these critical issues in national planning and policy-making mechanisms.

We are already working towards this objective in a number of fora, including through the Global Environment Facility, but this is not enough.

Integrating global environmental issues in national development strategies

The “Rio Conventions” reflect the commitment of all countries to preserve the global environment, on the basis of common but differentiated responsibilities and respective capabilities. They also clearly recognise that meeting national development needs and responding to global environmental threats must go hand in hand. Thus, they are about sustainable development, not just about the environment.

Too often, global environmental issues have been considered as a “stand-alone agenda” of limited concern to national or local development priorities. In many countries, for example, environment ministries have been assigned the prime responsibility for implementing the Conventions, without co-ordination at a government-wide level to implement the necessary response measures in key sectors such as agriculture, energy, transport, and beyond.

It is urgent to recognise this shortcoming and take necessary corrective actions, focussing on national development strategies which respond simultaneously to social, economic and environmental concerns.

There are many opportunities for “win-win” approaches

Tackling environmental degradation should go hand in hand with improving economic and social welfare. Improving food security and livelihoods for rural population requires combating desertification, conserving biodiversity and reducing vulnerability to climate change. Safeguarding the livelihoods of poor landless peasants, pastoralists or forest dwellers requires protecting the ecosystems on which they rely for

food and shelter. Improving access to efficient fuels and cookstoves improves the health and safety of women and children, reduces the burden of fuelwood collection chores, and also helps reduce pressures on forests.

In our capitals:

- **We will develop our agencies' capacity to recognise critical poverty reduction-global environmental linkages and formulate appropriate responses**

A sound understanding of poverty-environment linkages, and the threats arising from global environmental degradation, is necessary for the formulation of sound policies. We are committed to integrate these issues in our policies and country support strategies. We will also work to ensure that understanding of these issues is shared throughout our agencies, and not confined to the environmental specialists.

- **We will intensify our relationships with other ministries and agencies involved in global environmental issues**

Intensifying our relationships with other ministries and agencies involved in global environmental issues will help to formulate coherent approaches. Our active participation in international negotiations on global environmental issues and in the formulation of national positions gives us direct opportunities to ensure that the agreements made, and the mechanisms established to support them, complement our efforts to sustainably reduce poverty and reflect our experience in the field.

With our developing country partners:

- **We will help our partners meet their commitments and take advantage of the new opportunities arising from global environmental agreements**

We will assist our partners to develop the policy and institutional framework necessary to meet their commitments under the conventions. This includes helping our partners avail themselves of incentives provided by emerging market-based mechanisms to achieve global environmental goals.

In this context, there will be a heavy focus on support for capacity development, in the public and private sectors and civil society, making full use of available capacity. The "Rio Conventions" identify a wide variety of fields where capacity development is needed – for example, for compliance with reporting obligations; for scientific monitoring and technology assessment; for policy formulation; and for effective participation in international negotiations on environmental conventions. The GEF, the Global Mechanism of the Desertification Convention and, in the context of climate change, the new funds established in Marrakesh, are all valuable instruments in this connection. Additional support will be provided through our bilateral programmes and through multilateral

Priorities for our actions

development banks. We will also support pilot-scale projects in order to experiment with new emerging approaches, and to demonstrate their feasibility, thereby helping create a critical mass of concrete experience.

■ **We will also help our partners to integrate global environmental issues in Poverty Reduction Strategies**

Country-led planning frameworks such as Poverty Reduction Strategies or National Agendas 21 provide unique opportunities to integrate issues of environmental sustainability in poverty reduction efforts. This will imply integrating the national action plans formulated under the global environmental conventions in relevant national, or sub-national, or even regional-level planning processes.

We will also highlight the importance of global environmental issues, and their links with development objectives, by systematically putting these issues on the agenda of our regular dialogues with senior policy-makers from partner countries, in the context of aid programming.

We are already supporting efforts in a number of areas which link closely with one or several issues addressed by the “Rio Conventions”. We will ensure that these ongoing initiatives recognise and take maximum advantage of opportunities for win-win approaches.

Among development co-operation agencies:

We will intensify our co-ordination among development co-operation agencies in support of the “Rio Conventions”, at the country level and globally, including on the implications for our efforts in related areas, such as sustainable poverty reduction, conflict prevention and gender equality.

Executive Summary

This document is primarily intended for decision makers and development policy experts in donor organisations. It aims to clarify the linkages between the global environmental issues on the one hand, and sustainable development and poverty reduction on the other. It also aims to provide insights on how development co-operation agencies can support developing countries' efforts to integrate responses to global environmental threats into their national poverty reduction and other development plans. We know from experience that the most effective assistance is that which supports country-led development programmes, and that builds on rather than substitutes for partners' own efforts. Therefore, the analysis and the recommendations in this document are relevant for donors as well as their partners. It is hoped therefore that they will be of use to developing country policy makers.

While this document concentrates on the three "Rio Conventions" – which concern climate change, loss of biodiversity and desertification, many of its findings apply equally to other global or regional environmental issues.

I. Why integrate the Rio Conventions into development policy?

Reason 1: Addressing global environmental challenges is key to development and poverty reduction

Global environmental threats hurt the poor disproportionately. Nearly a billion households, particularly the rural poor, rely directly on natural resources for their livelihoods. But global threats are undermining this resource base. Desertification and biodiversity loss are proceeding rapidly in many countries. Emissions of greenhouse gases and aerosols due to human activities continue to alter the atmosphere in ways that are expected to affect the climate. The poorest countries are the most threatened: firstly, because of their populations' dependence on natural resources for their livelihoods, their food security and health; secondly, because they have fewer resources to adapt to change. Poverty reduction, as the development agenda's priority, is therefore closely linked to sound management of the local, national, regional *and* global environment.

Reason 2: Responses to global environmental threats require measures in a variety of sectors

Responses to global environmental threats have to be consistent with priority national development objectives and *vice versa*. This requires integrating these strategies into national development agendas. The "Rio Conventions" present a legal framework to address these environmental threats and to reverse current trends of environmental degradation. Too often, however, global environmental issues have been considered as a "stand alone agenda" of limited concern to national or local development priorities. In many countries, for example, environment ministries have been assigned the prime responsibility for implementing the Conventions, without government-wide co-ordination to implement the necessary response measures in key sectors

such as agriculture, energy, transport and others. It is urgent to take necessary corrective actions, focussing on development strategies that respond simultaneously to social and economic development and global environmental concerns.

II. The global environment and the development agenda: understanding the linkages

Global environmental changes can adversely affect ecosystems' ability to support human livelihoods.

Ecosystems underpin human livelihoods

The Earth's natural ecosystems provide humans with a vast array of both marketable ecosystem *goods*, such as food, forage, building materials (timber, palms), biomass fuels, medicinal products, as well as with *services* such as air and water purification; detoxification and decomposition of wastes; moderation of floods and droughts; pest control; generation and renewal of soil fertility; and many others. Although ecosystems are naturally resilient and can accommodate considerable disturbance, human activities have put global ecosystems under stress.

The impacts of their degradation cut across man-made boundaries

Natural ecosystems, and the impacts of their degradation, do not respect administrative or national boundaries. Greenhouse gas emissions, marine pollution, and the build-up of persistent organic pollutants (POPs) in the environment, for example, affect all countries and can be addressed effectively only through collective efforts. Thus the pursuit of environmentally sustainable development requires cross-sectoral and often international approaches.

The driving forces underlying global environmental threats are many and varied...

Human activities put pressures on ecosystems, through, for example: unsustainable levels of fishing, grazing and logging; conversion of forests, grasslands, and wetlands to other uses (including agriculture, industry and urban settlements); fragmentation of once interconnected natural areas – that increases their vulnerability to shocks and stresses – and uncontrolled introduction of invasive alien species, a leading cause of species extinction. The resulting loss in genetic diversity undermines the productive capacity of ecosystems and their resilience to natural or man-made shocks.

... but they share a number of key root causes

These include rapid population growth; increased consumption; absence of markets or market failure; flawed public policies; weak institutional capacities; and use of inappropriate or obsolete technologies that are inefficient, degrade ecosystems, and cause high levels of health-threatening pollution.

Climate change, biodiversity loss, desertification: impacts on sustainable development

Although all countries are affected by global environmental changes, the poorest countries are the most threatened:

- **Climate change** is projected to result in decreasing precipitation in arid and semi-arid areas, thus aggravating land degradation, in turn reducing livelihoods and increasing the threats of hunger and famine. Other projected impacts of

climate change include shifts in climatic zones, leading to the potential spread of insect infestations and extending the range and season for some infectious diseases and contracting them for others. Sea level rise could also displace millions of people from low-lying delta areas and small island states. Climate change is also projected to increase risks of some extreme weather events such as cyclones, drought and floods.

- **Biodiversity loss threatens ecosystems goods and services important for small and large scale agricultural production.** Ecosystem degradation and accompanying biodiversity loss have severe consequences for the rural poor, who depend directly on those goods to support their livelihoods. Biodiverse ecosystems also provide a pool of species to draw from, which allows farmers to adapt to changing conditions, respond to crop diseases, climatic change and insect infestation. **Desertification and poverty create a vicious cycle** where deteriorating natural resources contribute to declining livelihoods, as people are forced to encroach further on fragile soils, sparse vegetation and limited water resources to meet basic needs. The people affected by desertification include many of the world's poorest, most marginalised and politically weak citizens. Desertification can also fuel conflict and large scale involuntary migration. These global threats also reinforce one another.

Tackling global environmental threats: win-win approaches and hard choices

It is vital for decision-makers to take maximum advantage of available opportunities to address short-term developmental needs while at the same time safeguarding critical environmental resources in the long term – so-called “win-win” options. To a large extent, this document finds that policies and strategies needed to take global environmental threats into account are consistent and complementary with “business as usual” approaches. For example, moving towards market-based mechanism and removing environmentally harmful subsidies and other measures can lead to “win-win” development-environment outcomes. The scope for win-win poverty reduction-global environment approaches is therefore wide. However, it is also vital to recognise that in the **short term**, social and economic priorities, including reducing poverty, may conflict with medium and long-term environmental objectives. For example, short term priorities may call for intensive exploitation of natural resources and land while longer term concerns require the protection of critical resources such as land and water.

Hard choices must sometimes be made. Participatory mechanisms that involve government representatives, affected communities, elected officials and technical experts are needed to allow the identification of optimal approaches. In many cases, such multi-stakeholders processes lead to the formulation of policy options which can considerably mitigate the conflicts perceived at the outset.

III. The Rio Conventions: international responses to global environment issues

The Rio Conventions and sustainable development

The United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (UNCBD) and the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) were conceived in the run-up to the Rio Conference as responses to environmental threats that governments consid-

ered global in scale. They reflect the commitment of signatory countries to incorporating the principles of sustainable development and global environmental concerns into their national development agendas while providing developing countries with specific instruments to respond to these threats. They also provide for mechanisms to assist implementation, notably with regard to financial resources and capacity building, such as the Global Environmental Facility (GEF).

Capacity development

The Rio Conventions identify a wide variety of fields where capacity development is required, including needs related to the reporting of steps taken to implement the Conventions; needs related to forecasting and monitoring of ecological and socio-economic conditions, etc. Capacity development programmes in support of the Conventions also need to take account of the overlaps and synergies with broader capacity development efforts, and take an integrated approach.

Capacity development needs relevant to *climate change* include: identifying sources of greenhouse gas (GHG) emissions, developing GHG inventories, assessing mitigation and adaptation as well as technology options and needs; formulating measures for adapting to the impact of climate change; options, and, more broadly, formulating national programmes to address climate change as part of national development plans. Needs relating to *desertification* include: early warning systems; drought contingency plans, food security systems, including storage and marketing in rural areas, promoting alternative livelihoods to provide incomes in drought-prone areas, and developing of sustainable irrigation programmes. Capacity needs specifically relevant to *biodiversity* include: assessing the impact of climate change on biodiversity, especially in relation to forests, and tapping indigenous knowledge of forest resources conservation.

Complementarities among the Conventions

The three Conventions complement each other to a large extent. In many cases, the same response policies or measures can simultaneously address climate, biodiversity and desertification objectives. The most obvious examples relate to the sustainable management of natural resources.

Integrating the Conventions into mainstream planning processes

The Conventions also complement and reinforce each other. In many cases, the same response policies or measures can simultaneously address objectives of the three Conventions. But the challenge is to integrate the Conventions into “mainstream” planning processes. The impacts and root causes of desertification, climate change and biodiversity issues cut across a wide variety of economic sectors. Responses to these threats will need to be taken into account as countries pursue their development objectives. The “action plans” called for by the Conventions or related agreements (such as National Action Plans to Combat Desertification; National Climate Change Programmes Biodiversity Strategies and National Adaptation Programmes of Action) call for legal, policy and planning measures across a wide range of relevant economic sectors. Although developed with reference to a specific Convention, these are by nature cross-sectoral and must be consistent with (and, whenever possible, reinforce) priority national development objectives. Accordingly, it is essential that decision-makers integrate the Conventions into “mainstream” development policy and planning processes.

IV. Entry points and instruments for integration

Key entry points: sustainable development strategies (SDS)

Sustainable development strategies (SDS) are dynamic processes that aim to steer development policies and plans towards a sustainable path. A central objective of SDS is reconciling short- and long-term goals, and integrating national priorities with international commitments and obligations. A variety of established strategic planning processes such as “national visions”, national or local “Agenda 21 Plans”, National Conservation Strategies, and Poverty Reduction Strategies (PRSs) provide useful entry points for integrating responses to global environmental threats. Because of their high profile in developing countries, PRS deserve special attention.

Poverty reduction strategies

PRSs “... should be country-driven, be developed transparently with broad participation of elected institutions, stakeholders (including civil society), key development co-operation agencies and regional development banks, and have a clear link with the agreed international development goals”.¹ They incorporate the key principles of sustainable development strategies and, as such, provide a major opportunity to address linkages between poverty and environment and to mainstream environmental concerns into social and economic interventions to reduce poverty.

As PRSs increasingly become the basis for agency support, agencies and countries need to consider their consistency with other international agreements for sustainable development, notably with the Action Plans developed in the context of the Rio Conventions. A comprehensive analysis of local natural resource base concerns and the linkages with poverty, in line with the synergies identified in this Policy Guidance, should therefore be part of the PRS. To the extent practicable, the PRS should also reflect countries’ commitments under Global Environmental Conventions.

Sectors where this integration is particularly relevant include:

- For issues related to *Desertification*: linkages with the agriculture/livestock, energy, forest management, and water sectors.
- For issues related to *Climate Change*: linkages with energy production, industry, transport, forest management, agriculture/livestock, waste management, water and coastal zone management.
- For issues related to *Biodiversity*, agriculture/livestock, forest management, fishery, tourism, energy, coastal zone management and water.

Approaches and instruments for integration

Many approaches and instruments can foster integration. They include:

Ecosystem-based approaches

Most developing countries depend to a considerable extent on their natural resource base for development and poverty reduction. By capturing both the environment and social-economic development aspects of sector-specific decisions, an ecosystem-based policy framework can provide a way for policy-makers to identify the most promising development options and make decisions based on a sound understanding of their long-term consequences.

Land use planning and management

There is an intimate link between land resources and key ecological functions of ecosystems. Addressing desertification, loss of biodiversity and climate change all requires tackling complex land use planning and management questions as well as sensitive issues regarding rights over lands and other natural resources. An ecosystem-based approach has important implication for policy frameworks. In addition, a system for integrated resource planning and management is critical in translating synergies into practice.

Strategic Assessment/Strategic Environmental Assessment (SEA)

SEA methodologies and global environmental issues. Strategic Assessment, or Strategic Environmental Assessment (SEA) has emerged in response to growing awareness of the limitations of project-level environmental and social impact assessments. SEA approaches can help address the challenges posed by global environmental threats and assess the consequences of various development responses to global developments.

Project-level Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA²) is a decision-making tool used to predict and evaluate the environmental, and social consequences of a proposed (usually large-scale) development project from the formulation to the implementation and, where applicable, decommissioning stages.

Community-based Natural Resource Management (CBNRM)

Community-based Natural Resource Management (CBNRM) has two dimensions: Firstly, the involvement of those concerned with resource use and management, particularly local government, communities and indigenous peoples, is essential for the sustainable management of natural resources, as well as to identify and address resource degradation issues, and resource conflict. Secondly, CBNRM may help ensure that resource management and protection strategies reflect the fact that the livelihood strategies of many rural poor depend on the natural surroundings for their livelihoods.

Integrated capacity development

In the majority of cases, the human and institutional capacity development programmes initiated in relation to the conventions have direct relevance in a wide range of other areas. It is therefore essential to formulate capacity development initiatives associated with global environmental issues within the context of broad capacity development needs. Above all, it will be essential to avoid creating specific capacities tailored to the demands of the Conventions but isolated from “mainstream” policy and planning processes.

V. Win-win development strategies and global environmental issues: agriculture, sustainable forest management and energy sectors

Notwithstanding the importance of cross-sectoral approaches for sustainable development, it must be recognised that governments as well as development co-operation agencies are generally organised around sectors. Section 5 of this document therefore examines the linkages between global environmental threats and policies in agriculture, energy and sustainable forest management, three sectors that, in most developing countries, are centrally relevant to national development priorities and to global environmental issues.

VI. Integrating global issues into development policies and development co-operation: priority areas for action

This section sums up the concrete actions which development co-operation agencies can take to foster integration of global environmental threats into development co-operation policies and programmes.

Actions at the international level: enhance global governance for sustainable development

At the international level development agencies, in collaboration with other relevant ministries and agencies, are well placed to:

- Promote coherent approaches through the Convention negotiation processes.
- Enhance collaboration among the Conventions Secretariat and with relevant UN and other agencies.
- Mobilise civil society and the private sector.
- Help raise awareness of global environmental issues in relevant international fora.
- Harmonise the reporting of DAC Members' efforts.

In development agency headquarters

Within development co-operation agencies, donors should:

- Make a clear commitment to integrating global environmental issues.
- Intensify links with other ministries and agencies involved in global environmental and other relevant issues, including, but not limited to, Environment Ministries, with a view to increasing the coherence of policies across various fields.
- Increase the understanding of linkages with poverty reduction.
- Strengthen agency analytical and policy formulation capacities.
- Integrate global environmental threats into sectoral policies.
- Reconsider sectoral responsibilities for global environmental issues.
- Establish special funds, including for “pilot projects”.
- Take stock of relevant activities across institutions.

At the partner country level

At the level of the partner country, development co-operation agencies should:

- Raise global environmental issues in country programming processes.
- Integrate the action plans prepared into responses to the Rio Conventions in country-level planning frameworks.
- Integrate “Sector-Wide” and multi-sector approaches with project approaches.
- Strengthen the effectiveness of donor co-ordination mechanisms.
- Build on ongoing projects and programmes.
- Foster policy integration in partner country institutions through capacity development.

Notes

- 1 Development Committee Communiqué, September 1999.
- 2 Rio Declaration, Principle 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.”

Busy reader's guide to this document

What are the global issues addressed by the Rio Conventions?	Section 1
How do they relate to poverty reduction and development?	Section 2
What do the Rio Conventions actually say?	Section 3.1 + Box 8 + Annex 2
What instruments do the Conventions provide?	Section 3.2
What are the main constraints to integration?	Section 3.4.3
What tools can I use for integration?	Section 4
How can I formulate policies reaping ‘win-win’ opportunities on the development and environment front :	Section 5
In the agriculture sector	Section 5.2.6
In the forests sector	Section 5.3.5
In the energy sector	Section 5.4.4

1 The Goals of the Guidance

1.1. Addressing global environmental issues is key to sustainable poverty reduction

Nearly a billion households, particularly the rural poor, rely directly on natural resources for their livelihoods. But global environmental threats are undermining this resource base. Biodiversity loss is proceeding at a rapid rate in many countries, as is the build-up of toxic chemicals. Desertification and drought are problems of global dimensions, affecting all regions. Greenhouse gas emissions are threatening the world's climate, and developing countries are likely to be the most vulnerable to the impacts.

Global environmental threats hurt the poor most

Although all countries are affected, the poorest are the most threatened because they have fewer resources to address the root causes of environmental threats and adapt to their impacts, and because their populations are highly dependent on natural resources for their livelihoods. Sustainable poverty reduction, a central priority on the development agenda, is therefore closely linked to sound environmental management at the local, national, regional and global levels.

The Rio Conventions are global instruments for sustainable development

International responses to global threats were negotiated at the 1992 Earth Summit in Rio. Key outcomes were six international environmental agreements (two agreed at Rio and four since), which defined specific government commitments to address the issues of Biodiversity; Climate Change; Desertification; Persistent Organic Pollutants (POPs); Prior Informed Consent (PIC); Straddling and Migratory Fish Stocks. Earlier environmental agreements covered, for example, wetlands (Ramsar Convention), Trade in endangered species (CITES Convention), the Ozone layer (Vienna Convention and Montreal Protocol), migratory species (CMS) and others. For reason of focus, this document concentrates on the UN Framework Convention on Climate Change (UNFCCC), the UN Convention on Biodiversity (CBD) and the UN Convention to Combat Desertification (UNCCD). These are often referred to as the "Rio Conventions". However, many of the suggestions made in this document also apply to other international environmental agreements, including those mentioned above.

Integrating global environmental issues into national development strategies

The Rio Conventions reflect the commitment of all countries to preserve the global environment. They also clearly recognise that meeting national development needs and responding to global environmental threats must go hand in hand. Thus, they are about sustainable development, not just about the environment.

Nearly a billion households rely directly on natural resources for their livelihoods...

... but global environmental threats are undermining this resource base...

The poorest are the most threatened...

The Rio Conventions on Climate Change, Biodiversity and Desertification are about sustainable development, not just about the environment...

Poverty, environment and socio-economic development should be addressed simultaneously...

Too often, global environmental issues have been considered as a “stand alone agenda”...

It is urgent to recognise this shortcoming and take necessary corrective actions...

The focus is on “win-win approaches”...

Fostering local, national and global objectives simultaneously...

Integrating the implementation of the Rio Conventions into their development co-operation efforts...

Poverty, environment and socio-economic development are interrelated and their objectives should be addressed simultaneously to reduce poverty and achieve sustainable development. Response, adaptation, mitigation and protection strategies addressing global environmental challenges have to be consistent with priority national development objectives and vice versa. This requires integrating these strategies into the national development agenda.

Too often, global environmental issues have been considered as a “stand alone agenda” of limited concern to national or local development priorities. In many countries, for example, environment ministries have been assigned the prime responsibility for implementing the Conventions, without the government-wide co-ordination needed to implement the necessary response measures in key sectors such as agriculture, energy, and transport and others. It is urgent to recognise this shortcoming and take necessary corrective actions, focussing on development strategies that respond simultaneously to social and economic development and environmental concerns.

1.2. The goals of the guidance

In line with the general mandate of the DAC, this Policy Guidance document is intended to promote policy coherence among donors on the issue of integrating* the global environmental challenges into development co-operation. The specific goals of the Guidance are to:

- Elucidate the linkages between the global environmental challenges addressed by the Conventions and sustainable development, with specific focus on the priority objective of sustainable poverty reduction.
- Raise awareness of the opportunities for integrating responses to global environmental threats, including adaptation and protection strategies, into the sustainable development efforts of developing countries. The focus is on “win-win approaches” that can foster local, national and global objectives simultaneously.
- Describe the spectrum of opportunities for development co-operation agencies to integrate the implementation of the Rio Conventions related to climate change, biodiversity and desertification into their development co-operation efforts (and consequently into their organisations).

We know from experience that the most effective assistance is that which supports country-led development programmes, and that builds on rather than substitutes for partners’ own efforts. Therefore, the analysis and the recommendation in this document are relevant for donors as well as their partners. It is hoped therefore that the document will be of use to developing country policy makers.

Guiding principles

This document is guided by the following well-known goals and principles:

- The goals concerning environmental sustainability and regeneration of the OECD-DAC *Shaping the 21st Century* Report.
- The collective responsibility towards the management of all living species and natural resources, in accordance with the precepts of sustainable development (see the *Millennium Declaration 2000*).

* Mainstreaming and integration are used interchangeably throughout this document

- The principles contained in the Rio Declaration and Agenda 21.
- High-level acceptance that socio-economic development and environmental protection are interrelated, and that there is a need to address these objectives simultaneously.
- The partnership relation between developed and developing countries as set forth in the Rio Declaration and Agenda 21.
- A recognition that ownership by developing countries and awareness by both sides of development co-operation partnerships are preconditions to the integration of global environmental challenges into development co-operation.
- Acknowledgement of the unique role of development co-operation and of its limitations in supporting developing country efforts to implement Multilateral Environmental Agreements (MEAs) in the context of national sustainable development priorities
- Recognition that good governance is a precondition for sustainable development and proper environmental management.
- Effective participation, transparency and accountability are essential to effectively focus response, adaptation and protection strategies to the needs and livelihood strategies of local governments, communities and indigenous peoples and resolve resource degradation issues and resource conflicts.

2 The Global Environment and the Development Agenda: Understanding the Linkages

This section provides an overview of the importance of ecosystems for sustainable development and how global environmental changes – climate change, biodiversity loss, and desertification – can adversely affect ecosystems’ ability to support human livelihoods. It then reviews the impact of development processes on the global environment.¹

Natural ecosystems provide goods and services that are vital to human well-being...

2.1. Ecosystems and human livelihoods

The Earth’s natural ecosystems provide a vast array of marketable ecosystem *goods*, such as food, building materials (timber, palms), biomass fuels, natural fibres and others. A large share of these goods is consumed directly and does not enter commercial market mechanisms. They thus go unrecorded in national accounting systems. Ecosystems also provide *services*² that, while very rarely traded in the marketplace, are vital to human well-being. These include climate regulation; air and water purification; detoxification and decomposition of wastes; moderation of floods and droughts; pest control; crop pollination; generation and renewal of soil and soil fertility; and many others. Although ecosystems are naturally resilient and can accommodate considerable disturbance, human activities have put global ecosystems under high stress (Box 1).

Human activities have put global ecosystems under high stress...

2.2. Global environmental issues, ecosystems, and sustainable development

Natural ecosystems do not respect administrative or national boundaries. They include such elements of the “global commons” as the atmosphere, the ozone layer and the oceans. Similarly, the impacts of their degradation spill over man-made boundaries. For example, a ton of carbon dioxide has the same impact on the Earth’s atmosphere regardless of where it is generated. Loss of biodiversity also results in the degradation of a global common, namely the genetic heritage of mankind. Thus the pursuit of environmentally sustainable development will ultimately depend on maintaining the integrity of the global commons, requiring international approaches. Greenhouse gas emissions, and the build-up of persistent organic pollutants in the environment, affect all countries and require collective as well as country-level efforts.

Natural ecosystems do not respect administrative or national boundaries...

Some environmental issues do not relate directly to “global commons” but, as they grow in scope and scale, become globally important through their cumulative impact on ecosystems. Desertification and drought are problems of global dimension in that they affect all regions in the world. Loss of biological diversity is proceeding on a scale that makes it an issue of global importance. They may also be aggravated by the degradation of global commons, notably global climate change. These issues can be addressed effectively on a regional or national basis, and often require multilateral agreements. The global environmental issues addressed by the Rio Conventions are outlined in Box 2 below. Table 1 outlines their impacts on sustainable development. The “**Tip Sheets**” in Annex 2 provide a succinct overview of the global environmental issues addressed by the Rio Conventions, and the key terms and concepts associated with these issues.

The impacts of their degradation affect all countries and require collective as well as country-level efforts...

Box 1. Global ecosystems are threatened

- Some 75% of the major marine fish stocks are either depleted from overfishing or are being fished at their biological limit.
- Logging and conversion have reduced the world's forest cover by as much as one half. Roads, farms, and residences are rapidly fragmenting what remains into smaller forest islands.
- Some 58% of coral reefs are threatened by destructive fishing practices, tourist pressures, and pollution.
- Fully 65% of the roughly 1.5 billion hectares of cropland worldwide are affected by soil degradation.
- Overpumping of groundwater by the world's farmers exceeds natural recharge rates by at least 160 billion m³ per year.
- Human activities are causing biological diversity to be lost at a global rate estimated to be at 50-100 times the average natural rate.
- Human-induced climate change could alter global ecosystems significantly as the Earth's vegetation redistributes itself to adjust to rising temperatures and changes in rainfall patterns. According to the most recent assessment report of the Intergovernmental Panel on Climate Change (IPCC), there is significant evidence that climate change is occurring, due to man-made factors.

Source: World Resources 2000-2001. People and Ecosystems: A Fraying Web of Life.

Table 1. Global environmental issues and impacts on national sustainable development

Types	Examples	Distinguish features	Impact on national sustainable development	Ways to address the issues
Global Commons Issues	<ul style="list-style-type: none"> ■ Climate change ■ Ozone layer depletion ■ Marine pollution ■ Persistent organic pollutants ■ Some aspects of biodiversity loss 	<ul style="list-style-type: none"> ■ Cause global changes in the Earth's biophysical systems ■ Adversely affect the global commons, independently of where they occur 	<ul style="list-style-type: none"> ■ Impacts are indirect or diffuse ■ Impact likely to be irreversible ■ Impact is difficult to determine precisely due to the complexity of the processes involved 	<ul style="list-style-type: none"> ■ Co-ordinated preventive and mitigative actions among nations ■ Adaptation on local, regional and national basis ■ Domestic mitigative actions
Issues of Global Importance	<ul style="list-style-type: none"> ■ Desertification and land degradation, degradation of fresh waters ■ Deforestation and unsustainable use of forests ■ Some aspects of biodiversity loss 	<ul style="list-style-type: none"> ■ Local and regional problems ■ Can be aggravated by the degradation of global commons 	<ul style="list-style-type: none"> ■ Impacts are direct (e.g. reduced food production) ■ Impacts occur over the short to medium term 	<ul style="list-style-type: none"> ■ Can be addressed effectively on local and regional basis ■ Often require multilateral agreements

This document covers Climate Change and Biodiversity loss, which are global environmental issues, and desertification, an issue of world-wide importance. However, for the sake of simplicity, the remainder of the document will subsume all three issues together under the headings "Rio Conventions" or "global environmental issues/problems/threats".

Box 2. What are the environmental issues addressed by the “Rio Conventions”?

Climate change is due to increasing concentrations of certain gases into the atmosphere. These increases result primarily from human activities, largely the burning of fossil fuels such as coal, oil and natural gas, and land-use practices, particularly deforestation. Projected consequences include the warming of the Earth’s global mean surface temperature, leading to changes in precipitation patterns, shifts in vegetation cover, rising sea levels and increased frequency of some extreme weather events.

Desertification is land degradation in arid, semi-arid and dry sub-humid areas. While land degradation occurs everywhere, it is only defined as “desertification” when it occurs in those areas. Desertification affects seventy per cent of the world’s drylands, amounting to one fourth of the world’s land surface. It is caused by natural events such as droughts, combined with human activities, including over-tilling and overgrazing; deforestation and poor irrigation practices (leading to salinisation); and use of chemicals that contaminate and degrade the soil. Land degradation undermines the productivity of rainfed and irrigated cropland, rangelands, pastures, forests and woodlands.

Biodiversity has three dimensions: genetic diversity, the variation between individuals and between populations within a

species; species diversity, the different types of plants, animals, and other life forms within a region; and ecosystem diversity, the variety of habitats found within an area (grassland, marsh, and woodland, for instance). Biodiversity also provides a stock of raw genetic material for medical science and biotechnology of potential use to all of mankind, present and future. In this sense, biodiversity is a global common. These issues are closely linked because protecting species, and genetically distinct populations of each species, requires protecting their habitats.

The loss of biodiversity also has several dimensions: It undermines agriculture because the continued productivity of crops and livestock hinge in large part on making use of the genetic variations within each species. Biodiversity loss also leads to the loss of biodiversity products such as food, fodder, timber, and other goods harvested from natural ecosystems. It undermines such critical functions as the maintenance of water purification, watershed stability and the provision of habitats for pollinators, all of which are expensive to replace by artificial means. Biodiversity loss also undermines ecosystem resilience, and their ability to recover from natural or man-made shocks. Ecosystem degradation and biodiversity loss go hand in hand.

2.3. Driving forces underlying global environmental problems³

2.3.1. Human activities put pressures on ecosystems

Despite increasing awareness of the detrimental effects of human activities on the planet’s ecosystems, degradation continues. According to one major study, the state of the Earth’s natural ecosystems has declined by about a third over the last 30 years and, during this time period, the ecological pressures of human activities has increased by about 50%.⁴ The greatest pressures on ecosystems are exerted by:

- **Overuse** through excessive fishing, grazing, logging, water harvesting, or intensive agricultural production – all factors that diminish their productive capacity.
- **Conversion** of relatively “natural” or undisturbed forests, grasslands, and wetlands to other uses (including agriculture, industry and urban settlements).
- **Fragmentation** of once interconnected natural areas is increasing their vulnerability to various shocks and stresses.
- **Uncontrolled introduction of invasive alien species**, which is a leading cause of species extinction.

These pressures, acting alone or in combination, can result in loss of genetic diversity undermining the productive capacity of ecosystems and their resilience to natural or man-made shocks.

**Ecosystem
degradation
continues...**

Box 3. Unnatural disasters, economic impacts

In the 1990s, natural catastrophes such as hurricanes, floods, and fires caused over \$608 billion in economic losses worldwide, an amount greater than during the previous four decades combined. Between 1985 and 1999, while the wealthiest countries sustained 57.3% of the measured economic losses to disasters, this represented only 2.5% of their GDP. The poorest countries endured 24.4% of the total economic losses, which represented 13.4% of their GDP losses.

But there is growing evidence that a significant share of this devastation is not “natural” at all: the effects of a disaster are magnified by ecologically destructive practices, like degrading forests, engineering rivers, filling in wetlands, and destabilising the climate.

Mozambique. The floods that devastated Mozambique in 2000 were exacerbated by the loss of vital wetlands and overgrazing in the upper watersheds of the Limpopo River in

Botswana, Zimbabwe and South Africa, resulting in a disaster that killed hundreds and displaced thousands.

China. Extensive deforestation in China’s Yangtze River basin contributed to the 1998 flood that caused more than 4,000 deaths, affected 223 million people, inundated 25 million hectares of cropland and cost well over \$36 billion.

Philippines. In 1999, continuous rains combined with deforestation displaced more than 110 000 families in the province of Lanao del Norte on Mindanao. The floods affected agricultural production and caused substantial infrastructure damage costing millions of pesos in public funds.

Bangladesh. Logging upriver in the Himalayas of Northern India and Nepal made the 1998 floods in Bangladesh worse, as did the fact that the region’s rivers and floodplains have been filled in with silt and constricted by development.

Source: Abramovitz, J. 2001. *Unnatural Disasters*. Worldwatch Paper 158. Washington: Worldwatch Institute.

2.3.2. Underlying drivers of global environmental problems

Global and local environmental problems share a number of root causes...

Most global and local environmental problems share a number of root causes: rapid population growth; increased consumption; market absence or failures; flawed public policies; weak governance and institutional capacities; and choice of technologies.

- **Rapid population growth** in many of the economically poorest developing countries is placing ever greater pressure on natural resources and ecosystem integrity. Everyone requires at least some minimum of water, food, clothing, shelter, and energy – all ultimately harvested directly from ecosystems or obtained in ways that affect ecosystems. The United Nations projects world population to grow from 6.1 billion in 2000 to 9.4 billion in 2050, with most if not all of the growth occurring in developing countries.
- **Increased consumption** has greatly outpaced population growth for decades. The countries in the Northern Hemisphere contain less than one quarter of the world’s population, but they are responsible for more than half the annual consumption of a number of resources.
- **Market absence or market failure.** Market prices can send the wrong signals when the cost of environmental degradation is not accounted for. Many ecosystem goods and services are not marketed and are available at no cost to the user, which can encourage over-use and environmentally unsound practices. Market-based national income accounting systems rarely incorporate damage to natural resources and the global environment, with the result that the costs of natural resources’ and ecosystems’ degradation are largely “invisible” to policy makers.
- **Flawed public policies.** Natural resources, such as water, are often used inefficiently. This is often due to the distorting effect of subsidised or free provision of goods and services such as irrigation water. Similarly, land tenure regulations can encourage forest destruction, when, for example, the award of tenurial rights is conditioned on the land having been cleared of trees.

- **Weak institutional capacities.** Many governments lack the financial and human resources to adequately plan and regulate natural and biological resources and maintain ecosystem integrity, including those under formal state ownership, such as forests and waterways. They are also constrained with regard to access to technical knowledge, skills and tools needed to deal with long-term resource allocation, planning, enforcement and impacts assessment. In many countries, furthermore, the institutions responsible for natural resource management have unclear or overlapping mandates, leading to inefficient use of available resources, and conflict.
- **Conflict or civil unrest.** In some countries, violent conflict is a significant factor underlying environmental degradation, through, for example, large-scale displacement of population towards environmentally fragile areas or the exploitation of resources such as timber or gems by conflicting parties to finance the war effort. Environmental degradation can also work with other factors to cause or exacerbate conflicts.
- **Choice of technology.** Many countries only have access to obsolete technologies that are inefficient, degrade ecosystems, and contribute to high levels of pollution. Some technologies have been developed for temperate conditions and are not appropriate for the ecological and social circumstances found in developing countries.

2.4. Climate change, biodiversity loss, desertification: impacts on sustainable development⁵

Although all countries are affected by global environmental changes, the poorest countries are the most threatened:

2.4.1 Climate change will threaten human livelihoods in various ways

Climate change is projected to result in shifts in climatic zones and rises in sea levels, and to increase the risks of extreme weather events such as cyclones, draught and floods, affecting many of the world's poorest communities. Decreasing precipitation in arid and semi-arid areas will aggravate land degradation, undermining both rainfed agricultural production and ecosystem-based livelihoods. This, in turn, could increase the number of undernourished people in the developing world, particularly in the tropics. Other projected impacts of shifts in climatic zones include the possible spread of vector-borne diseases such as malaria to areas where they are presently absent, as well as the increased incidence of insect infestation. Sea level rise could displace millions of people from small island states and low-lying delta areas and lead to rapid shifts in the distribution and productivity of terrestrial and aquatic ecosystems (see Box 4 and Annex 1A).

2.4.2. Loss of biodiversity threatens ecosystems' services important for small- and large-scale agricultural production

Biodiversity loss undermines human livelihoods and economic development. Natural ecosystems provide a large variety of edible fruits, wild plants, game, wood for fuel or building, fodder and various other products used for medical, ritual and other purposes. Biodiversity loss and the accompanying ecosystem degradation have severe consequences for the rural poor, who depend directly on ecosystem goods to support their livelihoods. Biodiverse ecosystems provide a pool of species to draw from, which

Poorest countries are the most threatened by global environmental changes...

Shifts in climatic zones, rises in sea levels, increased risks of extreme weather events...

Biodiversity loss has severe consequences for the rural poor...

Box 4. Impacts of climate change on human livelihoods

The Intergovernmental Panel on Climate Change (IPCC), the advisory body for the Climate Change Convention, has identified arid and semi-arid regions, coastal zones and marine ecosystems as highly vulnerable to climatic impacts such as sea level rise and increased intensity of extreme weather events. Sub-Saharan Africa and coastal nations throughout the Caribbean, the Pacific and Indian Oceans are particularly vulnerable.

Potential impacts include:

- Changes in coastal fish stock due to shifting migration patterns.
- Impact on coral reefs and other coastal ecosystems.
- Changes in sea levels (resulting in shoreline displacement, exacerbated coastal erosion, and higher bases for floods).
- Increased stress on arid and semi-arid regions, where water scarcity is already severe.

These changes could threaten:

- Food security, as a result of declining fisheries linked to the degradation of coral reefs and other critical marine habitats.
- Public works infrastructure (transportation systems, protective dams, etc.) that are at risk due to sea level rise and extreme weather events.
- Development in sectors such as agriculture and tourism.
- Human health due to the spread of infectious diseases and changes in existing infectious disease patterns.

allows farmers to adapt to changing conditions, such as responding to crop diseases, climatic change and insect infestation. Genetic diversity also provides the raw material which commercial breeding programmes use to enhance crop and stock productivity, for example for higher yield or disease resistance. Though disappearing fast, indigenous varieties remain a vital resource for plant breeders because of their resistance to stresses such as disease and climatic changes. They also provide raw genetic material for medical science and biotechnology.

Biodiversity underpins ecosystem integrity and functions while influencing their resilience and resistance to environmental changes. Thus ecosystem services essential for human livelihoods (e.g. soil formation, water filtration, erosion control, waste treatment, pollination, hydrological regulation) are generated by the biodiversity present in natural ecosystems. For example, watershed stability, maintained through interactions among individuals of different species, is critical for the proper functioning of downstream irrigation, hydropower generation, water supply and other infrastructure. Thus, loss of biodiversity has direct costs. Box 5 and Annex 1A provide examples of the impacts of biodiversity loss on socio-economic development.

Desertification and land degradation directly affect over 250 million people...

Desertification and land degradation directly affect over 250 million people, and a further one billion are at risk. It is considered to be a problem of global dimension in that it affects all regions of the world, calling for joint responses by the international community. The people affected by desertification include many of the world's poorest, most marginalized and politically weak citizens. Africa is most affected. While desertification has long been regarded as a technical issue, it is now recognised to be inextricably linked to social, cultural, economic and political issues. The feedback between poverty and desertification creates a vicious cycle in which deteriorating natural resources contribute to declining livelihoods, as people are forced to encroach further on fragile soils, sparse vegetation and limited water resources to meet basic needs. As with many processes of environmental deterioration, the poor are likely to be affected most. Desertification can also fuel conflict and large-scale involuntary migration (see Box 6 and Annex 1A).

Box 5. The socio-economic impacts of biodiversity loss

Biodiversity loss threatens ecosystem services that provide the backbone for productive activities in such sectors as energy, agriculture, forest management, tourism etc. Losses of biodiversity can result in degradation of ecosystem services. Very often, decision-makers fail to appreciate the value of ecosystem services that are not traded on the market. Although it is very difficult to put an economic price tag on these services, one way of expressing their value is in terms of the cost of replacing the functions performed by ecosystems. For example:

The value of mangroves for flood control

Mangroves play an essential role in maintaining the stability of hydrological cycles. Their destruction leads to increased incidence of floods. In Bangladesh the Sunderbans coastal mangroves protect the hinterland and safeguard peoples' lives from the impact of tidal waves and storms. A study in Malaysia has estimated the cost of rock walls that would be needed to compensate for mangrove destruction at around \$300,000 per kilometre. This estimate does not take account of the many other functions provided by mangroves, which are sources of fuel, food and many other goods and services.

The value of watershed stability for water supply and flood control

Losses of biodiversity that result from conversion of forests to other uses (including urban settlements and agriculture) can contribute to watershed degradation that in turn affects water supplies. New York City, for example, found that deteriorating quality of drinking water supply would require the construction of a water purification plant, at a cost of around \$4 billion. Instead, the City opted to invest in improved watershed management, at a cost of \$1.4 billion. This not only restored the forest ecosystem's services of water purification, but also provided improved protection against floods.

The value of wild pollinators for agricultural productivity

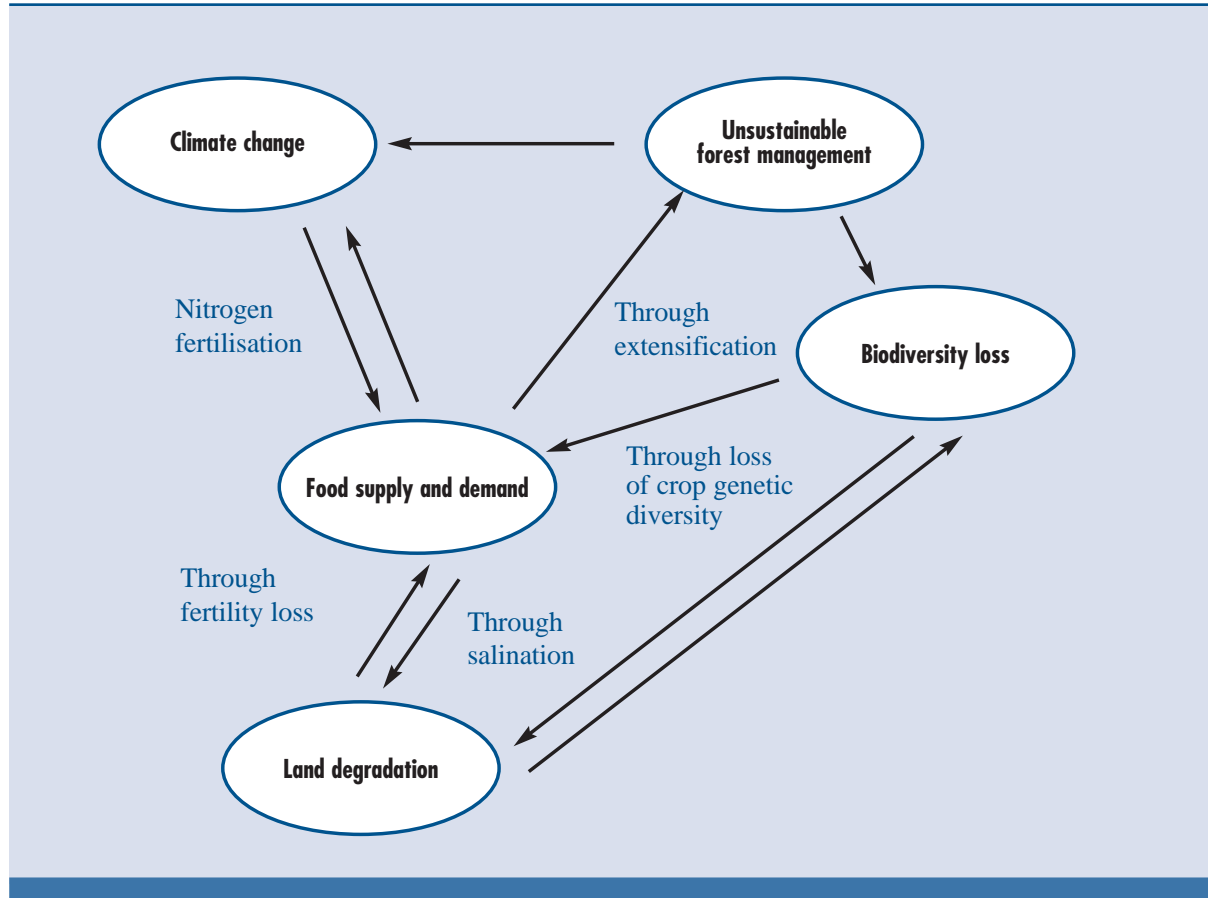
Many economically important plants are pollinated by wild animals. At least 20 kinds of animals, in addition to honey bees, provide pollination services to the world's 100 most important crops. For example, durians, neem trees, wild bananas, timber species of eucalyptus and several species of palm are all pollinated by bats. The populations of about 1 200 wild pollinators are listed as endangered species. Their decline is reducing yields in a variety of crops and locations including cashew nuts in Borneo, Brazil nuts in Brazil and Bolivia and blueberries and cherries in Canada. Researchers have estimated the contribution of wild pollinators to the US agricultural economy to be in the order of \$4-7 billion per year.

Box 6. Impacts of desertification on socio-economic development

The countries least prepared to respond to desertification – the least developed countries of Africa – are already feeling its impacts and it is the poorest communities that are disproportionately bearing this burden. Desertification undermines development in a number of ways:

- **Food production is undermined**, as is production of non-food crops which provide the necessary income to purchase food. Desertification is therefore likely to be a major threat to food security. **Drought and land degradation can also help trigger or aggravate famine.**
- **Desertification exacerbates poverty and political instability.** Famine, civil unrest, and large-scale migration are a recipe for political instability, civil strife, tensions between neighbouring countries, and even for armed conflict. In many countries, large numbers of people have become internally displaced or forced to migrate to other countries due to drought and dryland degradation. In many dryland areas, conflicts occur between nomadic cattle ranchers and farmers over scarce resources such as water and grazing land.
- **Desertification is a huge drain on economic resources.** Globally, it is estimated that the annual income foregone in the areas immediately affected by desertification amounts to approximately US\$42 billion a year. The indirect economic and social costs suffered outside the affected areas, including the influx of “environmental refugees” and losses to national food production, may be much greater.

Source: Adapted from CCD Website: www.unccd.int, *The Consequences of Desertification*.

Figure 1. Linkages among food production and global environmental issues

Note: Adapted from R.R. Watson, J. A. Dixon, S.P. Hamburg, A.C. Janetos, and R.H. Moss, 1998: *Protecting our Planet, Securing our Future: Linkages among Global Environmental Issues and Human Needs*. UNEP, NASA and the World Bank.

Global environmental problems are clearly linked to poverty, human welfare, and the development agendas of all countries...

Climate change, loss of biodiversity, and desertification are clearly linked to poverty, human welfare, and the broader development agendas of all countries. In particular, these global environmental problems make the challenge of meeting the priority development needs of the poorest in developing countries more difficult. Annex 1A describes the impacts of the global environmental degradation on selected development sectors (agriculture, energy, forest management, and water). Conversely, Annex 1B illustrates the impacts of these sectors on the global environment.

2.5. Interaction between global environmental threats

Global environmental threats interact with one another. The major components of the Earth's system are interlinked through a whole host of physical, chemical and biological processes. Any impact on the global environment is therefore likely to create reverberations throughout the Earth's system. In addition, their combined and cumulative impacts can reinforce each other to magnify the threat they pose to human livelihoods. An understanding of these linkages is important if the magnitude of the threat to development of global environment problems is to become fully appreciated. Box 7 illustrates how desertification, climate change, and loss of biodiversity are linked.

Figure 1 depicts the linkages between food production, forest management and global environmental issues.

Box 7. Desertification, biodiversity and climate change: some linkages

Climate change could worsen the effects of desertification. Climate change could initiate or reinforce drought in certain regions. Countries with arid and semi-arid areas are particularly vulnerable to the resulting vegetation depletion.

Climate change is expected to affect the resilience and productivity of many ecosystems. Shifts in climatic zones will trigger species' migration and shifts in ecosystems. Many species may not be able to migrate or adapt sufficiently rapidly and will be exposed to higher risks of extinction. Subsequently, ecosystems' resilience and productivity will be impaired. Marine species and associated ecosystems will be particularly vulnerable to rises in temperature.

Desertification can contribute to climate change. Land degradation reduces vegetative cover and thus carbon absorption and storage capacity. Desertification has already caused substantial soil carbon losses. The periodic burning of arid and semi-arid grasslands, often associated with unsustainable slash-and-burn agriculture, contributes directly to the release of greenhouse gases in the atmosphere.

Desertification and biodiversity loss go hand in hand. While biodiversity is often associated with tropical rain forests, dryland ecosystems also contain a rich biota, including plant and animal species not found elsewhere. Many of humanity's most important food crops, such as barley and sorghum, originated in drylands, which also provide critical habitats for wildlife, including large mammals and migratory birds. These habitats are particularly vulnerable to land degradation which is both a cause and consequence of biodiversity loss.

Deforestation leads to land degradation, biodiversity loss and greenhouse gas emissions. Deforestation reduces agricultural productivity through a number of avenues such as increase in soil erosion, decline in soil fertility, reductions in pollinator and pest control functions. Since forests are habitats to a large number of species, reduction in forest areas will result in direct biodiversity loss. Deforestation also contributes to the release of carbon dioxide in the atmosphere.

2.6. Addressing global environmental problems: hard choices and win-win options

Sustainable development means integrating the economic, social and environmental objectives of society in order to maximise human well-being in the present without compromising the ability of future generations to meet their needs. This means seeking mutually supportive approaches whenever possible and making hard choices where necessary. Such hard choices often involve balancing short-term (3-5 years) and long term (over 10 years) priorities.

Integrating the economic, social and environmental objectives of society...

2.6.1. Short term *versus* long-term priorities

In the **short term**, social and economic priorities, notably reducing poverty, may be in direct conflict with medium- and long-term environmental objectives. For instance, many countries are faced with an urgent need to increase agricultural production to ensure food security and meet the needs of rapidly growing populations.⁶ This can argue in favour of rapid conversion of available lands to monocrop agriculture, the maximum exploitation of available water resources, and the intensive application of chemical fertilisers and pesticides.

... through mutually supportive approaches whenever possible and hard choices where necessary...

In the medium and long term, however, the resulting conversion of natural ecosystems will result in lost or diminished ecosystem services that are critical to maintain the biological productivity of land, to avoid the contamination of water resources, and to prevent the erosion of soils. In addition to undermining agricultural productivity, this will have severe negative impacts on transport, water supply, power generation and other critical infrastructure. Excessive use of pesticides and other agrochemical inputs also lead to the contamination of soils and water, directly threatening human health. Farmers and plantation workers who are exposed to pesticides suffer directly from pesticide poisoning.⁷

Win-win approaches...

2.6.2. Win-win approaches

The short-term vs long-term conflicts described above make it vital for decision-makers to take maximum advantage of available opportunities to address short-term developmental needs while at the same time safeguarding ecosystem services and goods for the long term. Such “win-win” – or “no regret options” – which can reconcile long- and short-term objectives also involve approaches which are beneficial from the national or local point of view and which would therefore make sense whether global environmental issues are taken into account or not. In many cases, for example, the utilisation of market-based mechanisms or the reduction of environmentally harmful subsidies result in “win-win” development-environment outcomes. Section 5 below provides illustration of win-win approaches and as well as instances where hard choices must be faced, in the agriculture, forest management and energy sectors.

Tackling difficult tradeoffs...

2.6.3. Dealing with hard choices

Tackling the difficult tradeoffs outlined above, and others, requires careful assessment of the costs and benefits of various options, as well as their distributions across social groups. In addition to objective analysis, participatory mechanisms are needed, involving government representatives, affected communities, elected officials and technical experts in the formulation of optimal approaches.⁸ In many cases, such multi-stakeholder processes lead to the identification of policy options which can considerably mitigate the conflicts perceived at the outset or even identify “win-win” possibilities.

In some cases, a development undertaken with *global* environmental protection in mind costs more than the same development pursued with only the national interest in mind. The “incremental cost” of protecting the global environment is a measure of the economic burden that would be placed on a country for undertaking its development in a way that takes global environmental problems into account. The Global Environmental Facility (GEF) was established to address these issues in a strategic manner (see Section 3 below).

Notes

- 1 This Section draws from R.T. Watson, J.A. Dixon, S.P. Hamburt, A.C. Janetos, and R.H. Moss. 1998. *Protecting Our Planet, Securing Our Future; Linkages Among Global Environmental Issues and Human Needs*. UNEP, NASA, World Bank; and from *The World Bank and the Global Environment: A Progress Report*. May 2000.
- 2 Ecosystem services are defined as the benefits from processes and conditions of natural ecosystems that support human activity and sustain human life.
- 3 This section is drawn from *Protecting Our Planet, Securing Our Future* (UNEP, US/NASA, World Bank, 1998), and *World Resources 2000-2001* (WRI 2001).
- 4 *Living Planet Report* (WWF 2000).
- 5 This description of the global environment and poverty reduction is excerpted from the World Bank's *Environment Strategy and OECD/DAC (2001): Poverty-Environment-Gender Linkages*.
- 6 Nearly 800 million people in today's world are malnourished. While the food security of most countries could be improved through better and more equitable distribution systems, full success in meeting the nutritional needs for growing populations would likely require continued growth in production.
- 7 Issues related to pesticide management are addressed in depth in OECD/DAC 1995: *Guidelines for Aid Agencies on Pest and Pesticide Management*.
- 8 See OECD (2001): *DAC Guidelines on Strategies for Sustainable Development* for more detailed discussion of this issue.

3 The Rio Conventions: International Responses to Global Environment Issues

This section focuses on the specific provisions of the “Rio Conventions”, on desertification, climate change and biodiversity, and the opportunities and instruments they offer to address the challenges outlined above and promote sustainable development.

3.1. The Rio Conventions and sustainable development

The United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) were conceived in the run-up to the 1992 Rio Conference as responses to environmental threats that governments considered global in nature.

The Rio Conventions provide the legal basis for an international response to the global environmental concerns of climate change, loss of biodiversity and desertification. They have received wide acceptance and have been ratified by most countries. Ministries and agencies all over the world that have environmental mandates support the Rio Conventions and have taken the lead in implementing them in their respective countries. Affected communities and constituencies, such as environmental organisations, that consider environmental protection and the conservation of natural resources as their primary concern or mission have likewise mobilised to support the Conventions.

While this support from the environmental community is vital, it would be a mistake to consider the agreements as solely or principally environmental. From the start of the negotiations that culminated in the adoption of these Conventions, it was clear that they would receive universal acceptance only if they were designed to become instruments of national development. It was also clear that these new instruments would be effective only to the extent that they incorporated the need of developing countries to meet their development priorities, particularly the reduction of poverty, ensuring food security and achieving sustained economic growth and sustainable development. Industrialised countries also placed strong emphasis on pursuing the goals of the Rio Conventions in a way that is consistent with meeting priority economic objectives. Meeting development needs while responding to global environmental concerns is thus a central theme in all three Rio Conventions.

The Rio Conventions reflect the commitment of signatory countries to incorporate the principle of sustainable development and global environmental concerns into their respective national development agendas and to participate and join in the global efforts to deal with these issues. More importantly, they provide developing countries with specific instruments to respond to these global threats.

3.2. The Conventions provide specific response instruments and mechanisms

The Rio Conventions themselves provide for mechanisms to assist implementation. They all contain provisions related to financial resources, technology transfer, and capacity development. Although still at an early stage, the Conferences of the Parties of the UNFCCC, CBD and the CCD have adopted decisions that are intended to implement these provisions.

The Conventions were conceived as responses to environmental threats that governments considered global in nature...

They reflect the commitment of signatory countries to incorporate global environmental concerns into their respective national development agendas and provide specific instruments to respond to global threats...

Box 8. What do the conventions say?

The **United Nations Convention to Combat Desertification (UNCCD)** highlights the relationship between desertification and drought and poverty, poor health, lack of food security, and issues linked to demographic dynamics and migration. It also notes that the poorest countries, notably the least developed countries, are among those most seriously affected. While recognising that the consequences of desertification are particularly tragic in Africa, it acknowledges that desertification and drought are problems of global dimension, which affect all regions of the world. Thus, although national governments and local communities in affected areas play a critical role in combating desertification, joint action by the international community is necessary.

The **United Nations Framework Convention on Climate Change (UNFCCC)** acknowledges that change in the Earth's climate and its adverse effects are a common concern of humankind. It sets the "ultimate objective" of stabilising atmospheric concentrations of greenhouse gases at a "safe" level, namely a level that would prevent dangerous anthropogenic interference with the climate system. This should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner. Under the UNFCCC, the

Kyoto Protocol establishes three mechanisms, including the **Clean Development Mechanism (CDM)** for collaboration between developed and developing countries to support sustainable development and foster the objectives of the Convention. (See Box 26 on the CDM in Section 5, and section 3.2 below for some recently established mechanisms).

The **United Nations Convention on Biological Diversity (UNCBD)** affirms that, while States have sovereign rights over their own biological resources, the conservation of biological diversity is a common concern of humankind. Thus, it aims towards the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. It addresses all aspects of biological diversity: genetic resources, species, and ecosystems. Under the UNCBD, the **Cartagena Protocol on Biosafety** seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It establishes an "advance informed agreement" procedure to ensure that countries are provided with the information necessary to make informed decisions before agreeing to the importation of such organisms into their territory.

See more details on the key terms and concepts associated with the Conventions in the "Conventions tip sheets" in Annex 2.

3.2.1. Financial instruments

All three Rio Conventions include provisions for new and additional financial resources for their implementation.

Global Environmental Facility...

The **Global Environmental Facility (GEF)** assists developing countries in protecting the global environment in the areas of biodiversity, climate change, international waters and ozone layer as well as land degradation, when it is linked to climate change or biodiversity loss. It provides grant and financing to countries to undertake sustainable development activities that generate global benefits, where the cost of doing so exceeds the national benefits. Thus, the GEF financing is limited to the "incremental costs", that is the extra costs of changing a management practice, a policy or an investment so that it generates global benefits. The GEF has recently been moving to further engage the private sector at both project and strategic levels by using "Contingent Finance Mechanisms". These aim to increase the effectiveness of the use of GEF funds and maintain the performance incentives for the private investor while reducing investment risks (*e.g.* for new technologies or for technologies so far not applied in LDCs). At the same time, these mechanisms reduce the need for direct grants. "Contingent Finance Mechanisms" include: *i) contingent grants*, which have to be returned to the GEF if an investment achieves its objectives (performance-based); *ii) contingent loans*, which are (partly) forgiven if a project is unsuccessful. They have a higher repayment priority than contingent grants; and *iii) partial risk or credit guarantees*, which assume part of the performance or other risk of an investment or project, which normally is assumed by debt or equity. This reduces the financing risk and supports the mainstreaming of clean technology financing into the financial sector by guaranteeing some portion of the risk of cleaner technologies or project development (*e.g.* drilling risk for geothermal plants). They can also leverage other (public or private)

capital in high-risk markets. These instruments are expected to have considerable potential in the future. At the present time, however, the most common form of GEF support remains unconditional grant with no payback provision.

GEF-financed projects are implemented by the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), and the World Bank as well as the four Regional Development Banks, the Food and Agriculture Organisation (FAO), the United Nations Industrial Development Organisation (UNIDO) and International Fund for Agricultural Development (IFAD). The GEF has emerged as the principal financial mechanism to support implementation of two Rio Conventions (Climate Change and Biodiversity). It currently funds more than 500 projects and 400 Enabling Activities in developing countries, having committed US\$4 billion in grants, and raised several billions in co-financing. The GEF also provides grant financing to help countries comply with the formal obligations of the conventions. As concerns the UNFCCC, this includes support to draw up greenhouse gas inventories, to formulate national action plans to mitigate and to adapt to climate change and to report on steps taken to implement the Convention (National Communications).

The GEF also supports the preparation of national biodiversity strategies and action plans under the CBD, and supports operational programmes that reflect different ecosystem types (e.g. arid and semi-arid, coastal/marine, and forest ecosystems, and integrated ecosystem management).

The Clean Development Mechanism (CDM), established under the Kyoto Protocol of the Climate Change Convention, as one of three market-oriented instruments, provides for collaboration between developed and developing countries who have ratified the Protocol in achieving sustainable development and contribute to the ultimate objectives of the Convention (see Box 26 in Section 5 below.)

The Bonn Agreements and related decisions provide for the establishment of three new funds: a **special climate change fund** and a **least developed countries fund** under the Convention, and an **adaptation fund** under the Kyoto Protocol. The special climate change fund will finance activities relating to climate change in the areas of adaptation; technology transfer, energy, transport, industry, agriculture, forest management and waste management; as well as activities to assist developing countries whose economies are highly dependent on income generated from fossil fuels in diversifying their economies. The least developed countries fund will support a work programme for least developed countries to help those countries formulate National Adaptation Programmes of Actions (NAPAs). These Plans should identify activities which, if further delayed, could increase vulnerability or lead to increased costs at a later stage. This fund is to be supported by bilateral donors.

The **Global Mechanism established under the Convention to Combat Desertification** aims to promote the mobilisation and channelling of financial resources to affected countries. This implies building on existing planning and programming institutions and mechanisms at the local, national or sub-regional levels. This is in line with the multi-sector approach of the Convention, which calls for the mobilisation and co-ordination of all available financial resources in support of its implementation.

3.2.2. Benefit sharing, traditional knowledge

The Convention on Biological Diversity calls for “the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources”. Such resources are often collected from lands inhabited by local or indigenous communities, and their traditional knowledge is sometimes used to identify potentially valuable resources. To date, however, benefits from the commercial use of these genetic resources have largely

**The Clean
Development
Mechanism...**

**Global Mechanism
established under
the Convention
to Combat
Desertification...**

**Benefit sharing,
traditional
knowledge...**

Box 9. Implementing the Rio Conventions: capacity development needs

Needs directly relevant to *climate change* issues include capacity to identify and monitor main sources of GHG emissions; to develop greenhouse gas inventories and to assess mitigation and adaptation options in the context of environmental management strategies. They also include capacity to formulate national programmes to address climate change as part of national development plans, including measures for adapting to the impact of climate change (particularly for countries identified to be vulnerable to climate-related natural disasters). Many countries will also require assistance to develop the policy and institutional framework necessary to attract private investment in support of climate-friendly projects, and to take advantage of opportunities arising from emerging mechanisms such as the Clean Development Mechanism.

In the case of *desertification*, assistance will be required for the establishment or strengthening of early warning systems; mechanisms for assisting persons internally displaced due to environmental degradation; drought preparedness and management systems; drought contingency plans; food security systems, including storage and marketing facilities in rural areas; the promotion of alternative livelihood projects to provide incomes in drought-prone areas; and the development of sustainable irrigation programmes for crops and livestock.

Capacity development needs specifically relevant to *biodiversity* include assessment of the impact of habitat loss on

biodiversity, especially in relation to forests; research on indigenous knowledge of conservation of forest resources; the establishment of long-term reliable access to relevant scientific information networks and data bases, including notably through internet; and human resource development in a wide range of scientific disciplines including ecosystem management, taxonomy and information technology.

In the biodiversity context, many practical difficulties constrain the effective implementation of benefit-sharing agreements. For foreign users or in-country scientists, the challenge is to know from which community "*Prior Informed Consent*" is required and how to undertake the consultation. For a community, the challenge is to understand the proposed terms and negotiate a fair deal. Capacity development needs include: the development of legislation to regulate access to resources that require PIC to protect traditional knowledge; the development of biodiversity registers, local access protocols, codes of conduct, monitoring of exports, and improved recognition (in law and in practice) of community rights over land and natural resources. The recently adopted Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising out of their Utilization and UNEP Guidelines on Compliance and Enforcement of Multilateral Environmental Agreements could play in this context an important role in advancing capacity strengthening.

been enjoyed by companies and research institutes which have the research and development capacity required to develop marketable products, and obtain intellectual property rights (IPRs) and patents on novel products.

While highlighting the need for benefit-sharing with local communities, the CBD leaves benefit-sharing policy to be defined in national law, with the active participation of local and indigenous communities. One effective way of handling access to genetic resources and benefit sharing is through contracts (Mutually Agreed Terms), based on the principle of Prior Informed Consent (PIC)¹ of the communities whose resources or traditional knowledge are to be used. Ways to recognise the contribution of traditional knowledge include the development of community biodiversity registers, local access protocols and codes of conduct for collectors and users of biodiversity resource. Capacity development is needed in all these areas.

3.2.3. Technology transfer

Technology transfer...

The Rio Conventions emphasise the importance of technology co-operation and transfer in achieving their respective goals.

For *climate change*, priority areas for technology transfer include those technologies related to energy development and consumption. Energy efficiency and renewable energy technologies are critical if countries are to avoid or reduce increases in carbon emissions without compromising their ability to meet their energy needs. Methods for preserving "carbon sinks",² such as low impact logging and more effective reforestation and forest management techniques are also needed in many countries. Adaptation technologies are likewise a priority area in climate change.

Box 10. Capacity development for the Rio Conventions

There are a number of initiatives to support capacity development in relation to the Rio Conventions:

The GEF/UNDP Capacity Development Initiative (CDI) promotes a comprehensive and strategic approach to developing the capacities needed at the country level to meet the challenges of global environmental action. One of the main approaches is to help countries design and implement National Capacity Needs Self Assessments (NCSAs). These assessments aim to identify needs for capacity development to areas related to biological diversity, climate change, and land degradation, and to encourage countries to examine the linkages between these issues and wider concerns of environmental management and sustainable development. The NCSA process places particular emphasis on building upon

and strengthening existing capacity and reviewing and incorporating the results of previous analyses, studies, and assessments. The CDI will thus provide countries with an opportunity to examine the cross-cutting and synergistic aspects of their capacity to address global environmental issues.

As part of its strategy to assist countries prepare for the entry into force of **the Cartagena Protocol on Biosafety**, the GEF is also collaborating with UNEP on a project to support the development of **National Biodiversity Framework**. This project will assist up to one hundred countries develop their national frameworks so that they can comply with the Protocol. The project also promotes regional and sub-regional co-operation on Biosafety.

Technology co-operation will have an important role to play in assisting developing countries to address climate change. We know from long experience that the main constraint to the rapid diffusion of cleaner production is the lack of human, institutional, technical, managerial and financial capacities needed to manage technological change. Areas where support could be provided include technology needs assessment; the identification of sources and suppliers, the determination of optimal modalities for the acquisition and absorption of relevant technologies, and the assessment of policy options for reducing barriers to technology transfer (including in the financial and fiscal policy spheres). An expert group was recently established under the Climate Change Convention to make recommendations in these areas.

Technologies related to sustainable agriculture, ecosystem protection and management, sustainable forest management, and the environmentally sound management of genetic resources (from their collection to commercial development) are priorities for combating *desertification* and *biodiversity loss*. Many of these technologies are low-cost and should be easily shared with the right incentives and mechanisms.

3.2.4. Capacity development

Many countries do not have the requisite scientific, technical and institutional capacities to respond effectively to climate change, loss of biodiversity and desertification. For this reason, capacity development has received considerable attention in each of the Rio Conventions. See Box 9.

Development co-operation agencies, including multilateral financial institutions, have supported many initiatives related to capacity development (See Box 10). Scientific and technical expertise has been enhanced in many countries. In the area of climate change, for example, support from the GEF and other bilateral and multilateral institutions make it possible for many countries to develop high quality national inventories and national climate change action plans. This is also true for biodiversity and desertification where a critical mass of in-country and/or regional scientific and technical experts have made it possible for many countries to prepare their scientific assessments and their respective national strategies and action plans.

Broader issues relating to donor support for capacity development are addressed in further detail in Section 4 below.

**Capacity
development...**

The same response policies or measures can simultaneously address climate, biodiversity and desertification objectives...

3.3. Complementarities among the Conventions

The three conventions complement each other to a large extent. In many cases, the same response policies or measures can simultaneously address climate, biodiversity and desertification objectives. The most obvious examples relate to the sustainable management of natural resources. The parties to the UNFCCC have committed themselves to promote sustainable management, and promote and co-operate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases. The conservation and sustainable use of biological diversity, two of the objectives of the CBD, also demands similar practices. Likewise, sustainable practices in land use and agriculture are key response strategies to desertification under the UNCCCD. Many measures which can help countries combat biodiversity loss and desertification also help them adapt to the impact of climate change.

Issues concerning the synergies and linkages undertaken between multilateral environmental agreements have been recognised among the main challenges in ongoing international debates on how to establish a more coherent and cost-effective international environmental governance regime.³ The sections below point to avenues for building on the complementarities across the Rio Conventions.

3.3.1. Complementarities through scientific assessments, reporting and policy formulation

There are many overlaps in the scientific information needed to further understand the global environmental issues and their socio-economic impacts. The establishment of integrated information and reporting systems applicable to the three conventions can help pool scientific and technical expertise and generate more accurate and relevant information in a cost effective way. Such systems could also prove valuable for the collection of information required for the “National Reports” called for by the Rio Conventions. This could be complemented by the development of analytical and policy-making tools that would integrate a coherent appreciation of the issues addressed by all the Rio Conventions.

3.3.2. Synergies through international negotiation processes

The precise implementation modalities of each Rio Convention are refined over time through a series of international negotiations (“Conferences of the Parties” or “COPs”, where “Parties” refers to countries that are Parties to the Conventions). The decisions taken by the successive COPs thus play a critical role in orientating Convention implementation efforts. However, the negotiations processes for each convention are largely independent of each other. This can lead to overlaps and/or missed opportunities to avail of synergies. Building on the growing body of convention-specific decisions that deal with the relationships among the Conventions, much more could be done to foster the implementation of the conventions in an integrated manner, particularly through enhanced national level co-ordination. Improving consistency amongst the decisions made by the different COPs is an important way of enhancing complementarities amongst the Conventions.

3.3.3. Complementarities through the Conventions’ Secretariats and national-level Conventions focal points

Each Convention and associated Conference of the Parties (COP) and subsidiary bodies are serviced by a secretariat, whose main functions are to make practical arrangements for sessions of the Convention bodies, to assist Parties in implementing their commitments, to provide support to on-going negotiations and, as directed, to co-

Box 11. Climate change “adaptation” and “mitigation”

Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climate stimuli or their effects which moderates harm or exploits beneficial opportunities. Examples include the establishment of new environmental regulations and institutions, the devel-

opment of water supply and coastal infrastructure and the management of forests.

Mitigation is an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases such as carbon dioxide, methane and nitrous oxide.

ordinate with the secretariats of other relevant international bodies. These Secretariats operate under the authority of their respective COPs which have consistently emphasised the importance of collaboration among the Rio Conventions Secretariats. This has led to collaboration in a number of areas. It may also involve the possibility of co-location of Environmental Convention Secretariats working in related areas.

Each party to the Convention names a representative to serve as the “focal point” for the Convention. Increased collaboration among the Conventions “national focal points” is another way to foster improved coherence across the Conventions as well as their integration into broader development plans and programmes.

3.4. Integrating convention implementation into “mainstream” national planning processes

This section has so far focussed on the objectives of the Rio Conventions and the instrument they provide. However, the global environment, poverty, and development should be addressed simultaneously to achieve sustainable development. Responses to climate change, loss of biodiversity and desertification involve a variety of processes through which societies attempt to reduce the adverse effect of these environmental threats on their development prospects and to contribute to their prevention or mitigation. These responses will inevitably have an impact on how countries pursue their development objectives. They will therefore have to be consistent with and, if possible, reinforce priority national development objectives in order to be effective. The critical challenge is therefore to integrate responses to global environmental threats into “mainstream” national social and economic development policies and plans at the international, national, sectoral, and local/project levels.

3.4.1. The “action plans” called for by the Conventions

All three Conventions call on Parties to formulate “implementation programmes” or “action plans” and to report on progress towards their implementation. Although developed with reference to a specific convention, these policy documents are by nature cross-sectoral, since the impacts and root causes of desertification, climate change and biodiversity issues cut across a wide variety of economic sectors.

The Convention-related “action plans” (*i.e.* a Biodiversity strategy under the CBD, the National Action Plan of the CCD, and the National Climate Change programme under the FCCC) call for the establishment of conducive legal and policy frameworks, the implementation of policy and planning measures in relevant economic sectors, the strengthening of relevant institutions and traditional systems, the mobilisation of public action and many other measures. Accordingly, it is essential to integrate these “action plans” into “mainstream” development policy and planning processes, rather than pursue them as separate agendas. Clearly, in the absence of accompanying policy and institu-

The critical challenge is to integrate responses to global environmental threats into “mainstream” development policies and plans...

Convention-related “action plans”...

tional reforms, to provide a conducive policy framework, even well-designed efforts to, for example, protect biodiversity at the local level, will fail or have limited impacts. Issues relating to the integration of the Conventions Action plans into “normal” development planning are discussed in further detail in Section 4.2.1. below.

3.4.2. Integrated capacity development

Capacity development programmes in support of the Conventions need to take account of the overlaps and synergies with broader capacity development efforts, and take an integrated approach. These issues are discussed in Section 4.3.6. below.

3.4.3. Key challenges of integration

The challenge of integration, or “mainstreaming”, is to bring on board and engage other development sectors, in particular those government ministries and agencies that are responsible for national development. To date, however, efforts have often concentrated on the scientific and technical aspects of implementing the Rio Conventions. For example, most capacity development efforts have been limited to either environmental institutions or to academic/scientific institutions in developing countries. In addition, insufficient attention has been placed on institutional and governance capacities. As long as they are viewed solely or principally as environmental agreements, the Rio Conventions will not be effectively integrated into national development planning and policy-making and will not receive priority attention in the face of competing needs.

The main challenges to integration are:

- ***Raising awareness of the developmental impacts of global environmental threats:*** While the global and regional impacts of global environmental threats addressed in the Conventions have generally been well studied, much remains to be done to understand and forecast their impacts at the level of the countries, sectors and communities affected by these threats. This should not be a strictly scientific or bureaucratic process. Scientific studies of impacts are, of course, essential, but the understanding of the likely socio-economic impacts of climate change, biodiversity loss, and desertification requires the active participation of affected stakeholders at the local, sub-national or national level, and policy-makers in relevant economic sectors. This is a critical first step in formulating and implementing effective responses.
- ***Linking to established policy making processes:*** Protection, response, and adaptation strategies related to global environmental threats, *e.g.* the Rio Convention “Action Plans”, are cross-sectoral in nature and therefore need to be integrated into established policy making at the national, sectoral and cross-sectoral levels. Conversely, some of the national action plans prepared in response to convention obligations could provide the basis for significant components of broad strategies to combat poverty. Integrating the action plans formulated into response to the Rio Conventions in broader development frameworks require institutional mechanisms capable of approaching the problem from a cross-sectoral perspective and mobilising stakeholders, within the framework of broader national development policies.
- ***Linking with planning and budget allocation processes:*** In many cases, Rio Convention Action plans have been designed independently of planning and budget allocation mechanisms at the national, subnational or sectoral levels. Thus, there has been no systematic way to ensure consistency between the investment measures provided for by the action plans and likely budget availability. This is a key dimension of integration.

As long as they are viewed as environmental agreements, the Rio Conventions will not receive priority attention...

The main challenges of integration are...

- ***Promoting cross-sectoral responsibility for implementation:*** In many countries, responsibility for global environmental issues has been given to environmental ministries – often amongst the weakest and least influential in government, and without the support of an “all of government” co-ordination mechanism. Environmental ministries and agencies clearly do not have the mandate to implement policy changes in relevant areas such as energy and agriculture although response measures in these sectors are required. This has hindered the necessary process of cross-sectoral policy integration. Therefore, the design and implementation of strategies addressing global environmental issues should not be the sole responsibility of one Ministry but of all stakeholder governmental institutions.

Approaches, entry points and instruments to tackle these challenges are discussed in the next Section. The scope for “win-win” development-environment policies in the agriculture, forest management and energy sectors is discussed in Section 5 below.

Notes

- 1 The formula “Prior Informed Consent” is also used in relation to international procedures to control international trade in potentially hazardous chemicals. This is a totally different context.
- 2 See Annex 2 for an explanation of key terms and concepts.
- 3 Decisions adopted by the UNEP Governing Council at its Seventh Special Session- Cartagena de Indias, Colombia 13-15 February 2002 – SS.VII/1 International Environmental Governance.

4 Integrating Global Environmental Issues into the Development Agenda: Approaches, Entry Points and Instruments

As noted in Section 3 above, tackling the issues addressed by the Rio Conventions effectively, and in a manner consistent with priority national development objectives, implies integrating global environment objectives into general social and economic development policies and plans at the international, national, sectoral, and local/project levels. This is a major challenge, calling for special attention to analytical, governance and management approaches and tools. This section outlines some of the main opportunities for integrating global environmental concerns. These strategies and tools are already in use to varying degrees, making them opportunities and viable entry points.

Integrating global environment objectives into general development policies and plans...

4.1. Key entry points: sustainable development strategies (SDS)¹

At the 1992 UN Conference on Environment and Development (UNCED), Governments made a commitment to adopt national sustainable development strategies. Agenda 21 states that SDSs “*should build upon and harmonise the various sectoral, economic, social and environmental policies and plans that are operating in [a] country*”. This commitment was reaffirmed in the UN Millennium Declaration and the Millennium Development Goals and calls upon countries to “*integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources*”.

National sustainable development strategies are dynamic processes...

4.1.1. Sustainable development strategy: a generic concept and not a “model”

Sustainable development strategies (SDSs) are dynamic processes which aim to steer development policies and plans towards a sustainable path. The term “*sustainable development strategy*” therefore refers to as generic concept, covering a wide range of possible approaches, rather than as a “blueprint” or “model” for a particular kind of strategy. The emphasis is on what a strategy “does”, managing progress towards sustainability goals rather than what it “is” *i.e.* a “plan” enshrined in a document. Accordingly, SDSs can take a variety of forms depending on national circumstances, and can come under a variety of “labels”, such as “*National Agenda 21*”, “*National Poverty Eradication Strategy*”, “*National Vision 20-20*”, etc. In some cases, such as when two or more countries are closely linked through economic, ethnic or other ties, or share critical natural resources and ecosystems (*e.g.* a river basin or watershed), the formulation of sustainable development strategies must take explicit account of the regional dimension.²

4.1.2. SDS: Dynamic processes focussing on integration

A central objective of SDS is the reconciliation of short- and long-term goals, and the integration of national priorities and international commitments and obligations. The requirements of integration cover several dimensions: *i)* integrating the multiple perceptions, needs and aspirations of different stakeholders; *ii)* integrating economic, social and environmental objectives – or making informed choices between them where full integration is not possible; *iii)* integrating technical planning concerns in

Reconciling short and long term goals....

Box 12. Key principles underlying sustainable development strategies

Sustainable Development Strategies should be:

Country-led and nationally-owned. Countries must take the lead and initiative in developing their own strategies.

Rooted in a vision of long-term development. The vision should reflect a consensus among social, economic and political stakeholders across the political spectrum. High-level government commitment to the vision is also essential.

Defined through a participatory process, involving civil society, the private sector and political stakeholders to open up debate, expose issues to be addressed, and build consensus and political support on action.

Based on a solid analytical basis, including a comprehensive review of the present situation and forecasts of trends and risks, including those beyond the country's control.

Focused on ensuring sustained beneficial impacts on disadvantaged and marginalised groups, notably the poor.

Comprehensive and integrated. Strategies should seek to integrate economic, social and environmental objectives through mutually supportive policies.

In developing a strategy it is essential to:

Build on existing strategies and processes, rather than adding additional ones, and focus on improving the convergence, complementarity and coherence between different planning frameworks and policies.

Link national and local levels. The main strategic principles and directions should be set at the central level but detailed planning, implementation and monitoring would be undertaken at a decentralised level.

Set realistic and monitorable targets linked to clear budgetary priorities. The strategy needs to be fully integrated into the budget process to ensure that financial resources are available to translate it into action. Conversely, the formulation of budgets must take account of the priorities highlighted in the strategy.

Define the roles, responsibilities and relationships of key participants in strategy processes early on. Governmental, civil society, and private sector stakeholders should agree on the “rules of the game” and be bound to a clearly defined stand.

Identify priority capacity development needs. This includes taking stock of the institutional, human, scientific and financial capacity of state, market and civil society stakeholders and finding ways to fill gaps.

“Build in” continuous monitoring and improvement from the outset. This requires developing mechanisms and indicators to track progress, capture lessons from experience, identify necessary changes of course. Local capacities for analysis and existing information should be fully utilised.

Source: OECD, September 2001. Policy Brief: Sustainable development strategies: What are they and how can development co-operation agencies support them? P. 4.

Integrating of national priorities and international commitments...

political decision-making processes; *iv*) linking policy making processes with budget allocation mechanisms; *v*) linking different sectoral strategies and *vi*) linking local, national and global levels.

The key principles underlying SDSs, are summarised in Box 12. Any strategy which conforms to these principles can be considered to be a sustainable development strategy.

4.1.3. Building blocks of sustainable development strategies

Notwithstanding country-specific differences, SDS rely on a number of common “building blocks”, which include:

- a*) **A broad long-term vision** reflecting the country's history and core values widely shared among the public and all actors across the political spectrum. It provides an articulation of a country's aspirations, for current and future generations, as well as its role and ambition with regard to regional or global issues. It includes a reflection of responsibilities, obligations and commitments in relation to global agreements such as the Rio Conventions. In some countries the “national vision” is enshrined in a document formally endorsed by parliament.

A broad long-term vision...

- b) *Mechanisms for cross-sectoral policy formulation*, which are essential to facilitate interaction between policy decisions taken at different levels (national, sub-national or local) and in different sectors, as well as finding ways to integrate different objectives - or make informed trade-offs between them when integration is not possible. They must be linked to resource-allocation processes.
- c) *Multi-stakeholder forums*. Multi-stakeholder forums or consultative mechanisms involving government, business, labour and civil society. These are needed to build bridges across society, translate goals into policies, and gather societal support. So-called Councils for Sustainable Development have in some countries played an important role in this respect.³ Many countries have a National Council on Sustainable Development (Costa Rica, Tunisia, Ghana, Mongolia) comprised of different ministries (Finance, Environment, Education, and others), representatives of civil society, and NGOs.
- d) *A capacity to monitor socio-economic and environmental conditions and likely future trends*. A sound knowledge base is essential to assess policy options and constraints, define realistic objectives, monitor progress towards agreed goals, and identify necessary changes of course. The Rio Conventions all highlight the importance of a sound analytical basis in order to understand the complex economic, social and ecological factors driving environmental degradation, forecast long term trends and risks, and formulate appropriate response measures.

Taken together, the “building blocks” and the closely related key principles outlined in Box 12 form the basis of a sustainable development strategy.

4.2. Poverty reduction strategies

As noted above, a variety of established strategic planning processes can provide useful entry-points to develop “sustainable development strategies”. Because of their high profile in developing countries, PRSs – and the related Comprehensive Development Framework – deserve special attention here.

The Comprehensive Development Framework (CDF) was introduced by the World Bank in 1998 as a concept for a holistic, comprehensive approach to development. A key element of CDF is to encourage a **long-term strategic horizon** for the development planning process of, at least, 15-20 years. It seeks a better balance in policy-making by highlighting the interdependence of all elements of development – social, structural, human, governance, environmental, economic, and financial. It emphasises partnerships among governments, development co-operation agencies, civil society, the private sector and others involved in development.

Within this framework, the World Bank and the IMF launched in September 1999, a process of **Poverty Reduction Strategies** for low-income countries. Poverty reduction strategies “... should be country-driven, be developed transparently with broad participation of elected institutions, stakeholders including civil society, key development co-operation agencies and regional development banks, and have a **clear link with the agreed international development goals**”.⁴ Countries were invited to design their own strategy, and operationalise it through a Poverty Reduction Strategy (PRS). The PRS process should build on existing national strategies and policies. Some countries already had what were, in effect, PRSs.

PRSs incorporate the key principles of the sustainable development strategies and, as such, provide a major opportunity to address linkages between poverty and environment and to integrate environmental concerns into social and economic interven-

Mechanisms for cross-sectoral policy formulation...

Multi-stakeholder forums...

A capacity to monitor socio-economic and environmental conditions and likely future trends...

Poverty reduction strategies should reflect countries' commitments under Global Environmental Conventions...

tions to sustainably reduce poverty. A number of challenges remain to be addressed to fully translate this potential into reality and ensure the success of this approach.

As stated in the DAC Guidelines on Sustainable Development Strategies: "As PRS increasingly become the basis for agency support, there is a need to improve the analysis, process and content, ensuring the integration of key development issues, such as gender and environment. There is also growing recognition of the need to consider poverty-environment linkages and long term sustainability issues in Poverty Reduction Strategies, in line with the principles of the CDF. In particular, agencies and countries need to consider consistency of the PRSs with other international agreements for sustainable development (e.g. the UN Convention to Combat Desertification)." A comprehensive analysis concerning local ecosystem and natural resource base concerns and global environmental threats and the linkages with poverty, in line with the synergies identified in these Guidelines, should therefore be part of the PRS. To the extent practicable, the PRS should also reflect countries' commitments under Global Environmental Conventions. A review of PRS, conducted by the World Bank, suggests that progress to date is still limited.⁵ Boxes 13 and 14 below provide examples of progress in this regard. Box 28 in Section 6 below provides further examples of emerging good practice.

4.2.1. "Action Plans" developed in response to the Rio Conventions

As noted in Section 3 above, all three Rio Conventions call for the formulation of "Action Plans" for implementation. Although developed with reference to a specific convention, these policy documents are by nature cross-sectoral, since desertification, climate change and biodiversity issues cut across a wide variety of economic sectors, as concerns their impact and root causes. These "Action Plans" also call for a variety of policy and other measures in a wide range of relevant sectors.

National Action Plan to Combat Desertification...

National Action Plan to Combat Desertification: The Desertification Convention calls upon affected countries to prepare and implement national action programmes (NAPs) to combat desertification and the effects of drought, building on existing relevant successful plans, at the national or regional level and in the context of other efforts to formulate national policies for sustainable development. (Article 9). The purpose of NAPs is to identify the factors contributing to desertification as well as practical measures which can be taken, at the local, national, sub-regional and regional levels, to combat it. The linkages with poverty reduction and sustainable development are evident. The Convention particularly highlights the need for cross-sectoral approaches to land-use planning, integrated water resources management, and emphasises the socio-economic dimensions of desertification processes.

National Climate Change Programme...

National Climate Change Programme: The Climate Change Convention calls upon parties "to formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change".⁶

National Adaptation Programmes for Action...

As noted in Section 3 above, a special fund had been recently established to support least developed countries in developing ***National Adaptation Programmes for Action*** (NAPA). The Guidelines for the preparation of these Plans, which are still under development, provide for their integration into the national sustainable development strategies or Poverty Reduction Strategies. They also highlight the need to ensure coherence between the NAPAs and the action plans formulated in response to the other conventions.

Box 13. Integrating the biodiversity conservation strategy within the PRS: the case of Bolivia

Bolivia is a country where 94% of the rural population is under the poverty level. Under these conditions a biodiversity strategy must start from the recognition of the priority of satisfying basic needs. The Bolivian Biodiversity Sustainable Use and Conservation Strategy focuses on giving value to wild ecosystems and thereby alleviating poverty. Due to the large size of the country (1 098 581 square kilometres), and its small population (approximately 7.5 million), low intensity use options are still feasible in a large proportion of its surface area, most of which are poverty stricken. At present 10% of employment in the country depends on biodiversity use. Sustainable management of key species will increase

income in these areas. Biodiversity-based products with commercial potential include Vicuna wool, and forest products such as medicinal plants, rubber and brazil nut. The definition of the biodiversity strategy and action plan through a highly participatory process ensured strong emphasis on the link between poverty reduction and biodiversity use and conservation. The economic focus of the strategy, together with intensive collaboration of the Sustainable Development Ministry with the Economic Policy Council, has enabled the biodiversity strategy to be incorporated as a part of the Bolivian Poverty Reduction Strategy, which is one of the main governmental statements of policy

Source: Material collected in the course of the DAC work to formulate NSSD Guidelines.

Biodiversity Strategy: The Biodiversity Convention calls upon parties to “develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes [...] and to integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies” (Article 6).

Biodiversity Strategy...

In addition to these, the plans prepared in relation to natural disaster prevention, preparedness and mitigation, including in response to the 1994 World Conference on Natural Disaster Reduction and related “Yokohama Strategy and Plan of Action for a Safer World” provide relevant entry points for integrating issues related to global environmental threats into national plans and programmes.⁷

4.3. Approaches and instruments for integration

Governments as well as development co-operation agencies tend to follow sectoral approaches to development decision making as well as with regard to environmental protection and regulation. This traditional approach is both convenient and effective in delivering the objectives of a given sector. However, the challenges of poverty reduction, sustainable development, and global environmental threats call for a cross-sectoral understanding of the issues, their backward and forward interlinkages and their collective impact on development. Cross-sectoral mainstreaming into local, national or regional policies and plans is therefore a critical challenge. Section 4 outlines some of the sectors where the linkages between local development and environmental issues and global environmental threats are particularly relevant. These include:

- For issues related to **Desertification**: linkages with agriculture/livestock, energy, forest management, and water sectors.
- For issues related to **Climate Change**: linkages with energy production, industry, transport, forest management, agriculture/livestock, waste management, water, land and coastal zone management.
- For issues related to **Biodiversity**: agriculture/livestock, forest management, fisheries, tourism, energy, coastal zone management and water.

Box 14. Ecological considerations in poverty reduction strategies

Some PRSs apply ecological approaches in order to specifically identify the linkages between ecological, social and economic conditions. For instance, the PRSs of Honduras, Burkina Faso, Mauritania and Guinea present maps showing the regional distribution of poverty, population and natural resource attributes. The poverty and resource maps help in the assessment of spatial and temporal relationships between

poverty and the resource base. They can also be used to track the impacts of policy and management interventions relating to poverty reduction. The Burkina Faso PRS, in particular, notes that climatic conditions and low agricultural productivity, related to degradation of soil and water resources, are major constraints to economic growth and contribute to massive poverty and severe food insecurity among rural inhabitants.

Source: World Bank PRS Source Book.

Box 15. Key features of an ecosystem-based approach

An ecosystem-based approach is a strategy for the integrated management of land, water and living resources to improve human well-being and that promotes sustainable use in an equitable way. The key features presented below are based on current understanding and principles regarding the ecosystem approach (e.g. as adopted by the CBD).

Institutional concerns

- The approach reorients management. It emphasises a systemic approach, recognising that ecosystems function as whole entities and need to be managed as such, not in pieces. Thus it looks beyond traditional administrative and jurisdictional boundaries.
- Management objectives are a matter of societal choice depending on their own economic, cultural and social needs.
- Management should be decentralised to the lowest appropriate level. Rights of access to resources and responsibilities for their management are important factors affecting sustainability. Use is most likely to be sustainable where the prime beneficiaries are those living with and using the resource are involved and/or responsible.
- Managers should consider the effects (actual and potential) of their development decisions on adjacent and other ecosystems insofar as relevant.
- Sustainability of management options should be assessed in socio-economic terms and in terms of ecological effects at the ecosystem level, and trade-offs should be made transparent.

Social-economic concerns

- The approach should not be focused on production alone although it explicitly links human needs to the production capacity of ecosystems to fulfil those needs. It views production of goods and services as the natural product of a healthy ecosystem, not as an end in itself. Within this approach, management is not successful unless it preserves or increases the capacity of an ecosystem to produce the desired benefits in the future.

- Recognising the potential gains from management, the ecosystem should be understood in an economic context considering: the reduction of those market distortions that adversely affect or overexploit the ecosystem; align incentives to promote sustainable use; and internalise costs and benefits in the given ecosystem to the extent possible.
- Sustainability is more likely when: economic activities are closely linked to resource tenure systems; incentives are aligned to favour reinvestment of returns from use in ecosystem conservation; and market interventions arising from externally-imposed conservation concerns take full account and mitigate the socio-economic implications of their application.
- The approach should involve all relevant sectors of society and scientific disciplines (stakeholder participation).
- The approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.

Ecological concerns

- A key feature of the approach is to include the conservation of the ecosystem structure and functioning. Ecosystems should be managed within the limits to their functioning.
- Recognising the varying temporal scales and lag effects which characterise ecosystem processes, objectives for management should be set for the long term. Due to the inherent dynamics of change of ecosystems, an adaptive management is necessary to anticipate and cater for changes. This should also be reflected in an appropriate balance between conservation and use.

This section outlines some of the approaches and instruments available to identify linkages between national or local development issues and global environmental concerns and to ensure that appropriate linkages are made across different sectors.

4.3.1. Ecosystem-based approaches: matching development strategies with countries' physical and ecological conditions

Country-specific analysis of development options based on the natural resource base: Most developing countries depend on their natural resource base for development and poverty reduction. Ecosystems – agro-ecosystems, forests, freshwater watersheds, grasslands and coastal zones – are therefore critical to meeting socio-economic development goals. Basic ecological factors, such as topography, endowments in water resources or climatic conditions play a significant role in determining the development options available to a country and its development sectors. An important aspect of sustainable development strategies is therefore to ensure that the formulation of development plans is based on a clear understanding of physical, ecological, social and economic factors. The general practice, however, is to assess the impact of their development plans **on** natural resources and ecological functions, not on identifying development options particularly well-suited to the country's specific ecosystems. Ecosystem-based approaches will help balance assessments of development policy options which focus mostly on the socio-economic dimensions. See Box 14 for examples how ecological concerns are being addressed in relation to PRS.

*Ecosystem-based approaches*⁸ are the way to shape development strategies in line with countries' physical and ecological conditions, and are essential to integrate the local and global environmental concerns into sector-specific development decisions (see Box 15 for their key features). By capturing both environmental and social-economic development aspects of sector-specific decisions, an ecosystem-based policy framework can provide a way for policy makers to identify the most promising development options and make decisions based on a sound understanding of their long-term consequences.⁹ It provides a way to assess the impacts of global environmental threats on national or local development strategies and *vice versa*. For example, in regions where crops are grown at or close to their heat tolerance, the agriculture sector could be highly vulnerable to even small changes in temperatures due to global climate change. As a management approach, it provides a way for integrated land, water and living resources utilisation to improve human well-being. As an analytical approach, it complements standard socio-economic and financial analysis.

4.3.2. Spatial planning and land use management

Land use planning and management is one of the critical entry points for effective integration of global environmental issues into social and economic development plans. There is an intimate link between land resources and key ecological functions of ecosystems. Addressing desertification, loss of biodiversity and climate change all requires tackling complex land use planning and management questions. An ecosystem-based approach for development sectors constitutes the policy framework. In addition, a system for integrated planning and management of resources is critical in translating synergies into practice. Without good and sustainable land use plans, or by not adhering to such plans, development decisions will tend to be ad hoc, short term and create conflict among stakeholders, and the integration of social, economic and environmental objectives will not occur.

Development plans is based on a clear understanding of physical, ecological, social and economic factors...

Ecosystem-based approaches can integrate local and global environmental concerns into sector-specific development decisions...

Land use planning and management...

Integrating administrative and ecosystem boundaries...

Integrating administrative and ecosystem boundaries: For land use planning and management to be effective, it should take into account traditional, administrative as well as ecosystem boundaries. So far, in many countries the focus has mainly been on administrative boundaries when tackling land-use planning and management. What is more, the manner in which land is utilised should not only take into account land as a physical entity in terms of its topography and spatial nature, but should also recognise the fact that land contains vital natural resources such as minerals, water and biota.

4.3.3. Assessing the impact of development policies and plans: Strategic Environmental Assessment (SEA)

Strategic Environmental Assessment...

Assessing national development strategies (including adaptation and response): Strategic Assessment, (SA) or Strategic Environmental Assessment (SEA) has emerged in response to growing awareness of the limitations of project-level environmental and social impact assessments. This is because project-level assessment methods (*i.e.* Environmental Impact Assessment – see below) cannot capture cumulative, nor sector-wide, economy-wide and transboundary effects. SEA involves analysing the likely environmental and social consequences of development policies at the strategic level in order to ensure they are fully included and appropriately addressed at the earliest stage of decision-making. It is a dynamic and systemic process whereby the impacts of policy choices are identified and evaluated, and corrective measures identified and implemented in an iterative fashion. The appropriate SEA methodologies will vary across sectors and across countries, in line with their unique institutional and other features. However, actual in-country experience with this instrument is still limited and most countries do not yet have legal procedures. As in the case of project-level (see below), the effectiveness of SEA processes depends strongly on the transparency of the process and on the degree to which relevant stakeholders can effectively be involved.

SEA methodologies and global environmental issues: SEA is very helpful in addressing strategic policy questions like how an agricultural strategy increases or decreases vulnerability to climate changes and therefore can address the challenges posed by global environmental threats and assess consequences of various development responses to global developments. The matrices presented in the Annexes (*e.g.* the matrix *Agriculture, Ecosystem Goods and Services, and Global Environment Linkages*) illustrate how an ecosystem-based approach can be applied in the context of SEA in the agriculture and energy sectors respectively. They highlight the impacts of these sectors on key ecosystem processes and their ability to produce the goods and services needed for development, as well as potential global impacts.

4.3.4. Project-level Environmental Impact Assessment (EIA)

Environmental Impact Assessment...

Environmental Impact Assessment (EIA¹⁰) is a decision-making tool concerned with predicting, estimating and evaluating, the environmental and social consequences of a proposed (usually large-scale) development project from the formulation to the implementation and, where applicable, decommissioning stages. Key requirements of EIA processes include transparency and public participation. Many governments have accepted that EIA is an essential and integrated part of planning processes. Laws requiring EIAs lay down the imperative to plan development in a manner that would optimise resource use but at the same time minimise the adverse impacts of human actions on the environment. EIA procedures, which focus on local-level issues, can readily be extended to assess potential impacts of projects on global environmental issues and related legal commitments, when those impacts occur at that level.

EIA procedures do not, however, provide for the assessment of the impacts of environmental changes¹¹ on projects (e.g. due to global climate change). This could have significant implications for very long-lived infrastructure projects (such as dams, irrigation facilities and the like), which are likely to be impacted by climate change. Thus, projects which are not expected to have significant local or global environmental impacts (such as the rehabilitation of existing infrastructure) may not be submitted to EIA, even though they may be significantly vulnerable to climatic change.

Linkages between EIA and the Rio Conventions: Several issues need to be addressed to optimise the linkages between EIA and the Rio Convention instruments:

- *Scientific issues:* Local or programme-level environmental problems of concern in an EIA may also be related to global environmental issues mentioned in the Rio Conventions.
- *Stakeholder involvement:* The Rio Conventions state that public participation in decision-making and community-based management should be promoted. EIA is a legally defined mechanism for stakeholder and public participation, and may thus serve as a vehicle to promote the objectives of the conventions.
- *Public information campaigns:* The Rio Conventions emphasise the importance of public information campaigns. An opportunity to raise awareness on global environmental concerns may lie in EIA capacity development programmes.
- *Enabling environment:* This includes institutional and legal action, such as updating legislation and procedures that may hinder implementation of the Conventions. Environmental assessment is an important legal instrument that can be used to enhance the issues raised by the Conventions.
- *Indicators and benchmarks:* The Rio Conventions promote the development and application of indicators and benchmarks. Preferably, these indicators describe the present situation with respect to a specific global environmental problem (state), the rate of change (pressure), or the effectiveness of measures (response).

4.3.5. Community-Based Natural Resource Management (CBNRM)

Local governance and control over natural resources: The involvement of those concerned with resource use and management, particularly local government, communities and indigenous peoples, is essential for the sustainable management of natural resources, and to address resource degradation issues and resource conflicts. Local control over resources may lead to resource degradation especially in situations where there is lack in good governance, no enabling environment and insecure resource rights. In many countries a decentralisation process of government responsibilities is already ongoing, giving greater control to communities over the management of local resources and ensuring stakeholder participation in decision-making. Effective community-based institutions are crucial for collective management of resources as well as in efforts to aid the poor in developing sustainable livelihoods¹². Community-Based Natural Resource Management (CBNRM) is based on the recognition that local people must be involved in decision-making over their natural resources in order to encourage local sustainable development.

Livelihood strategies and CBNRM: The livelihood strategies of many rural poor depend on their natural surroundings. They regard their biological resources as a social and economic resource and the environment, *i.e.* the ecosystem, as an underlying condition. This should be reflected in resource management and protection strategies.

**Community-Based
Natural Resource
Management...**

Box 16. Global – local linkages: local participation

As with other international agreements, formal responsibility for implementing the Rio Conventions lies with the state. However, effective local participation is indispensable if global environmental problems are to be tackled effectively. After all, it is at the local level that people are experiencing the impact of global environmental problems, *e.g.* in the form of diminished agricultural output due to more frequent natural disasters including those that would result from climate change. Conversely, action to counter global environmental problems needs to be taken at the local level, given that most environmentally harmful activities occur in particular communities and within specific political boundaries. For instance, several of the main causes of desertification and biodiversity loss such as land degradation and drought are often localised phenomena and need responses at that level. Unless local governments and communities have a stake, by

sharing in the benefits and by having the authority for regulating sustainable use, or receive revenues for conserving ecosystems and watersheds, efforts to attain the objectives of these conventions will remain difficult. Global-Local Linkages gain additional importance if one considers that local communities usually do not interact with the central government but with local governments. When unsustainable activities result in damage which affects hundreds, if not thousands, of citizens, their first recourse for relief as well as contact point for complaints are the local authorities. At the same time, it has to be borne in mind that some issues cannot be resolved at the local level, *e.g.* because, at the local level, land ownership and the distribution of political leverage may be too intertwined to allow for fair solutions to land ownership disputes; or because they result from policy decisions made at “higher” – regional, national – levels.

CBNRM does not automatically lead to sustainable resource management and is not the solution to all resource use problems, but may facilitate solutions in areas where people depend on their surroundings for their livelihood. Subjects to be dealt with are the enhancement of rural livelihoods and poverty reduction, land tenure (defining access and ownership rights), land use planning (defining how resources can be used), institutional development, training and capacity development, resource protection. The CBD (as well as the Ramsar Convention) recognises the role and traditional dependence of many local and indigenous communities on biological resources. The Conventions provide opportunities for community management, protection of traditional knowledge, access and benefit-sharing, and sustainable use.

Integrated capacity development...

4.3.6. Integrated capacity development

As noted in Section 3 above, all three Rio Conventions identify a wide variety of fields where capacity development is required. (See Box 9 in Section 3 above.) These include needs related to forecasting, and monitoring of ecological and socio-economic conditions; and the formulation of adaptation, response and disaster prevention strategies.

Other needs relate to the development of conducive policy and institutional frameworks. These include development planning and policy-making processes in sectors such as agricultural development, energy, transport and many other key economic sectors; as well as capacity for cross-sectoral policy-making, planning and programming dialogue, negotiation, mediation, conflict resolution, education and awareness raising.

In the majority of cases, the human and institutional capacity development programmes initiated in relation to the conventions, in areas such as forecasting, monitoring of ecological and socio-economic conditions, land use planning, disaster mitigation, policy-formulation and cross-sectoral policy making and planning, have direct relevance in a wide range of other areas. Similarly, capacity development in the areas related to good governance, including participatory planning and decision making, negotiation, mediation and conflict resolution have very wide relevance to developing societal capacity.

Box 17. Capacity development and capacity building

Although the concepts of capacity development and capacity building are often treated as synonyms, these concepts can be seen to embody quite different ways of thinking. The words capacity building imply that capacity can somehow be “built” from the outside, and that development will result from a transfer of skills and knowledge from North to South, through training, technical co-operation, and similar activities. The expression capacity development is intended to emphasise that knowledge and skills development require the active involvement of local partners in an

ongoing process of learning, adaptation and innovation. Capacity development has thus been defined as a process by which individuals, groups, organisations, and societies create and implement approaches and strategies to enhance their abilities to meet development objectives in a sustainable manner. An important feature of this definition is its emphasis on the endogenous character of capacity development. External agents can play a supportive or catalytic role, but capacity development is something that development actors do for themselves.

Capacity development programmes will have to take account of these many overlaps and synergies and ensure that they are integrated within broader capacity development efforts. It is therefore essential to formulate capacity development initiatives associated with global environmental issues within the context of broad capacity development needs, thereby helping to integrate them within broader strategies for sustainable development. This would help foster policy integration, and avoid duplication of effort ultimately increasing the effectiveness. Above all, it will be essential to avoid creating specific capacities tailored to the demands of the Conventions but isolated from “mainstream” policy and planning processes and therefore with limited impact.¹³

The human and institutional capacity development programmes initiated in relation to the conventions have direct in a wide range of other areas...

Notes

- 1 This section draws primarily from United Nations Department of Economic and Social Affairs (2002): *Guidance in preparing a National Sustainable Development Strategy: Managing Sustainable Development in the New Millennium*. For a more general analysis of SDSs, see OECD (2001): *Strategies for Sustainable Development: Guidance for Development Co-operation*, Paris.
- 2 For example, the Andean Biodiversity Strategy developed by several South American countries provides a shared regional vision and identifies common interests.
- 3 Monitoring of national Rio Convention implementation has sometimes been delegated to these councils or similar entities. It should be noted, however, that such councils and similar entities are not a substitute for getting the right institutional framework in place for implementing the Conventions as instruments of sustainable development.
- 4 Development Committee Communiqué, September 1999.
- 5 Jan Bojo and Rama Chandra Reddy, World Bank Africa Region (2001): *Poverty Reduction Strategies and Environment: A review of 25 Interim and Full PRSPs*.
- 6 Article 4 of the Climate Change Convention.
- 7 See, for example, OECD/DAC (1994): *Guidelines for Aid Agencies on Disaster Mitigation, or UN International Strategy for Disaster Reduction*, website: www.unisdr.org/unisdr/
- 8 Examples are the ecosystem approach of the CBD, Integrated Coastal Zone Management, Integrated Water Management.
- 9 As ultimate causes to unsustainable use of resources are identified: inappropriate land tenure, population change, cost-benefit imbalances, cultural factors, misdirected economic factors, and policy failure (Sustainable Use Initiative by the IUCN, February 2000).
- 10 Rio Declaration, Principle 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.”
- 11 Environmental change must be distinguished from “normal” climatic variability, which includes periodic and thus partially predictable extreme events (*e.g.* bridges are designed to resist to the “30 year flood”) which are generally taken into account in infrastructure projects.
- 12 See also the Sustainable Livelihood Approach developed by DfID.
- 13 The DAC *Guidelines on Strategies for Sustainable Development* (page 56) provides an illustrative list of the steps involved in developing co-ordinating strategic planning and capacity development mechanisms.

5 Sectoral Development Strategies and Global Environmental Issues: Synergies and Hard Choices

The previous sections described the linkages between global environmental issues, national development agendas and the responses provided by the Rio Conventions. This section looks at the potential for building on the synergies and addressing the hard choices between global environmental issues in the context of sectoral development policies at the national level.

A focus on the sectoral level may seem contradictory in a document which emphasises the critical importance of cross-sectoral approaches for sustainable development. However, governments as well as development co-operation agencies are generally organised around sectors, and sectors remain an essential unit of analysis for our purposes. As noted above, however, sectoral policies do not operate in isolation from each other or in a “vacuum”. Important cross-sectoral linkages are accordingly identified wherever relevant.

For practical reasons, this analysis is limited to three sectors: agriculture, energy and sustainable forest management, which, in most developing countries, are centrally relevant to national development priorities and to global environmental issues. This is not to suggest that these are the only sectors of interest in this connection. Other sectors, ranging from water management, coastal zone management to urban planning, transport development or tourism would warrant similar analysis.

Even within the confines of these three sectors, it is not possible to offer anything more than a broad overview. The formulation of sectoral development strategies and plans which could reconcile national and global environmental priorities would require much more detailed analysis, taking account of the wide range of relevant economic, social, institutional and ecological factors which vary across countries or regions. This is beyond the scope of these guidelines and would require additional analysis.

5.1. Development-global environment: “win-win” options and hard choices

Sustainable development strategies aim to integrate the economic, social and environmental objectives of society in order to maximise human well-being in the present without compromising the ability of future generations to meet their own needs. This means seeking mutually supportive approaches whenever possible and making hard choices where necessary. The short-term vs long-term conflicts discussed above (notably in Section 2.5) make it vital for decision-makers to take maximum advantage of available opportunities to address short-term developmental needs while at the same time safeguarding critical environmental resources in the long term.

“Win-win” options are those which allow national and global objectives to be pursued jointly. They involve policies and approaches, which are beneficial from the national or local point of view and which would therefore make sense whether global environmental issues are taken into account or not. The analysis below focuses on identifying such “win-win” options. In many cases, taking global environmental issues into consideration actually reinforces well-accepted policy approaches and recommendations.

Synergies and hard choices in sectoral development policies: agriculture, energy and sustainable forest management...

“Win-win” options and hard choices...

Taking global environmental issues into consideration often reinforces accepted policy approaches...

In some cases, however, there will be a disconnect between national (or indeed local) and global priorities. Protecting the global commons may imply restricting development options or imply higher costs at least in the short term. For example, conserving globally valuable biodiversity, *e.g.* old-growth forest or the habitats of endangered species, may entail costs in terms of foregone agricultural production. Key examples of such hard choices, and ways to address them, are also discussed below. In case of conflicts, ‘hard choices’ have to be made on the basis of a thorough analysis of all available options. Such cases are outlined below.

As noted in Section 3, the Global Environmental Facility (GEF) was created to help overcome such hard choices. To this end, the GEF provides grant and contingent financing to countries to undertake activities that generate global benefits, where the cost of doing so exceeds the national benefits.

5.2. Agricultural development and global environmental issues

5.2.1. Basic approach: increasing agricultural production

Reducing rural poverty, improving rural livelihoods are key development priorities in most developing countries. Increased productivity of small- and medium scale farmers has been identified as an important determinant of growth (both farm and non-farm) and poverty reduction in rural areas. In many cases, however, the prospects for increasing employment in the farming sector are constrained by the trend towards labour-saving modernisation. Thus, the priority objective often is to foster expansion of non-farm activities in rural areas (*e.g.* agroprocessing, light industries, maintenance of vehicle and farm machinery, handicrafts, and services geared towards local consumers, etc.). Increasing agricultural production as such therefore is not synonymous with rural development and increased employment.¹

Raising agricultural production is, and will remain, however, an important way to enhance food security² – for urban as well as rural citizens – and a key development objective in most countries. In principle, two basic ways are available to achieve this: 1) increasing the productivity of areas already cultivated (intensification) or 2) increasing the area under cultivation by converting new land to agriculture (extensification). Both approaches are consistent and complementary with efforts to diversify the crop mix in order to reduce vulnerability to natural or economic shocks, to foster the adoption of high-yielding varieties, to move towards higher value crops or to reduce post-harvest crop loss etc.

Most national agricultural development strategies involve a mix of “intensification” and “extensification” approaches in different parts of the country or in relation to different crops, depending on local circumstances. Below, however, we distinguish between these two approaches in order to examine the relationships with global environmental issues.

5.2.2. Policy instruments available for steering the agricultural sector

The main policy instruments that can steer the development of the agricultural sector include:

- Government-imposed production quotas or other restrictions.
- Direct or indirect subsidies or taxes on crop production.
- Policies regulating the pricing and trading of farm products both domestically and internationally.

Raising agricultural production is a key development objective in most countries...

- Policies and other provisions regulating property or access rights over land and water.
- Policies regarding taxation of land and agricultural assets.
- Policies regarding the regulation of markets for rural credit and insurance and for agrochemical supplies.
- Infrastructure development programmes (irrigation facilities; farm-to-market roads, waterways etc.).
- Agriculture extension programmes (e.g. farmer education to foster the adoption of new crops and techniques).
- Subsidies for the introduction of new technologies.
- Policies regarding the promotion and regulation of transport services in rural areas.

These instruments can be directed towards either intensification or extensification approaches. However, the former generally requires determined policy efforts (some of which are outlined later in this chapter) while the latter results from a variety of means ranging from policy choices (either intended or unintended) to weak enforcement of laws. This tendency is most obvious when existing laws regarding, for example, land tenure or access to public forest and protected lands are weakly enforced or in cases where the conversion to recognised agricultural use is a requirement to obtain land tenure titles. Where population pressures are high, employment opportunities are few and public lands (or territories reserved for indigenous communities) readily accessible, agricultural extensification often takes place through illegal encroachment of *de facto* open-access lands. As such lands are generally steeply sloped and/or forested areas, the ecological (and thus economic) implications, notably in the form of deforestation, soil erosion, disruption of water cycles and other forms of land degradation, can be very severe. In this situation, the expansion of agriculture to marginal lands by landless migrants is not generally the result of deliberate policy choices, but rather the combination of a number of factors including lack of political will, unequal land distribution, declining farm size due to demographic growth and insufficient income opportunities in industry or other sectors in urban or rural areas.³

5.2.3. Agriculture-biodiversity linkages

The most direct threat to biodiversity resulting from agriculture **extensification** includes the conversion of forests or other fragile ecosystems to agriculture, leading directly or indirectly to biodiversity loss.⁴ Threats due to agricultural **intensification** are less direct, linked to poor soil management techniques, the overuse or misuse of pesticides and fertilisers, and the over-pumping of groundwater. It is difficult to make generalisations regarding fertiliser use. In some countries, levels of application of agrochemicals approach those in OECD countries, and are often considered excessive. In the poorest countries, however, fertiliser use, notably by small-scale farmers, is still minimal and must be increased, under environmentally-appropriate conditions, to maintain and enhance soil fertility. Pesticide overuse, and the impact on agriculture workers, is a serious concern in many countries, however.⁵ In some countries, furthermore, uncontrolled introduction of genetically modified organisms or exotic species by commercial-scale operators is a concern.

Box 18. Policies for biodiversity-friendly agriculture

Biodiversity conservation is often associated with undisturbed or protected areas. This, however, neglects the rich biodiversity found in habitats that have been modified for crop and livestock production. This includes the wide variety of plants and animals that contribute directly or indirectly to the raising of crops and livestock. Some land use systems and agricultural practices enhance biodiversity within managed landscapes. Practices leading to biodiversity-friendly agriculture include:

- i) Reliance on biocontrol agents, to check crop and livestock pests including integrated pest management.
- ii) Judicious use of crop rotation.
- iii) Use of livestock waste and leaf litter to inject nutrients into the soil.
- iv) The use of “environmental corridors” in agricultural landscapes to help mitigate the fragmentation of natural habitats.
- v) Increased use of no- or low-till farming techniques.
- vi) Development of mixed agricultural systems comprising both wild and domestic species (e.g. cattle together with antelope).

Policies which discourage the adoption of biodiversity-friendly agricultural methods include:

- i) Rules specifying the use of a narrow range of “certified seeds” for the obtention of credit.
- ii) Policies subsidising chemical inputs.
- iii) Fiscal and regulatory measures that promote homogeneity in crop and livestock production, such as implicit or explicit subsidies encouraging the production of a narrow range of crops.

Source: The World Bank (1998): *Agriculture and the Environment – Perspectives on Sustainable Rural Development*. Washington, DC.

Agriculture is often seen as the “enemy” of biodiversity, rather than as part of it. This perception arises because intensive agriculture is often associated with monocrop plantations, heavy use of chemical inputs, accelerated soil erosion and, especially in the case of livestock, the alteration of vast expanses of previously wild land through extensive grazing. Indeed, many of the main processes through which biodiversity is lost (like loss of soil micro-organisms, or accelerated soil erosion) can be linked to certain harmful agricultural practices (like the use of chemicals, or overgrazing).

However, recent studies have shown that some land use systems and agricultural practices which are integrated as part of the landscape can actually enhance biodiversity (see Box 18). Thus the patterns of agricultural transformation and intensification are key to how many species and how much genetic variation will survive.

5.2.4. Agriculture-desertification linkages

In addition to those mentioned above, the main direct factors of desertification and land degradation linked to agriculture in arid and semi-arid lands relate to overgrazing, poor water management, high water-consuming crops and the need to cope with extreme climatic events, notably drought.

5.2.5. Agriculture-climate change linkages

Agriculture is not a major contributor to carbon dioxide emissions, but it is one of methane and nitrous oxide, both of which are important greenhouse gases. Methane is produced by livestock through enteric fermentation and the decomposition of animal manure. Wet-rice cultivation in paddies leads to the release of methane due to the decomposition of organic matter in the soil. Many chemical fertilisers contain nitrogen and contribute to the emission of nitrous oxide. In addition, some intensive farming methods contribute to CO₂ emissions by exposing the subsoil and intermediate layers. Similarly, extensive grazing or farming tends to contribute to the release of CO₂ by reducing the vegetative cover on land.

Ways to contain greenhouse gas emissions from agriculture include the use of new livestock feed mixtures and vitamin and mineral supplements in dairy cows' feed. Methane from wet rice cultivation can also be reduced significantly through changes in irrigation (*e.g.* modifying water depth and timing of irrigation) and changes in the types of fertilisers used as well as the rate and methods of applications.

At the same time, agriculture is highly vulnerable to the impact of climate change, notably the disruption in rainfall patterns and increased frequency of violent weather events. Coping with climate change may require changing agriculture techniques (changing planting time, improving water management and flood control), and shifting to more resilient crop varieties.

5.2.6. Win-win options agriculture-biodiversity-desertification

In view of the above-mentioned basic facts, a Biodiversity and Desertification Conventions-friendly agriculture policy would focus on increasing the productivity of agriculture in already farmed or abandoned lands while, to the extent possible, limiting agriculture expansion on frontier lands – and minimising the negative impacts of conversion where it happens. This would involve the closely inter-related and complementary areas of action, such as:

- Facilitating access for the rural poor to key inputs such as credit, insurance, improved cultivars, agro-chemicals and transport and marketing services. In many countries, this would imply reviewing regulations that hinder private sector investment in these areas.
- Encouraging different regions, in line with their environmental conditions, to concentrate on high-value market crops where they have a comparative advantage on the market (either locally, nationally or world-wide). Steeply-sloped mountainous areas, for example, are often well-suited to tree crops which are often of high value and which help stabilise soils. For this strategy to be successful it must be possible to export these crops to other regions or abroad and to bring in food crops.
- Fostering the adoption of environmentally sustainable farming techniques (*e.g.* contour farming, integrated pest management, green manure, improved irrigation and water management techniques, low-till farming etc.), and crops. This requires research and development of suitable crops and techniques and their dissemination, through agricultural extension, community-based organisations, co-operatives or farmer exchange, site visits and other approaches.
- Directly addressing issues related to conflict over shared land and water resources and those related to unresolved resource ownership. In drylands, these often involve conflicts between nomadic pastoralists on the one hand and farmers or large ranches on the other.
- Developing specific mechanisms to respond to extreme cyclical climatic events such as drought (*e.g.* food storage and distribution systems to cope with emergencies).
- Promoting the development of value-added agro-industrial activities, taking advantages of the new opportunities arising from increasing consumer demand for environmentally-friendly produce in many countries.
- Providing the necessary infrastructure (in relation to transport, marketing, information-knowledge systems linking producer to the market etc.) to complement above-mentioned efforts.

Box 19. Agricultural intensification can in some cases fuel deforestation

In general, agricultural intensification through improved land tenure, technological progress and improved access to markets will tend to reduce pressure on forests by reducing incentives to convert “open access” forest lands, thereby helping to stabilise the agricultural frontier. However, increased profits from agriculture can give farmers the incentive and the means to expand the areas under production,

hence fuelling deforestation. This is likely to be the case when farmers operate on a commercial scale and not as subsistence-oriented producers; expansion is feasible with limited labour inputs and forest lands suitable for production of commercial crops, at least in the short run; and when the rules prohibiting such conversion of public lands to private agriculture are poorly enforced.

Source: Arild Angelsen and David Kaimowitz: “When does technological change in agriculture promote deforestation?” Paper presented at the AAEA International Conference on “Agricultural Intensification, Economic Development, and the Environment”, Salt Lake City, 1998.

In dryland areas, there is increasing recognition of the potential benefits of taking a joint approach to combating desertification and adapting to climate change. Integrated dryland management is an important response strategy because it is supportive of efforts towards economic development and improving social welfare, thus reducing the underlying causes of desertification. Specific measures include the establishment or strengthening of early-warning systems; and drought preparedness and management, including drought contingency plans; establishment and/or strengthening of food security systems, including storage and marketing facilities; establishment of alternative livelihood projects that could provide incomes in drought-prone areas and the development of sustainable irrigation programmes for crops and livestock.

The policies outlined above, which are “Biodiversity- and Desertification-friendly”, would be largely **consistent and complementary with standard environmentally sustainable agricultural intensification** policy and indeed broader efforts to reduce rural poverty. In many cases, efforts to preserve biodiversity and prevent desertification by, for example, limiting expansion of agriculture to marginal lands would directly reinforce the agricultural sector in the long term, by reducing soil erosion, helping to preserve watersheds and avoiding the need to rely on expensive interventions (*e.g.* pump groundwater from increasingly greater depth) etc. Such policies would therefore be mostly “no regrets”, especially in the long term.

Policies to increase non-farm rural income opportunities would be advantageous from the standard “development” point of view as well as from the point of view of preserving biodiversity and containing land degradation. This is predicated on the assumption that crops and cropping methods are in line with the carrying capacity of the land, that inputs such as fertilisers are used in appropriate quantities, invasive species have either not been introduced or are being controlled and that all available techniques to minimise biodiversity degradation (such as integrated pest management, use of biopesticides, host plant resistance and other sound agricultural practices) are used.⁶ With this important caveat, it can be concluded that policies to foster environmentally sustainable agricultural intensification are desirable from the biodiversity and desertification point of view.

This conclusion may be incorrect in cases where the scope for expansion of commercial agriculture in forested land is large, due to poor enforcement of forestry regulations, and such agriculture is highly profitable (see Box 19 below). This is not an argument against agricultural intensification as such, but rather an argument for environmentally-sound policies and legislation supported by rigorous enforcement of rules prohibiting the conversion of public lands to commercial agriculture.

Box 20. Deriving financial benefits from biodiversity: approaches and instruments

Many of the benefits from conserving biodiversity – such as the preservation of species variety, the prevention of soil erosion, and the absorption of atmospheric carbon – are indirect and accrue at national, regional or global levels and to future generations. From the perspective of local populations, immediate benefits from converting biodiverse ecosystems to monocrop agriculture or pasture often exceed costs. This is due to that fact that non-traded goods and environmental services are not recognised in terms of their market-value and therefore communities living in these ecosystems are not able to capture the full economic value of their surroundings. The Convention on Biodiversity accordingly emphasises the need to maximise the direct social and economic benefits from the protection and sustainable use of biodiversity and their equitable distribution. To be successful, strategies to protect biodiversity must acknowledge such hard choices and provide direct incentives for conservation by local users, especially through creating or enhancing markets for biodiversity services. Ways of doing this include:

Payment for watershed preservation services: Forest ecosystems provide a wide range of services including watershed protection, thereby providing filtration and purification of water. The use of financial incentives to encourage the conservation of forest watersheds is increasingly gaining support in a number of places. For example, in Colombia, self-organised private deals and public payment schemes are being used to improve forest management, reforestation activities and development of watershed communities. In Costa Rica, private upstream owners of forestland are being compensated by private hydroelectric utilities, the Government of Costa Rica and a local NGO. New York City has set up an elaborate watershed management scheme which includes compensating upstream private landowners for adopting watershed-friendly land uses, in addition to regulatory measures and the purchase of particularly ecologically sensitive land. In all such schemes, assessing the level of the payments to be made and verifying compliance are key challenges.

Payment for carbon sequestration services by plants: Land users may receive payments for specific land uses – including

reduced or low-impact logging, and conservation of natural forests – that generate environmental services such as carbon sequestration and long-term storage by plants.

Payments for commercially valuable genetic and chemical products: pharmaceutical companies may pay for exclusive rights to first use of selected genetic material. In recent time, such agreements have provided for benefit-sharing. Unfortunately, the amount generated by such programmes in places where they have been implemented – *e.g.* Costa Rica – have been modest (usually several million dollars per contract spread over a number of years), and would not be sufficient to provide compensation to local populations who are asked to forgo conversion options in order to maintain these ecosystems intact. However, as countries obtain more experience in this area, the greater the potential for ensuring benefits accruing to local communities and development of incentives to support conservation measures.

Marketing of biodiversity-based consumer goods: Several firms have over the past years invested in the marketing of sustainably harvested natural timber forest products (*e.g.* honey, nuts...) in industrialised countries. It appears that a number of consumers in industrialised countries are prepared to pay a premium for “environmentally-friendly” goods that support local communities and conservation efforts.

Ecotourism: Ecotourism may create employment and income for local communities as well as revenue for biodiversity conservation (in fact, successful eco-tourism by itself tends to lead to protection of biodiversity since many “eco-tourist” attractions (bird watching etc.) rely heavily on the preservation of biodiversity. Yet, ecotourism potential is limited and should not be overestimated: *e.g.* countries with poor (tourist) infrastructure and/or high political instability (which includes most of the poorest countries) are unlikely to be able to generate sufficient revenues from tourism to justify the costs of protected area maintenance, let alone develop national infrastructure to a point where tourism has the potential to support the national economy.

Sources: OECD (2001): Valuation of Biodiversity Benefits – Selected Studies. Paris. OECD (2001): Sustainable Development – Critical Issues. Paris. The World Bank (1998): Agriculture and the Environment – Perspectives on Sustainable Rural Development. Washington, DC.

Hard choices could, however, present themselves where the pressures on land are so strong and the scope for alternative opportunities so limited that it becomes very difficult to avoid the complete and irreversible conversion of biodiversity-rich areas to agriculture. In such cases, the preservation of biodiversity will require making maximum use of available instruments to maximise its direct and indirect commercial value (see Box 20) and to promote an equal sharing of benefits arising from the use of

these biodiversity resources. It may also require external assistance, *e.g.* through the GEF, to cover the direct incremental costs of biodiversity protection. However, where the demand for land leads to the large-scale conversion and opening-up for cultivation of steeply-sloped forest land, the long-run impact in terms of soil erosion, disruption of hydrological cycles etc. outweighs the short-term benefits in terms of crop production. Such conversion thus does not represent a viable long-term development option.

5.3. Forest development and global environmental issues

5.3.1. Basic approach: reconciling the multiple functions of forests

The forest management sector still plays an important role in generating income, employment and fiscal revenue in many developing countries. Forests are crucial to the livelihood strategies of many small and medium farmers and landless poor. Direct products from forests include timber, firewood and a wide range of non-timber products (*e.g.* wild fruits and roots; grasses, vines, mushrooms, medicinal substances, gums, honey, game, meat, etc.) primarily for local consumption.

Forests provide a wide range of services including watershed preservation, the regulation of water cycles and the provision of habitats for a wide range of wild species. Thus, they play a major role in protecting surrounding and downstream lands, and preventing the degradation of water supply, hydropower, irrigation, transport and other important man-made infrastructure. They also provide direct means of livelihood for their inhabitants. With the exception of timber and some non-timber forest products, the economic value of forest ecosystem services and goods are, for the most part, unpriced and unmarketed.

The “public good” nature of natural forests is reflected in the fact that they are formally under state ownership in most countries, although indigenous groups have in a few cases been granted rights over the forest areas which they have traditionally occupied. The sustainable management of forests is beginning to be recognised as an important development objective at the local and national levels. Hence, when leasing forests to private sector operators, for example for logging purposes, forest authorities generally specify a range of quantitative and qualitative rules aimed to ensure that such logging minimise the damage to the forests, is more environmentally-sound, and sustainable. The main challenge of forest policy is to reconcile the multiple functions of forests.

5.3.2. The multiple threats to forests

The main threats to forests include conversion to commercial agricultural uses or pasture; gradual encroachment by landless farmers with no alternative livelihoods; excessive timber extraction (whether legal or illegal) – and destruction by uncontrolled fires set by human activities. Surface mining and infrastructure expansion are other major causes of forest destruction. Recently, attention is being paid to the impact of invasive species on the integrity of forests, in addition to the loss of key species that will negatively impact forest regeneration.

Root causes of forest destruction include: 1) population pressures; 2) lack of income opportunities in the farm and non-farm sectors; 3) inequalities in land ownership or use; 4) policies fostering agricultural expansion through conversion of forestlands (in some countries, clearing of forests is a requirement to obtain land tenure titles); and 5) increased consumption of timber and other forest products to meet the demands of growing economies. As noted above in Box 18, there are also circumstances where increased prosperity in the agricultural sector fuels expansion into

forests. These phenomena have in common that they are largely beyond the control of forest authorities. In addition, a lack of appreciation of the economic value of forests and its benefits to development sectors (such as agriculture, energy and water supply) by those involved in decision-making about forest policies contributes to deforestation.

The principal instruments of forest policy include:

- Regulation governing the use of forests by private parties for logging, mining or pasture purposes and the exploitation of these resources. For example, in most countries, leases over timber lands prescribe selective logging and a variety of qualitative and quantitative regulations aimed at preserving the long-term productivity of the forest.
- Policies regarding the assessment and collection of royalties on products extracted from forests.
- Regulations regarding the commercialisation of forest products.
- Policies encouraging the establishment of timber plantations, which can perversely encourage the accelerated conversion of natural forests.
- Policies and regulations regulating the transfer of public forest to private or group ownership.
- Policies and regulations regarding the construction of public roads, railways, gas pipelines and other public infrastructure in or through public forests.

In most countries, the preservation of the environment is a stated objective of forest policies. Thus, if effectively implemented, forest policies would basically contribute to combating land degradation, preserving biodiversity and mitigating greenhouse gas emissions.

Deforestation can however result from 1) regulations allowing excessive timber extraction by commercial-scale operators and levies which fail to discriminate between timber which is sustainably harvested from timber which is not; 2) encroachment of forests associated with the construction of roads or other infrastructure; 3) incentives for the establishment of plantations on logged-over forest land; 4) poor enforcement of forestry laws, including notably illegal logging; and/or 5) corruption. While the first three are amenable to reform, the others represent failure to implement formal policies rather than deliberate policy choices. Thus, deforestation is not just the result of poor policies, but also of a lack of capacity or will to enforce existing policies.

5.3.3. Forest-biodiversity-climate change-land degradation: linkages

Natural forests are host to a wide number of animal and plant species, in addition to being a tremendous store of minerals and nutrients critical to both managed and natural ecosystems. Protecting the environmental integrity of these systems will therefore preserve biodiversity. Protecting forests will also help ensure the long-term storage of carbon that is stored in the soil and subsoil of forests, as well as to minimise additional release (deforestation) without regeneration. Thus, from a global perspective, natural forest protection is a priority, both for mitigating the negative impacts of climate change and for protecting biodiversity.

5.3.4. Development and the global environment: hard choices

In principle at least, the various goods and services provided by forests can be produced jointly. In most countries, there is ample scope for rehabilitating degraded or abandoned lands and converting them to agroforestry or tree plantations for fuelwood

Box 21. Forests and biodiversity in the climate change negotiations

Forests play an important role in sequestering atmospheric carbon. Therefore, issues relating to land use, land use change and forestry (“LULUCF” in the jargon of the climate change negotiations) have been a major focus in the international climate change negotiations. The scientific underpinnings of debate regarding the role and contribution of forests and land use change is, in part, related to methodologies of measuring and verifying changes in carbon stocks through time. The accuracy of existing methodologies is being actively discussed under the UNFCCC, with the aim of continuing to improve the precision with which countries can report changes in carbon stocks from “land use, land use change and forestry” activities. This is due to concerns of some countries regarding the accuracy of the existing methodologies and the degree of confidence that various methods yield, and to the difficulty of reporting on how land use, land use change and forestry activities act as a source of carbon emissions or as sinks, in particular in the long run. The UNFCCC COP’s ultimate decision with regard to “land use, land use change and forestry” – as defined under the Kyoto Protocol – could have both positive and negative impacts on biological diversity,

depending on how activities are implemented on the ground. These decisions could provide substantial incentives for developed countries and the private sector to invest in biodiversity-friendly “land use, land use change and forestry” activities through forest conservation focusing on protection (set aside areas), sustainable management, reforestation and afforestation activities. The COP’s decision to limit the possible activities to just two (reforestation and afforestation) may mean that in developing countries a very small percentage of the potential land and forest-based carbon investment opportunities can be credited within CDM projects. In addition, there is some concern that these activities could have perverse incentives with respect to biodiversity conservation, and so may contribute relatively little to biodiversity conservation. For example, those activities that promote the establishment of fast-growing, short-rotation tree crops rather than the slower growing hardwood trees in natural forests. Thus, CDM projects will have to be screened by the developing country governments to balance the long-term social and environmental costs and benefits to the country.

or timber. This can also greatly help reduce pressures on remaining forests. Given appropriate policies, regulations, technologies and management systems, the extraction of timber and non-timbers product, the protection of biodiversity, as well as the maintenance of watersheds, could be compatible. A basic objective of a forest policy is therefore to reconcile these various uses of forest lands and balance the human needs for forest products and services and the imperative of conserving remaining natural forests.

Timber extraction will impact biodiversity on all levels (species, population, community, ecosystem structure and diversity). Certain techniques (for example reduced-impact logging) can minimise these impacts or protect those unique elements through a balanced landscape-level assessment that will allow for a level of biodiversity conservation. However, these techniques require high levels of know-how and, given current timber prices, are less profitable than the standard techniques. Fostering the development and dissemination of these improved methods, along with means to reward loggers who implement them, is a priority.

Another hard choice is that between direct and indirect users of forests: Those benefiting indirectly from forest ecosystem services (*e.g.* soil erosion control, watershed management, carbon storage) do not pay for them, while many of the direct users of forests (*e.g.* loggers or migrant farmers) have strong incentives to exploit them (*e.g.* through excessive logging, conversion to slash and burn agriculture etc.) without regard to the consequences for ecosystem functioning. In theory, one solution would be for indirect users to pay direct users for refraining from damaging practices. In practice, this is very difficult, although examples of such initiatives already exist, such as in New York and in Costa Rica. (See also Box 20 on commercial benefits of biodiversity.)

The difficulty in reconciling direct and indirect uses depends on local conditions: In countries with large areas of abandoned land, the scope for reconciling multiple stakeholders is wider. There is more scope, for example, for allocating certain areas for

timber plantation, logging or agricultural activities, while restricting access to particularly fragile, biodiversity-rich or otherwise ecologically important areas.

The hardest choices arise where most or all remaining forest areas are vital for downstream infrastructure or for biodiversity protection while poverty, landlessness and demographic growth combine in strong pressures to convert forests. In most cases, the need to protect downstream infrastructure (*e.g.* irrigation, hydropower generation or water supply) is likely to override other considerations.

5.3.5. “Win-win” policy approaches

A sound forest policy will have to address these hard choices openly, balancing the social, economic and environmental values of forests. In addition, the many root causes of deforestation, which lie beyond the forest management sector, must be addressed in the context of broader agriculture and rural development, energy, and other policies. Priority issues include:

- **Taking stock of the forest estate:** In many countries, state-owned “forest lands” are in fact a patchwork of deforested or degraded lands, which are used as pasture; lands converted through slash-and-burn agricultural practices; commercial tree crops (*e.g.* for oil, rubber) or timber; secondary forests at various degrees of depletion and where logging still takes place; and primary forests in their natural states, some of which are “biodiversity hotspots”. Additionally, there is often a mismatch between, on the one hand, areas designated officially as “protected” and, on the other, areas which serve important ecological functions (watershed protection; the provision of habitats for rare species) or actually have primary forests and need to be protected.

A key starting point in formulating a forest policy is therefore to take stock of remaining forest. This includes conducting inventories to assess the amount and quality of remaining forests and identifying which areas could be allocated for logging and other uses, and which must be protected for ecological reasons.

- **Defining modalities for sound long-term forest use:** The state may often have to acknowledge its inability to exercise actual control over land which it formally owns and develop appropriate legal arrangements and financial incentives to allow de-facto occupants to manage the land (that is of lower global biodiversity value) without degrading it (*e.g.* by granting tenurial rights subject to ecologically-motivated constraints). At the same time, it should re-focus its efforts on preventing encroachment of the most fragile or biodiversity-rich areas which must be protected from further encroachment and improving and enforcing existing forest laws on those who extract timber or non-timber products.

- **Fostering the rehabilitation of degraded or abandoned lands for agroforestry or other uses:** The settlement of landless migrants in forest areas is a basic fact in many countries. These people are often the poorest of the poor. Steering them towards sustainable management implies granting them some security of tenure over the lands which they occupy (often illegally), thereby providing the necessary incentives to permit investment in their long-term productivity. Necessary accompanying measures to foster sound development of these areas are the same as those outlined in connection to agriculture policy (above).

- **Formulation of logging policies that can actually be enforced:** In many countries, forests can continue to be used for logging purposes with relatively acceptable ecological impacts. The scale of deforestation and subsequent land conversion associated with large-scale commercial operations are often

attributable not just to poor forest laws but to poor enforcement. This includes, in particular, failure to enforce selective logging rules or the award of leases on a short-term basis which directly discourages long-term approaches. A priority is therefore to develop policies and practices that can allow continued timber extraction with acceptable environmental damage, and which can actually be enforced given existing capacities.

By fostering sound management of remaining forests, such policies offer the best chance that remaining biodiversity will actually be preserved.

5.3.6. Protecting forests through the clean development mechanism?⁷

Forest-based carbon trading through carbon-offset projects or activities involves a country or company which emits CO₂ paying another country or resource manager to absorb CO₂ in biomass growth, thereby gaining carbon credits to set against its own emissions. Forest conservation through afforestation and reforestation is a possibility under the Clean Development Mechanism (CDM) of the Kyoto Protocol, if ratified. Box 21 discusses both the potential benefits and problems of LULUCF for biodiversity. However, as noted in Box 21 above, there are concerns that the CDM could encourage fast-growing tree monoculture, possibly leading to the clearance of natural biodiversity-rich forests in the process.

5.4. Energy development and global environmental issues

5.4.1. Energy use in developing countries: basic facts

The energy demand of developing countries will continue to increase in the coming years, along with the development of their economies. Oil, natural gas and coal supply most of the energy used to produce electricity and for direct combustion in transport and industry. In rural areas, households often rely on wood and biomass, including cow-dung, for the bulk of their energy needs. Increased access to energy, for such basic needs as cooking, heating, lighting and transport, is an essential component of poverty reduction efforts. For many countries, another key concern in relation to energy supply relates to dependency on imports and the associated concerns relating to security of supply and vulnerability to price and other fluctuations in international energy markets.

Given the close linkages between economic growth, welfare, and energy consumption, most developing countries place a high priority on improving access to energy services for both urban and rural populations. The two basic and complementary ways to do this are: 1) Expanding energy supplies and 2) increasing the efficiency of the energy supply chain (including production, transport and end-use). Both these approaches are generally consistent with efforts to reduce dependence on imports by developing domestic energy sources⁸ (e.g. by exploiting locally available sources of coal, oil, fuelwood, developing hydro and wind-power potential, etc.) and to reverse past policy biases which have often privileged urban dwellers.

Energy use in developing countries is, on average, inefficient and, in many cases, associated with very significant emissions of health-threatening pollutants. Examples include sulphur emissions from coal-fired power plants, noxious fumes associated with indoor cooking and heating, which harm women and children disproportionately⁹ and the wide range of pollutants from motor vehicles notably in urban areas.¹⁰ Improving energy efficiency could thus have important economic benefits (in the form of direct cost savings) while contributing to health and containing greenhouse gas emissions. This suggests a considerable scope for win-win approaches.

Box 22. Why is energy use so inefficient in developing countries?

In many developing countries, especially the poorest among them, the household sector is the largest single energy consumer and cooking is the dominant energy need. In countries such as Burkina Faso, Ethiopia and Nepal, households account for more than 90% of total energy consumption. In these countries, traditional energy sources such as fuel wood and biomass are predominant.

People living in poverty not only pay a high price per unit of energy services of poor quality, but also spend considerable amounts of time obtaining these energy services. Moreover, the use of traditional fuels has negative impacts on health, due to high levels of indoor pollution in poorly ventilated houses. Women and children suffer the most.

It may seem paradoxical that those who can least afford to waste energy end up using such inefficient fuels and devices. This is because traditional fuels (wood, crop residues,

untreated coal, bituminous coal, kerosene, etc.) – generally the only ones available to rural households – are often used with traditional cooking and lighting devices (cookstoves and kerosene lights) which are highly inefficient compared to their modern technology counterparts. For example, predominant cook-stove efficiencies of firewood, kerosene and gas are around 15%, 50% and 65% respectively. Lighting with a kerosene lamp can be over 15% less efficient per unit of light produced than electric-powered fluorescent lights. This does not even take into account factors such as safety and convenience, which also work overwhelmingly in favour of the more modern fuels and technologies.

It is estimated that over half of the world's households still rely on traditional fuels for their cooking needs. Fostering a shift towards improved fuels (e.g. coal briquettes, improved kerosene) and improved stoves presents major opportunities for win-win economic-social and environmental improvements.

Source: UNDP-EC Poverty-Environment Initiative, Volume 4.

5.4.2. Policy instruments available for steering the energy sector

Energy development strategies will usually combine efficiency improvement and supply expansion approaches. The main policy instruments available include:

- **Fuel pricing policies:** In many countries, fuel is heavily subsidised, eroding incentives for conservation and investment in energy-efficient installations or renewable energy technologies. This applies foremost to fossil fuels used for heating, transport, power generation, etc. Subsidies on fossil fuel can also hinder the development of alternative energy sources such as biomass, fuelwood and other renewable energies. Reducing or removing subsidies on fuel, to ensure that users pay the full price of provision, is a precondition for fostering energy efficiency and energy-saving programmes. Taxation of different fuels can also be used to discourage use of the most polluting kinds of fuels or promote more efficient fuels (such as, for example, coal briquettes). Reductions in energy subsidies must be accompanied by appropriate measures to ensure that they do not hurt the poor. (See Box 23.)

- **Reform of power-generation and distribution markets:** In many countries, electricity generation and transmission is controlled by public monopolies. This has often been associated with poor management practices and insufficient or badly targeted public investment. In addition, tariff levels considerably below cost-recovery levels – or *de facto* free supply to government agencies, have often favoured relatively well-off urban consumers and promoted wasteful energy use. The current trend in many developing countries is for the government to open the power generation and transmission to private sector investment. Such wide-reaching policy and regulatory reforms provide important opportunities to steer investments towards more modern and more energy-efficient options. The challenge is one of formulating a conducive fiscal and regulatory environment for private sector investment in the energy sector (including independent energy production and distribution companies) and setting and

Box 23. Protecting the poor from the impacts of energy subsidy reform

Energy subsidies often benefit relatively rich urban households, who have access to the services and who consume the most energy. Reducing such subsidies frees up public funds which can be allocated directly for poverty reduction purposes. However, subsidy reductions can also hurt the poor. They should be accompanied by compensating measures specifically targeting the poorest households. The focus should be on improving access to the services, notably by the

rural poor rather than on covering the operating costs of providing the services. Options include subsidies on the one time capital costs of expanding service provision. Such measures must be an integral part of any energy reform program and can be designed to be technology neutral or to favour renewable energy. The World Bank (2000) Energy Development Report 2000: "Energy Services for the World's Poor" provides a comprehensive analysis of these issues.

enforcing performance standards. These may specify energy efficiency standards and encourage the use of renewable energy sources, as is done in many OECD countries.

- **Policies regarding the importation of energy technologies and equipment:** Many countries impose high levels of taxes and import duties on important energy equipment which discourage the adoption of more recent and more energy efficient technologies.
- **"Demand-side" management measures (DSM):** DSM refers to administrative, regulatory and technical approaches which can help dampen energy demand at the source without penalising the final user. Examples include urban planning and transport development measures which reduce the need for transport while reducing congestion and the need for new roads; building codes which encourage energy-efficient designs thus reducing the need for heating or cooling; regulations to encourage makers of electric appliance, or motor vehicles to "build-in" energy efficiency (and pollution reduction); and many others. Taken together, such measures can amount to considerable energy savings.
- **Rural energy supply programmes.** Energy supply for small rural communities is an important incentive for rural social and economic development. Some opportunities exist for promoting environmentally-friendly technologies (e.g. Biogas). Some rural electrification by off-grid community-based systems may be promising from an environmental perspective and may also have a local economic value (household-based production, small-scale enterprises) and social value (education). However, they often lead to higher costs than conventional solutions. A balance has to be found between improving energy security and affordability.
- **Active promotion of energy efficient fuel stoves in rural areas:** In many rural areas, cooking is a primary source of energy demand – and fuelwood demand a major cause of land degradation and deforestation. Encouraging the dissemination of energy-efficient stoves is a major way to promote energy conservation while also leading to time and financial savings for households, and avoiding indoor air pollution (a very important health issue for poor women and children). Many countries have supported programmes to promote the adoption of improved cookstoves on a large scale. Relevant measures include support for the development of culturally appropriate stoves which can be made and serviced locally, the provision of microcredit to facilitate the acquisition of improved stoves, awareness-raising campaigns, etc.

Box 24. Demand-side management in the energy sector

Demand Side Management aims to affect the demand for energy. Such approaches are particularly relevant in the electricity sector. At first sight, it may seem to be a contradiction for a power supply company to promote energy conservation, or to discourage consumer demand for its services, since the company is mainly interested in selling energy services.

However, DSM approaches can yield benefits for both the consumer and the supplier. Dampening demand for electricity at times of peak demand (peak load), through differentiated tariffs, can help better manage the supply over time, resulting in cost savings for the provider and the consumer. These benefits materialise in the form of reduced need for “peak time” reserve power-generation reserve. This cuts

down the investment needed to keep the system functioning properly. In addition, it generally yields significant fuel savings since meeting peak-demand often involves switching on some of the least efficient power stations.

Promoting the use of energy-efficient devices, such as energy-saving lamps, refrigerators and air conditioners by final consumer is also an important DSM measure. Other DSM measures include those aimed at reducing the under-reporting of consumption or outright theft (through illegal connections) or at improving tariff collection. DSM measures thus complement efforts to reduce “technical losses” which are due to poorly managed or maintained power generation or transmission equipment.

5.4.3. Energy-global environment linkages

Energy-climate change linkages: The energy sector is linked to climate change concerns primarily due to its role in the emission of greenhouse gases. Carbon dioxide, which results from the burning of fossil fuels (such as coal and petroleum) is the most important greenhouse gas. The main ways to reduce the contribution to climate change from energy use include 1) reducing greenhouse gas emissions at the stage of extraction (*e.g.* reducing gas flaring in oil fields and recovering some of the flared gases); 2) improving efficiency at the level of energy production, transport and end-use (or, in the case of electric power, from the stages of power generation to transmission and utilisation by the final user); 3) switching to non- or low-carbon-based energy sources, such as natural gas or hydrogen fuel cells, and renewable energies (biomass, hydropower; wind-power, solar power etc.); 4) limiting sink loss by encouraging the production of rural energy sources (*e.g.* fuel-wood plantations, biomass) on a commercial scale.

Energy-biodiversity-land degradation linkages: The most direct potential threat to biodiversity and land degradation resulting from measures in the energy sector could be the accelerated degradation of natural forests (including mangrove). This could result, for example, from a decision to reduce subsidies for commercial fuels in a situation where substitute fuelwood can readily be obtained from “open access” forests. Where such forests are under state ownership and control, this is more the result of policy or enforcement failure in the forest management sector than a deliberate policy choice in the energy sector.

Where natural forests are well-protected and land tenure rights well-defined and enforced, the scope for over-exploiting natural forests would be very limited. A reduction in subsidies on commercial fuel could therefore foster the development of fuelwood plantation on idle lands, or the conversion of agricultural lands to fuel-wood or other forms of biomass without contributing to accelerate biodiversity loss or land degradation. In most countries, there is sufficient degraded land available for conversion to fuelwood plantation to eliminate the need to convert natural forest for these purposes. Such land is typically situated in the proximity of urban centres and therefore markets, which makes it all the more suitable. Policies to encourage the conversion of natural forests to plantations to produce fuelwood or bio-energy on a large scale could, however, accelerate the degradation of natural forest, leading to biodiversity loss.

Box 25. Reducing greenhouse gas emissions in China through subsidy reduction

Although it was not primarily prompted by climate change concerns, China has since the mid-1980s made remarkable progress in reducing energy subsidies, particularly in the coal sector, which produces more than 70 per cent of the country's energy. Subsidy rates for coal have fallen from 61 per cent in 1984 to 11 per cent in 1995. At the same time, China removed price controls on coal, and encouraged the development of private coalmines, which now produce about 50 per cent of the country's coal. Subsidy reform in China has produced multiple benefits: energy savings, financial savings, and reduced emissions of greenhouse gases relative to "business

as usual". The economic performance of coal mines has improved rapidly. These reform measures in the energy sector have reduced government spending and – along with other policy reforms and technological change – have contributed to energy conservation and environmental protection. Energy intensity in China has fallen by about 30 per cent since 1985, implying that energy consumption (in oil equivalents) and CO₂ emissions are now, respectively, 0.3 billion metric tons less and 1.1 billion metric tons less than would have been the case if the reform had not taken place.

Box 26. The Clean Development Mechanism (CDM)

The objective of the CDM, as outlined under Article 12 of the Kyoto Protocol, is to help non-Annex B countries (which include mostly developing countries) to achieve sustainable development while assisting Annex B countries (which include mostly developed countries) in complying with their GHG emissions targets.

By providing additional incentives for investment in developing countries, when such foreign investments "count" towards meeting the Kyoto commitments of the countries from which they originate, the CDM could provide a valuable source of finance for climate-friendly investments in developing countries for example in power generation.

Progress is underway to establish detailed rules for the CDM. Once implemented, the CDM should provide incentives for developing countries to engage in achieving global emission reductions in a cost-effective way. But the CDM will not, in itself, address the impediments to foreign direct investment, notably those related to poor regulatory environments or macro-economic instability, in a particular country. Thus investment in CDM projects may flow most readily to countries where conditions are already favourable for such investment. It may not reach those where they are less favourable, or where emissions reduction potential (and hence emission reduction "credits") is limited.

5.4.4. Energy-global environment: "win-win" options and hard choices

Maximising efficiency in the production, transmission and use of energy: A climate-change-friendly energy policy would focus on maximising efficiency in the production, transmission and end-use of energy in all sectors and in urban as well as rural areas. In view of the close linkages between energy generation and use and emission of pollution at the local level, such policy would generally have positive impacts on health, in addition to the savings in direct costs of procuring energy. By and large, energy-efficiency, health improvements and climate friendliness thus go hand in hand. In particular, measures to improve the efficiency of transport networks, reduce congestion and contain urban sprawl would yield significant socio-economic and health benefits, in addition to lower GHG emissions, for the many developing countries currently experiencing rapid urbanisation. The poorest tend to benefit most from reductions in air pollution. Improved efficiency in the use of fuelwood in rural areas would also tend to reduce land degradation and biodiversity loss. In rural areas, increased access to efficient energy technologies and fuels (*e.g.* improved stoves and fuels) would likewise carry many economic and health benefits, notably in the form of reduced indoor pollution, which would benefit women and children.

Such a policy would not be very different to a "global environment-neutral" energy policy and would be consistent with broader efforts to reduce the national

energy bill, stimulate economic growth and reduce rural and urban poverty. ‘Hard choices’ could occur, however, where measures to reduce fuel subsidies or raise electricity tariffs to full-cost pricing penalise the poorest. There are, however, many ways to prevent this. (See Box 23).

Limiting GHG emission in energy generation: Approaches towards energy production specifically aimed at limiting GHG emissions in the power generation sector involve more hard choices. This is because low-GHG technologies (such as renewable energies, hydropower, etc.) often involve higher costs over their life cycle (including investment and operational costs) which may not be compensated by the associated economic and other benefits. The nature and severity of these “hard choices” often depend on the time horizon considered. Over the long term, new technologies and energy options are likely to “soften” the “hard choices” between economic efficiency and GHG reduction and pollution reduction. Mechanisms such as the Clean Development Mechanism (see below) may help alleviate these hard choices. Large-scale dams for hydropower generation schemes could in some circumstances limit GHG emissions but may also result in loss of biodiversity.¹¹

A wide range of low GHG energy technology options which can support economic growth, social development and environmental sustainability are available. They include efficient, clean carbon-based energy systems, modernised biomass, solar photovoltaics, wind, hydrogen and other renewable energy options. While some of these options are already competitive for niche solutions, most remain too expensive for broad-scale applications. Fostering the expansion of these technologies beyond their present niche situation requires, in particular, reducing barriers to market access, notably to stimulate large-scale low-cost mass production.¹²

Annex 1A summarises the impacts of climate change, desertification and biodiversity loss on the agriculture, forest and energy sectors while Annex 1B outlines the impacts of these three sectors on global environmental issues.

Notes

- 1 Issues related to subsistence agriculture relying on a mix of farm management (*e.g.* shifting cultivation and on-farm conservation of wild crop varieties, harvesting of wild resources (*e.g.* shrimp fry collected in mangrove areas) are discussed in detail in the recent DAC publication on Poverty-Environment-Gender linkages (“Poverty-Environment-Gender Linkages”. The DAC Journal 2001, Volume 2, No. 4. OECD, Paris.) and are therefore not discussed in this document.
- 2 Food security is not synonymous with “self sufficiency in food production”. It is concerned with ensuring that the poor, with appropriate assistance from the government, have the means to purchase food when needed, and can therefore cope with shocks or cyclical fluctuations in food supply. In many cases, maximizing the production of high-value export crops and importing food is a good way to achieve “food security” .
- 3 These issues are examined in greater detail in “Poverty-Environment-Gender Linkages”, The DAC Journal 2001, Volume 2, No. 4., OECD, Paris. For issues related to wetlands, see *Guidelines for Aid Agencies for Improved Conservation and Sustainable Use of Tropical Wetlands*, OECD/DAC 1996.
- 4 See OECD (2002) *ibid.*
- 5 See, for example *Guidelines for Aid Agencies on Pest and Pesticide Management* or Report of the OECD-FAO Workshop on Obsolete Pesticides. www1.oecd.org/ehs/pest/obsolete-ws.pdf
- 6 See the DAC *Guidelines on Guidelines for Aid Agencies on Pest and Pesticide Management* for more detail.
- 7 European Commission, DFID, IUCN (no date given): “Biodiversity in Development”. Biodiversity Brief No. 4.
- 8 Sometimes, the search for energy independence and the desire to be protected from international price fluctuations leads countries to develop local energy sources even if the costs are higher.
- 9 Traditional cookstoves cause high indoor concentration of pollutants such as suspended particles, carbon monoxide, benzene and formaldehyde. These are linked to acute respiratory infections, lung diseases, lung cancer and eye irritation.
- 10 Principal transport-related pollutants include carbon monoxide, nitrous oxide, lead, benzene (from gasoline-powered engines), suspended particles (from diesel-powered and two-stroke engines) and photochemical smog.
- 11 Dams may also lead to GHG emissions. See the Report of the World Commission on Dams and Development for a comprehensive coverage of these issues.
- 12 The “UNEP World Energy Assessment” provides a comprehensive overview of the range of policy, regulatory, institutional, technical and other measures which would be needed to foster the adoption of clean energy technologies on a large scale, as well as the associated needs in terms of capacity development and financial assistance.

6 Integrating Global Issues into Development Policies and Development Co-operation: Priority Areas for Action

Climate change, biodiversity loss and desertification are threats of a global scale which endanger the sustainable development of our societies and constitute social, economic and political problems to all countries. Developing countries are especially susceptible to the consequences of these threats to their society and their efforts for poverty reduction and development.

The Rio Conventions FCCC, CBD and CCD present the commitments, obligations and a legal framework to address these global environmental concerns and to reverse current trends of degradation of the natural resource base. The Conventions are therefore important instruments for sustainable development on a global level as well as for the development priorities of partner countries.

Development co-operation based on partnership with the developing country (“ownership”) should recognise and address the two sides of the integrating effort: to integrate national goals related to global environmental concerns into national planning and sectoral policies, and to integrate development goals into national and global environmental policies. Drawing on the key observations and conclusions made in the previous sections, this section identifies priority actions and recommendations for development co-operation agencies and other bodies involved in issues at the interface of development and global environment. It distinguishes between actions to be taken at the international level, within development co-operation agencies, and in the field with developing country partners.

6.1. Actions at the international level: enhance global governance for sustainable development

Many environmental and social processes transcend national boundaries and have to be dealt with on a global scale. Global collective action requires an effective international governance structure covering environmental, social and economic concerns. Global governance is based on numerous treaties, agreements, financial mechanisms and organisations. A coherent vision is needed to strengthen the international community’s ability to monitor the global environment and respond effectively to global environmental problems.

6.1.1. Promoting coherent approaches through the Conventions negotiation processes

The successive “Conferences of the Parties” of the Rio Conventions provide important opportunities to foster the mutually supportive approaches to their implementation and their integration into other international efforts in support of sustainable development. This includes making appropriate linkages with international initiatives in pursuit of the Millennium Development Goals as well as international processes related to trade and investment.

6.1.2. Enhancing collaboration among the Conventions' Secretariats and with relevant UN and other Agencies

Collaboration amongst the secretariats responsible for the Rio Conventions and other organisations involved in relevant areas is another way to foster effective and efficient implementation of the Conventions.

Mobilising civil society and the private sector

The debate on international governance structures has implications for policy and regulatory regimes and institutional arrangements in all countries. Its relevance for mainstream development sectors is therefore evident. The involvement of civil society and the private sector in the formulation of international governance structure is critical.

DAC Members should, through their participation in international processes, encourage these developments.

6.1.3. Helping raise awareness of global environmental issues in relevant international fora

Recent natural disasters, including floods, droughts and hurricanes, have served to raise concern about climate change and loss of ecosystem services as phenomena which could affect everyday lives of people worldwide. Yet, awareness of climate and other global environment issues remains relatively low among policy makers. Donors could play an important role in fostering awareness of global environmental issues and their policy and other implications in relevant fora.

Events such as the World Environment Day, the World Food Day the World Desertification Day and the Poverty Day could also provide useful opportunities for partnerships between bilateral donors and UN Agencies to raise awareness of global environmental issues.

6.1.4. Harmonising the reporting of DAC Members' efforts

Donors could contribute considerably to monitoring progress towards the implementation of all three Conventions by harmonising the reporting of the measures they have taken in support of the Rio Conventions. Efforts underway in the DAC to allow the statistical recording of DAC Members' development co-operation in support of the Desertification, Climate Change and Biodiversity Conventions. This work, undertaken in collaboration with the Secretariats of the Conventions is an important step in this direction. The possible introduction of Convention markers may not only serve statistical purposes but it would also help to stimulate the integration of Convention matters at the project work level.

6.2. In development agencies' headquarters

Poverty reduction, as a priority of the development co-operation agenda, is closely linked to natural resource base issues and development priorities of partner countries, global environmental concerns and international development. These global-local linkages should be recognised and acted upon. This calls for integrating global environmental concerns into development co-operation policies, programmes and projects.

6.2.1. Making a clear commitment to integrating global environmental issues

The commitment of agency leaders and senior management is essential in promoting integration of global environmental issues within agencies. A commitment to integrating global environmental issues into relevant policies, programmes and projects must therefore be reflected in Agencies' general mission statements, "business

plans” and other documents setting out priority goals. The inherent cross-sectoral nature of local and global environmental issues implies that commitment to integration must be shared – and stated explicitly by senior-level staff – widely across the agency, and not confined to environmental departments or units.

Commitment to integrating global environmental issues should also be reflected in regular dialogue and partnerships with multilateral agencies or NGOs, in order to encourage similar efforts in these agencies.

Other means to signal and reaffirm this commitment include, for example, the participation of senior representatives of the agency to relevant international events focussing on global environmental issues, such as the “Conferences of the Parties”, held in connection with the Desertification, Climate Change and Biodiversity Conventions.

6.2.2. Intensifying links with other ministries and agencies involved in global environmental and other relevant issues

Collaboration with environment ministries

International negotiations relating to global environmental issues and associated UN Conventions are frequently led by Environmental Ministries. Active participation of development co-operation agencies in these negotiations and the formulation of national positions are important ways to ensure that the agreements made reflect relevant experience in the field. This is particularly crucial when developed countries make commitments, which ultimately have to be operationalised through development co-operation agencies. Other ways to foster common approaches with other ministries and agencies involved in global environmental issues include regular exchanges of view among senior policy makers, staff exchanges, and others.

Collaboration with other relevant ministries and agencies

A number of international or regional negotiation processes relating to, for example, trade, investment, agriculture, intellectual property rights and others have direct relevance for development and global environmental issues. Donors have an important role to play in ensuring that these perspectives are reflected in their national positions. This requires close collaboration with their counterparts in relevant ministries.

Donors should also take all opportunities to raise relevant global environmental issues in international fora such as the “World Food Summit, Five Years Later”; relevant FAO Conferences, events related to disaster mitigation, and others.

6.2.3. Increasing the understanding of linkages with poverty reduction

Since all agencies have multiple objectives, (*e.g.* poverty reduction, gender equality, conflict prevention, etc.), strategies to integrate global environmental issues should focus on highlighting the linkages between global as well as local environmental issues and linkages with poverty reduction efforts, and resulting opportunities for complementary “win-win” approaches. The problems addressed by the Conventions are often seen as low-priority by agency staff. Raising awareness of their direct relevance and importance is a necessary first step.

A good starting point for this is to highlight the vulnerability of developing countries to the problems of global environmental issues such as climate change. Key issues to be emphasised include:

- The high vulnerability of poor countries to extreme events expected to be associated with climate change (storms, floods) and desertification (droughts).

- The distributional effects of these impacts, which fall disproportionately on the poorest.
- The risks that desertification and climate change will increase competition over already strained land and water resources. This can escalate into violent conflict.
- The linkages between natural disasters and global issues such as climate change and the impact on critical infrastructure such as irrigation or flood control facilities, including those established with donor support.
- The wide scope for combining sound development (*e.g.* combating land degradation and improving rural livelihoods) with the reduction of vulnerability and the complementarities between sound policy reforms (*e.g.* reducing energy subsidies to improve energy efficiency) with global objectives (*e.g.* reducing greenhouse gas emissions). (See Section 5 above).

6.2.4. Strengthening agencies' analytical and policy formulation capacities

Agencies need to strengthen their capacity for cross-sectoral policy analysis and integration. This requires applying analytical tools and methodologies which help to identify relevant linkages between local development issues and global environmental issues, quantify associated benefits and costs and formulate appropriate policy and programming responses. Relevant tools include, for instance, Strategic Environmental Assessment (see Section 4 above) or the extension of standard economic analysis to include environmental economics. Existing mechanisms such as state of environment reporting, poverty-environment studies, participatory poverty assessment, as well as established "environmental safeguard procedures" such as Environmental Impact Assessment or Strategic Impact Assessment can be built upon for this purposes.

6.2.5. Integration in sectoral policies

The need to integrate global environmental issues into all relevant sectors is a key message of this document. Global environmental issues should be given proper recognition in documents outlining sectoral policies and priorities. They should also be identified systematically in the context of sector-wide programmes, and associated policy dialogue, with a view to availing of any win-win opportunities and minimising conflicts between local and global objectives where they exist. This would include ensuring that the relevant instruments provided by the Conventions are fully taken into account and utilised.

This integration should focus on the sectors where these issues are most directly relevant:

- For climate change issues: energy, transport, industry, urban development, agriculture, forestry and coastal zone management.
- For desertification issues: agriculture, livestock, water management, and energy.
- For biodiversity issues: forestry, agriculture, coastal zone management, and fisheries.

Efforts to identify the impact of global environmental issues on development co-operation programmes should focus first on the countries and regions which are most vulnerable to the impact of global environmental degradation.

Box 27. Illustrative examples of special funds

France's Fond Français pour l'Environnement Mondial (FFEM) provides an example of such a mechanism established at the bilateral level. While this mechanism is targeted at global environmental issues, with eligibility criteria modelled after those of the Global Environmental Facility (GEF), it targets "exemplary projects that form part of broader sustainable development programmes integrating environment into development policy." (DAC Aid Review of France, 1997.) As such, the mechanism is an instrument for integrating global environmental issues into France's bilateral co-operation programmes.

The Canada Climate Change Development Fund is another example of a special mechanism targeted at global environmental issues. Its goal is to "promote activities in developing countries that seek to address the causes and effects of climate change, while at the same time contributing to sustainable development and poverty reduction." (source: CIDA). The governance structures of both the FFEM and the CCDF involve co-operation across several ministries and/or departments, which fosters cross-sectoral integration and ensures inputs from expertise at various levels and from various disciplines.

6.2.6. Reconsidering sectoral responsibilities for global environmental issues

An important way to foster integration into country programmes is to assign responsibility for global environmental issues to relevant sectoral units. Too often, global environmental issues and associated international negotiations are the exclusive responsibility of environmental units, which hinders their integration into operations. This may imply, for example, assigning responsibility for the UN Convention to Combat Desertification to the section(s) of the agency dealing with agriculture and rural development.

6.2.7. Establishing special funds or "pilot projects"

Global environmental issues raise unfamiliar questions for development co-operation agencies. Similarly, the mechanisms emerging from the associated global agreement, *e.g.* the Clean Development Mechanism established in relation to the Climate Change Convention, are new and untested. This may call for specific funds or pilot-scale projects to experiment with new approaches, demonstrate their feasibility, helping create a critical mass of concrete experience.

Special pilot projects focussing on vulnerability and adaptation may also be justified for particularly vulnerable countries such as Bangladesh, countries in the Caribbean, and the Pacific Island states. In addition to fostering integration of global issues into standard operations, such special mechanisms may also be instrumental in bringing best practices in the field to the negotiations of the conventions.

6.2.8. Stocktaking of current relevant activities across institutions

In most DAC Member countries there is currently no systematic record of which institutions are involved to which degree in Convention work. This would be called for, particularly in light of the possibility of overlapping work between different agencies. Such a systematic record should show, firstly, which institutions have which budgetary provisions for activities to promote the goals of the Convention, and secondly which institutions are involved in specific kinds of programmatic work towards the goals of the Convention.

6.3. At the partner country level

Notwithstanding the importance of actions taken at the international level or in development co-operation agencies' headquarters, the integration of global environmental issues into development policies and programmes can only happen in the coun-

Box 28. Integrating global environmental issues into PRSPs: examples of emerging good practice

A review of 38 Poverty Reduction Strategy Papers (PRSPs), conducted by the World Bank, noted slow progress in integrating global environmental issues. However, examples of good practice were identified.

The **Kenya Interim PRSP** presents a description of the environmental issues relating to land use and water and suggests strategies, monitoring indicators and cost of implementation of the strategies relating to land use, water and energy. It is also sensitive to loss of biodiversity. It highlights the links between property rights and natural resources management and proposes “*to implement land law systems to create an efficient and equitable system of land ownership*”. In the context of water, the PRSP notes that “*the incidence of violation of water rights, conflicts, and pollution have dramatically increased.*”

The **Mauritania PRSPs** acknowledge the critical importance of drought and desertification issues. “*With the exception of mining and fisheries, the country is under-endowed in directly exploitable natural resources. Vegetation and forest resources are sparse and water resources, both surface and underground, are either limited or difficult to reach. Due to limited water resources, the arable land potential of Mauritania is less than 0.5 million ha (< 1% of the country’s*

geographical area). In addition, 60% of the farms are less than 1 ha and lack secured tenure.”

The **Burkina Faso PRSP** notes that climatic conditions, low agricultural productivity, related to degradation of soil and water resources, are major constraints to economic growth and contribute to massive poverty and severe food insecurity among rural inhabitants. Income from farming and livestock raising is highly dependent on rainfall, which varies considerably from year to year.

The **Honduras (Interim) PRSP** presents a detailed assessment and quantification of vulnerability due to hurricane Mitch. The PRSP notes that “*Hurricane Mitch had a severe impact on living conditions in Honduras and this in turn affected poverty levels nation-wide.*”

Some of the PRSPs reviewed (**Honduras, Burkina Faso, Mauritania and Guinea**) present maps showing regional distribution of poverty, population and natural resource attributes. Poverty and resource maps help in the assessment of spatial and temporal relationships between poverty and the resource base. They can also be used to track the impacts of policy and management interventions relating to poverty reduction.

Source: The World Bank PRSP Sourcebook.

tries concerned. The needs of developing countries require effective development strategies with short-term benefits as well as response and adaptation strategies to global environmental concerns on a longer term. Both concerns should be addressed in the development agenda. For these reasons, this document has focussed on integrating global environmental issues at the country level (the focus of Section 4) and at the sectoral level (the focus of Section 5). As in all development co-operation activities, the efforts of development co-operation agencies to support this integration should be guided by the concepts of partnership and ownership.

6.3.1. Raising global environmental issues in country programming processes

Donors should highlight the importance of global environmental issues and their links with development objectives, by systematically putting these issues on the agenda of their regular dialogues with senior policy-makers from partner countries, in relation to aid programming. At the same time, it may be useful to require that the annual reports prepared by embassies or other country level representatives provide a systematic review of global environmental issues in the country in question.

6.3.2. Integrating into country-level planning frameworks

The integration of global environmental issues into country-level strategic planning frameworks, such as “National Visions”, “National Agenda 21” and Poverty Reduction Strategies (PRS) is a priority. Box 28 below provides illustration of progress achieved to date in this direction.

Box 29. Sector-wide approach: clarifying the role of donors

The need for donors to support governments in designing and implementing SWAps, and in ways which ensure low transaction costs through adequate donor co-ordination, raises a number of issues:

- Donors and government should share the same broad agenda.
- Only if this is so will it be possible for governments to lead in specifying priority areas in which donors should co-ordinate, and the types of outcomes desired. If donors co-ordinate only among themselves, governments may feel that they are being presented with a “united front”, which may provoke negative reactions.
- Donors themselves need to commit to co-ordination of policies, and to view sector analyses and strategy definition as a common exercise for all in which they participate merely as one group of stakeholders.
- Donors should be committed to streamlining aid instruments (such as projects, technical assistance, or sector programme support) and procedures (*e.g.* procurement, reporting).
- Donors and governments need to agree on the role of projects – an area in which views have differed widely within and between agencies; a nascent consensus suggests a need for projects that augment SWAp processes by creating space for policy development, and by helping to build capacity and to obtain replicable pilot experience.

Source: Key Sheet Sector-Wide Approaches (jointly by DfID and MoFA/The Netherlands)

It will be essential, in particular, to integrate the national action plans formulated under the Rio Conventions into relevant national or subnational or even regional-level planning processes. A priority in this connection is to develop close links between the Ministries and agencies responsible for global environmental issues (usually environmental ministries), the line ministries responsible for the relevant sectors, and the ministries responsible for planning and finance. For example, the Ministry of Agriculture should play a key role with regard to implementation of the National Action Programme to combat desertification. At the same time the NAP must be linked with national level budget allocation mechanisms, in order to ensure consistency between its objectives and available financial resources. Effective cross-sectoral mechanisms will be required at all relevant levels (regional, national, regional and local).

A key challenge is to foster greater coherence and complementarity between previously unrelated processes, without undermining their respective integrity. For example, many of the National Action Plans to combat desertification have been formulated through participative mechanisms and have developed a momentum of their own.

6.3.3. Sector-wide approaches

A Sector-Wide Approach (SWAp) is a development co-operation strategy to enhance the effectiveness of aid, through the support to a sector* as a whole, jointly by the government and multiple donors. It is generally accompanied by efforts to strengthen government procedures for disbursement and accountability. Policy and programmes are to be based on a thorough consultation process involving all stakeholders, and common approaches should be adopted across the sector. When the planning in a sectoral context starts from the micro level, the likelihood is increased that the aims and possibilities of the target group are incorporated. One approach is that donor interventions could be in the form of macro level support only, under appropriate country circumstances.

* A sector is defined as a coherent set of activities at the micro, meso, and macro levels, within an institutional and budget framework, for which the government has a defined policy.

Box 30. Donor co-ordination in Uganda

In Uganda, the Global Mechanism under the CCD, the Earth Council, and the Secretariat of the three Rio Conventions, UNDP and Uganda's National Environment Management Authority are collaborating to map out a strategy for a more synergistic approach to the implementation of the three Rio

Conventions and the Convention on Wetlands (RAMSAR). This approach is to be anchored in Uganda's Poverty Eradication Plan (PEAP) and the Plan for the Modernisation of Agriculture (PMA) and linked to the national budget process.

Sector-Wide approaches promote donor co-ordination and policy coherence. They provide a major opportunity to integrate global environmental concerns and poverty reduction efforts into the supported sector because of its comprehensive and participatory characteristics. This co-operation approach can not only promote the participation of the sector in Conventions preparations and the cross-sectoral implementation of Rio Convention Action, but also foster the adoption of the approaches and instruments identified in Section 4.

6.3.4. Enhancing donor co-ordination mechanisms

At the country level, the focus should be on developing, or refining, donor co-ordination mechanisms, with a view to harmonising interventions and maximising the effectiveness of external resources. Developing common training materials and programmes for use by Embassy and other country-based staff could also help co-ordination. It may also be useful in some cases to establish donor co-ordination mechanisms centering on global environmental themes, rather than just around sectoral themes, as is currently practised, notably in relation to sector-wide approaches. A much appreciated framework for donor co-ordination and partnership are the quarterly mini-Consultative Group meetings under the Comprehensive Development Framework of the World Bank. The meetings bring together donors and creditors (development partners) and government to share information and co-ordinate policy and programme implementation issues.

The "Tandem Chef de File", whereby a bilateral donor teams up with a multilateral agency, to assume leadership for a given sector or theme, is another valid mechanism which should also be considered. Putting issues relating to global environmental issues on the agenda of donor co-ordination mechanisms such as Consultative Groups and Round Tables would foster integration.

Collaboration with the UN system, especially in connection with its activities in the follow-up to UN conferences, can also provide means to improve the integration of global environmental issues into broader frameworks. The Millennium Development Goal Reporting mechanisms, for example, could be used to assess the extent to which integrating efforts are yielding the expected benefits in terms of sustainable development.

6.3.5. Building on ongoing projects and programmes

Donors are already supporting activities in a number of areas of direct relevance to one or several global environmental issues. Such activities can provide useful entry points for integrating the Rio Conventions. A systematic review of these efforts, at the country level, could help identify important linkages and, in some cases, suggest necessary changes to ensure consistency with global environmental objectives. The

development of common databases at the country level to keep track of projects and activities that have a direct impact on global environmental issues would play an important role in facilitating donor co-ordination and more efficient use of resources.

6.3.6. Fostering policy integration through capacity development

The Rio Conventions identify a wide variety of fields where capacity development is needed. These range from capacity to comply with reporting obligations to capacity for the formulation of policy and institutional frameworks conducive to the implementation of the conventions. As the financial mechanisms for two of the three Conventions, the GEF has primary responsibility in these areas, and notably for enabling countries to meet their formal reporting requirements under the conventions. Though the activities financed by the GEF have resulted in significant capacity development in areas beyond those directly emphasised by the Conventions (see Box 30 below), its efforts should continue to be complemented by bilateral donors and other international institutions that provide technical assistance.

In most cases, the human and institutional capacity development programmes initiated in relation to the Conventions, have direct relevance in a wide range of other areas. These include, in particular:

- ***Needs related to the monitoring of socio-economic conditions:*** forecasting and economic assessment of the impacts of climate change and other threats to ecosystems and affected economic sectors, the establishment of integrated scientific information and reporting systems, and human resource development in relevant scientific disciplines including information technology.
- ***Needs related to the formulation of adaptation and protective strategies in response to global environmental threats:*** capacity for the formulation of measures for adaptation to the impact of climate change (particularly for countries identified to be vulnerable to climate-related natural disasters); capacity for the establishment or strengthening of early warning systems; drought preparedness and contingency plans.
- ***Needs related to the development of conducive policy and institutional framework:*** capacity for cross-sectoral policy-making, planning and programming, notably in sectors such as agricultural development, energy, transport and many other key economic sectors.
- ***Needs related to technological development and reducing barriers to technology transfer.*** Capacity for technology needs assessment; the identification of sources and suppliers; the determination of optimal modalities for the acquisition and absorption of relevant technologies; and the identification of policy – related impediments to technology diffusion (including in the financial and fiscal policy spheres). The main relevant lessons from experience in the area of technology co-operation are summarised in Annex 3.
- ***Needs related to governance:*** Capacity for participatory planning and decision making, negotiation mediation and conflict resolution and awareness raising.

Formulating capacity development efforts in these areas within the context of broad capacity development needs, including in the context of Poverty Reduction Strategies, is an important way to foster policy integration, avoid duplication of effort and ultimately increase the effectiveness. Above all, it will be essential to avoid creating centres of capacity focussed on the conventions but isolated from mainstream policy and planning processes and therefore with limited impact.

Box 31. Catalysing policy review and reform through capacity development

One of the findings of the assessment phase of the Capacity Development Initiative was that over 90% of GEF-funded projects analysed focused in part on building or strengthening the capacity of host countries. This has included projects specifically designed to catalyse the review, reform, and/or establishment of policy and legislative frameworks (building systemic capacity).

In **Yemen**, the *Socotra* project's research on the island chain's biodiversity and natural resource base was used as a crucial input for the zoning plan recently established by presidential decree, which forms the basis for the archipelago's development master plan.

In **Russia**, a *Greenhouse Gas Reduction through Energy Efficient Building Technology* project has helped to catalyse

and influence the formulation of new policies. A project report "Heat Supply in the Russian Federation: ways out of the Crisis" regarding heat supply system reconstruction and reforms in the housing and utilities sectors is being used by decision-makers as primary guidance for the development of a National Strategy for Municipal Heat Supply Reform.

In **Madagascar and Syria**, GEF-financed activities have resulted in the drafting of new legislation still awaiting formal adoption by their national legislatures. As part of the *Madagascar Environmental Program Support* project, two laws relating to the intellectual property rights and the access to living resources were approved and will soon be submitted to the National Assembly. Legislative proposals on access and exchange of genetic resources have also been drafted in Syria as part of the *Dryland Agro-biodiversity* project.

Source: UNDP.

In addition to these, capacity development needs more directly related to the convention implementation include capacity to develop the policy and institutional framework necessary to attract private investment in support of climate-friendly projects. This will be important to enable many countries to avail of opportunities arising from emerging mechanisms such as the Clean Development Mechanism. Many countries will also need assistance to develop their capacity to participate effectively in the negotiation of the Convention and related discussions at the global level.

6.3.7. Integrating at the project level: building on existing "safeguard" procedures by:

a) *Modifying existing 'safeguard' procedures to cover global environmental issues*

Project-level assessment procedures for safeguarding purposes are well-established in development co-operation agencies. In many cases, issues relating to the Rio Conventions can readily be "built in" existing procedures. Assessing potential vulnerability to long-term climate change, and making necessary design changes, is particularly important in the case of large-scale capital infrastructure projects with high initial costs and a long physical life.

b) *Expanding the coverage of safeguard procedures to ensure that all relevant projects are covered*

"Safeguard" assessments, as carried out today, aim to identify and address risks *by* the project *to* the natural environment, rather than the other way round. Consequently, assessments are not required for projects that do not impact on the environment substantially, even if they may face risks from the natural environment themselves (such as hospitals or school buildings in a flood-prone area).

"Safeguard" assessments are also often waived for emergency reconstruction projects, although these projects deal with areas that are almost certainly very vulnerable to environmental influence or natural hazards. Thus, important risks relating, for example, to long-term climate change are "missed" out and opportunities to reduce vulnerability for future events are foregone. Addressing this limitation would imply reviewing the criteria used to screen projects and determine whether an assessment is required, to ensure specific assessment of vulnerability to, for example, floods, storms and drought.

Annex 1A. Selected impact of global environment on sectors*

	AGRICULTURE SECTOR	ENERGY SECTOR	FOREST SECTOR	WATER SECTOR
Impact of biodiversity loss	<ul style="list-style-type: none"> ■ Loss of genetic variety increases vulnerability to catastrophic plague ■ Loss of wild relatives to draw on for improving genetic pool 		<ul style="list-style-type: none"> ■ Reduced genetic and species diversity reduces resiliency and productivity ■ Loss of valuable tree species 	<ul style="list-style-type: none"> ■ Loss of aqua-biodiversity can reduce fresh water productivity ■ Some species perform water filtration and quality functions ■ Invasive species can negatively impact water quality
Impact of climate change	<ul style="list-style-type: none"> ■ Pole-ward shifts of agricultural productivity in mid-latitudes ■ Increased stress on crops ■ Increased crop and livestock loss to disease ■ Decreased yields due to changes in rainfall and more severe floods/droughts ■ Changes in CO₂ level in atmosphere affect physiological functioning of plants 	<ul style="list-style-type: none"> ■ Changes in climate could alter the amount, frequency, and distribution of precipitation and impact the production of hydropower. ■ Changes in climate could change energy demands for heating/cooling 	<ul style="list-style-type: none"> ■ Climate change affects boundaries, composition, and functioning of forests ■ Climate change affects production of wood and fibre ■ Changes in species composition ■ Forests are not able to migrate quickly enough to adapt to changing climatic conditions resulting in forest loss ■ Changes in CO₂ level in atmosphere affect physiological functioning of plants 	<ul style="list-style-type: none"> ■ Alteration of global hydrological cycle can result in floods and droughts
Impact of desertification	<ul style="list-style-type: none"> ■ Climate change and desertification can exacerbate each other through positive feedback loops ■ Lower yields due to decreased soil productivity 	<ul style="list-style-type: none"> ■ Less availability of fuel wood 	<ul style="list-style-type: none"> ■ Loss of forest cover 	<ul style="list-style-type: none"> ■ Climate change could result in warming and drying of climate, decreasing water availability and increasing desertification rates. ■ Desertification can alter micro climatic conditions and reduce water availability

* Adapted from UNEP, NASA, World Bank, November 1998. *Protecting Our Planet, Securing Our Future; Linkages Among Global Environmental Issues and Human Needs.*

Annex 1B. (Mirror) Impact of sectors on global environment*

	IMPACT OF AGRICULTURE SECTOR	IMPACT OF ENERGY SECTOR	IMPACT OF FOREST SECTOR	IMPACT OF WATER SECTOR
Impact on biodiversity loss	<ul style="list-style-type: none"> ■ Expanding land cultivation converts diverse ecosystems to fields growing only a few species ■ Fragmentation of remaining intact habitats ■ Proliferation of invasive, weedy species 	<ul style="list-style-type: none"> ■ Changes in the climate system (see below) will in turn affect biodiversity and ecological systems 	<ul style="list-style-type: none"> ■ Harvesting forests results in habitat loss and fragmentation of remaining habitat, resulting in declines in biodiversity 	<ul style="list-style-type: none"> ■ Water withdrawals from rivers and streams can lead to reduced flow and periodic drying, with potentially negative effects on aquatic biodiversity
Impact on climate change	<ul style="list-style-type: none"> ■ Forest conversion for agriculture leads to net loss of carbon to atmosphere that accompanies the deforestation ■ Release from chemical fertiliser of nitrogen gases (some of which are potent greenhouse gases) into atmosphere 	<ul style="list-style-type: none"> ■ Burning fossil fuels for energy increases emissions of carbon dioxide into the atmosphere which contribute to human-caused climate change ■ Fossil fuel burning also results in release of nitrogenous gases, some of which contribute to global warming 	<ul style="list-style-type: none"> ■ Timber harvesting results in a net release of carbon dioxide into the atmosphere (the smaller, younger trees or other vegetation planted to replace mature trees contain much less carbon) 	
Impact on desertification	<ul style="list-style-type: none"> ■ Soil degradation when agriculture strategy does not include nutrient and structural enhancements of the soil ■ Extensive irrigation on thin soils in semi-arid or arid climates can lead to land degradation and salinization of soils 	<ul style="list-style-type: none"> ■ Sulfur compounds resulting from fossil fuel burning are major contributors to acidification of waters and soils 	<ul style="list-style-type: none"> ■ Removing physically stabilising root systems can accelerate erosion and topsoil loss by reducing capacity of the soils to absorb rainwater and hence control runoff ■ Soil erosion decreases fertility of originally forested landscape and makes forest regeneration more difficult 	<ul style="list-style-type: none"> ■ Reduction of available surface or groundwater can lead to land degradation and desertification.

* Adapted from UNEP, NASA, World Bank, November 1998. *Protecting Our Planet, Securing Our Future; Linkages Among Global Environmental Issues and Human Needs.*

Annex 2. Conventions Tip-sheets

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

www.biodiv.org

Key terms and concepts

Biological diversity refers to the number and variety of living organisms on the planet. It is defined in terms of genes, species, and ecosystems which are the outcome of over 3 000 million years of evolution. To date, an estimated 1.7 million species have been identified. The exact number of the Earth's existing species, however, is still unknown. Estimates vary from a low of 5 million to a high of 100 million.

Species extinction is a natural part of the evolutionary process. However, species and ecosystems are more threatened by human activities than ever before in recorded history. The losses are taking place all over the world, primarily in tropical forests – where 50-90 per cent of identified species live – as well as in rivers and lakes, deserts and temperate forests, and on mountains and islands. The most recent estimates predict that some two to eight per cent of the Earth's species will disappear over the next 25 years. **Species extinction therefore has important implications for economic and social development.** At least 40 per cent of the world's economy and 80 per cent of the needs of the poor are derived from biological resources. In addition, the richer the diversity of life, the greater the opportunity for medical discoveries, economic development, and adaptive responses to such new challenges as climate change.

Main causes of species extinction include habitat loss, such as deforestation -whether accidental or due to the conversion of forests to other uses, such as mono-crop agriculture, and land degradation due to pollution, drought, and over-exploitation. Main causes of marine biodiversity loss include pollution and over-harvesting of marine species (corals, fish, etc.). The degradation or conversion of wetlands is an important cause of biodiversity loss. The deliberate or accidental introduction of invasive alien species is another cause of species extinction.

Key features of the Convention

The **Biodiversity Convention** aims towards the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. It addresses all aspects of biological diversity: genetic resources, species, and ecosystems. It also recognises the need to reconcile conservation and socio-economic development needs. Parties are thus requested to develop or adapt national strategies, plans or programmes for the conservation and sustainable use of biological diversity and to integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Means to support developing countries implement the Convention include scientific and technical co-operation, access to financial and genetic resources, and the transfer of ecologically sound technologies.

To this end, the Convention provides for a financial “mechanism” (the GEF) and a subsidiary body on scientific, technical and technological advice.

A “**Clearing House for Technical and Scientific Co-operation**” is also established to provide a means for identifying and disseminating information relevant to the implementation of the Convention. This includes providing data for decision-making; supporting access to existing knowledge, generating new knowledge and more generally to promote technical and scientific communication and avoid duplication of efforts.

The Conferences of the Parties have defined “Thematic Work Programmes” on Coastal and Marine Biodiversity, Forests, Inland Waters, Agricultural Biodiversity, and Dry and sub-Humid Lands. These thematic “work programmes” outline the priorities for implementation of the Convention, related to specific ecosystems. Each work programme also identifies specific areas where research is required in support of implementation objectives. In the forest area, for example, these include the relationship between forest biodiversity and forest products and services; the impact of climate change on biodiversity, especially related to forests, and research on indigenous knowledge of conservation of forest resources.

Examples of activities to conserve biodiversity

Direct measures: *in situ* conservation

- Protection of ecosystems and natural habitats; development of legislation for the protection of threatened species and populations.
- Rehabilitation of degraded ecosystems; support to local populations to develop and implement remedial action in degraded areas.
- Controlling risks associated with biotechnology (living modified organisms).
- Sustainable wildlife management.
- Identification of components of biological diversity important for its conservation and sustainable use; monitoring these components through sampling and other techniques (including databases).
- Identification and promotion of indigenous knowledge related to biodiversity use and conservation, and assistance for indigenous groups to participate in relevant meetings at national and international levels. Support for developing countries’ participation in the expert-level discussions held to clarify the key technical and scientific issues relevant to the implementation of the Convention.

Direct measures: *ex-situ* conservation

- Establishment and maintenance of ex-situ conservation facilities in developing countries (e.g. - botanical gardens, gene banks etc).
- Establishment of facilities for ex-situ research on, plants, animals and micro-organisms.
- Assistance related to the Clearing House Mechanism: access to relevant scientific information networks and databases, including notably through Internet and capacity development in relevant disciplines.
- Support for improved access to, or transfer of, technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources.

Capacity development and enabling environment

Integration of biodiversity into national planning and policy making

- Identification of processes and activities which have, or are likely to have, a significant adverse impact on the conservation and sustainable use of biological diversity; systematic environmental impact assessments.
- Development of appropriate legislative frameworks, for example in the area of biosafety.

Education, training, research

- Legislative, administrative and policy measures on access to genetic resources for environmentally sound uses.
- Facilitate access to, and transfer of, technology.
- Capacity to identify, acquire, develop and apply necessary technologies to ensure sustainable use of biological resources; and to comply with reporting requirements.
- Exchange of information relevant to the conservation and sustainable use of biological diversity.
- Establishment of national assessment and monitoring systems and assistance for technical and policy-formulation efforts relevant to each of the “thematic work programmes”.

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

www.unfccc.int

Key terms and concepts

Climate change is due to increasing concentrations of certain gases in the atmosphere. There are many uncertainties about the scale and impacts of climate change. Because of the delaying effect of the oceans in absorbing or emitting **GreenHouse Gases (GHGs)**, surface temperatures do not respond immediately. However, the balance of the evidence suggests that the climate may have already started to change.

GHGs control the flow of natural energy through the atmosphere by absorbing infrared radiation. The overall concentration of GHGs in the atmosphere depends on the balance between the release of GHG into the atmosphere and their re-absorption back from the atmosphere. Principal GHGs include Carbon Dioxide, Methane, Nitrous Oxide, a range of artificial chemicals (CFCs, HCFCs and Sulphur Hexafluoride),¹ Ozone. While many GHGs are released by natural processes, human activities contribute to the build-up of GHG in the atmosphere by releasing GHGs (anthropogenic GHG sources) and by interfering with natural GHG “sinks”.

GHG sources are processes that lead to the release of GHGs into the atmosphere. Examples include burning fossil fuels and cattle raising. **GHG sinks** remove GHGs from the atmosphere. For example, a growing tree is a “**Carbon Sink**”: it takes carbon dioxide from the atmosphere, uses the carbon to create wooden matter, and releases oxygen (This is called photosynthesis). Converting a forest to other uses stops this “sink” function. Because considerable amounts of carbon are captured in the sub-soil, land degradation leads to the emission of carbon back into the atmosphere.

Carbon dioxide (CO₂) is produced when fossil fuels are used (e.g. coal, petroleum) to generate energy² and when forests are converted to other uses. These are probably the first and second largest sources of GHGs emissions from human activities. **Methane** (CH₄) and **Nitrous Oxide** (N₂O) are emitted from agricultural activities, changes in land use and the decomposition of organic wastes in landfills. Extracting, processing, transporting, and distributing fossil fuels also release greenhouse gases. This happens when natural gas is flared or vented from oil wells, emitting mostly carbon dioxide and methane, respectively but also from accidents, poor maintenance, and small leaks in well heads, pipe fittings, and pipelines. **Ozone** in the lower atmosphere is generated indirectly by automobile exhaust fumes.³ **Artificial chemicals** (CFCs, HCFCs, PFCs) and other long-lived gases such as sulphur hexafluoride (SF₆) are released by industrial processes.

Global climate change: impacts and remedies

Climate change is likely to have a significant impact on the global environment. In general, the faster the climate changes, the greater will be the risk of damage. The mean sea level is projected to rise, causing **flooding of low-lying areas** and other damage. Climatic zones (and thus ecosystems and agricultural zones) could shift towards the poles, forests, deserts, rangelands, and other unmanaged ecosystems would face new climatic stresses and individual species will become extinct. Risks of more extreme weather events and of changes in the Gulf Stream could increase.

Human society will face new risks and pressures. Some regions are likely to experience food shortages and hunger. Water resources will be affected as precipitation and evaporation patterns change around the world. Physical infrastructure will be damaged, particularly by sea-level rise and by extreme weather events. Economic activities, human settlements, and human health will experience many direct and indirect effects. **The poor and disadvantaged are the most vulnerable to the negative consequences of climate change.**

Key features of the Convention and Protocol

The UN Framework Convention on Climate Change sets an “ultimate objective” of stabilising atmospheric concentrations of greenhouse gases at a “safe” level, namely a level that would prevent dangerous anthropogenic interference with the climate system. This should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. To achieve this objective, all parties have a general commitment to address climate change, adapt to its effects, and report on the action they are taking to implement the Convention. The Convention notes “that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low, and that the share of global emissions originating in developing countries will grow to meet their social and development needs.”

The Convention divides countries into “Annex I-Parties” and “non-Annex-Parties”. Annex I Parties include developed countries, and economies in transition.⁴ Non-Annex I Parties include primarily developing countries. Annex I Parties committed to adopting national policies and measures with the (non-legally binding) aim of returning their greenhouse gas emissions to 1990 levels by the year 2000.

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, inter alia by the set of Principles laid out in Article 3. (See Box 32.)

The Convention commits all Parties to *i*) develop and submit “national communications” containing inventories of greenhouse-gas emissions by sources and greenhouse-gas removals by “sinks”; *ii*) adopt national programmes for mitigating climate change and develop strategies for adapting to its impacts; *iii*) promote technology transfer and the sustainable management, conservation, and enhancement of greenhouse gas “sinks” and “reservoirs” (such as forests and oceans); *iv*) take climate change into account in their social, economic, and environmental policies; *v*) co-operate in scientific, technical, and educational matters; and *vi*) promote education, public awareness, and the exchange of information related to climate change.

Parties to the 1997 Kyoto Protocol have agreed that Annex I countries will have a legally binding commitment to reduce their collective emissions of six greenhouse gases by at least 5% below 1990 levels in the period 2008–2012. The Protocol also establishes an emission trading regime and a “clean development mechanism (CDM)”.

Examples of concrete measures to implement the climate change Convention

Collection and exchange of information related to climate change

- Scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system (causes, effects, magnitude and timing of climate change; economic and social consequences of various response strategies).
- Exchange of scientific, technical, socio-economic information related to climate change.

Capacity development and enabling environment

Cultural, educational, institutional, legal, and regulatory practices are all very important to effective mitigation of climate change. Examples of relevant activities in this area include:

- Formulation of measures to foster the incorporation of climate change concerns into social, economic and environmental policies and actions.
- Impact assessments of sectoral policies on GHG emissions and removals. Relevant sectors include energy, transport, water management, agriculture, forest management and others. This includes measures to take into account potential climate change impact when designing infrastructure.
- Establishment of policies and regulatory frameworks to encourage GHG reduction by consumers, investors and producers. This includes taxes, regulatory standards, tradable emissions permits, voluntary programmes, and the phase-out of counterproductive subsidies, etc.

Box 32. Article 3

1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.
2. The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.
3. The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.
4. The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.
5. The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

Measures to contain GHG emissions and enhance GHG absorption

The avenues for limiting GHG emissions are many and varied. They include encouraging energy efficiency and the limitation of GHG emissions in industry, power generation, transport, housing, waste management and agriculture. Specific examples include:

- Development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent GHG emissions.
- Sustainable management of forests, wetlands, drylands, etc.
- Improved agriculture and livestock management.
- Programmes to improve urban management (reducing congestion, urban sprawl, etc).
- Activities to reduce the release of GHGs in the extraction and processing of fossil fuels (*e.g.* by reducing leaks or recovering methane).

Many of these measures will have direct socio-economic benefits apart from climate change-relevant benefits.

UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

www.unccd.int

Key terms and concepts

“**Desertification**” means land degradation in arid, semi-arid and dry sub-humid areas. While land degradation occurs everywhere, it is only defined as “desertification” when it occurs in those areas. Desertification affects seventy per cent of the world’s drylands, amounting to one fourth of the world’s land surface.

Land degradation means reduction or loss, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands. Land degradation is often linked with food insecurity and poverty, in a cause-effect relationship.

Causes of land degradation include natural hazards – droughts, floods – combined with human activities – notably over-tilling and overgrazing, deforestation and poor irrigation practices (leading to salinization). Fertilisers, pesticides, and contamination by heavy metals, and the introduction of exotic (invasive) plant species also lead to soil degradation.

Actions to combat desertification include activities aimed at preventing and/or reducing land degradation; rehabilitating partly degraded land and reclaiming desertified land.

Actions to mitigate the effects of drought include activities related to the prediction of drought and intended to reduce the vulnerability of society and natural systems to drought as it relates to combating desertification.

Key features of the Convention

The Convention to Combat Desertification aims to combat desertification and mitigate the effects of drought in affected countries, particularly in Africa, with a view to contributing to the achievement of sustainable development. It recognises that achieving this objective will involve long term integrated strategies aimed at improving the productivity of land and rehabilitating, conservation and management of land and water resources, with a view to improving living conditions, especially at the community level. Under the Convention, *affected country parties* undertake to give due priority to combating desertification and allocate adequate resources, address the underlying causes of desertification, with special attention to socio-economic factors providing an enabling policy and legislative environment, and promoting increased awareness and facilitating the participation of local populations and NGOs in efforts to combat desertification and mitigating the effects of drought. *Developed country parties* are committed to promote the mobilisation of financial and other resources to combat desertification, and encourage the mobilisation of private sector and non-governmental sources.

Under the Convention, affected developing country parties⁵ are required to prepare **National Action Programmes** to combat Desertification. These plans elaborate long-term policies and strategies to combat desertification; mitigate the effects of drought; prevent the degradation of land not yet affected. These plans should be formulated within the broader context of national policies for sustainable development. Action Plans to combat desertification can be developed at the national, sub-regional or regional levels as appropriate.

Examples of activities to combat desertification and mitigate the effect of drought

Direct measures

- Food security systems.
- Fixation of shifting sand dunes; erosion control; biodiversity conservation.
- Strengthening agricultural extension services, training rural organisations.

- Development and dissemination of efficient use of alternative energy sources and technologies.
- Water resources management for arid-land agriculture.
- Integrated management of international river, lake, and hydrogeological basins.
- Alternative livelihoods, (*e.g.* eco-tourism).

These activities are often integrated as part of broader socio-economic development projects, including Integrated Local Area Development Programmes (LADPs).

Capacity development and enabling environment

- Research on the processes leading to desertification and drought and on the impact of natural and human causal factors; collection and exchange of information related to desertification.
- Strengthening hydrological and meteorological services.
- Development of environmentally sound technology relevant to combating desertification.
- Adaptation of traditional methods of agriculture to modern socio-economic conditions.
- Identification of policy and institutional factors which may hamper the fight against desertification (*e.g.* in the area of agriculture, water management etc).
- Strengthening of institutional and legal frameworks; including the regimes for tenure and resource harmonisation of policy and legislation.

Notes

- 1 Although they are important greenhouse gases, CFCs and HCFCs are better known for their role in damaging the earth's ozone layer. Their production is regulated by another treaty, the Montreal Protocol. Hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) are used as replacements for CFCs and HCFCs in some applications, as they do not deplete the ozone layer. However, as they are greenhouse gases, HFCs and PFCs are covered by the Climate Change Convention and are also included in the six greenhouse gases subject to emission targets under the Kyoto Protocol.
- 2 Because combustion is often incomplete, carbon monoxide and other pollutants are also produced. When fuel is burned completely, the only by-product containing carbon is carbon dioxide.
- 3 At ground level Ozone is a pollutant harmful to human health. At the level of the stratosphere, however, Ozone plays a role in filtering harmful radiations from the sun. The Vienna Convention and Montreal Protocol aim to combat the depletion of the stratospheric ozone layer.
- 4 Annex I Parties are: Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, European Community, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, UK and USA. The OECD members of Annex I are also listed in the Convention's Annex II. They have a special obligation to provide "new and additional financial resources" to developing countries to help them tackle climate change, as well as to facilitate the transfer of climate-friendly technologies to both developing countries and economies in transition. Much of this assistance is provided through the Convention's financial mechanism, the Global Environment Facility.
- 5 An up-to date list of Parties to the Conventions and ratification status is found at www.unccd.int/Convention/ratif/doiif.php

Annex 3. Technology Co-operation: Key Lessons from Donor's Experience

Members of the OECD Development Co-operation Assistance (DAC) have over time acquired considerable experience in helping developing countries take advantage of cleaner production methods in order to reduce pollution and energy use. From this work, a number of key principles have emerged.

Effective co-operation must be driven by local needs and adapted to the local circumstances

Cleaner production projects and programmes must be based on the actual needs of the recipient country, and be tailored to local conditions. It is essential to involve local stakeholders and potential beneficiaries in the definition of needs and thereby generate a genuine ownership of the resulting actions, rather than an externally imposed solution. Local experts can provide the necessary insight on such matters as cultural background, gender roles, and local political and legal structures.

Co-ordination under the leadership of the partner country is key

Notwithstanding the urgency and importance of moving forward in the area of co-operation towards cleaner production, the risk of unco-ordinated – and ultimately ineffective – initiatives must be avoided. Adapting assistance to local needs requires co-ordination among the various external and domestic actors involved. This is essential in order to avoid contradictory approaches or conflicting advice, overlaps and duplication, which place additional burdens on administrative structures in developing countries. Co-ordination facilitates the sharing of experience and the dissemination of “best practices”. Co-ordination fora should be led by the host country itself.

Successful technology co-operation promotes capacity development and not only hardware

The principal constraints to the rapid diffusion of cleaner production technologies in developing countries relate to a lack of institutional and managerial capacities needed to manage technological change. Support for the dissemination of technological know-how must concentrate on developing the necessary human, scientific, technological, organisational, institutional and resource capabilities to underpin the long-term application of new technologies. The provision of training for specific cleaner production projects should be linked to broader efforts to improve the country's overall technological and scientific know-how.

Effective co-operation is a long-term effort

Capacity development is a long-term process rather than a finite product. Its results will have to be absorbed and accepted into the general societal fabric of a country and, therefore, this may require a continuous effort over a long period of time. Effective technology co-operation may require commitments for support that go beyond the normal planning horizon of 3-5 years. Efforts towards policy and institutional sector reform take even longer and may be framed within a time horizon of as long as 10-20 years.

Involving industry in the design of regulations and enforcement mechanisms is critical

The major actor in technology innovation, diffusion and application is the private sector, therefore it should be involved at an early stage in policy formulation and, more specifically, in the design of regulations and enforcement mechanisms.

Efficient channels of communication and greater collaboration between industry and government are important instruments in this regard. In an increasing number of countries, private sector actors, including

business and industry associations, chambers of commerce, and academic research centres, are improving co-operation with government. The involvement of the trade sector – *i.e.*, industries with export and import linkages – can also facilitate greater coherence between national environmental and other policies.

Information dissemination is crucial

Access to up-to-date and accurate information on available and emerging cleaner technology options is necessary to foster technological change. Such information is often difficult and costly to find, especially for small and medium-sized enterprises. Information dissemination is an important factor in efforts to promote technology diffusion. This should focus on identifying cleaner technology options, *i.e.* evaluating the cost and benefits of cleaner production and providing information on existing and emerging laws and regulations.

The impact of weak enforcement of intellectual property rights is a topic of considerable debate in discussions about the transfer of cleaner technologies to developing countries. OECD research shows that intellectual property rights do not appear to be a significant factor. Weak or inadequately enforced environmental regulations or poor access to financing are considered to be far more important obstacles.

Public awareness of the impact of environmental degradation can greatly assist efforts to create a conducive policy framework

Public awareness of the health and other impacts of pollution and the necessity of a transition towards sustainable development is an important factor promoting the formulation of a conducive policy framework. Improving public knowledge of environmental problems can assist in mobilising collective efforts towards environmental protection and create a demand for the improved environmental performance of public and private actors.

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