

# **LINKING POVERTY REDUCTION AND ENVIRONMENTAL MANAGEMENT**

## **Policy Challenges and Opportunities**

**Department for International Development, United Kingdom (DFID)  
Directorate General for Development, European Commission (EC)  
United Nations Development Programme (UNDP)  
The World Bank**

**July 2002**

## Foreword

---

One in five people on the planet – two-thirds of them women – live in abject poverty. While the last century saw great progress in reducing poverty and improving well-being, poverty remains a global problem of huge proportions. Of the world's 6 billion people, 2.8 billion live on less than \$2 a day, and 1.2 billion on less than \$1 a day. To address this challenge, the world's governments committed themselves at the United Nations Millennium Summit to the Millennium Development Goals, including the overarching goal of halving extreme poverty by the year 2015.

Yet, at the same time, our planet's capacity to sustain us is eroding. The problems are well-known – degrading agricultural lands, shrinking forests, diminishing supplies of clean water, dwindling fisheries, and the threat of growing social and ecological vulnerability from climate change and loss of biological diversity. While these threats are global, their impacts are most severe in the developing world – especially among people living in poverty who have the least means to cope.

Is this environmental decline inevitable in order for poverty to be reduced? We argue not. Indeed, quite the opposite is true. If we do not successfully arrest and reverse this erosion of natural resources, the world will not be able to meet the Millennium Development Goals, particularly the goal of halving extreme poverty. As this paper demonstrates, tackling environmental degradation is an integral part of effective and lasting poverty reduction. The 2002 World Summit on Sustainable Development (WSSD) provides the international community with a pivotal opportunity to redirect the global debate, and to forge a more integrated and effective global response to poverty and environmental decline.

To succeed, we need to focus on the most important links between poverty, the environment and sustainable development. Up until now, many have argued that ensuring sound environmental management means curtailment of economic opportunities and growth, but without growth we cannot reduce poverty. In fact, there is no simple relationship between economic growth and environmental degradation, and appropriate policies nationally and internationally can bring major benefits on both fronts. To this end, we need to look beyond what environmental institutions can do, and search for opportunities across all sectors.

This document is based on contributions from four organizations that are pursuing similar objectives for poverty eradication and environmental management – the Department for International Development (DFID) in the United Kingdom, the Directorate General for Development of the European Commission (EC), the United Nations Development Programme (UNDP) and the World Bank. Inspired by our common agendas and the opportunity provided by WSSD, we have pulled together our existing (but independent) strategies on poverty and environment. We have consulted widely and are grateful to the more than one thousand people from 84 countries who have participated in the discussions, and many of whom have submitted comments. Drawing also from the work of others, we have assembled evidence of the important linkages between environmental management and poverty reduction, and what we believe are significant policy opportunities for moving the poverty-environment agenda forward.

Clare Short  
*Secretary of State for  
International Development*  
  
*Department for  
International Development  
United Kingdom*

Poul Nielson  
*Commissioner for  
Development and  
Humanitarian Aid*  
  
*European Commission*

Mark Malloch Brown  
*Administrator*  
  
*United Nations  
Development Programme*

James D. Wolfensohn  
*President*  
  
*The World Bank*

# Acknowledgements

---

This report has been prepared by a team comprising Paul Steele (DFID), Simon Le-Grand (EC), Philip Dobie and Peter Hazlewood (UNDP), and Jan Bojö (World Bank). The team benefited greatly from comments, suggestions and contributions by the following people:

DFID: Fenella Frost, Alicia Herbert, Julian Quan, Julie Thomas and Yolanda Wright.

EC: Marc Debois, Elisabeth Drory, Jean-Pierre Dubois, Karin Eckerdal, Karen Fogg, Bart Kuitert, Andre Liebaert, Philip Mann, Patrick Rabe, Peter Rundell, Artur Runge-Metzger, Maija Sala, Christoph Wagner and Uwe Werblow.

UNDP: Stephen Browne, Linda Ghanime, Selim Jahan, Arun Kashyap, Charles McNeill, Leida Mercado, Frank Pinto, Alvaro Umaña, Jake Werksman and Gregory Woodsworth.

World Bank: Gayatri Acharya, Anders Agerskov, Charlotte Bingham, Katie Bolt, John Briscoe, David Cassells, Kenneth Chomitz, Louise Cord, Ashok Dhareshwar, John Dixon, John Flora, Kristalina Georgieva, Kirk Hamilton, Marea Hatziolos, Jane Holt, Hans Ibrek, Steen Jorgensen, Mats Karlsson, Elizabeth Kelley, Nalin Kishor, Agi Kiss, Jeni Klugman, Odin Knudsen, Anil Markandya, Ajay Mathur, Michele de Nevers, Poonam Pillai, Jamal Saghir, Alexandra Sears, Kristina Sörby, Priya Shyamsundar and Limin Wang.

Other: Marcel Engel (World Business Council for Sustainable Development), Izabella Koziell (IIED), Melissa Leach (Institute for Development Studies, University of Sussex), Pradeep Tharakan (Syracuse University) and Harry van der Wulp (Global IPM Facility).

Comments were received from the following individuals through the Poverty-Environment Partnership (PEP), an informal network of donor agencies pursuing similar objectives of poverty reduction and environmental management: Henk van Trigt (Netherlands), Tomas Andersson, Anders Ekbo, Maria Schultz and Eva Tobisson (Sweden), Thierry Oliveira (UNEP), and Leslie Johnson (USA).

The paper has been widely disseminated and discussed in the process leading up to the 2002 World Summit on Sustainable Development (WSSD). In January 2002, the paper was issued as a 'Consultation Draft' and posted on several public websites. The Consultation Draft was presented at 'side events' during the Second (January 2002) and Third (March 2002) Preparatory Committee meetings for WSSD. The paper also was presented in Tunisia at the 7th Bi-Annual Conference of the International Society of Environmental Economics, and in El Salvador at a World Wide Fund for Nature workshop.

From 1 February until 31 May 2002, the World Bank Institute hosted an electronic discussion on the Consultation Draft, which drew more than 1,000 participants from 84 countries. Over the course of the four-month e-discussion, a total of 668 messages were received, and regular summaries of the discussion together with authors' responses were distributed. During the final ten weeks of the e-discussion, a thematic format was introduced based on several key topics that had emerged from the discussion, including: directional causality of poverty and environment; appropriate technology; quality of growth and environmental management; and trade, foreign direct investment and the environment. Numerous amendments to the previous text in the Consultation Draft have been inspired by contributions to the e-discussion.

Special thanks go to Rama Chandra Reddy (World Bank), who moderated the e-discussion on the Consultation Draft, and to Jim Cantrell (World Bank), who guided the design and production of the paper from the Consultation Draft through to this final version.

While the authors have made strong efforts to accommodate comments received, the responsibility for this paper remains with our four organizations.

# Contents

---

## FOREWORD

---

## OVERVIEW: LINKING POVERTY REDUCTION AND ENVIRONMENTAL MANAGEMENT 1

---

## PART 1: WHY THE ENVIRONMENT MATTERS TO PEOPLE LIVING IN POVERTY 5

1.1 Livelihoods and the environment

1.2 Health and the environment

1.3 Vulnerability and the environment

1.4 Economic growth and the environment

---

## PART 2: POLICY OPPORTUNITIES TO REDUCE POVERTY AND IMPROVE THE ENVIRONMENT 17

2.1 Improving governance

2.2 Enhancing the assets of the poor

2.3 Improving the quality of growth

2.4 Reforming international and industrialized country policies

---

## CONCLUSION 46

---

## ENDNOTES 47

---

## ABBREVIATIONS AND ACRONYMS 52

---

## REFERENCES 53

---

## BOXES

1. Why the environment is key to achieving the Millennium Development Goals	7
2. Burden of water collection on women and children	12
3. Impacts of global climate change on the poor	14
4. An improved understanding of poverty-environment relationships	19
5. Integrating environment in Uganda's Poverty Eradication Action Plan	21
6. Indonesia's Program for Pollution Control, Evaluation and Rating (PROPER)	23
7. Tackling corruption in the Cambodian forestry sector	24
8. Natural resources fuel conflict in the Democratic Republic of the Congo	25
9. Land tenure and environmental improvements	28
10. Community forestry in Nepal	29
11. Improving resource-poor farmers' access to environmentally-sound technology	30
12. Public-private partnerships for water in South Africa	36
13. Energy subsidy reform and the poor in China	37
14. Successful adjustment to environmental health standards	40
15. Mining companies and the environment in Latin America	41
16. Curbing developed country imports of illegal timber from Indonesia	43

## FIGURES

1. Environment and the Millennium Development Goals	5
2. Natural resources and household incomes in rural areas of Zimbabwe	8
3. Burden of disease and environmental risks (1990)	11
4. Economic growth and environmental quality (1981-1998)	15
5. Policy options to address poverty-environment linkages	17
6. Adjusted national income accounts in Sub-Saharan Africa	34

## OVERVIEW

# Linking Poverty Reduction and Environmental Management

---

*Addressing environmental issues that matter to the poor is critical to sustained poverty reduction and achieving the Millennium Development Goals ... But this requires a more 'pro-poor' and integrated approach – linking action at local, national and global levels.*

Prepared as a contribution to the 2002 World Summit on Sustainable Development (WSSD), *Linking Poverty Reduction and Environmental Management* focuses on ways to reduce poverty and sustain growth by improving environmental management, broadly defined. It seeks to draw out the links between poverty and the environment, and to demonstrate that sound and equitable management of the environment is integral to achieving the *Millennium Development Goals*, in particular eradicating extreme poverty and hunger, reducing child mortality, combating major diseases, and ensuring environmental sustainability.

Four priority areas for sustained policy and institutional change are highlighted:

- **Improving governance** to create a more enabling policy and institutional environment for addressing the poverty-environment concerns of the poor, with particular attention to the needs of women and children;
- **Enhancing the assets of the poor** to expand sustainable livelihood opportunities and to reduce their vulnerability to environmental hazards and natural resource-related conflict;
- **Improving the quality of growth** to promote sound environmental management and protect the environmental assets and livelihood opportunities of the poor;
- **Reforming international and industrialized country policies** to address the poverty and environment concerns of developing countries and the poor.

## Policy opportunities exist to reduce poverty and improve the environment

The environment matters greatly to people living in poverty. The poor often depend directly on a wide range of natural resources and ecological services for their livelihoods; they are often the most affected by unclean water, indoor air pollution and exposure to toxic chemicals; and they are particularly vulnerable to environmental hazards (such as floods, prolonged drought and attacks by crop pests) and environment-related conflict. Addressing these poverty-environment linkages must be at the core of national efforts to eradicate poverty.

Many opportunities exist to reduce poverty by improving the environment – but there are significant and often deeply entrenched policy and institutional barriers to their widespread adoption. The past decade of experience since the 1992 Earth Summit in Rio reveals some important lessons that help point the way forward. Three broad lessons are highlighted here:

- **First and foremost, poor people must be seen as part of the solution** – rather than part of the problem. Efforts to improve environmental management in ways that contribute to sustainable growth and poverty reduction must reflect the priorities of the poor. Supportive policies and institutions are needed, including access to information and decision-making, that expand the poor's opportunities to invest in

environmental improvements and enhance their livelihoods. At the same time, it is essential to address the activities of the non-poor since they are the source of most environmental damage.

- ***The environmental quality of growth matters to the poor.*** It cannot be assumed that environmental improvement can be deferred until growth has alleviated income poverty and rising incomes make more resources available for environmental protection. This ignores the importance of environmental goods and services to people's livelihoods and well-being, and how the diversity of these goods and services contribute to the poor's opportunities for moving out of poverty. Further, there are many examples of how bad environmental management is bad for growth, and of how the poor suffer most from environmental degradation. Ignoring the environmental soundness of growth – even if this leads to short-run economic gains – can undermine growth itself and its effectiveness in reducing poverty.
- ***Environmental management cannot be treated separately from other development concerns,*** but requires integration into poverty reduction and sustainable development efforts in order to achieve significant and lasting results. Improving environmental management in ways that benefit the poor requires policy and institutional changes that cut across sectors and lie mostly outside the control of environmental institutions – changes in governance, domestic economic and social policies, and in international policies.

## Improving governance

- **Integrate poverty-environment issues into national development frameworks** by addressing the environmental concerns of the poor in nationally-owned poverty reduction strategies and related macroeconomic and sectoral policy reforms, so that they can become national sustainable development strategies.
- **Strengthen decentralization for environmental management** by integrating poverty-environment issues into sub-national policy and planning processes and sectoral investment programs.
- **Empower civil society, in particular poor and marginalized groups,** to influence environmental management policy and planning processes at all levels by expanding public access to environmental information, decision-making and justice.
- **Address gender dimensions of poverty-environment issues** by ensuring that they are fully integrated into the formulation, implementation and monitoring of poverty reduction strategies and related policy reforms.
- **Strengthen anti-corruption efforts to protect the environment and the poor** by improving legislative and regulatory frameworks and oversight mechanisms; increasing the penalties for violators; and ensuring effective mechanisms for feedback from communities to enforcement agencies.
- **Reduce environment-related conflict** by improving conflict resolution mechanisms in the management of natural resources and biodiversity, and addressing the underlying political and economic issues that affect resource access and use, including the role of corruption.
- **Improve poverty-environment monitoring and assessment** by strengthening government and civil society capacity to monitor environmental change and how it affects the poor; integrating poverty-environment indicators into national poverty monitoring systems; and building capacity to apply monitoring and assessment results in poverty-environment policy formulation and implementation.

## Enhancing the assets of the poor

- **Strengthen resource rights of the poor** by reforming policies and formal and informal institutions that influence land and natural resource access, control and benefit-sharing, with particular attention to resource rights for women.
- **Enhance the poor's capacity to manage the environment** – including conservation and sustainable use of land, water and biological resources, and access to clean energy, water supply and sanitation services – by strengthening local management arrangements and capacity, and supporting women's key roles in managing natural resources.
- **Expand access to environmentally-sound and locally-appropriate technology** – such as crop production technologies that conserve soil and water and minimize the use of pesticides, or appropriate renewable energy and energy efficient technologies that also minimize air pollution – by improving protection of and access to indigenous knowledge and technologies; improving incentives for pro-poor technology development; and involving the poor in technology research, demonstration and dissemination.
- **Reduce the environmental vulnerability of the poor** by strengthening participatory disaster preparedness and risk reduction and mitigation capacity; supporting the formal and informal coping strategies of vulnerable groups; and expanding access to insurance and other risk management mechanisms.

## Improving the quality of growth

- **Integrate poverty-environment issues into economic policy reforms** by expanding the use of strategic environmental assessment and poverty social impact analysis approaches, and strengthening environmental management standards and monitoring capabilities.
- **Increase the use of environmental valuation** in adjusting national income accounts and determining appropriate price levels to better reflect the value of environmental goods and services and improve economic decision-making.
- **Encourage appropriate private sector involvement** by strengthening government and community capacities to partner with the private sector to expand environmental services for the poor; providing incentives for local enterprise development based on the sustainable use of biodiversity (such as community-based ecotourism or sustainable harvest of natural products); and putting in place appropriate regulations and voluntary codes to safeguard the interests of the poor and the environment.
- **Implement pro-poor environmental fiscal reform** through appropriate pricing of natural resources, particularly energy and water; expanding the use of fiscal incentives to promote environmentally-sound practices; improving the use of rent taxes to better capture and more effectively allocate natural resource revenues; and improving the use of pollution charges to better reflect environmental costs in market prices.

## Reforming international and industrialized country policies

- **Improve international and industrialized country trade policies** by addressing trade-environment-poverty links in the negotiation and implementation of multilateral trade agreements; reforming trade-distorting agricultural subsidies and trade barriers to give developing countries equitable access to international markets and to encourage environment-friendly products and trade practices; and



eliminating subsidies that lead to unsustainable exploitation – such as subsidies for large-scale commercial fishing fleets that encourage over-harvesting in developing country fisheries.

- **Make foreign direct investment more pro-poor and pro-environment** by encouraging compliance of multinational corporations with the revised OECD Code of Conduct for Multinational Enterprises; raising awareness among shareholders and investors of corporate social and environmental responsibility issues; and expanding UNEP's Global Reporting Initiative and other approaches to improving corporate social and environmental reporting.
- **Enhance the contribution of multilateral environmental agreements (MEAs) to poverty reduction** by strengthening developing country capacity to participate in the negotiation and implementation of MEAs (for example, to ensure that the Clean Development Mechanism promotes investments that benefit the poor and the environment); improving coordination among MEAs so that scarce developing country capacity is used most effectively; and increasing funding for the Global Environment Facility as a major source of funding for global public goods in the environment, such as a stable climate, maintenance of biodiversity, and protection of international waters and the ozone layer.
- **Encourage sustainable consumption and production** – industrialized country consumers and producers through their trade, investment, pollution emissions and other activities affect the environmental conditions of developing countries. Making rich country consumption and production more sustainable will require a complex mix of institutional changes – addressing market and government failures as well as broad public attitudes.
- **Enhance the effectiveness of development cooperation and debt relief** in addressing poverty-environment issues, particularly for the poorest countries where aid and debt relief continue to have a valuable role to play in helping governments to make many of the changes recommended above. This includes 'mainstreaming' environment in donor agency policies and operations through staff training, development and application of new skills, tools and approaches, and revisions to the way resources and budgets are allocated. Improved monitoring of progress against stated objectives and targets is needed in order to hold development agencies accountable and to ensure that a commitment by senior management to addressing poverty-environment issues is put into practice throughout the organization.

## Conclusion

This paper looks ahead with some degree of hope and optimism for the future – there are sometimes win-win opportunities, and there are rational ways of dealing with trade-offs. Environmental degradation is not inevitable, nor the unavoidable result of economic growth. On the contrary, sound and equitable environmental management is key to sustained poverty reduction and achievement of the Millennium Development Goals. There are significant policy opportunities to reduce poverty and improve the environment, but more integrated and pro-poor approaches are needed. The World Summit on Sustainable Development is an opportunity to focus on what is most important and to forge a coherent framework for action, with clear goals and achievable targets backed-up by adequate resources and effective and transparent monitoring mechanisms. There can be no more important goal than to reduce and ultimately eradicate poverty on our planet.

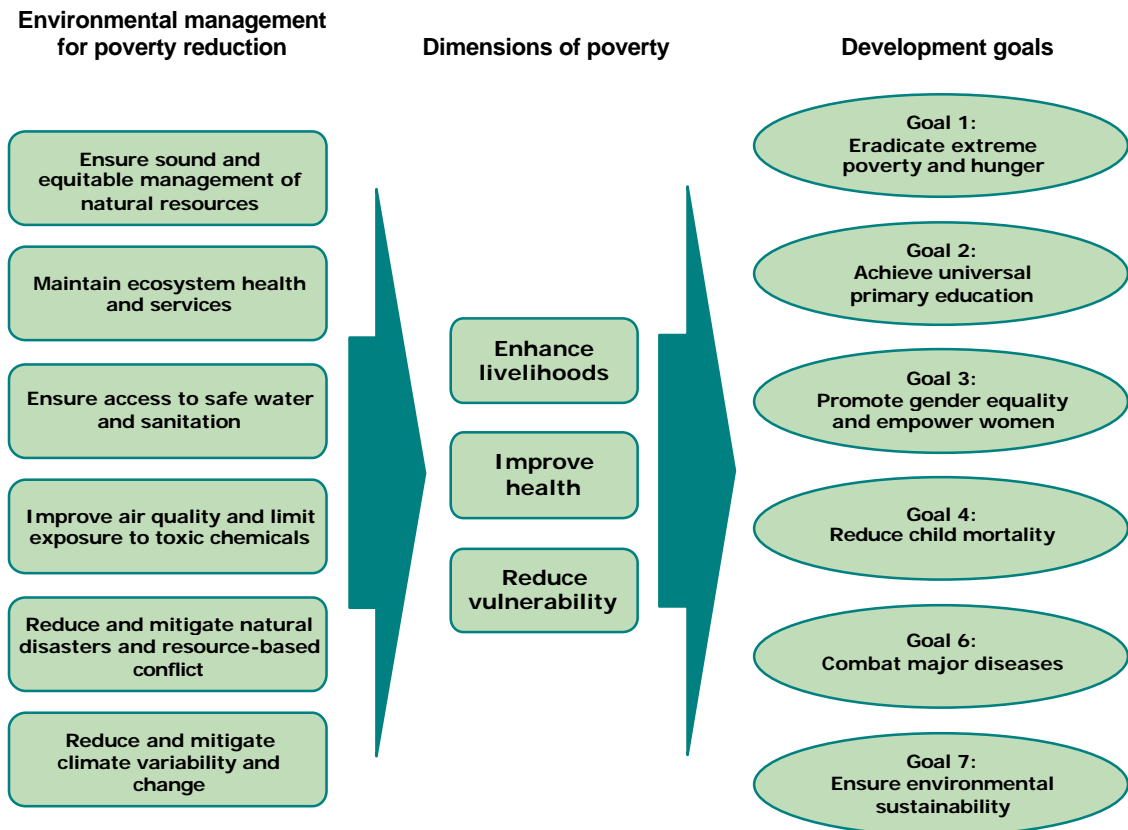
## PART 1

# Why the Environment Matters to People Living in Poverty

*“Water is life and because we have no water, life is miserable” (Kenya)*  
*“We think the earth is generous; but what is the incentive to produce more than the family needs if there are no access roads to get produce to a market?” (Guatemala)*  
*“In the monsoons there is no difference between the land in front of our house and the public drain. You can see for yourself” (India)*

In their own words, the environment matters greatly to people living in poverty.<sup>1</sup> Indeed, poor people’s perceptions of well-being are strongly related to the environment in terms of their livelihoods, health, vulnerability, and sense of empowerment and ability to control their lives. Figure 1 provides a simplified framework for understanding how environmental management relates to poverty reduction, and why these poverty-environment linkages must be at the core of action to achieve the Millennium Development Goals and related national poverty eradication and sustainable development objectives.

**FIGURE 1: ENVIRONMENT AND THE MILLENNIUM DEVELOPMENT GOALS**



*Part 1* of the paper focuses on the poverty-environment relationship by examining how the environment and environmental change in both rural and urban settings affect the poor in terms of three key dimensions of human poverty:

- **Livelihoods** – poor people tend to be most dependent upon the environment and the direct use of natural resources, and therefore are the most severely affected when the environment is degraded or their access to natural resources is limited or denied;
- **Health** – poor people suffer most when water, land and the air are polluted, and environmental risk factors are a major source of health problems in developing countries;
- **Vulnerability** – the poor are most often exposed to environmental hazards and environment-related conflict, and are least capable of coping when they occur.

We also are concerned with the relationship between *growth* and the environment and how it affects the poor and efforts to reduce poverty. The environmental soundness of growth is critical to the livelihood opportunities of the poor, and countries with similar levels of income and growth can have quite different levels of environmental performance.

While Figure 1 illustrates the main pathways between environmental conditions and dimensions of poverty, in reality these linkages are dynamic and often inter-connected:

- **Poverty** is now widely viewed as encompassing both income and non-income dimensions of deprivation – including lack of income and other material means; lack of access to basic social services such as education, health and safe water; lack of personal security; and lack of empowerment to participate in the political process and in decisions that influence one's life. The dynamics of poverty also are better understood, and extreme vulnerability to external shocks is now seen as one of its major features.
- **Environment** refers to the living and non-living components of the natural world that together support life on earth. The environment provides goods (natural resources) and services (ecosystem functions) utilized for food production, harvesting of wild products, energy and as raw material; a recipient and partial recycler of waste products from the economy; and an important source of recreation, beauty, spiritual values and other amenities.
- **Poverty-environment linkages** are dynamic and context-specific – reflecting both geographic location and economic, social and cultural characteristics of individuals, households and social groups. Different social groups can prioritize different environmental issues. In rural areas, poor people are particularly concerned with secure access to and the quality of natural resources – arable land and water, crop and livestock diversity, fish and bushmeat resources, forest products and biomass for fuel. For the urban poor, water, energy, sanitation and waste removal, drainage and secure tenure are key concerns. Poor women regard safe and physically close access to potable water, sanitation facilities and abundant energy supplies as crucial aspects of well-being, reflecting their primary role in managing the household (Brocklesby and Hinshelwood, 2001).

Thus, *environmental management* as used in this paper extends well beyond the activities of public environmental and natural resource management institutions. In relation to poverty, environmental management is concerned fundamentally with sustaining the long-term capacity of the environment to provide the goods and services upon which people and economies depend. This means improving environmental conditions and ensuring equitable access by the poor to environmental assets – in particular land and biological resources, and safe and affordable water supply and sanitation – in order to expand poor people's livelihood opportunities, protect their health and capacity to work, and reduce their vulnerability to environment-related risks.

This broader conception of environmental management in relation to poverty reduction points to the need for policy and institutional change across many sectors and involving many actors in the public, private and civil society arenas – within both developing and industrialized countries and at the international level. These

actions need to affect both political and economic processes – both of which have a major impact on how the environment is managed.

There have been some impressive gains since the 1972 United Nations Conference on the Human Environment – the first global conference devoted to environment and development issues. There has been a proliferation of environmental policies and institutions at national and sub-national levels, and environmental issues are firmly placed on the agendas of governments, civil society and the private sector. Major global environmental agreements have been forged and global environmental organizations established. Environmental sustainability has become a core concern of bilateral and multilateral development cooperation, and billions of dollars have been spent on environment-related programmes and projects.

Tangible progress also has been achieved ‘on the ground’, although the picture is usually mixed. For example, in the 1990s some 900 million people gained access to improved water sources. However, this was merely enough to keep pace with population growth, and about 1.2 billion people are still without access to improved water sources, with rural populations particularly under-served (Devarajan et al, 2002).

Despite these gains, pressure on the environment continues to mount worldwide, posing major challenges to the prospects for poverty reduction and human development in developing countries, in particular the least developed countries. The situation is summed-up succinctly in UNEP’s 2002 *Global Environment Outlook* report: “...The level of awareness and action has not been commensurate with the state of the global environment today; it continues to deteriorate” (UNEP, 2002). Box 1 summarizes key environmental challenges facing developing countries in relation to the Millennium Development Goals. These linkages are addressed in more detail in the following sections on livelihoods, health, vulnerability and growth.

<b>BOX 1: KEY LINKS BETWEEN THE ENVIRONMENT AND THE MILLENNIUM DEVELOPMENT GOALS</b>	
<b>Millennium Development Goal</b>	<b>Examples of links to the environment</b>
1. Eradicate extreme poverty and hunger	Livelihood strategies and food security of the poor often depend directly on healthy ecosystems and the diversity of goods and ecological services they provide.
2. Achieve universal primary education	Time spent collecting water and fuelwood by children, especially girls, can reduce time at school.
3. Promote gender equality and empower women	Poor women are especially exposed to indoor air pollution and the burden of collecting water and fuelwood, and have unequal access to land and other natural resources.
4. Reduce child mortality	Water-related diseases such as diarrhea and cholera kill an estimated 3 million people a year in developing countries, the majority of which are children under the age of five.
5. Improve maternal health	Indoor air pollution and carrying heavy loads of water and fuelwood adversely affects women’s health and can make women less fit for childbirth and at greater risk of complications.
6. Combat major diseases	Up to one-fifth of the total burden of disease in developing countries may be associated with environmental risk factors – and preventive environmental health measures are as important and at times more cost-effective than health treatment.
7. Ensure environmental sustainability	Current trends in environmental degradation must be reversed in order to sustain the health and productivity of the world’s ecosystems.

## 1.1 Livelihoods and the environment

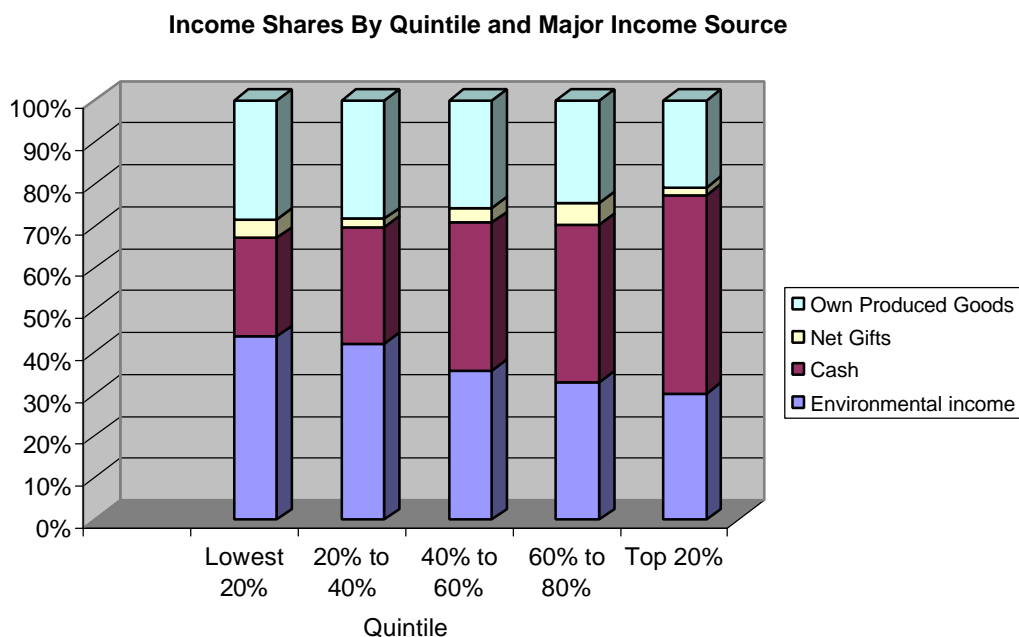
*“There is a strong correlation between sound natural resource management and poverty reduction.” (Cambodia Interim Poverty Reduction Strategy Paper, 2000)*

The poor, particularly those living in rural areas, often rely on a variety of natural resources and ecosystem services as a direct source of livelihood. Increasingly, the rural poor live in areas of high ecological vulnerability and relatively low levels of biological or resource productivity, such as subtropical drylands or steep mountain slopes. New estimates for the *World Development Report 2003* indicate that some 1.3 billion people live on marginal lands (World Bank, 2002d). Limited access to land and other natural resources is another key aspect of rural poverty – more than half of the rural poor have landholdings too small to provide an adequate income, and nearly a quarter are landless (UNCHS, 1996). Thus, both environmental conditions and access to a variety of natural resources are crucial to the ability of poor people to sustain their livelihoods.

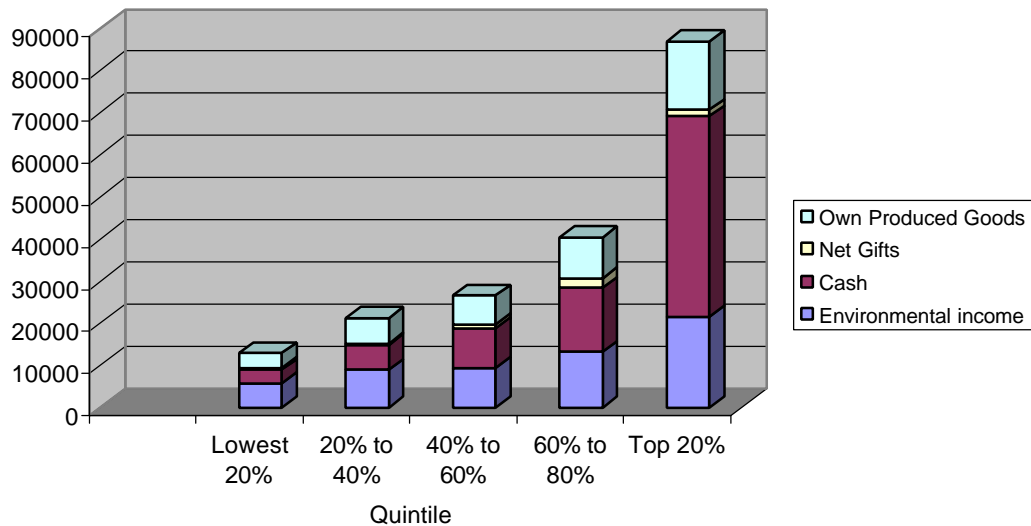
### Natural resources

Natural resources can be a primary source of livelihood or may supplement the household’s daily needs and income. A growing body of research shows that poor rural households often derive a significant share of their incomes from natural resources. An excellent study from Zimbabwe (Cavendish, 1999) illustrates the degree of natural resource dependence of poor people in rural areas.<sup>2</sup> Two facts stand out in the graphs below: (i) the poorest are most dependent on environmental income in **relative** terms, but (ii) the somewhat better off make more use of natural resources in **absolute** terms. Hence, degradation of natural resources would hurt the poorest the most. However, rising income would tend to increase the use of natural resources; growth will not automatically alleviate environmental pressure in this context.

**FIGURE 2. NATURAL RESOURCES AND HOUSEHOLD INCOME IN RURAL AREAS OF ZIMBABWE**



**Income in Z\$ by Quintile and Major Income Source**



Natural resource degradation is undermining the livelihoods and future livelihood opportunities of large numbers of the poor. This is most evident with respect to agricultural systems. Soil and water degradation is a major threat to improving agricultural productivity, which underpins the livelihoods of the vast majority of the rural poor and is a cornerstone of poverty reduction strategies in many countries. International trade can cushion local deficiencies in food production for the better off, but for the poorest this is not an option.

Current estimates are that up to one billion people are affected by soil erosion and land degradation due to deforestation, over-grazing and agriculture. Water scarcity is a major issue in more than 20 developing countries. If current trends in water use persist, two-thirds of the world's population could be living in countries experiencing moderate or severe water scarcity by 2025. Fisheries provide livelihoods for some of the poorest and most marginalized groups, and often are the main source of animal protein for the poor. Yet, many small-scale fisheries are over-harvested, often by commercial enterprises that do not benefit the poor (IFAD, 2001; WRI, 2000, UNEP, 2002).

Poor people are affected by natural resource degradation much more than the better off because of their limited assets and their greater dependence on common property resources for their livelihoods. For example, better-off farmers are able to compensate for falling natural fertility by using more fertilizer, but fertilizer use by poor people is very low. Under these circumstances, land degradation has been shown to have pernicious direct effects upon poverty. In a study in West Africa, children showing growth abnormalities associated with poor nutrition (stunting) were found most frequently in areas of high soil degradation (GRID/Arendal, 1997).

Over 2 billion people continue to rely on biomass fuels and traditional technologies for cooking and heating, and 1.5-2 billion people have no access to electricity (UNDP, UNDESA and World Energy Council, 2000). Shortage of wood fuel imposes time and financial costs on poor households, putting a particular burden on households that are short of labour and making it harder for children to attend school.

Poor rural women are disproportionately affected by degradation of natural resources. Participatory poverty assessments and other studies have shown the increased time, physical burden and personal risk that women face in having to travel greater distances in order to collect fuel, fodder and water due to growing resource scarcity or more restricted access to common property areas. This reduces the time spent on income-generating activities, crop production, and household and child-rearing responsibilities (Brocklesby and Hinshelwood, 2001; Dasgupta and Das, 1998).

## **Ecosystem services**

Ecosystems – such as forests, agroecosystems, grasslands, freshwater and coastal ecosystems (including coral reefs) – provide essential ‘services’ that contribute in numerous ways to productive activities. Some examples of ecosystem services that support livelihoods include: provision of natural habitat for wild pollinators that are essential to food crops, natural predators that control crop pests and soil organisms important to agricultural productivity; watershed protection and hydrological stability, including recharging of water tables and buffering of extreme hydrological conditions which might otherwise precipitate drought or flood conditions; maintenance of soil fertility through storage and cycling of essential nutrients; and breakdown of waste and pollutants.

These services are ‘public goods’, providing indirect values that are only partially traded in the market place, but which are vital to the livelihoods of the poor, especially in more marginal environments or where the poor have limited access to external technology and other inputs (Koziell and Saunders, 2001). By maintaining productivity and a healthy and stable environment, ecosystem services also contribute to maintaining livelihood options and the potential for livelihood diversification. When ecosystem functions are impaired, this inevitably leads to a narrowing of livelihood choices and an increase in the vulnerability of the poor.

While ecosystems can be highly resilient to human disturbances, certain ecosystem types are at particular risk of a sudden collapse. In particular, coral reefs, freshwater systems and nutrient-poor lands may go from a functioning to a non-functioning state in a very short time due to pollution, overuse or other perturbations that exceed a certain threshold. The consequence is that people who are dependant on these ecosystems may find themselves deprived of essential goods and services in a relatively short time span and unable to cope or adapt.

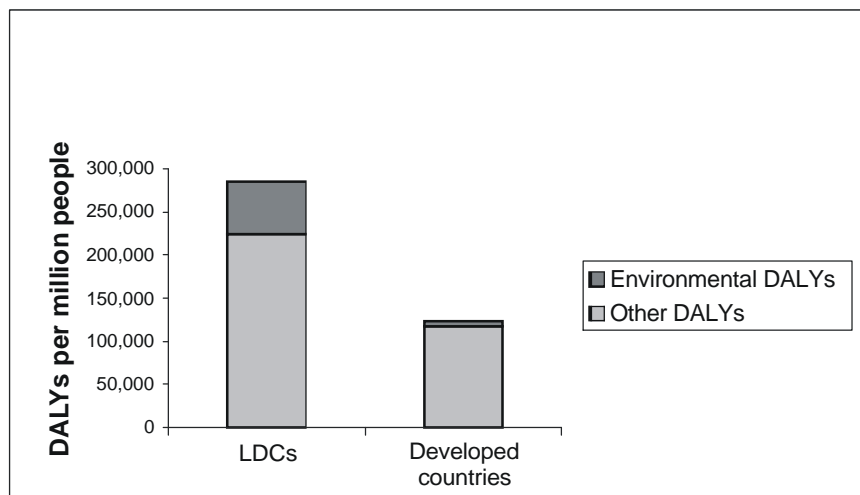
## 1.2 Health and the environment

*“...a study in Tegucigalpa showed...high lead intoxication in the children attending public schools. The study also notes that contaminants in soil and water are responsible for a high index of diarrhea diseases... Soil and water pollution is further compounded by solid waste dumping with low coverage of garbage collection services, poor waste management, and the lack of sanitary landfills. Respiratory diseases are also common, especially among children under five...partly caused by increasing number of cars and the presence of factories that are not subject to any kind of environmental regulations.” (Honduras Poverty Reduction Strategy, 2001)*

Up to one-fifth of the total burden of disease in the developing world – and up to 30% in sub-Saharan Africa – may be associated with environmental risk factors.<sup>3</sup> This is comparable to malnutrition and larger than any other preventable risk factors and groups of disease causes. While the total burden of disease in poor countries is about twice that of rich countries, the disease burden from environmental risks is 10 times larger in poor countries (see Figure 3). The poor, particularly women and children, are most affected by environmental health problems, and traditional environmental hazards – lack of safe water and sanitation, indoor air pollution and exposure to disease vectors – play by far the largest role (Lvovsky, 2001; WHO, 1997).<sup>4</sup> Indeed, poor people are acutely aware of how poor environmental health affects their ability to move out of poverty (Brocklesby and Hinshelwood, 2001; Narayan, 2000).

Analyzing the impact of policy changes and investments on the poor is important in bringing out the specifics in the relationship between income growth and environmental quality. Such analysis frequently shows that the poor stand to benefit from environmental interventions now rather than later. Many interventions are low-cost, yet can save people from disease that can seriously impair their earning capability and welfare.<sup>5</sup>

**FIGURE 3: BURDEN OF DISEASE AND ENVIRONMENTAL RISKS (1990)**



*Note:* Disability-Adjusted Life Years (DALYs) are a measure of the burden of disease. They reflect the total amount of healthy life lost to all causes, whether from premature mortality or from some degree of disability during a period of time.

*Source:* Lvovsky (2001).



## Water and sanitation

Inadequate access to safe drinking water and sanitation, combined with poor hygiene practices, are major causes of ill-health and life-threatening disease in developing countries. The rural poor rely on natural water sources such as streams for their washing and drinking water (see Box 2). Water-related diseases, such as diarrhea and cholera, kill an estimated 3 million people a year in developing countries, the majority of which are children under the age of five (Murray and Lopez, 1996).

Vector borne diseases such as malaria account for up to 2.5 million deaths a year, and are linked to a range of environmental conditions and factors related to water contamination and inadequate sanitation (WRI, 1998). These are likely to worsen as a result of climate change (IPCC, 2001).

### BOX 2: BURDEN OF WATER COLLECTION ON WOMEN AND CHILDREN

A recent water use study in Kenya, Uganda and Tanzania went back to the same 34 sites that were studied in 1972. Water is still primarily collected by women and children and carried on the head leading to headaches, general fatigue and pains in the chest, neck and waist. The distance walked to collect water was about 580 m in rural areas (although for some it can reach over 4 km) and 300 m in urban areas. This is a slight improvement since 1972 due to more standpipes, wells and private vendors, including in rural areas. However, due to population increase, time spent queuing has increased significantly, especially in urban areas. A return journey to collect water takes about 25 minutes (double the time since 1972), and 3.9 trips per day are made by each household. Thus, an average household spends 1 hour and 40 minutes collecting water each day. This reduces time for cooking and can reduce the amount of time children spend at school.

Source: IIED et al. (2002).

## Pollutants

Indoor air pollution caused by the burning of traditional biomass fuels (wood, dung, crop residues) for cooking and heating affects one billion people, resulting in premature death for an estimated 2 million women and children each year (Smith, 1999). In India, recent studies suggest that 130,000–150,000 women may die prematurely as a result of indoor air pollution (Smith, 2000). A recent study of rural households in central Kenya found that “exposure to high emissions from cooking and other domestic activities for adults result in women being twice as likely as men to be diagnosed with acute respiratory infection or acute lower respiratory infections” (Ezzati and Kammen, 2001). This has been confirmed by similar studies in Gambia (Campbell, 1997) and Guatemala (Bruce et al., 1998). In addition, the increased time and energy involved in the collection of biomass fuels contributes to the physical burden and ill-health of women and children.

Outdoor air pollution is becoming a more significant health issue in urban areas of a number of developing countries, especially in large industrializing developing countries such as China and India, and is projected to become as important a health risk as indoor air pollution over the next two decades.

Pesticide poisoning is a significant health problem among poor farmers in developing countries, although the exact extent is not well documented. One estimate by WHO in 1990 indicated a level of some 3 million cases of acute, severe poisoning per year worldwide. Widening the scope to cases of pesticide “exposure” that can either result in acute illness or chronic health impacts, estimates for Africa alone point to some 11 million cases per year (Goldman and Tran, 2002). The poor also suffer more indirect effects from excessive use of pesticides, such as depletion of fish stocks due to pesticide loads in agricultural runoff. Contamination of food crops with pesticide residues is a growing income problem for farmers producing for export markets, as several important markets are tightening their regulations regarding pesticide residue levels.

## 1.3 Vulnerability and the environment

*“Natural disasters are a risk factor, which affect the pace of economic growth and destroy the assets of the poorest segments of the population in affected areas, reducing them to a state of dependency, at least temporarily, on donations ... natural disasters seriously affect the living conditions of affected populations, and constitute an obstacle to a definite break with certain degrees and patterns of poverty. Therefore, measures aimed at managing this risk are of the utmost importance.”*  
(Mozambique Action Plan for the Reduction of Absolute Poverty, 2001-2005)

Insecurity is one of the key concerns of poor people, including their vulnerability to unpredictable events. Insecurity relates to people's risk of exposure, susceptibility to loss, and capacity to recover. Both the rural and urban poor are most often exposed to environmental hazards and environment-related conflict, they suffer the greatest losses (at least in relative terms) and they are in the weakest position to cope and adapt.

### Environmental stresses and shocks

Resource mismanagement and environmental degradation can exacerbate the frequency and impact of droughts, floods, forest fires and other natural hazards. The poor are the most vulnerable to environmental disasters ('shocks') as well as more gradual processes of environmental degradation ('stresses') – as the majority of the rural poor live in ecologically-fragile areas, while the urban poor often live and work in environments with a high exposure to environmental hazards. By exacerbating economic deprivation in the short term, environmental disasters can compromise long-term welfare by forcing affected households to sell-off assets that would otherwise be used to meet future needs and contingencies. The effects of droughts and long-term land degradation are more gradually felt. They may build up over several years, during which a household's accumulated reserves are run down as a result of recurrent years of poor production. This will result in a slow but inexorable inability to invest in production and often leads to impoverishment and the abandonment of land.

Natural hazards claim an estimated 100,000 lives each year, and inflict billions of dollars in damage. While natural hazards can strike everywhere, about 97 percent of the natural-disaster related deaths occur in developing countries. The relative economic losses are also highest in poor countries. (ISDR, 2002). Natural disasters affected an estimated 256 million people in developing countries in 2000 (ICRC, 2001).

When asked, the poor talk of living in increasingly fragile environments and experiencing natural hazards, changing climatic conditions and unpredictable seasons. These environmental stresses were making livelihood tasks more time-consuming, more dangerous, more costly and often requiring more inputs. Poor people highlight their dependence on the diversity of common property or open access resources – grazing lands, water bodies and forests – as a safety net during hard times. A decline in the diversity of these resources increases their vulnerability (Brocklesby and Hinshelwood, 2001).

Increasingly, environmental degradation and disasters cause their victims to migrate in search of better conditions. People may be able to recover, with help, from sudden disasters, and people often return and rebuild after floods and storms. However, long-term attrition caused by drought or land degradation has led to permanent migration from susceptible areas such as the Sahel. The Red Cross estimates that 1998 was the first year in which the number of refugees from environmental disasters exceeded those displaced as a result of war (ICRC, 1999). However, much of the information on environmental degradation and disasters as a source of migration is anecdotal, and it is difficult to analyze the complex system of inter-connected social, demographic and environmental phenomena that together form the basis for cross-border migration (Leighton, 1999).

The frequency, intensity and duration of extreme weather events is likely to increase as a result of climate change. The latest report on the impacts of climate change suggest that many developing countries in Africa,

Asia and Latin America will suffer potentially significant negative impacts from increased food insecurity, greater spread of vector borne disease, more flooding and exacerbation of land degradation (see Box 3).

Poor people employ a range of coping mechanisms and survival strategies in the face of environmental degradation and disasters. But their capacity to mitigate and recover from disaster is often constrained by the wider policy and institutional context, in addition to factors related to their social and economic status. For example, in many developing countries, there is a lack of social safety nets and other protections that can help to mitigate the impacts of environmental disasters on the poor. Informal institutions such as local social networks also are important, and their density and capacity can underpin the ability of the poor to cope.<sup>6</sup>

### **BOX 3: IMPACTS OF GLOBAL CLIMATE CHANGE ON THE POOR**

Climate change impacts will particularly affect poor countries who will find adaptation measures more costly, and affect poor people who have more limited coping mechanisms. Major impacts include declining water availability, reduced agricultural productivity, spread of vector borne diseases to new areas, increased flooding from sea level rise and heavier rainfall.

In Bangladesh, the risk of flooding is predicted to rise by 20 percent in the next 20-50 years. Predicted yield changes for wheat, maize and rice by the year 2020 suggest that yields in Nigeria and Brazil will fall by 2.5-5 percent, and in India by 5-10 percent (although there are countries where yields may rise). Relatively small increases in temperature may spread malaria into large urban areas such as Nairobi and Harare that currently lie just outside the malaria range.

*Source:* IPCC (2001); IIASA (2001); CGIAR (2000).

## **Crisis and conflict**

Tensions between diverse interest groups over natural resources can contribute to conflict. These tensions may be played out at a regional level, as can be seen in the water conflicts in the Middle East; at national level, for example the competition for control of diamonds in Sierra Leone; and at the local level over access to natural resources on which the poor directly depend for their livelihoods (DFID, 2000a). In such circumstances, the poor will be the most negatively affected because they have the least resources to cope with physical loss, and are the most vulnerable to violence and lack appropriate means for legal redress.

New research suggests that civil wars more often are fueled by rebel groups competing with national governments for control of diamonds, coffee, and other valuable primary commodities, than by political, ethnic or religious differences. Analysis of 47 civil wars from 1960-1999 shows that countries which earn around a quarter of their yearly GDP from the export of unprocessed commodities face a far higher likelihood of civil war than countries with more diversified economies. Since conflict prevention efforts have paid relatively little attention to these issues, there would seem to be considerable scope for both domestic and international policy to prevent civil conflict more effectively (World Bank, 2001a).

In some cases, natural resource conflicts can be so severe that they contribute to wider unrest and can affect the political stability of a country. In Burundi and Rwanda, there is some evidence that intense population pressure combined with limited land resources were contributing factors to the ethnic tension that led to full-scale civil war (ACTS, 2000). And there is evidence that some of the enduring conflicts in other African countries – for example in Angola, Democratic Republic of the Congo, Liberia and Sudan – have either arisen from competing desires to control rich natural resources, including conflict among elites over control of profits from natural resource exploitation, or have provided funds for the conflict to continue (ACTS, 2000; Global Witness, 2000 and 2001; Oxfam, 2002; Göteborg University, 2002).

## 1.4 Economic growth and the environment

The links between growth, economic policies and the environment are important for poverty reduction in two inter-related ways:

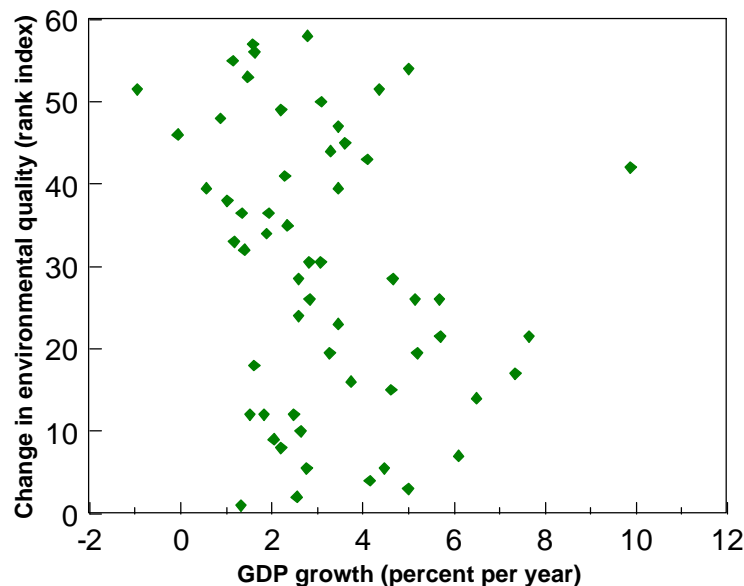
- Countries can have high levels of growth and improved environmental performance. As shown in Figure 4, there is no simple trade-off between growth and the environment – countries with similar levels of income and growth can have quite different levels of environmental performance.
- Ignoring the environmental soundness of growth – even if this leads to short-run economic gains – can hurt the poor in the short-term and undermine long-run growth and its effectiveness in reducing poverty.

### The quality of growth matters

Current strategies for poverty alleviation are fundamentally built upon premises of economic growth. A wealth of empirical evidence reveals that economic growth, as commonly measured in increases of real Gross Domestic Product (GDP), is necessary but not sufficient to reduce the number of people living in poverty (World Bank, 2001). Economic growth is essential for poverty reduction, and so is its distribution.

Critical to discussing economic growth as it relates to environmental impact and poverty is the consideration of the *quality* of growth. The same rate of growth in the economy can be associated with widely different environmental impacts, as seen in Figure 4. Depicted on the y-axis are changes in environmental quality based upon an environmental quality index measuring changes in water pollution and air pollution during the 1980s and deforestation over the 1980s and 1990s.<sup>7</sup> The higher the position on the y-axis, the more a country's environmental quality ranking has improved. While this type of un-weighted, simple index only partially covers the concept of environmental *quality*, it serves to illustrate a fundamental point. We are not dealing with a simple trade-off between growth and environment since there is a wide range of environmental performance scores for a given level of GDP growth.

FIGURE 4: ECONOMIC GROWTH AND ENVIRONMENTAL QUALITY (1981-1998)



Source: World Bank (2000c)

As economies grow, their environmental performance tends to deteriorate or improve depending on what variable one considers. Comparing across countries at different income levels:

- Water quality tends to improve with rising income;
- Air pollution from sulfur dioxide tends to first get worse with rising income, but then decline;
- Finally, the emission of carbon dioxide tends to continue to grow with income, although not uniformly so (World Bank, 1992).

These are comparisons across country income groups, but countries at similar income and growth levels show large differences. The bottom line is simple; policy matters.

### **Ignoring the environment can undermine long-term growth**

While there is no simple relationship between growth and environment, there are many examples of how bad environmental management is bad for growth. These short-run growth paths are bad for long-run growth, but also have high social and environmental costs. Some examples include:<sup>8</sup>

- Collapse or near collapse of fisheries in many countries both in the developed and developing world – for example, the cod fishery in the North Atlantic and the Argentina hake fishery. The latter was over-fished by about double the maximum sustainable yield in the late 1990s (UNEP, 2002a).
- Decline of agriculture due to salinization from irrigation in several countries – for example in Pakistan, where it has been estimated that about 16% of the country is subject to salinization from low quality groundwater provided by tube wells and excessive water application. The damage from salinization costs the country over US\$200 million per year in reduced yields (World Bank, 1996). Another example of unsustainable irrigation was the draining of the Aral Sea to grow cotton, which has cost the region millions of dollars.
- Downstream impacts due to upstream land use change. Understanding the linkages between land use and downstream siltation and flooding are complex – but there is some evidence of the links. For example, the Chinese government has concluded that the severe flooding of 1998 was caused in large measure by deforestation in the Yangtze River's watershed (World Bank, 2002d).
- Decline in exports of intensively-farmed commercial aquaculture operations, in particular shrimp farming due primarily to disease from pollution and poor environmental controls. The Taiwanese shrimp industry collapsed after the introduction of diseased animals. Disease caused financial losses of over a billion dollars in Asia in the 1990s. In addition, there were costs of land degradation, human health impacts and mangrove destruction – estimated to be over 20% of revenues in Bangladesh (UNEP, 1999). Now the shrimp industry in Latin America is threatened by these same pathogens (Bartley, 1999).

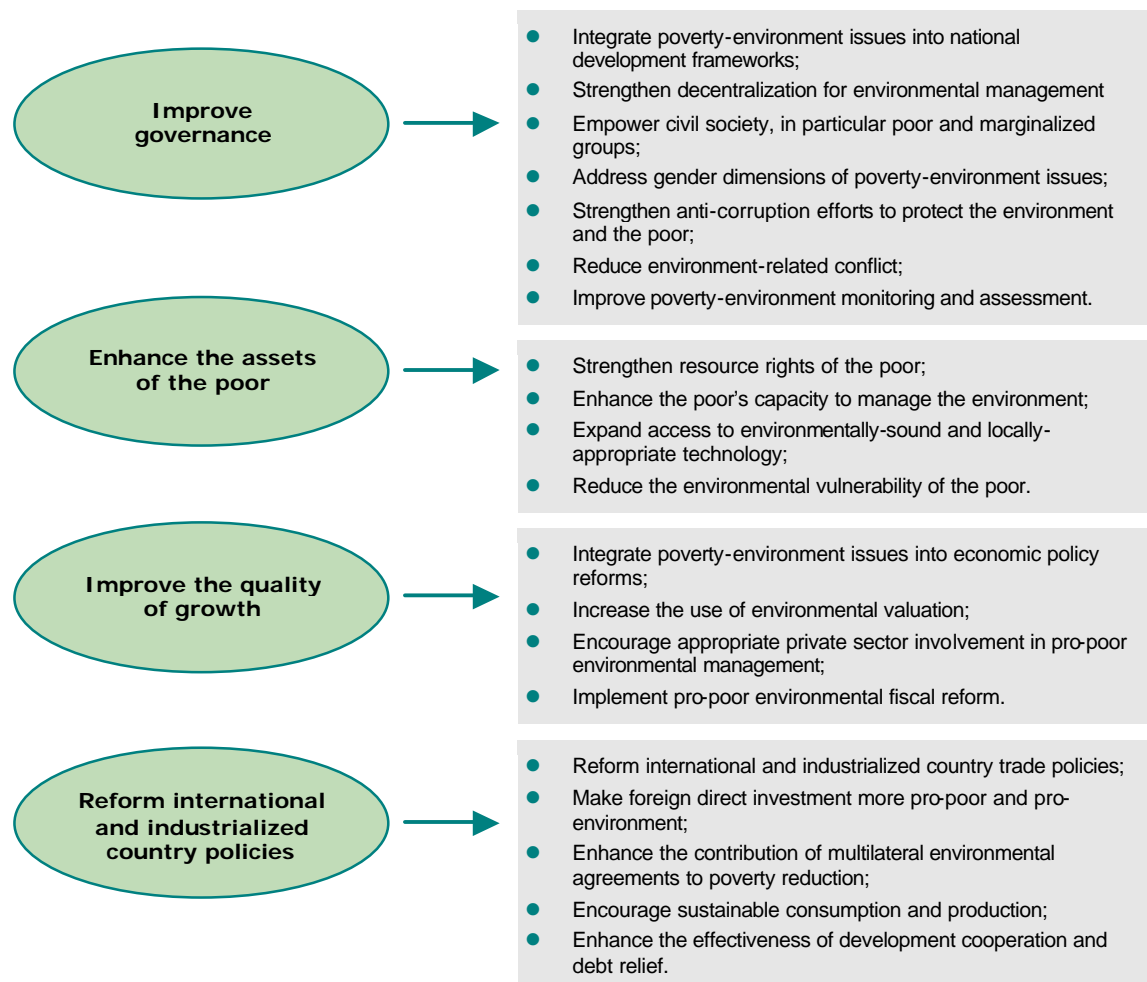
## PART 2

# Policy Opportunities to Reduce Poverty and Improve the Environment

---

*Part 2* looks at policy opportunities to reduce poverty by improving the environment. Given the complex and multidimensional nature of poverty-environment linkages, it is inevitable that this encompasses a broad agenda for policy and institutional change across many sectors. We have grouped these issues into four main areas of policy action:

**FIGURE 5: KEY AREAS FOR POLICY ACTION TO IMPROVE POVERTY-ENVIRONMENT OUTCOMES**



## The need for policy and institutional change

Experience demonstrates that, with judicious policy-making, significant ‘win-win’ opportunities exist to reduce poverty by improving the environment.<sup>9</sup> If better environmental management can contribute to poverty reduction, how can these opportunities be taken and what is preventing their wider adoption?

Many of the underlying causes of poverty and environmental degradation are related to issues of governance and politics. There are significant and often deeply entrenched policy and institutional barriers – at local, national and global levels – that work against the interests of poor and marginalized groups, and often create incentives to cause or overlook damage to the environment.

The past decade of experience since the 1992 Earth Summit in Rio reveals some important lessons that help point the way forward. Four broad lessons are highlighted here:

- ***First and foremost, poor people must be seen as part of the solution – rather than part of the problem.*** Efforts to improve environmental management in ways that contribute to sustainable growth and poverty reduction must begin with the priorities of the poor. In many cases, policies continue to be based on uncertain assumptions and over-simplifications concerning the poor and their relationship to the environment. A considerable body of evidence now exists that supports an improved understanding of poverty-environment interactions, in particular how environmental conditions affect the poor and their access to environmental assets (see Box 4).<sup>10</sup> Supportive policies and institutions are needed, including access to information and decision-making, to expand the poor’s opportunities to invest in environmental improvements and enhance their livelihoods. At the same time, however, it is essential to address the activities of the non-poor since they are the source of most environmental damage.
- ***The spatial and temporal trade-offs and competing economic and political interests that often underlie environmental management decisions and practices need to be addressed in ways that involve and benefit the poor.*** Developing countries can face difficult choices in allocating scarce resources among pressing development needs, and the environment is often viewed as a longer-term concern that must be traded-off to address short-term needs (as has often been the case in the industrialized countries). At the same time, many examples are known where efforts to protect the environment have not taken into account the interests of poor and marginalized groups and have left them worse off. There are rational ways of dealing with conflicting interests and trade-offs, but they require more participatory, transparent and accountable policy and decision-making processes to ensure their credibility and longer-term effectiveness.
- ***Ignoring the environmental soundness of growth – even if this leads to short-run economic gains – can undermine longer-run growth and its effectiveness in reducing poverty.*** The environmental quality of growth matters to the poor. Environmental improvement is not a luxury preoccupation that can wait until growth has alleviated income poverty, nor can it be assumed that growth itself will take care of environmental problems over the longer-term as incomes rise and more resources are available for environmental protection. First, this ignores the fundamental importance of environmental goods and services to the livelihoods and well-being of the rural and urban poor. Second, there are many examples of how bad environmental management is bad for growth, and of how the poor bear a disproportionate share of the costs of environmental degradation. To improve the environmental soundness of growth, economic policies and decision-making must better reflect the ‘public goods’ nature of many environmental goods and services by addressing the persistent policy and market failures that lead to their under-valuation and misuse.
- ***Environmental management cannot be treated separately from other development concerns, but requires integration into poverty reduction and sustainable development efforts.*** Improving environmental management in ways that benefit the poor requires policy and institutional changes that cut across sectors and lie mostly outside the control of environmental institutions – changes in governance, domestic economic policy, and in international policies.

#### **BOX 4: AN IMPROVED UNDERSTANDING OF POVERTY-ENVIRONMENT RELATIONSHIPS**

■ ***Most environmental degradation is caused by the non-poor:***

Most environmental degradation is caused by the non-poor as a result of their production and consumption levels, which are much higher than those of the poor, particularly in the highly-industrialized countries. Even where poor people degrade the environment, this is often due to the poor being denied their rights to natural resources by wealthier elites and, in many cases, being pushed onto marginal lands more prone to degradation.

■ ***Population growth does not necessarily lead to increased degradation:***

While increasing population undoubtedly places greater pressure on productive land and resources, it is not necessarily population per se that causes the damage. The complex of locally-specific social, economic, environmental and governance circumstances in which increasing population takes place – which in turn can be strongly influenced either positively or negatively by external economic and political forces – are the primary driving forces behind poverty-environment interactions. Indeed, conventional economic theory would suggest that as population increases and land becomes scarcer, the land should increase in value and merit greater care and investment. Research in Kenya has documented cases where, even in the face of increasing population pressures, farmers have managed semi-arid, degraded, unproductive lands in a manner that has rehabilitated them and made them profitable (Tiffen et al., 1994). A wider review shows that for population growth to lead to improved soil and water investments, market access and attractive producer prices are essential, as well as social and economic support to prevent the collapse of social structures (Boyd and Slaymaker, 2000). In many areas, these conditions will not be present, and population growth will increase pressure on the environment.

■ ***The poor are capable of investing in environmental improvement:***

The conventional wisdom has been that poor people are too impoverished to mobilize resources for enhancing the environment. In some cases this is true. But numerous experiences demonstrate that when incentives are favorable, low-income households and social groups can mobilize enormous resources, particularly labor. Many urban environmental problems can most effectively be solved when poor communities mobilize themselves or form coalitions with less poor groups to improve service provision, often with some contribution in cash or kind (Satterthwaite, 2001).

■ ***Poor people often have the technical knowledge for resource management:***

It is often assumed that a lack of technical knowledge is a key constraint to poor people's management of natural resources. Indeed, when poor people move to areas with new ecological conditions, or when something happens to change the balance under which their resource management practices developed, a period of adjustment is required. Evidence is increasingly showing that poor people have an enormous store of indigenous technical knowledge – for example, environmentally-sound cultivation practices, efficient water harvesting techniques and myriad uses of medicinal plants. This knowledge is often undervalued or completely ignored. There are many well-documented cases of poor people investing their own time and resources in environmental management, and succeeding in maintaining production and profitability, while keeping their families and communities from the worst effects of poverty.<sup>11</sup>



## 2.1 Improving governance

### Key areas for policy action:

- **Integrate poverty-environment issues into national development frameworks**
- **Strengthen decentralization for environmental management**
- **Empower civil society, in particular poor and marginalized groups**
- **Address gender dimensions of poverty-environment issues**
- **Strengthen anti-corruption efforts to protect the environment and the poor**
- **Reduce environment-related conflict**
- **Improve poverty-environment monitoring and assessment**

Poor people are very capable of sustaining and improving their own livelihoods as long as they have adequate opportunities to make a living, a voice in decisions that affect them, and recourse to justice to defend their rights. Improved governance – including an active civil society and open, transparent and accountable policy and decision-making processes – is often the missing link in creating a more enabling policy and institutional environment to address poverty-environment issues that matter to the poor. Addressing governance issues at both national and sub-national levels is vital. Politicians, the judiciary, the civil service and the private sector all have a role to play as the state directly controls access to many natural resources, or determines the rules for resource use, controls investments for environmental infrastructure and creates the framework for public policy debate about poverty-environment issues.

### **Integrate poverty-environment issues into national development frameworks**

Poverty-environment issues need to be integrated into mainstream development planning and resource allocation processes – including national development plans and budgets, poverty reduction strategies, and sector plans and budgets. This is necessary in order to forge a broad-based and more coordinated response to poverty-environment challenges, to achieve synergy between diverse interventions across many sectors, and to ensure that adequate domestic and external resources are being allocated and effectively targeted.

All countries have some form of national strategic planning process. At the 1995 World Summit for Social Development, governments committed themselves to developing more explicitly pro-poor policy frameworks through the preparation or strengthening of national strategies to reduce poverty. In 1999, the World Bank and the International Monetary Fund (IMF) made Poverty Reduction Strategy Papers (PRSPs) the basis for debt forgiveness and new concessional lending.<sup>12</sup> Nationally-owned poverty reduction strategies, including the PRSP process, provide a critical entry point for incorporating relevant poverty-environment issues and ways to tackle them into a country's mainstream development policy framework.

Although poverty reduction strategies are intended to reflect the poor's priorities, issues that matter most to the poor, including poverty-environment links, often have been overlooked or received inadequate attention. Recent environmental reviews of PRSPs prepared in 40 countries found a mixed picture (DFID, 2002b; Bojö and Reddy, 2002). Some countries, such as Bolivia, Honduras, Mozambique, Nicaragua and Uganda (see Box 5) have made a significant effort to address the issues of improved natural resource management, better environmental health and disaster preparedness. However, in most other countries, these issues have not been adequately addressed in the context of poverty reduction planning. Even where environmental matters are adequately addressed in PRSPs, considerable work still needs to be done to ensure that Medium-Term Expenditure Plans and sectoral budgets contain adequate and properly directed resources for investment in the environmental management concerns of the poor.<sup>13</sup>

At the 1992 UN Conference on Environment and Development (UNCED), governments made a commitment to adopting national strategies for sustainable development, and this commitment is reflected in the Millennium Development Goals (e.g., Goal 7 on “ensuring environmental sustainability”). The UN has prepared guidance to assist countries in preparing a sustainable development strategy (UNDESA, 2002), and the OECD Development Assistance Committee has prepared similar guidelines for development agency support to such processes (OECD, 2001).<sup>14</sup> Each country needs to determine its own strategy process. The challenge is to seek convergence between poverty and sustainable development strategies, and avoid the continuing tendency of donors to promote multiple and competing strategy frameworks. Where Poverty Reduction Strategies adhere to their stated principles including the integration of relevant environmental issues, then this can be considered a national strategy for sustainable development (OECD, 2001; DFID, 2000c).<sup>15</sup>

#### **BOX 5: INTEGRATING ENVIRONMENT IN UGANDA’S POVERTY ERADICATION ACTION PLAN**

In early 2000, Uganda’s Poverty Eradication Action Plan (PEAP) was updated. Early drafts of the revision contained little recognition of environmental issues and long-term sustainability. For example, the focus in energy policy was on electrification, although fuelwood accounts for 96 percent of domestic energy supply. The National Environmental Management Authority (NEMA) engaged in the process by producing a series of amendments and additions that were incorporated into the strategy. Other parts of the Ministry of Water, Lands and Environment submitted their own PEAP amendments once the influence of the NEMA initiative became known. Since the PEAP was adopted, NEMA has been engaged in following-up on sectoral plans such as the Plan for the Modernization of Agriculture, and in identifying poverty-environment indicators to monitor implementation.

*Source:* DFID (2000b).

Environmental issues that matter to the poor need to be fully integrated into relevant sectoral plans, policies and budget frameworks. Promoting commercial farming that drains wetlands without thinking of the impact this will have on existing users of the wetland is short-sighted and may negatively impact the poor. Promoting an energy policy that focuses only on electrification, which the poor cannot afford and so will remain dependent on fuelwood, is counter-productive. Funding more rural health clinics, without investments to reduce environmental health hazards, is also not cost-effective. All policies need to be assessed to ensure that environmental opportunities to help the poor have not been overlooked (Yaron and White, 2002).

A greater emphasis on cross-sectoral approaches does not imply a less significant role for Environment Ministries and natural resource-related agencies, nor does it reduce the need for adequate funding, staffing and training to carry out their policy and regulatory mandates. However, it does mean that environmental organizations – including in civil society – need to better understand how environmental conditions impact the poor and the ways in which environmental management can contribute to poverty reduction. It also means that environmental organizations must engage more effectively with Ministries of Planning and Finance, or other agencies driving the national planning process, to ensure that poverty-environment issues are addressed. In most cases, this shift in orientation will require a reassessment of environmental management mandates and capacity development needs.

#### **Strengthen decentralization for environmental management**

With the trend toward greater decentralization and devolution in many countries, planning is increasingly being undertaken at Provincial, district and local levels. For example, many countries such as Malawi, Tanzania, Egypt and Sri Lanka have introduced district-level environmental planning. While this is an important development, it is vital that these environmental plans are integrated into the mainstream local planning process. It is also important that these plans focus on issues which are relevant to poor people – approaching the issues from their perspective, and not only from an environmental perspective.

Decentralization in rural areas has given local governments control over many key natural resources – such as state land – and responsibility for infrastructure such as water supply, sanitation and irrigation. Rules on resource access – such as permits for mining, timber harvesting, grazing and industrial emissions – are generally issued by local government. In cities, up to half of urban land is commonly in the public domain as public buildings, public infrastructure and land (e.g., roads, railways, canals). The way local government chooses to use this land affects where industry locates, how congested a city is, where people live and how the city will develop (DFID, 2001b). Further, urban environmental problems can most effectively be solved when poor communities are able to mobilize themselves or form coalitions with less poor groups to improve service provision, often with some contribution in cash or kind (Satterthwaite, 2001).

Decentralization and local empowerment is not a *guarantee* for environmental stewardship. While greater local government control has in some cases made decision-making more responsive and accountable, this is by no means guaranteed. Local governments can be subject to the same “capture” by wealthy elites as central government, they can also manage local resources unsustainably to raise revenue and may have weaker environmental management capacity than central governments. In addition, decentralization has often been undermined when central governments have not provided sufficient resource transfers or revenue-raising powers for local government to implement their responsibilities.

Further, not all stakeholders have compatible objectives and degrees of power and influence can differ, often significantly. This can lead to conflicts when poorer and more marginalized groups are left out of the process or when success encourages others to enter. Hence, efforts to empower communities to locally manage natural resources must safeguard against elite capture, and build local capacity for participatory management. Also, devolution of power to the local level can increase pressure on natural resources in view of the income, employment, and revenue needs of local government and their constituents. Hence, when tradeoffs between environmental conservation and poverty reduction are resolved locally, they may result in short-term exploitation. However, this can be mitigated by two factors. The first is that local resource control also means that the benefits of sustainable management will accrue locally. The second mitigating factor is that financial transfers from the outside, for example through nationally-directed subsidies or international funding sources such as the Global Environment Facility, can make a big difference as to how these tradeoffs are resolved.<sup>16</sup>

### **Empower civil society, in particular poor and marginalized groups**

Civil society organizations, including organizations of the poor, have a key role in promoting improved environmental management. Religious organizations, trade unions, professional associations, farmers groups, community groups and public interest groups can be instrumental in holding government and the private sector accountable for improving environmental management, in raising awareness of environmental issues, and in helping poor people to secure their access to natural resources and environmental infrastructure. Where government is responsive, it can have a major impact. In India, reformist governments in the states of West Bengal and Andhra Pradesh were instrumental in promoting greater joint management by the poor of forestry resources (Lele, 2000). In several Latin American cities, progressive mayors and city councils have made a major impact in improving the access of the poor to environmental infrastructure (Hardoy et al, 2001).

Empowering civil society, in particular poor and marginalized groups, to participate in and to influence environmental management requires access to environmental information, to decision-making processes and to means of redress through the justice system and other means.

Public access to information is vital for effective environmental management. A free media has been instrumental in highlighting environmental problems in both the public and private sectors. In some countries, the state has effectively used public pressure by making information publicly available in order to encourage greater pollution compliance (see Box 6). This also applies to rural areas. In the Philippines, for example, access to information has contributed to community monitoring of forestry offences and the enforcement of forest regulations (Brunner et al., 2000).

**BOX 6: INDONESIA'S PROGRAM FOR POLLUTION CONTROL, EVALUATION AND RATING (PROPER)**

The Indonesian environment agency, BAPEDAL introduced PROPER in early 1995 focusing on 187 of the worst water polluters. The Vice President presided over a high profile ceremony to congratulate the one third of companies that met the regulations, while BAPEDAL privately notified the remaining two thirds that they were non-compliant and had six months to go before public disclosure. Following full disclosure, the program had by mid-1997 reduced pollution by 40%. Indonesia is now expanding the program to 2000 plants. Other countries have learnt from this approach and similar schemes are now underway in the Philippines, Mexico, and Colombia, and are planned in China and Venezuela.

*Source:* World Bank (2000b).

The participation of poor and marginalized groups in policy and planning processes is essential to ensuring that the key environmental issues that affect them are adequately addressed. It also fosters commitment to the environmental policies and interventions to be implemented. The *effective* participation of these groups depends on a number of factors. The participatory mechanisms put in place should be sensitive to the resource constraints of poor people, increase their access to environmental information, and must enhance transparency and accountability in order to convince poor people that their views will be considered and given due weight in decision-making.

Poor and marginalized groups often lack access to environmental justice in order to address environmental abuses and to protect their rights. At the same time, governments often do not have the resources to monitor in a timely and effective manner the resources and services that the poor depend upon, particularly in more remote rural areas. Governments need to support representation by institutions that are accountable to the poor, so that monitoring of action and enforcement of rights can take place at all levels. Citizen oversight boards, community-level review processes for government development plans and projects, and ombudsman systems for dispute resolution are examples of such mechanisms. It is also important to strengthen the judicial system as an impartial and independent institution, and to foster the emergence of institutions of civil society that can mediate between different actors (UNDP, 1999b).

**Address gender dimensions of poverty-environment issues**

Gender-related issues are a key dimension of the poverty-environment nexus (OECD, 2001a), and rigid gender roles contribute to inefficiencies in natural resource management (World Bank, 2001b). As described in Part 1, women are at higher risk and more vulnerable than men to many environmental hazards because of their particular social and economic roles.

To date, poverty-environment links that matter to poor women – such as lack of land and resource rights, the additional disease burden from indoor air pollution and the time and physical burden of collecting fuelwood and water – have been given very little recognition in almost all PRSPs. Existing gender analysis methods and tools must be employed to ensure that poverty reduction strategies, policy and budget frameworks, and monitoring systems reflect a more gender-disaggregated understanding of poverty-environment concerns and needed policy and institutional responses.

**Strengthen anti-corruption efforts to protect the environment and the poor**

Corruption is a general governance problem, but relates strongly to poor environmental management, especially concerning the extraction of natural resources, the regulation of pollution and the preference for lucrative hardware solutions (for example, the power and water sectors) over softer solutions like efficiency savings. The Environmental Sustainability Index (ESI) found that the variable that most correlated with poor environmental performance was corruption.

The provision and effective dissemination of good quality information, combined with an appropriate legal and regulatory framework and the eventual imposition of adequate sanctions, can improve the situation. Pressure can be brought to bear by national and international civil society, by international buyers and consumers, by donors, and by other governments (see Box 7). For example, according to Article 97 of the Cotonou Agreement between the European Union and ACP (African, Caribbean and Pacific) countries, serious cases of corruption should give rise to consultations between the Parties to the Agreement, and require the Party where the serious cases of corruption have occurred to take the measures necessary to remedy the situation immediately. In some cases, sanctions may be imposed such as suspension of aid.

While developing countries have a role to play in stamping out corruption, developed countries also can play a part – as they may be home to the briber. Recently the OECD passed a Bribery Convention – which says member states should make it illegal to bribe non-OECD nationals. The OECD requires government to introduce legislation to achieve this – which many OECD countries, such as the US and UK have done. There is also a desire by some developed country governments and businesses to agree multilateral rules to make it a requirement to make public the amount of rent taxes they are handing over to developing governments for legal exploitation – often for oil – to ensure that this money does not disappear.

#### **BOX 7: TACKLING CORRUPTION IN THE CAMBODIAN FORESTRY SECTOR**

Cambodia's Interim Poverty Reduction Strategy states: "controlling illegal logging, combined with measures already taken to restructure the forestry concession system, will begin to mobilize the revenue potential of the forestry sector which will become an important source of finance for poverty reduction measures in agricultural and other sectors." It is estimated that about US\$100 million are lost each year from corruption, compared to only about US\$13 million that are captured. The Forest Crime Unit supported by the international NGO Global Witness has been very blunt about drawing attention to the lack of action against illegal loggers. Faced with mounting domestic and international criticism, Cambodian Prime Minister Hun Sen announced the suspension of all logging operations effective January 2002.

*Source:* Hodess (2001).

### **Reduce environment-related conflict**

Environmental conflict is an issue at micro and meso level (e.g., pastoralists versus settled farmers, river basin users) and at a macro level (e.g., control of diamonds and timber fueling conflict). At the micro and meso level, conflict resolution structures are needed that provide a forum for informed dialogue to solve problems. For example, river basin management authorities are being set up in many countries to establish and support dialogue and management rules between different resource users. In some cases, the open access nature of many resources – land, fisheries, forests – needs to be altered to stop over-use which can lead to conflict. Local-level efforts to define appropriate management regimes need to be supported. This can be complex, as it is important not to exclude poor people. For example, while many protected areas are being managed with more involvement of local people, there are many examples of protected areas that lack effective mechanisms to facilitate local community participation and to resolve conflicts over access to 'protected' resources that local populations depend upon for their livelihoods and well-being (Lewis, 1996; Ghimire and Pimbert, 1997; Buckles, 1999).

Control over natural resource rents – particularly oil and other minerals – can cause conflict between local residents, governments and private extractors. In some cases, there also can be tension between the local district where the minerals are located and central government – who may get much of the revenue – an issue that has arisen in Indonesia, Papua New Guinea and Nigeria. There is no easy solution to these problems, but they must be addressed by attempts to reach a political settlement on the appropriate and transparent sharing of resource revenues, based on public debate.

In more extreme cases, natural resources may fuel war, and they often provide the funds and incentives to prolong conflicts once they have started. This has been the case in West Africa and South East Asia. The underlying cause for the conflict needs to be addressed, but in the meantime pressure from the international community – governments, civil society and consumers – can reduce the potential gains from resource extraction. The Kimberley diamond certification process is one such attempt, as is pressure by the UN Security Council to highlight natural resource extraction in the Democratic Republic of the Congo (see Box 8).

#### **BOX 8: NATURAL RESOURCES FUEL CONFLICT IN THE DEMOCRATIC REPUBLIC OF THE CONGO**

In the Democratic Republic of the Congo (DRC), the link between conflict and natural resources is now so explicit, the United Nations Security Council asked the UN Secretary general to set up in 2001 a special expert panel on the illegal exploitation of natural resources and other forms of wealth in the DRC. The Panel argued in their first report that there is "a pattern of continued exploitation carried out by numerous state and non-state actors, including rebel forces and armed groups, conducted behind various facades in order to conceal the true nature of the activities". The only loser in this huge business venture is the Congolese people. Following a debate on the panel's conclusions in December 2001 its mandate was extended to include an update of information from all relevant countries; an evaluation of possible actions that could be taken by the Security Council in order to help end plundering; recommendations on specific actions that the international community might take in support of the Congolese government; and recommendations on possible steps that might be taken by transit countries, as well as end users, to contribute to ending illegal exploitation of natural resources.

*Source:* IRINnews.org, UN Office for the Coordination of Humanitarian Affairs, 2002

### **Improve poverty-environment monitoring and assessment**

Improving environmental management to reduce poverty requires local understanding of how environmental conditions relate to dimensions of poverty, and the ability to identify and prioritize alternative policy options and to evaluate their effectiveness and impact. This, in turn, requires appropriate and effective indicators and monitoring systems. Environmental data tend to focus on environmental change without determining poverty effects, while poverty monitoring systems often ignore environmental concerns. Indicators are needed that measure how environmental conditions affect the livelihoods, health and vulnerability of the poor, and these indicators need to be integrated into national poverty monitoring systems and assessment.<sup>17</sup>

Some work is already underway to identify useful generic poverty-environment indicators, but the real need is to collect data in country.<sup>18</sup> Surveys in Nepal, Honduras and Uganda (Nunan et al, 2002) and Nigeria (Osuntogun, 2001) show that some data is already available. Generally, environmental health data are currently the most widely available, drawing from Ministry of Health and household survey sources. However, the extent to which certain health outcomes such as malaria can be reduced by environmental interventions requires further research. There are some qualitative data on natural resources and vulnerability from participatory poverty assessments (PPAs), but future PPAs could be designed with a more explicit focus on key poverty-environment issues (Brocklesby and Hinshelwood, 2001). Household and community-level data on the poor's dependence on natural resources are sometimes available for a particular sector, such as the forestry sector, often as part of preparing forestry sector and biodiversity strategies. Work has also been undertaken to overlay poverty data with existing environmental data to form "poverty-environment maps" that identify the spatial links between poverty and resource degradation (Henninger and Hammond, 2000).<sup>19</sup> While this suggests that data may be more available than is realized, it is scattered among different agencies, not collected systematically and often requires careful analysis and interpretation to develop its relevance for poverty-environment issues.

As with any indicators, the information collected is only useful to the extent that it is appropriately used. Poverty-environment data collection should build on existing data collection efforts such as those associated with livelihood surveys and participatory poverty assessments, and be anchored in institutions with appropriate skills such as the Statistics Department, Ministry of Finance or a competent local research institute. These institutions have experience in producing demand-led data and will make it more likely that the data is fed into ongoing poverty-related policy processes such as poverty reduction strategies and sectoral and spatial plans and programmes.<sup>20</sup>

## 2.2 Enhancing the assets of the poor

### Key areas for policy action:

- **Strengthen resource rights of the poor**
- **Enhance the poor's capacity to manage the environment**
- **Expand access to environmentally-sound and locally-appropriate technology**
- **Reduce the environmental vulnerability of the poor**

Many policy options for addressing poverty-environment interactions focus on improving the asset base of the poor. Assets include natural capital (land, forests, water, fish, energy resources and minerals); social capital (relationships of trust and reciprocity, groups, networks, customary law); human capital (skills, knowledge, beliefs, attitudes, labor ability and good health); physical capital (basic infrastructure); and financial capital (monetary resources). Supportive policies and institutional arrangements are needed to enhance the assets of the poor and their capabilities to meet basic needs and to create more flexible and secure livelihood options.

### Strengthen resource rights of the poor

Property rights to resources such as land, water and trees have been found to play a fundamental role in the poverty-environment nexus (Scherr, 1999). Property rights encompass a diverse set of tenure rules and other aspects of resource access and use, and strongly influence the patterns of natural resource management. They may either facilitate or impede sustainable use, protection or resource-improving investment.

Individual and collective property rights held by poor people represent key household and community assets that may provide income opportunities and access to credit, the ability to meet essential household subsistence needs, and/or provide a means of insurance against livelihood risk. Poorer people tend to rely more heavily on customary or informal rights that are not adhered to by outside user groups. Marginalized users, such as poor women, often lose out as a result of policies and processes which privatize and reduce complex bundles of rights into a single unitary right (under many land and water reforms). Uncertain ownership conditions can also affect long-term agricultural productivity and incentives for resource conservation and investment, and can especially cause rapid deterioration of lands or natural resources when the owner tries to squeeze out the maximum revenue during a short period. This is also relevant in urban areas, where insecure tenure in slums brings risks of demolition and discourages investment to upgrade living conditions.<sup>21</sup>

Good examples are available of well-established common-property management regimes that do not meet the criterion of private exclusivity, and yet function to the satisfaction of the included parties and have proven to be sustainable (Ostrom, 1990). There are also strong concerns that a shift toward privatization would be contrary to poverty alleviation: the rich tend to be the largest landowners after common land is privatized.<sup>22</sup> However, where traditional common property management regimes have broken down and fail to protect the poor, the formal issuance of legal titles may be beneficial for the poor and for agricultural productivity, and therefore create an incentive for investment in soil and water conservation (see Box 9). However, as *perceived* security and local enforcement are critical concerns, such formal titling may not be necessary if informal rules are honored.

To strengthen the land rights of the poor, it is necessary to reform the policies and institutions responsible for delivering land rights in order to make them more responsive to the poor's needs. These include central government land agencies, local government, traditional authorities, the justice system, and local land boards, commissions and tribunals.



### **BOX 9: LAND TENURE AND ENVIRONMENTAL IMPROVEMENTS**

The relationship between land tenure and environmental improvements in terms of afforestation and soil and water management in rural areas, and investing in better housing in urban areas, are complex and location-specific.<sup>23</sup>

A study of 115 upland farms in the Philippines using 6 years of soil erosion data found that farmers who had high security of tenure were more likely to install contour hedgerows to reduce erosion (Shively). However the study also found that adaptation is more likely with farms that have access to credit, and that larger farms are more likely to adapt than smaller farmers. This suggests that, while tenure is important, it is by no means the only factor that matters.

However studies from parts of Africa are less categorical – showing that while tenure is important, tenure security is not necessarily delivered by freehold titling (DFID, 2002a). Tenure security is often a question of perception and interpretation of the socio-political climate in relation to land rights.

The relationship may also work the other way – with people either increasing or reducing tree cover to assert ownership. In some parts of Latin America, ownership of forested areas is asserted through replacing forest with crops, while there is some evidence of the reverse in parts of Africa. There stronger tenure rights over communal land are sometimes granted to those who plant trees (Shepherd, 1991). This occurs in Ghana where women plant cocoa on family land to assert ownership (Quisumbing et al, 2001).

In urban areas, tenure is often vital for access to improved environmental services (Payne, 2002). Improving tenure is one of the indicators for monitoring the Millennium Development on environmental sustainability. However there is limited accurate information on this at present

*Source:* Shively, G (2001); DFID (2002a); Shepherd (1991); Quisumbing et al. (2001); Payne (2002).

### **Enhance the poor's capacity to manage the environment**

Strengthening the resource rights of the poor is a necessary but not sufficient condition for improving environmental management and people's livelihoods. Within the shift in many countries toward decentralization and devolution of environmental management responsibilities, greater emphasis must be given to strengthening local environmental management capacities by building social and human capital, especially among the poor. This is essential for decentralization processes to truly reflect and respond to the priority needs of the poor; otherwise, decentralization may serve to further concentrate power in the hands of the local elite and further marginalize poor and vulnerable groups.

In rural and urban areas throughout the developing world, a wide range of innovative approaches are being tried to empower local environmental management and to improve livelihood options. Many positive examples can be cited (see Box 10):

- Community wildlife reserves managed for sport hunting in southern Africa have been transformed into areas managed for conservation, where indigenous people's livelihoods become a force for conservation.<sup>24</sup>
- Water-user's associations that buy and sell water rights and organize for collective system maintenance have been established.<sup>25</sup>
- Community-based forestry enterprises are being linked to international timber and certification markets.<sup>26</sup>

- Cooperatives producing organic foods or coffee for domestic and international markets have revitalized traditional agricultural systems with new technologies.<sup>27</sup>

In all of these examples, the *institutional framework*, including the building and use of social capital, is a key element in success. Projects that successfully support such initiatives have included significant resources for human capital development, organizational strengthening, negotiation and conflict resolution, and other institutional skills. Community-level organizations have also developed relationships with higher-level institutions, and through them mobilized support for their interests and advocated a positive policy environment for their activities.

#### **BOX 10: COMMUNITY FORESTRY IN NEPAL**

The 1993 Forest Act legalized forestry user groups giving them the right to own the trees, although ownership of the land remains with the State. User groups develop operational plans, set forest product sale prices, and determine how surplus income is spent. By June 1997, there were 6,000 user groups managing 450,000 ha with a further 6,000 waiting for formal registration. Issues still arise within user groups, between them, and with the forest department. Concerns have arisen about domination by local elites, politicization of user groups, and pressures from the forest department to focus on tree planting rather than harvesting. Nevertheless, experience has been encouraging; and the condition of the managed forests has often improved.

*Source:* Arnold and Bird (1999).

### **Expand access to environmentally-sound and locally-appropriate technology**

There is an abundance of “appropriate” technologies that can improve the environment and the livelihoods of the poor. Many are based on local traditional knowledge and practices, others are the result of external technical innovation. Examples include terracing, tied ridging to hold rain water, planting grass bunds to reduce water run-off and soil erosion, water harvesting techniques, agro-forestry, the use of natural products to eliminate pests, improved livestock and fish production, the use of reeds or woody plants to trap and detoxify sewage and many others.

However, technology development and dissemination for the poor is often not fully provided by the market. Because of its possible spill-over benefits, governments, civil society groups, the poor themselves and donors have a role to play to support innovation. Such shifts might be brought about through introduction and demonstration projects that involve the full participation of poor people. There have been attempts to fund labor-intensive environmental technology projects through public works, especially “food for work” programmes. However, the ownership and ultimate sustainability of works that have been carried out with the incentive of an external supply of income is usually questionable.

In agriculture, much more success has been achieved by empowering innovative farmers to adopt and adapt new technologies and to pass their knowledge on to their peers (Reij and Waters-Beyer, 2001). Support should be provided to involve farmers in testing the suitability of these new practices and the use of “farmer-to-farmer” advisory and training services, leading to the introduction of a number of different practices that require little or no cash inputs - a very important feature when dealing with poor farmers (see Box 11). The practices can be based, for example, on making the best use of the rainfall and waste products like animal manure and crop residues and whatever other organic material can be found on the farm.

**BOX 11: IMPROVING RESOURCE-POOR FARMERS' ACCESS TO ENVIRONMENTALLY-SOUND TECHNOLOGY**

In many cropping systems, heavy reliance on chemical pesticides is threatening the sustainability of agricultural production. Small-scale farmers and the rural poor are disproportionately affected by the health and environmental impacts. Integrated pest management (IPM) has proved successful in providing poor farmers with a pest management technology they can afford. IPM is based on the farmer's management of the ecosystem through a mix of ecologically-sound pest control techniques, taking into consideration the social and economic aspects of the pest management decision. One of the largest-ever investments by a developing country in farmer training on IPM was the Indonesian IPM Training Project (1993-1999). Over 600,000 rice, vegetable and soybean farmers have been enabled to make better pest management decisions on their own farms. The project induced institutional development far beyond its originally planned extent.

*Source:* World Bank (2000c).

Clean and affordable energy is essential both for poverty reduction and environmental protection. Most poor households and communities have no access to modern energy services, and for them the establishment of appropriate renewable options is critical. Increased use of renewable energy sources in industry and transport will be essential in order to meet the rising energy demand from urban growth while maintaining air quality. Many cost-effective renewable technologies already exist, and they can contribute to reduce air pollution considerably.<sup>28</sup> For example, the two most populous developing countries—China and India—are also homes to the largest small-scale biogas programs, with some 5 million and 2 million units respectively (Venkata, 1997).

Electricity for home consumption is associated with clear environmental health benefits (Wang, 2002). It is a clean source of energy at the consumption stage, enables refrigeration, extends reading time, and supports modern communications. However, most poor people live in rural areas where the cost of grid-connection would be prohibitive. Off-grid, decentralized alternatives must be promoted for them.

The public sector needs to provide an enabling environment for energy technology enterprises, and direct support to research and demonstration projects. Experience shows that successful energy technology needs to be adapted to local circumstances, and based on sustainable consumer demand. NGOs, community-level organizations and private sector entrepreneurs all have a role to play in developing locally-appropriate technology that can also become financially sustainable in the long run.<sup>29</sup>

In the area of human health, there is tremendous need for improved cook-stove technology to reduce indoor air pollution and associated acute respiratory infections. In the past, many such programmes have failed, but there have been countries where, especially in urban markets, the new technology has successfully taken off. In Kenya and Ethiopia, for example, several million improved stoves have been sold. The success of these programs rely on a number of factors, including initial support from governments and donors, but also on the successful, long-term involvement of small-scale private sector entrepreneurs. These producers have found a commercially viable niche, particularly in supplying urban poor with an energy-saving appliance that also reduces indoor air pollution (ESD, 2000). The issue here as with all technology is to focus not just on the engineering side, but on the social, cultural, financial and marketing aspects of technical change.

Simple, low-cost technology is also available for better sanitation, but must be introduced in a culturally appropriate manner, and along with educational efforts.<sup>30</sup> Similarly, simple technologies exist for vector control to combat malaria, including control of habitats where mosquitoes breed, and distribution of bednets treated with insecticides.<sup>31</sup>

## Reduce the environmental vulnerability of the poor

The poor have many informal mechanisms to manage the risks that they face every day. These include ways to reduce and mitigate risk (e.g., use of common property resources, temporary migration, income diversification and informal insurance), and to cope with shocks once they occur (e.g., sale of assets, reduced consumption, loans). These risk management strategies may be at the individual, household or more collective level (World Bank, 2001).

State attempts to reduce the vulnerability of the poor to natural disasters should strike a balance between measures designed to *prevent* shocks that will adversely impact the poor, and *ex-ante* measures that *reduce* the impact of such shocks on poor and vulnerable groups or enhance their ability to *cope*. Intervention strategies need to be based on the realities of the poor and the kind of environmental risks they face. For example, government attempts to improve storm-water drainage and relieve flooding in the slums of Indore, India involved replacing open drains with closed drainage channels, which prevented residents from being able to predict the severity of the flood as they previously did. Also, the closed drains are more easily blocked by rubbish and can no longer be used to wash away excreta – thus the residents preferred the old system (WRI, 1996). In many environmental disasters, the majority of fatalities occur in the first 24 hours – long before national and international agencies arrive on the scene. So engaging local residents in disaster preparedness, mitigation and coping strategies is the only practical solution.

While natural hazards in general cannot be prevented completely, their impacts, and sometimes their magnitude, can be managed. There are four key approaches (ICRC, 2001):

- Address the causes of environmental hazards through measures addressed elsewhere in this report. For example, floods are strongly influenced by land and water management in upper catchments of watersheds. Good land-use planning and zoning can prevent a natural cycle of water flows from becoming a catastrophe. Fire breaks and early response can to some extent prevent wildfires to spread. Diverse crop varieties can reduce exposure to pathogen attacks.
- Focus more on participatory risk reduction, risk mitigation and disaster preparedness. Building codes for houses and other infrastructure can ensure that they are equipped to withstand natural hazards to a reasonable degree. Early warning systems that effectively provide local people with adequate information to minimize impacts can be very effective. Countries that have taken this approach have made a major impact. In Bangladesh, following the 1991 cyclone when 140,000 people died, a major effort was put into local-level disaster preparedness and since then fatalities have dropped substantially – although thousands are still made homeless. Even in the terrible 1999 Orissa super-cyclone – when an estimated 10,000 to 40,000 people died – an additional 40,000 were saved by locally constructed and managed shelters.
- After disasters have happened, improve response and relief efforts and ensure that they include a focus on improving livelihood opportunities that can withstand future disasters. While the coordination of humanitarian relief has improved somewhat, it can improve further with greater involvement of well-informed groups on the ground. Funds are often more useful than flying in foreign supplies and experts, which may be time consuming and have lower benefits for the local economy. Relief efforts should focus on longer-term recovery through, for example, the introduction of more income-earning opportunities. This is constrained by both government and development agencies who still tend to separate disaster relief from long-term development – so that relief is not sufficiently development-oriented and development does not fully incorporate disaster mitigation.
- Ensure that funds are available for dealing with disasters. While the international community may provide some funds, countries may find it more predictable to set up their own contingency reserves. A number of countries in Latin America have already begun this process. There is also a need to increase private sector insurance coverage.

Once a disaster has struck, emergency response management and delivery of rapid support to affected areas is critical to bring down human losses. Economic recovery requires a well-managed response with quick-

disbursing funds for clearing of disturbed sites, reconstruction, re-seeding of damaged crop land, micro-credit for commercial activities and so forth.<sup>32</sup>

Addressing chronic long-term environmental vulnerability such as drought and pest infestations is even more complex and, as it is less visible, receives much less attention. Long-term solutions require addressing the reasons for environmental decline. In the short term, the key is to understand the poor's own coping strategies and motives. In rural areas, coping strategies of the poor may include introduction of drought tolerant species, integrated pest management, and reducing dependence on declining natural resources, through shifting to off-farm employment and in some cases migration.

In urban areas, there is some evidence that the poor make short-term trade-offs to accept certain environmental hazards – such as polluted slums – in order to improve their economic opportunities (WRI, 1996). However, a wealth of evidence point to the possibilities of mobilizing the urban poor for upgrading their environment.<sup>33</sup>

## 2.3 Improving the quality of growth

### Key areas for policy action:

- Integrate poverty-environment issues into economic policy reforms
- Increase the use of environmental valuation
- Encourage appropriate private sector involvement in pro-poor environmental management
- Implement pro-poor environmental fiscal reform

More environmentally-sound and equitable patterns of economic growth are needed to protect the environmental assets of the poor. Environmental problems often arise because effective market mechanisms do not exist or are insufficient. Hence, there is an important role for government to complement economic policy reforms with measures to promote pro-poor environmental management. This includes the need to better account for the economic values of environmental good and services ignored by markets in order to make rational and enlightened choices possible. However, it is also important that governments correct the failures of their own policies. This refers to reform of environmentally-harmful subsidies, combating corruption and providing an enabling environment for the private sector to manage environmental resources when this can be done efficiently and in the best social interest.

### Integrate poverty-environment issues into economic policy reforms

To promote macroeconomic stability and enhance growth, many countries have undergone structural adjustment reforms that include exchange rate re-alignment, public sector reform and privatization, reduction of tariffs and subsidy reform. The effect of these past reforms on the environment is controversial and mixed.<sup>34</sup> Positive environmental impacts can occur when, for example, an over-valued currency is adjusted so that domestic nature-based tourist services are promoted, or when public subsidies to polluting industries are dismantled. Adverse environmental effects can occur when these reforms are undertaken in the context of unchanged institutional and market failures. Trade liberalization can enhance export opportunities for natural resources such as forestry, fisheries and minerals. However, if these resources are open-access and environmental regulation and management regimes ineffective, the repercussions may be quite negative from both an environmental and poverty reduction perspective.

Many countries have had to adjust unsustainable economic policies, but there is a need to complement such adjustment in two important ways. First, economic policy reforms need to be complemented with assessments of their poverty-environment impacts. Traditional environmental impact assessment is now being adapted to address economic policy changes. Strategic Environmental Assessment (SEA) can be applied to sectoral and regional policies and programs to identify potential impacts and design mitigating measures. Major deficiencies in environmental management can be identified and mitigation can be designed. For very broad macroeconomic reforms, however, it becomes difficult to predict what the ultimate impact on the environment will be. As numerous case studies have shown, the impacts often can be traced through chains of both positive and negative repercussions, but quantifying the impacts remains extremely difficult. Even after the implementation of an economic adjustment program, it remains a challenge to define the “without scenario”, that is, what would have happened in the absence of the reform program.<sup>35</sup>

Traditional economic models can have environmental components included – for example, to find out the effect of timber trade liberalization on forest cover. However, traditional economic and environmental analyses both need to be adapted to our current concern: that greater attention is given to those impacts which disproportionately affect the poor. In some cases, countries are already starting to experiment with Poverty Social Impact Analysis (PSIA) of policy changes, and there is a need to ensure that relevant poverty-environment issues are also captured.

This leads to the second important point: there is no substitute for targeted support to environmental management capacity in a reforming country. While not every impact of reform can be foreseen, certain environmental standards and monitoring capabilities can respond to and mitigate negative impacts that occur.

### Increase the use of environmental valuation

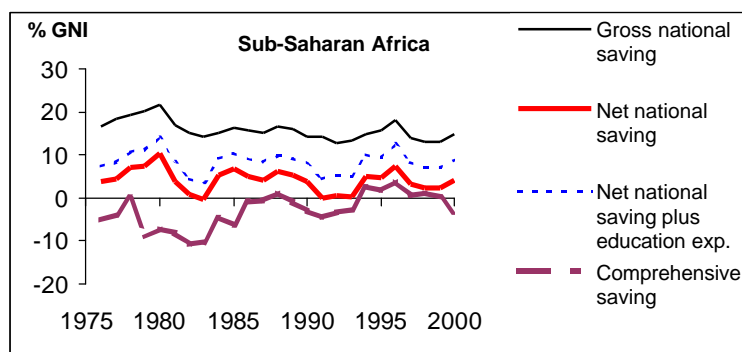
Markets form the backbone of the global economic system, but they fail to capture many important environmental values. This warrants attention both at the macroeconomic level, where social planning occurs, and at the microeconomic level, where households and individuals make small everyday decisions that, taken together, profoundly affect the level of environmental quality.<sup>36</sup>

To make rational choices when environmental and economic values are to be compared, it is essential that accounting systems and market prices reflect the relevant values. At the macroeconomic level, this means that the traditional system of national accounting needs to be amended to better reflect environmental values.

Two main types of amendments are needed from an environmental perspective. First, the national income accounting system needs to differentiate between income derived from sustainable use of resources, and income derived from liquidation of natural capital.<sup>37</sup> Second, water, soil and air pollution affect the level of environmental quality, and sometimes the productive capacity of the economy directly. In the latter case, the traditional income account already incorporates the negative impact of pollution. While no further adjustment to income is necessary, it is still of policy-relevance to trace the magnitude of the impacts. However, in the case where pollution does not directly affect current productivity, but non-marketed environmental services, or future productivity by inflicting long-term health damage, an amendment in the national income accounting is needed to reflect this.

The policy signals emerging from the national accounting data can be quite different if adjustments for subtractions/additions of human and natural capital are taken into consideration. One method is to derive an adjusted measure called Comprehensive Savings. Starting with the standard concept of net domestic savings, the current expenditures on education are added as an approximation of investment in human capital. Next, the depletion of non-renewable energy sources, minerals, and forests, are deducted. Finally, the damages from carbon dioxide emissions (as a proxy for overall air pollution) are deducted (World Bank, 2001e). This is illustrated in Figure 6, which shows a pronounced difference between the net domestic savings measure and the calculation of comprehensive savings for Sub-Saharan Africa.<sup>38</sup> From a poverty reduction perspective, this type of macro-level analysis needs to be complemented with a distributional analysis – how does natural resource exploitation and ecosystem change, pollution and investment in human capital affect the poor?

**FIGURE 6: ADJUSTED NATIONAL INCOME ACCOUNTS IN SUB-SAHARAN AFRICA**



Source: World Bank (2002c)

Environmental valuation also has a role to play in assessing the costs and benefits of public reforms impacting the environment. This is particularly so when the benefits of improved health must be compared with financial expenditure.<sup>39</sup>

Moving on from the perspective of society as a whole and down to the micro-level of individual and household decisions, poor people, like everyone else, will be influenced considerably by market prices. If market prices for environmental goods and services are not available, they need to be derived, using techniques of environmental economics. In summary, the incentives for people to make rational choices need to be improved. This is borne out in an example from Cambodia, where it was shown that local fisheries were damaged by the destruction of mangroves to make room for shrimp farms. Furthermore, the shrimp farms polluted the water, which further brought down catches for the traditional fishermen. The economic analysis showed that local communities in general would benefit from conserving the mangroves (Bann, 1997). Results from environmental economic analysis must be translated into policy and implemented if they are to have an impact on people's actions. This could be done, for example, through imposing fees on the harmful activities (clearing of mangroves, establishment of shrimp farms). This will not only discourage such activities, but it may also be a vehicle to compensate those who suffer the consequences.

### **Encourage appropriate private sector involvement in pro-poor environmental management**

With increasing liberalization in many countries, the role of the private sector has expanded, and the private sector is now an important player in terms of its ability to implement sustainable practices, as a source of expertise and funding, and as a potentially potent advocate for sound environmental management (particularly where private sector interests may coincide with those of the poor). The impacts on poverty-environment issues are mixed, but are heavily dependent on the way the private sector is both managed and regulated.

[Promote investment in “sustainable” products and services that can expand the poor’s income opportunities without adversely impacting the environment – such as ecotourism, brazil nuts harvesting, aquarium fish trading) and assist identification of new niche products (e.g. wild meat framing, other wild products lots of eggs from Amazon).]

Governments need to maximize the efficiency gains from the private sector while safeguarding the interests of the poor. For example, while privatization can improve the economic efficiency of environmental services such as waste management, sanitation and wastewater treatment, governments may need to provide safeguards to ensure that access by the poor is protected and improved. At the same time, governments need to increase their capacity for environmental regulation of private sector operations and enforcement of compliance. Particular attention should be given to ensuring that private sector operators integrate environmental considerations into their operations. This can include promotion of environmental management systems, environmental auditing and reporting and adherence to internationally-agreed codes of conduct.

However, full privatization of environmental services may not be desirable or possible. A private company may not find it profitable to invest in potable water or sewage services for the poor, and strong trade unions may oppose private sector involvement if they fear heavy job losses. A promising approach to bringing in private sector investment is the establishment of public-private partnerships. These are arrangements where a government (national or local) enters into an agreement with a private sector enterprise to deliver investment and services within a jointly-agreed regulatory framework that safeguards the interests of the population to be served. Public-private partnerships are an increasingly common approach to expanding and seeking to improve environmental services such as potable water supply, sewage services, efficient transport and efficient energy production.

There has been an increase in private sector participation in the water services sector (water supply, irrigation and hydropower) in recent years (see Box 12). Still, the share of private sector water services is only about five percent worldwide (World Bank, 2002). The impact is the subject of a major controversy.<sup>40</sup> However, experience to date indicates that public authorities will need to ensure that the service providers do not use



their market power to exploit customers and that they internalize public health and environmental externalities. Public authorities also must ensure that water consumption is at a sustainable level, provide mechanisms to ensure that water supplies are efficiently allocated between alternative uses, and serve as a guarantor of a level of service provision that is consistent with a basic standard of living (Johnstone et al., 1999).

#### **BOX 12: PUBLIC-PRIVATE PARTNERSHIPS FOR WATER SERVICES IN SOUTH AFRICA**

In 1994, South Africa's first post-apartheid government produced a policy paper on Community Water Supply and Sanitation, in 1997 passed the Water Services Act, and in 1998 passed the National Water Act. South Africa's legislation provides an enabling framework for local action through the decentralization of powers, rights and responsibilities to the local level, as well as guidelines and regulations to help promote social equity and environmental sustainability. This flexibility at local level has led to innovation and experimentation with public-private partnerships to develop water systems for the poor. The government funds basic infrastructure services, while users must pay for higher levels of service such as household connections and maintenance through a fee-based system for water services. A substantial volume of work was also undertaken by water boards that are public sector bulk suppliers of water acting as implementing agents for government. The Boards, in turn, contracted private sector consultants and contractors who provided project management and specialist services to projects. The construction was undertaken by private contractors using local labor who were contracted to the water users. The water users are organized as for-profit organizations.

A European Commission review in 1999 found that this approach had provided 5 million people with water, completed 205 water projects and created 310,000 jobs (EU, 1999). The most recent figures are 7 million people provided with clean water. While the scheme has not been without problems, it has demonstrated the potential for developing water systems through innovative collaborations between all spheres of government, the private sector, civil society organizations and the users themselves.

*Source:* Personal communication from H. Muller, Acting Chief Director of Water Services, DWAF, South Africa (2002).

### **Implement pro-poor environmental fiscal reform**

**Subsidies.** Environmentally-harmful subsidies are a key area for policy reform. These are subsidies that are both financially quite costly and lead to the overuse of natural resources and other unintended side effects, such as increased pollution. It is important to acknowledge that the largest such subsidies are handed out in industrialized countries (see Section 2.4).

Environmentally-harmful subsidies also are common in developing countries, particularly in the agriculture and infrastructure sectors. While many subsidies have been reduced or eliminated as part of structural adjustment and other policy reform processes (see Box 13) – for example, the removal of pesticide subsidies in Indonesia<sup>41</sup> – the under-pricing of natural resources such as water for irrigation and various forms of fossil energy continues in many countries. Cost-recovery for irrigation water is only 10-25 percent in some of the major developing countries. Subsidies to gasoline and diesel in developing countries are in the order of \$13 billion, and subsidies to electricity amount to more than \$100 billion (World Bank, IMF and UNEP, 2002).

Subsidies to electricity can also be environmentally beneficial, as it encourages substitution from dirty fuels. However, these subsidies are often regressive as the rich benefit much more than the poor – for example, the poorest often are not served by subsidized electricity, water and waste collection. Even where the poor do get some benefit, subsidy reform can be structured to significantly increase its 'pro-poor' effect and to be less

environmentally damaging. For example, tariffs for water or electricity can be differentiated to ensure the poor a basic supply at a “lifeline” rate, while raising the marginal cost for large-volume consumers. There are other ways to directly target the poor to raise the standard of living in general, without subsidizing specific commodities that the rich also consume. The potential impacts on the poor and the environment of alternative approaches to subsidy reform should be reviewed through environmental and social impact assessments and be subject to public comment before they are adopted.

#### **BOX 13: ENERGY SUBSIDY REFORM AND THE POOR IN CHINA**

China has made major strides in reforming its energy subsidies, particularly those to the coal industry, with significant benefits in terms of reduced pollution. Total economic subsidies for fossil fuels fell from \$25 billion in 1990/1 to \$10 billion in 1995/6. However the remaining subsidies still benefit the wealthier households, as most of the subsidized coal goes to urban areas. In rural areas, households depend on biomass and coal for cooking bought on the free market. Even where subsidized coal is distributed in rural areas, such as Western Xiushui, it primarily benefits higher income households. Rural energy is also consumed by Town and Village Enterprises (TVEs), but where prices have risen, as in Changsha County, this has encouraged non-energy intensive production with higher value-added.

Source: World Bank (1997).

**Rent taxes.** The environment can be a major source of revenue, and thereby contribute to finance poverty reduction measures. The potential for additional rent capture is substantial in the forest sector of many countries, and has been estimated to amount to US\$9 billion per year.<sup>42</sup> Not all of this can reasonably be captured, due to illegal logging and poor data availability. However, moving towards better rent capture for forestry would dampen the rapid depletion of tropical forests, and could be particularly important for small, forest-rich countries in terms of their fiscal revenue (World Bank, IMF and UNEP, 2002).

Charging visitors fees for visiting protected areas is another under-utilized form of rent capture. Some US\$1-3 billion per year could probably be raised in developing countries if fees were raised to levels of actual willingness to pay among visitors. Some of these areas already charge, but many refrain from charging visitors, especially foreign visitors, fees that approach their appreciation for the environmental services provided by protected areas (World Bank, IMF and UNEP, 2002).

Rent taxes are more common for countries with rich fisheries that are exploited by other countries’ fishing fleets – such as Japan, Korea, Taiwan and Spain. While most countries in this position do charge for licenses or have joint venture agreements, they are often not receiving the full amount. The size of fishery rent tax revenues from other countries’ fleets is significant for certain countries – in particular for small islands in the Pacific and certain African countries. Between 1993 and 1999, Mauritania received 15% of total budget revenue from European Community fishing agreements, 13% for Sao Tome and 30% for Guinea Bissau (IFREMER, 1999).

**Pollution charges.** It is also important, where possible, to adjust market prices to include the non-marketed environmental effects. Examples include ‘green taxes’, effluent/emissions fees, deposit refund schemes, tradable permits and so forth. The poverty relevance of these instruments lie primarily in their ability to signal the full social cost of pollution and environmental damage, thereby providing an incentive to limit damaging activities that generally tend to impact the poor most (World Bank, 2000b).<sup>43</sup> However, the impact on the poor of market price adjustments must also be considered, particularly if they are significant and sudden.

These ideas have been vigorously put into practice in many countries. For example, China earned US\$600 million in 1999 from emission charges. Most of these funds went to finance pollution abatement measures (World Bank, IMF and UNEP, 2002). In the longer run, high pollution charges should result in a shift to less-

polluting industry practices, and hence falling revenues from emission charges. The main purpose, however, is not to raise revenue, but to correct for externalities.

Using market-based instruments (MBIs) to ensure that environmental costs are incorporated in market prices is institutionally demanding. A gradual and flexible approach is necessary. Environmental levies are often met with stiff opposition from the polluters who must pay, but earmarking the revenue from environmental fees can improve public acceptance of such levies. A review of the experience of eleven Latin American countries using MBIs emphasize that revenues must be channeled to local authorities so that they can build the institutional capacity required for effective implementation (Huber et al., 1998).

Price reform is important in correcting market signals, but there will always remain some environmental issues that require direct regulation of activities, including outright prohibition, in order to protect the environment and the poor. Examples include the banning of particularly harmful pesticides, and the regulation of allowable applications of others. These measures create an incentive for private producers to find new and more environmentally friendly products that can achieve the same objectives.

## 2.4 Reforming international and industrialized country policies

### Key areas for policy action:

- **Reform international and industrialized country trade policies**
- **Make foreign direct investment more pro-poor and pro-environment**
- **Enhance the contribution of multilateral environmental agreements to poverty reduction**
- **Encourage sustainable consumption and production**
- **Enhance the effectiveness of development cooperation and debt relief**

Reducing poverty through improved environmental management cannot be achieved on a sustainable basis through domestic action alone. Developing countries are economically and socially linked to the rest of the world through trade, investment flows, debt, development cooperation and humanitarian aid. These capital flows can each have varying impacts on the economic, social, and environmental sustainability of partner countries. There is a growing recognition of the need for more coherent global economic policy frameworks, including the international policies of developed countries, in order to better reflect the concerns of developing countries, sustain the environment and reduce poverty. This implies support for the poverty reduction and sustainable development strategies of developing countries, in particular for domestic policies that enhance sustainable development and create an economic environment conducive to environmentally sustainable trade, investment and economic growth; and it requires international economic frameworks that provide sustainable growth opportunities for developing countries, including market access for developing country exports.

### Reform international and industrialized country trade policies

International trade can make a decisive contribution to sustainable development by promoting the equitable integration of developing countries and the poor into the global economy, which can significantly boost economic growth.<sup>44</sup> However, trade and investment liberalization will provide maximum benefit when carried out within a sound supporting domestic policy and regulatory framework – including pro-poor economic policies – and pursued in tandem with sound environmental management.

In some sectors such as agriculture, many developing countries are still unable to realize their comparative advantage because agricultural trade policies in industrialized countries have the effect of depressing world prices for farm products. Protection in rich countries cost developing countries more than \$100 billion per year (World Bank, 2002a). The OECD countries subsidize their agriculture with almost US\$1 billion per day,<sup>45</sup> much of it encouraging use of agro-chemicals and planting of lands that otherwise would have been left fallow. These subsidies also have the effect of creating barriers to export of agricultural commodities from the poorer countries, making poverty reduction more difficult. Subsidies for marine fisheries have been estimated to total about US\$25 billion per year, or about one third of the value of the catch. This contributes significantly to the global pressure on this natural resource (Myers and Kent, 2001).

The overall impact of agricultural trade liberalization by developed countries on the environment and natural resources of developing countries is not clear, as the issues are complex and the possible effects are mixed. For example, more profitable agriculture could lead to the intensification (including wider use of pesticides) and expansion of cropland, including into forest areas. At the same time, increased agricultural exports may stimulate environmentally beneficial practices, such as greater fertilizer use that results in better ground cover and less soil erosion. More conclusive impacts arise from international fisheries agreements (for example, by many EC and African states) that often have had adverse development and environmental (resource depletion) impacts on local fisheries communities who depend on fish supply for their food security (MRAG, 2000). These agreements need to be reviewed and reformed.

Furthermore, the trade-related standards of most developed countries can affect developing countries and smaller-scale producers. For instance, legitimate legislation on sanitary and phyto-sanitary (SPS) measures can create challenges for developing countries that often lack the scientific expertise and technical capacity to comply with regulations set by importing developed countries. In effect, SPS measures can create (at least in the short-run) non-tariff barriers that potentially limit the ability of developing countries to access foreign markets for their agricultural and fisheries exports. However, by increasing the assurance that exports are produced in sustainable ways and that SPS standards are met, such measures can also add value and marketability to products.<sup>46</sup>

This is the case of organic shade-grown coffees that continue to earn fairly high prices despite generally depressed global market prices for lower-grade coffee. The application of certification standards for forest management practices is another promising area. An example of successful adoption of certified sustainable forest management (SFM) and market access is provided by Portico S.A. of Costa Rica. The company manufactures high-end mahogany doors that command a premium price. Thanks to its certified SFM can be exported worldwide without controversy at a time when tropical deforestation is an increasing concern. (Diener, 1998). These environmental standards need to be combined with capacity development in developing countries, in particular among small and medium-sized producers, to allow them to effectively meet the requirements and to turn them into a market advantage rather than an obstacle (see Box 14).

#### **BOX 14: SUCCESSFUL ADJUSTMENT TO ENVIRONMENTAL HEALTH STANDARDS**

In 1989, Germany, the leading export market for Indian leather products, banned the import of consumer goods containing PCP and a large number of dyes, citing concerns over health impacts on consumers. These chemicals were routinely used in leather tanning in India. It came as a shock to this important export industry, which ranked fourth in revenue at the time.

The export ban prompted a quick regulatory action by the Indian government to prohibit manufacturing of the banned chemicals, the application of standardized methods for testing, so as to ensure compliance, and rapid development of low-cost substitutes. Surprisingly, this example shows that even highly dispersed, traditional small-firm clusters can successfully meet strict environmental standards in a relatively short time and stay competitive.

*Source:* Pillai (2000).

### **Make foreign direct investment more pro-poor and pro-environment**

Foreign direct investment (FDI) and foreign portfolio flows now dwarf official development assistance, with over US\$160 billion by the end of the last decade (IMF, World Bank, UNEP, 2002)<sup>47</sup>. Even though these flows are focused on a handful of countries, foreign investment is still a key part of resource inflows in the remaining developing countries. Indeed, in order to promote poverty reduction, many countries are seeking to encourage foreign investment. This investment is particularly important to the poverty-environment agenda in those countries where foreign investment is concentrated in resource extraction, infrastructure and manufacturing sectors.

The overall environmental impact of multinational enterprises in developing countries is mixed – while there is not evidence of a “race to the bottom” in terms of environmental standards (World Bank, 2002)<sup>48</sup>, there is mixed evidence that foreign firms are cleaner than domestic ones once firm size is included (Zarsky, 1999). However, multinational firms operating in developing countries are increasingly trying to improve environmental performance supported by a number of important initiatives. In 2000, OECD members agreed upon a revised voluntary Code of Conduct for Multinational Enterprises, which has a significant environmental component (OECD, 2000). The UN has been promoting a Global Compact with the private sector that has nine principles, including on the environment. The Global Reporting Initiative, with the

support of UNEP, is a multi-stakeholder international undertaking that is drawing up an international standard for reporting on the economic, social and environmental dimensions of a firm's activities, products and services (GRI, 2000).

Foreign direct investment is particularly linked to poverty-environment issues through the oil, gas and mining sectors. Many of the world's poorest countries – Papua New Guinea, Chad, Mozambique, Nigeria – are the site of major investments, with the minerals often located in isolated regions. However, the contribution of an oil, gas or mining corporation to a country's wealth through tax and royalty revenues is frequently not matched by the influence that company has over revenue management. Companies with long-term investments have an incentive to improve relations with local residents. In some cases, this has led to investments in local schools, clinics and infrastructure. Generally, the companies would prefer to see this as the role of national and local governments. The problem arises where governments do not make these investments, and the private companies are reluctant to apply pressure on the host government for fear that they will lose out – for example, by not being awarded future contracts.

Targeted partnerships between investors, the host country national and regional government, development agencies and the local people affected can begin to address these problems. An example is the Lihir gold mine in Papua New Guinea, where participation by local residents as shareholders was financed by an investment bank. Furthermore, a closer alignment of social investment practices among oil companies, municipal governments and development agencies can provide the political incentive to redirect revenues back to the regions where minerals are extracted. Greater complementarity between community development activities of corporations and the regional development plans of municipal authorities can improve the responsiveness of government to community needs and increase the perceived legitimacy of public office (Warner, 2000).

[See IIED study...MNC's can also help finance the public good – seeing this happen very much in mining sector, where many mining companies will fund biological surveys as part of EIA thus helping strengthen taxonomic understanding and expertise. Whilst not directly relevant to poor frees up resources for more pro-poor activities from others sources, such as GEF of multilaterals or governments.]

#### **BOX 15: MINING COMPANIES AND THE ENVIRONMENT IN LATIN AMERICA**

Detailed studies of the mining sector of Chile, Peru, Brazil and Bolivia during a period of privatization found that environmental damage was not evenly distributed within the minerals sector of each country. Rather, it seemed to vary according to factors such as type of mineral; vintage of technology; stage of investment; stage of operation; level of integration; effectiveness of environmental regulation and its enforcement; and socioeconomic context (including poverty in local communities and workforce education and training). Most of all, environmental performance varied according to the firm's inherent technological dynamism – which did explain foreign firms generally better performance than state-owned national firms.

In the Chilean industry, several international mining firms adopted environmental practices in advance of legislated norms and institutional recommendations. While the state-owned companies face massive challenges in dealing with their sins of the past in terms of accumulated environmental problems, combined with other factors such as the state companies' history, culture, and resource constraints.

However, in Brazil - while foreign firms did sometimes have environmentally proficient practices due to their greater technological capacity and financial resources – others have lagged in the implementation of practices already adopted in the companies' more stringently regulated home countries.

*Source:* Warhurst (1998).

## **Enhance the contribution of multilateral environmental agreements to poverty reduction**

Globalization and global environmental change have focused international attention on the role of global public goods such as biodiversity, the atmosphere, international waters and global agricultural and health research in achieving sustainable development

Two of the major environmental global public goods – a stable climate and maintenance of biodiversity – have many benefits for the poor. The main historic responsibility for climate change lies with the developed world. Strong efforts must be made to reduce the global emissions of greenhouse gases.

Despite uncertainties about where changes in climate will occur, by when, and by how much, there is little debate on some basic issues of significance in a poverty-environment context. First, because of the rapid build-up of greenhouse gases (GHGs), the earth's overall temperature will warm significantly, precipitation patterns will change and sea levels will rise, leading to food insecurity, lack of access to potable water and loss of livelihoods. Second, the adverse impacts of projected changes in climate conditions will pose major development challenges for most developing countries in the tropical and sub-tropical zones. It is therefore of major importance to enhance the capacity of developing countries to adapt to future climate change.<sup>49</sup>

The developing world includes countries whose emissions of greenhouse gases and related pollutants are unsustainable, and locking themselves into high-emitting technologies is less and less likely to be the least cost option for development. So there is a need to ensure that whenever technically feasible and cost-efficient, development assistance is used to implement solutions that advance several development goals at once – such as public health, biodiversity conservation, and climate change mitigation and adaptation – all of which should contribute to poverty eradication.

The causes of biodiversity loss are more complex than climate change. As the whole world benefits from maintaining biodiversity,<sup>50</sup> and developing countries lack resources, it is incumbent on the developed world to bear a fair proportion of the costs of global biodiversity conservation, both through direct assistance and through more careful assessment of the impact of their trade, investment and other interactions with the developing world. A major instrument for direct assistance is the Global Environment Facility (GEF). Negotiations are currently ongoing for the GEF's next financing period, with a significant increase required to help protect the world's climate and biodiversity and other global environmental goods that benefit all, but often the poor most of all.

Over the past 50 years, international environmental policies have been agreed in the context of numerous multilateral environmental agreements (MEAs). Each agreement has customarily been designed to address a pressing environmental issue. As a result, some agreements support and strengthen the aims of others, while others have objectives that overlap and contradict one another. There is a need for better coordination and harmonization between MEAs during negotiation and implementation stages, and for elimination of contradictions and overlaps. Increased synergy among MEAs is required for more efficiency and ensure that MEAs contribute to furthering their own objectives while ensuring that the environmental considerations of such agreements are integrated in the broader dimensions of sustainable development and do not contradict other legal regimes.

Developing countries should be enabled to take on increased responsibilities under global agreements to which they are party, and to ensure that these agreements adequately reflect their concerns. Effective participation in international negotiations, however, requires capacity and resources that are often lacking in the poorest countries. It also requires political will for the interests of the poor to be made central to both the negotiation and implementation of these MEAs. Developed countries should assist developing countries in implementing the objectives of the MEAs to which they are each parties, and take care to ensure that they do not unilaterally, or through multilateral operations, support actions of developing countries that are not in compliance with MEAs to which they are party.

## **Encourage sustainable consumption and production**

Developed country consumers and producers through their trade, investment, pollution emissions and other activities affect the environmental conditions of developing countries. While this chapter focuses primarily on specific steps relevant to trade, investment and global public goods, there is a broader underlying issue – the level of production and consumption in the industrialized world.

Making rich country consumption and production more sustainable will require a complex mix of institutional changes – addressing market and government failures as well as broad public attitudes. As in developing countries, it will also require working with many different stakeholders in government, civil society and the private sector. Again as in developing countries, it is not just a technical process – but a political one – with certain groups that will welcome change, while others will resist it. One interesting example of the new alliances that are being forged both between stakeholders in developed countries and their partners in developing countries is the recent Memorandum of Understanding between Indonesia and the UK on Indonesia forestry exports (see Box 16).

#### **BOX 16: CURBING DEVELOPED COUNTRY IMPORTS OF ILLEGAL TIMBER FROM INDONESIA**

Indonesia is a major exporter of timber to Europe. Much of this timber is illegally and/or unsustainably harvested. In 2001, a conference in Asia on illegal logging examined how both developing country producers and developed country consumers could work together to promote sustainable logging. In 2002, this led to a Memorandum of Understanding between the Indonesian Minister of Forestry and UK Ministers for the Environment and International Development to cooperate on forest law enforcement and combat illegal logging and trade. This agreement will help set up legal compliance for Indonesian forest exports, which will eventually allow all UK imports to be only from legal sources. This would require amending UK customs law, which may also require EU legislation. In the meantime, the UK Timber Trade Federation has already drawn up a voluntary code of practice to work with Indonesian suppliers towards the elimination of illegal logging. G-8 partners, including the US, Germany and Japan are interested, and the EC is convening a meeting to debate extending the arrangement to the whole of the European Union. An African conference on illegal logging is now being planned between African producers and the US, France, UK and the EC.

*Source:* Internal DFID documents.

The rich countries of the world recently acknowledged their responsibility to reduce environmental pressure in the OECD report *Sustainable Development, Critical Issues* (OECD, 2001): “OECD countries have a key role to play in addressing the pressures on the environment from human activities. With 18% of the world’s population, they account for over half of today’s total energy consumption, over 60% of cereals consumption, 31% of consumption of food fish, 44% of consumption of forest products and a large fraction of the cumulative damage imposed on the environment globally.” The OECD report goes on to identify detailed steps in the energy, transport, agriculture and manufacturing sectors to reduce environmental damage – which will benefit both OECD countries, but also developing countries. For each of these key sectors, the OECD report provides a detailed list of institutional, regulatory and economic policy reforms to reduce environmental damage in its 30 member states. The OECD also carries out regular ‘peer reviews’ of its member states to assess environmental performance. These are Ministerial-level reviews and the final reports are public documents which provide constructive suggestions for improvement.

The EC also has been explicit in its strategy for the 15 members of the European Union: “Industrialized countries have important responsibilities in promoting sustainability initiatives – first and foremost by putting their own house in order, and by supporting a move to sustainable production and consumption patterns; in addition by ensuring more consistent market opening, increased public and private financing of development cooperation, as well as better functioning and greater stability in the international financial system” (EC, 2002).



## Enhance the effectiveness of development cooperation and debt relief

To achieve the Millennium Development Goal of halving absolute poverty by 2015 will require an approximate doubling of official development assistance (Devarajan et al., 2002; Zedillo Report, 2001). This would still only bring the total level of aid to less than half a percent of GNP in OECD countries, still far below the internationally acclaimed goal of reaching 0.7 percent of GNP. To eradicate poverty will demand a much more ambitious effort, and the financial flows must be received with efficiency and accountability to be effective. International aid works in a good policy environment.<sup>51</sup>

Many developing countries are burdened by unsustainable levels of debt. This hampers economic growth and undermines the ability of some countries to provide health, education and other basic services for their population. When unsustainable debt leads to budgetary cuts, environmental administration and services often are a target, leading to a slackening of environmental management. The Heavily Indebted Poor Country (HIPC) Initiative aims to tackle the problem of unsustainable debt, and to ensure that the benefits from debt relief are used to reduce poverty and to avoid entering into a renewed spiral of indebtedness.<sup>52</sup> Debt-for-nature swaps are another potential means for addressing poverty reduction and environmental management objectives.

Aid and debt relief can be provided to help governments make many of the policy changes recommended in this paper. As in developing countries, development cooperation agencies are seeking to improve their governance structures and operational effectiveness by:

- Adopting a more explicit commitment to poverty reduction as the over-riding objective of development cooperation;
- Strengthening developing country ownership of the development process through support of nationally-owned processes and improved aid coordination;
- Ensuring greater transparency, and greater engagement with civil society, at both policy and operational levels;
- Making development cooperation more results-based and accountable by focusing more strongly on development outcomes, in particular by strengthening capacity to help countries achieve the Millennium Development Goals;
- Decentralizing operations and empowering country-level staff to be more flexible and responsive to country needs.

To help move the poverty-environment agenda forward, development agencies must learn from past mistakes and incorporate these lessons into the new context for development cooperation.<sup>53</sup> The shift in development cooperation to focus more explicitly on poverty reduction and greater country ownership provides new opportunities for improving environmental management. While our agencies have committed themselves to better environmental management as a tool for poverty reduction, this now has to be operationalized throughout our respective organizations – both in headquarters and in country offices.<sup>54</sup> We also need to place less emphasis on our own in-house procedures for evaluating environmental risks – although these will remain important – and much more emphasis on helping to develop the capacity of our partners to build up their own national processes to take up opportunities to reduce poverty through better environmental management.

Putting these commitments into practice requires major changes in the way we do business – but we cannot afford to fail. To take this message forward will require improved staff training and staff skills. New tools and procedures need to be implemented. The shift in aid towards more upstream work with financial support provided for whole sectors and budgets provides new challenges. The traditional environmental impact assessment approach needs to be moved up to sectors and policies, but also made more focused on environmental issues that affect the poor – and integrated with poverty assessments. There is a need to provide incentives to programme managers to mainstream poverty-environment issues. Senior management needs to provide strong leadership – not just in policy statements, but also in the way resources and staff are

allocated. Finally, there is a need for effective and transparent monitoring of progress against stated objectives and targets.

## Conclusion

---

This paper set out to articulate ways to reduce poverty in a sustainable manner through better environmental management. We have mapped out the key relationships between environment and poverty. Specifically, we have pointed to the enormous burden of disease that impacts the poorest through polluted water and air. We have also illustrated how directly and heavily dependent the poor are on natural resources and ecosystem services, and how their degradation can undermine their livelihoods. Related to this point is the vulnerability to environmental disasters that the poor are exposed to, and their limited ability to cope with such shocks. We know this not only because of empirical evidence, but most compellingly through what the poor say themselves.

While many links between environment and poverty are reasonably clear, we have also held up relationships that are controversial. Environment and growth, environment and population, natural resource degradation and the poor, are all themes that have been subject to much generalization and over-simplification. Effective solutions must be guided by a nuanced understanding of the specifics of these relationships, often determined by localized institutions and policies.

While we share a sense of urgency in combating environmental degradation, we have not dwelled at length on descriptions of problems that are generally, albeit not universally, agreed. Instead, we have emphasized links between poverty and environment, and above all, what lessons we can learn for the future. Hence, this paper is one that looks ahead with some degree of hope and optimism for the future: there are sometimes win-win opportunities, and there are rational ways of dealing with tradeoffs. Environmental degradation is not inevitable, nor is it an unavoidable sacrifice on the altar of economic growth. On the contrary, better environmental management is key to poverty reduction.

In that spirit, this paper has discussed a large set of measures, both at the national and international level, which can be taken to reduce poverty and enhance environmental quality. This has taken us outside the realm of narrowly conceived “environmental management”, as the links between poverty and environment are complex and crosscutting. We have not attempted to be comprehensive and provide detailed recommendations. The details are best left to inclusive national processes for shaping poverty reduction and sustainable development strategies. Rather, we have tried to be selective and strategic; focusing on the key items around which we hope to stimulate debate and action.

The WSSD is an opportunity for us all to focus on what is most important and to forge agreements that can lead the way forward. There can be no more important goal than to reduce and ultimately exterminate poverty on our planet.

## Endnotes

---

<sup>1</sup> Quotes are from Participatory Poverty Assessments in each country, which attempt to find out the views of the poor on poverty issues. See Brocklesby and Hinshelwood (2001); Narayan et al. (2000).

<sup>2</sup> The study measured the nature and extent of 'environmental income' – livestock fodder, fuelwood, natural fertilizers, wild fruits, vegetables and insects, gold from panning, wood for carpentry, grasses for baskets, and so forth, all of which added up to about 100 items in total. Cavendish collected his data during two separate agricultural years and in four villages in Zimbabwe. The numbers of households interviewed was close to 200 in 29 villages.

<sup>3</sup> Definitions of 'environmental health' differ. The data presented here is based on an analysis of the following health risks that make the largest contributions to the burden of disease: poor water quantity and quality, inadequate sanitation and waste disposal, indoor air pollution, urban air pollution, malaria, and agro-industrial chemicals and waste (including occupational hazards). Some reviewers of the Consultation Draft have argued that HIV/AIDS should also be considered in this context. There is no dispute about the importance of HIV/AIDS, as HIV/AIDS is the number one cause of death in Sub-Saharan Africa, and it rates as the fourth largest killer worldwide. An estimated 40 million people live with this disease, and about half that number already have died (WDI, 2002). However, in the classification used in our main source (Lvovsky, 2001), this disease falls outside of the definition of 'environmental hazards'.

<sup>4</sup> In a study of 1000 randomly selected households in Accra, Ghana, Songsore and McGranahan (1993) analyze the links between local environment, wealth and health. Wealth is measured in terms of possession of certain consumer durables and frequency of meat, poultry or fish consumption. The poorest and the least poorest quintiles are singled out for comparison. The poorest households show higher incidence of diarrhea, especially among children: 22% of the children in the poorest quintile, but only 9% in the least poor were subject to diarrhea in the two weeks prior to the interview. The poorest enjoy significantly less environmental services (safe water, sewerage). They lack knowledge or means to efficiently prevent diseases, are exposed to more health hazards, and are subject to more crowding, i.e. more people share pots, toilets, living quarters, etc.

<sup>5</sup> For example, several interventions to diminish water-borne disease, limit indoor air pollution, and improve sanitation cost about \$20-\$120 per saved disability-adjusted-life-year (Bojö et al., 2001). The cost of saving a "statistical life" per year in Beijing through better sulfur dioxide abatement has been shown to be in the order of \$300/year (World Bank, 2000b). Lvovsky (2001) contains data on the cost-effectiveness of a large number of measures to combat air pollution. Natural resources degradation can reach a stage where rehabilitation is economically infeasible, such as for highly degraded cropland that has lost a viable rooting depth for crops. The most extreme case of irreversibility is the loss of species.

<sup>6</sup> Another example is that traditional coping mechanisms used by pastoralists are gradually being foreclosed by the establishment of sedentary agriculture in their traditional grazing lands.

<sup>7</sup> The indicators for the index of environmental quality are (i) decline in average emissions of carbon dioxide per capita, comparing the decade of the 1980s with the 1990s; (ii) decreases in the average emission of organic water pollutants (kg/day/worker) between the decade of the 1980s and the 1990s; and (iii) the annual average rate of deforestation measured over 1980-2000. Each country is ranked according to each criterion. Each country's point over all the components are averaged and the averages are used to re-rank the countries. This rank is the index measured on the y-axis in the figure. The higher the figure, the better the change in environmental ranking of indices over this time period. See World Bank (2000c) for further details.

<sup>8</sup> See Chapter 2 in World Bank (2002d) for additional examples and discussion.

<sup>9</sup> The win-win approach is developed under the UNDP/EC *Poverty and Environment Initiative* (UNDP, 1999a and 1999b), and in the World Bank's Development Report on *Development and Environment* (World Bank, 1992).

<sup>10</sup> Ekblom and Bojö (1999) review the literature in relation to nine hypotheses relating to links between poverty and environment. They show that often-conflicting empirical results should temper the tendency to over-simplify about these relationships. Nevertheless, they conclude that the poor tend to be major victims of environmental degradation, which opens up opportunities for win-win interventions. See also the *Poverty and Environment Initiative* (UNDP, 1999a and 1999b).

<sup>11</sup> For some examples, see the *Poverty and Environment Initiative* (UNDP, 1999a and 1999b); also *Farmer Innovation in Africa* edited by Reij and Waters-Bayer (2001).

---

<sup>12</sup> PRSPs were endorsed in September 1999 by the World Bank and the IMF as a new framework for poverty reduction. PRSPs are designed to be (i) country-driven, with broad participation of civil society; (ii) based on an understanding of the links between public actions and poverty outcomes; and (iii) oriented to achieve outcome-related goals for poverty reduction. This is usually a two-stage process with an ‘Interim’ PRSP followed by the more consultative and participatory full PRSP. For the latest versions of Interim and full PRSPs, see the World Bank or IMF website: [www.worldbank.org](http://www.worldbank.org) and [www.imf.org](http://www.imf.org) respectively. The *Poverty Reduction Sourcebook* (World Bank, 2001c) provides further detail on the design of PRSP. It also contains a chapter on Environment (Bojö et al, 2001). It can be accessed on [www.worldbank.org](http://www.worldbank.org).

<sup>13</sup> Of the 40 PRSPs reviewed, only eight were “full” PRSPs, while the rest are called “interim.” The latter implies that they were written more as roadmaps on the way to a more comprehensive PRSP. As more and more PRSPs become full PRSPs, the integration of environment is expected to improve.

<sup>14</sup> The UN guidance defines a strategy for sustainable development as “...a coordinated, participatory and iterative process of thoughts and actions to achieve economic, environmental and social objectives in a balanced and integrated manner...The particular label applied to a national sustainable development strategy is not important as long as the underlying principles...are adhered to” (UNDESA, 2001). For example, established frameworks such as a National Vision, National Agenda 21 or a nationally-owned poverty reduction strategy can all provide a good basis for strategic action toward sustainable development.

<sup>15</sup> One of the International Development Goals adopted by the UN General Assembly is to implement national sustainable development strategies by 2005. OECD has defined such a strategy as “A *coordinated set of participatory and continuously improving processes of analysis, debate, capacity strengthening, planning and investment, which integrates the economic, social and environmental objectives of society, seeking trade offs where this is not possible*” (OECD, 2001, p. 9).

<sup>16</sup> Financial transfers from GEF can contribute significantly to address four critical threats to the global environment: loss of biodiversity, climate change, degradation of international waters, and depletion of the ozone layer. But what about financial sustainability? The creation of Trust Funds in perpetuity has been one answer. These provide a means for ensuring long-term sustainability, but also tie-up substantial amounts of capital for the long-term. Other options include short-term financing of an investment phase to allow, e.g., a protected area to begin to generate its own financial revenues that can ensure sustainability. See GEF (1998) for an evaluation of experience with Conservation Trust Funds.

<sup>17</sup> Poverty-environment indicators can take a variety of forms. Some indicators are more generic in nature, such as deaths from acute respiratory infection as a measure of environmental health. Others are more site-specific, such as livelihood dependence on different kinds of natural resources. Interpretation is always site-specific. For example, in some cases reduced dependence on natural resources will mean a reduction in poverty as the poor move to off-farm employment. Alternatively, this could indicate increased poverty as a result of a decline in the poor’s access to resources. Even for more generic indicators such as environmental health, interpretation often will be context-specific – for example, acute respiratory infections may be lower in parts of Africa than India as more cooking is done outdoors. For some indicators, such as losses from environment-related disasters, more quantitative data will be possible. For other measures, such as the percentage of poor fishers with access to adequate catches, more qualitative data may be required. Indicators can be final (focusing on impacts and outcomes) or intermediate (outputs or inputs). Final indicators are the most important, but often it is hard to isolate the effect of the intermediate input on the final outcome. As with all indicators, poverty-environment indicators must be specific, measurable, attainable (and by implication cost-effective), relevant and time-bound.

<sup>18</sup> For example, see Shyamsundar (2002); Nunnan et al (2001); Henninger and Hammond (2000).

<sup>19</sup> For a discussion of spatially disaggregated data in an urban context, see Hardoy et al (2001).

<sup>20</sup> We have focused here on national level M&E, but it is recognized that lower levels of monitoring may be quite valuable in informing local decision-makers and the public at large.

<sup>21</sup> The importance of this issue is underlined in the context of the MDGS. MDG 5 contains Target 11: “By 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers” and an Indicator 31: “Proportion of people with access to secure tenure.”

<sup>22</sup> Jodha (1986) has documented this process in the case of privatization of common property resources in India.

<sup>23</sup> For a discussion about tenure options and significance in an **urban** context, see Payne (2002).

<sup>24</sup> See IIED (1994) for several examples.

<sup>25</sup> For example, in Mexico the government passed a new water law in 1992 that formalized property rights to water and established the principle of participation. In less than a decade more than 90 percent of the 3

---

million hectares in irrigation districts have been turned over to user associations, representing half a million farmers. Cost recovery has risen from 30 percent to 80 percent. Some associations are involved in groundwater management, and the example of Hermosillo shows that local empowerment can bring pumping and recharge into balance. Participation and establishment of trade in water markets have made this possible. See World Water Council (2000).

<sup>26</sup> See examples from Indonesia in Read and Cortesi (2001).

<sup>27</sup> Global sales of certified coffees (Organic, Fair Trade and Shade brands) are estimated at about US\$0.5 billion annually and are growing rapidly (Giovannucci, 2001).

<sup>28</sup> In their analysis for China and India, Boudri et al (2002) show that the substantial switches to renewable energy sources are not only directly cost-effective, but can also reduce the cost of SO<sub>2</sub>-emission control considerably.

<sup>29</sup> Venkata (1997) contains a number of articles documenting in considerable detail both the promise of renewable energy technology, and the many difficulties of a technical, financial and social nature that these face in developing countries.

<sup>30</sup> Many VIP latrines stand unused due to lack of awareness of their benefits, or because of poor placement or construction. Similarly, provision of low-cost soap will not help if people do not use them to wash their hands. Such simple social and technological changes should not be belittled: some 2-3 million children die every year of diarrheal diseases. Handwashing could perhaps cut that number in half. See Public-Private Partnership in Handwashing A coalition of between the World Bank, governments, donors, the private sector, and NGOs. (<http://www.worldbank.org/watsan/topics/handwashing.html>).

<sup>31</sup> WHO advocates four approaches to combat malaria: (i) prompt access to treatment, especially for young children; (ii) prevention and control among pregnant women; (iii) vector control; and (iv) prediction and containment of epidemics.

<sup>32</sup> For more details on the approach to disaster management, see ISDR (2002) and Gilbert and Kreimer (1999).

<sup>33</sup> For a multitude of examples, see the website maintained by MIT on collaboration with the World Bank and the Global Cities Alliance: Upgrading Urban Communities: A Resource for the Practitioners ([www.mit.edu/afs/athena/org/u/urbanupgrading/index.html](http://www.mit.edu/afs/athena/org/u/urbanupgrading/index.html)).

<sup>34</sup> See, for example, Reed (1992); Munasinghe et al. (1994); Munasinghe and Cruz (1995); and Reed (1996).

<sup>35</sup> Iannariello et al (20001) contains a basic framework for understanding the environmental consequences of macroeconomic reforms, and proposes a process for carrying out environmental impact assessment for such reforms.

<sup>36</sup> The discussion in this section is kept at the domestic level. International considerations are dealt with in Section 2.4.

<sup>37</sup> For example, there is a difference between sustainably harvesting the nation's forests up to their rate of growth ("living off the interest"), versus depleting the forest stock ("depleting the capital"). Similarly, the depletion of a mineral resource represents the liquation of a non-renewable asset, which, in traditional income accounting, is registered only as an income, but not as a depreciation of savings. More precisely, the depreciation of savings is represented by the *resource rent*, i.e. the difference between the world market price of the commodity in question and the extraction/harvesting cost (see World Bank, 1997 for details). This gives social planners and civil society less than a complete picture of the development of their economy. The United Nations Statistical Division, the World Bank and the U.S. National Academy of Sciences have all developed and recommended forms of more accurate national economic accounting systems to include the environment (Nordhaus and Kokkelenberg, 2001).

<sup>38</sup> The graph is derived from World Bank staff calculations based on World Bank (2002c).

<sup>39</sup> Increasingly, willingness to pay measures are derived in developing countries to assess the value of e.g. enhanced water supply, sanitation services, and waste collection (Bojö et al, 2001) When benefits are difficult to assess, cost-effectiveness analysis to achieve certain environmental goals can be very useful. See Lvovsky (2001) for examples.

<sup>40</sup> See Nickson and Franceys (2001); ADB (2000); Loftus and McDonald (2001) and World Bank (2002) for contrasting perspectives and examples of more and less successful interventions.

<sup>41</sup> World Bank (1997) Five Years After Rio details how subsidies of almost \$180 million in 1995 dollars were phased out in the late 1980s. Milled rice production has continued to rise.

<sup>42</sup> The concept of "rent" is used here to denote the difference between the market value and the full cost of resource extraction. The latter includes the normal market-based cost of capital. The excess is known as rent or profit.

---

<sup>43</sup> World Bank (2000c) *Greening Industry: New Roles for Communities, Markets, and Governments*, provides many examples of how economic instruments have been used successfully in developing countries. It also discusses how some countries, in particular Indonesia and the Philippines, have used public disclosure effectively, and how Mexico has successfully offered training to small and medium enterprises in pollution abatement.

<sup>44</sup> The World Bank study on *Globalization, Growth, and Poverty* (2002) details how more than 20 developing countries with some 3 billion people have doubled their ratio of trade to incomes of the past 20 years. They have also increased their growth rate to an average of 5 percent in the 1990s, which substantially exceeds the average for rich countries. However, some 2 billion people live in developing countries that have not successfully integrated themselves in the growing world economy, and their aggregate growth rate was negative in the 1990s. The relationship between aggregate growth and inequality is varied across countries. In Latin America, global integration has widened wage inequalities, but in several populous countries, such as China, India, and Vietnam, the data show that growth has been closely related to poverty reduction.

<sup>45</sup> Statistics from the official OECD website ([www.OECD.org](http://www.OECD.org)) on Total Support Estimate (TSE), which is an indicator of all gross transfers from taxpayers and consumers in support of agriculture (OECD, 2001), show a preliminary figure for 2000 of about US\$327 billion, down from US\$356 billion in 1999.

<sup>46</sup> An important example of adjustment to environmental standards comes from forestry. The Forest Stewardship Council (FSC) is an international non-profit organization founded in 1993 to support environmentally appropriate, socially beneficial, and economically viable management of the world's forests. Members come from environmental and social groups, the timber trade and forestry profession, indigenous people's organizations, community forestry groups and forest product certification organizations from around the world. Forest Certification is the process by which the performance of on-the-ground forestry operations are assessed against a predetermined set of standards. The Forest Stewardship Council's Principles and Criteria for Forest Management serve as the global foundation for the development of region-specific forest-management standards. Independent certification bodies, accredited by the FSC in the application of these standards, conduct impartial, detailed assessments of forest operations at the request of landowners. If the forest operations are found to be in conformance with FSC standards, a certificate is issued, enabling the landowner to bring product to market as "certified wood", and to use FSC trademark logo. The total area certified to date is close to 28 million hectares at 390 sites in 54 countries. However, about two-thirds of those sites are in Europe. See the FSC website for additional information ([www.fsc.org/principal.htm](http://www.fsc.org/principal.htm)). Extending this type of initiative to developing countries will be important to secure access for their products.

<sup>47</sup> About 75 percent of FDI accrues to only 10 middle-income countries, and the investments are heavily concentrated in a few sectors: automotive, chemicals, electronic, energy, petroleum and petrochemicals, and pharmaceuticals. A fraction goes to the poorest countries, with the 48 poorest only accounting for US\$3 billion, and Africa receiving about one percent of capital flows (IMF, World Bank, UNEP, 2002).

<sup>48</sup> Some developing countries have built up a more pollution-intensive industry, largely in response to domestic demand. While developing countries do struggle with pollution, foreign-owned plants tend to be less polluting than domestically owned in the same industry. Furthermore, empirical studies have not found a pattern of developing countries lowering environmental standards to attract investment. This is not to write off the problems: environmental regulation is too weak to protect the poor from industrial pollution, but the cause is not FDI or globalization, but lack of domestic capacity.

<sup>49</sup> This is the focus of a forthcoming Joint Agency Paper on "Climate Change and Poverty: Supporting Poor Countries and Poor People to Cope with Climate Change," expected to be released in October 2002.

<sup>50</sup> Our concern here is primarily with the decline in populations of both flora and fauna important to the poor for a balanced diet and as sources of fiber and medication.

<sup>51</sup> Dollar and Pritchett (1998) provide the empirical underpinnings for our general statements in an influential study on the effectiveness of aid: *Assessing Aid: What Works, What Doesn't, and Why*.

<sup>52</sup> The HIPC Initiative was launched by the World Bank and IMF in 1996. A major extension was agreed in 1999 to (i) expand debt relief to about US\$50 billion, aiming at reducing the debt of more than 30 countries. Freed-up resources will be used to support poverty reduction measures, with emphasis on education and health. To date, 24 countries have entered the Initiative. More information is available on [www.worldbank.org/hipc/](http://www.worldbank.org/hipc/).

<sup>53</sup> A 2000 review of DFID found that "environment as a potential development opportunity – rather than as a risk to be minimized and mitigated – has not been fully mainstreamed across the bilateral programme" (Flint et al., 2000). Similarly, a 1997 review of the environmental performance of EC programmes in developing countries found that "there is no institutional accountability for ensuring that environmental actions are fully

---

integrated into country programming or that the support for environmental projects is based upon a broad strategy across regions (ERM, 1997). A review by the Operations Evaluation Department of the World Bank's environmental policies and activities, the first since 1987, found that "...Bank performance has substantially improved... but it has not yet integrated environmental concerns fully into its core objective or its country assistance and sector strategies" (Liebenthal, 2002). A 2000 review of UNDP's global programme on environment reached similar conclusions as above, and recent audits of UNDP have stressed the need for strengthened mechanisms to mainstream environmental considerations at both the policy and operational levels. Other development agencies face similar concerns.

<sup>54</sup> DFID; EC; UNDP; the World Bank's new strategy – *Making Sustainable Commitments: An Environment Strategy for the World Bank* – sets out to meet this challenge, and provides a direction for the long-term, as well as specific actions for the next five years (World Bank, 2001c).



## Abbreviations and Acronyms

---

CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
DAC	Development Assistance Committee (OECD)
DALYs	Disability-Adjusted Life Years
DFID	Department for International Development (UK)
EC	European Commission
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEF	Global Environment Facility
HIPC	Heavily Indebted Poor Country Initiative
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
IPCC	International Panel on Climate Change
IPRSP	Interim Poverty Reduction Strategy Paper
IUCN	World Conservation Union
MEA	Multilateral Environmental Agreement
NGO	Non-Governmental Organization
NSSD	National Strategy for Sustainable Development
OECD	Organization for Economic Co-operation and Development
PEI	Poverty and Environment Initiative (UNDP)
PPA	Participatory Poverty Assessment
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
SEA	Strategic Environmental Assessment
SIA	Social Impact Analysis
UNCCD	United Nations Convention to Combat Desertification and Drought
UNCED	United Nations Conference on Environment and Development
UNCHS	United Nations Centre for Human Settlements (Habitat)
UNDP	United Nations Development Programme
UNDESA	United Nations Department for Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
WHO	World Health Organization
WRI	World Resources Institute
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wide Fund for Nature

## References

---

- ACTS (African Centre for Technology Studies). 2000. *Ecological Sources of Conflict in Southern Africa*. Discussion Note. Nairobi.
- Agarwal, A. and S. Narain. 1999. *Community and Household Water Management: The Key to Environmental Regeneration and Poverty Alleviation*. Poverty and Environment Initiative Background Paper 2. UNDP, New York.
- Arnold, J. and P. Bird. 1999. *Forestry and Poverty*. Poverty and Environment Initiative Background Paper 6. UNDP, New York.
- Ashley, C., D. Roe and H. Goodwin. 2001. Pro-poor Tourism Strategies: Making Tourism Work for the Poor: A Review of Experience. Pro-poor tourism report No. 1. Overseas Development Institute, International Institute for Environment and Development and Centre for Responsible Tourism.
- ADB (Asian Development Bank). 2000. *Privatization of Water Supplies in Ten Asian Cities*. Manila.
- Bann, C. 1997. *An Economic Analysis of Alternative Mangrove Management Strategies*.
- Bartley, D.M. 1999. Species Introduction, International Conventions, and Biodiversity: Impacts, Prospects and Challenges. In Subasinghe, Arthur, Philips and Reantaso (eds.), *Thematic Review on Management Strategies for Major Diseases in Aquaculture*. Report of a workshop in Cebu, Philippines.
- Bass, S., M. Thornber, S. Roberts and M. Grieg-gran. 2001. *Certification's Impacts on Forests, Stakeholders and Supply Chains*. IIED (International Institute for Environment and Development), London.
- Bojö, J., J. Bucknall, K. Hamilton, N. Kishor, C. Kraus and P. Pillai. 2001. *Environment*. In *Poverty Reduction Strategy Sourcebook*. World Bank, Washington, D.C.
- Bojö, J. and S. Pagiola. 2000. *Natural Resources Management*. A contribution to the World Bank Environment Strategy. World Bank, Washington, D.C.
- Bojö, J. and R.C. Reddy. 2002. *Poverty Reduction Strategies: A Review of 40 Interim and Full PRSPs*. Environment Department Paper No. (x). World Bank, Washington, D.C.
- Boudri, J.C. et al. 2002. The potential contribution of renewable energy in air pollution abatement in China and India. *Energy Policy*, 30: 409-424. Elsevier.
- Boyd, C. and T. Slaymaker. 2000. *Re-examining the "more people, less erosion" hypothesis: special case or wider trend*. ODI Natural Resource Perspectives No. 63. Overseas Development Institute, London.
- Brocklesby, M.A. and E. Hinshelwood. 2001. *Poverty and the Environment: What the Poor Say*. Centre for Development Studies, University of Wales.
- Bruce N., L. Neufeld, E. Boy and C. West. 1998. Indoor biofuel air pollution and respiratory health: the role of confounding factors among women in highland Guatemala. *International Journal of Epidemiology*, 27: 454-58.
- Brunner, J., F. Seymour, N. Badenoch and B. Ratner 2000. *Forest Problems and Law Enforcement in Southeast Asia: The Role of Local Communities*. WRI, Washington, D.C.
- Buckles, D. 1999. *Cultivating Peace: Conflict and Collaboration in Natural Resource Management*. International Development Research Centre, Ottawa.

Campbell, H. 1997. Indoor air pollution and acute lower respiratory infections in young Gambian children. *Health Bulletin*, 55: 20-31.

Cavensdish, W. 1999. *Empirical Regularities in the Poverty-Environment Relationship of African Rural Households*. Center for the Study of African Economies. Working Paper Series 99-21. London.

CGIAR (Consultative Group on International Agricultural Research). 1997. *Report of the Study on CGIAR Research Priorities for Marginal Lands*. Technical Advisory Committee Working Document, TAC Secretariat. FAO, Rome.

Commission on Sustainable Development. 2002. *Implementing Agenda 21: Report of the Secretary-General*. Advance Unedited Text (E/CN.17/2002/PC.2/....). United Nations, New York.

Dasgupta and Das. 1998. *Health Effects of Women's Excessive Work Burden in Deforested Rural Areas of Uttarkhand*. Paper presented at the National Conference on Health and Environment. Center for Science and Environment, New Delhi.

Devarajan, S., M.J. Miller and E. Swanson. 2002. *Goals for Development: History, Prospects, and Costs*. World Bank, Washington, D.C.

DFID (Department for International Development). 2000a. *Achieving sustainability: poverty elimination and the environment*. Strategies for achieving the international development targets. London.

\_\_\_\_\_. 2000b. *Integrating sustainability into PRSPs: the case of Uganda*. Environmental Policy Department. London.

\_\_\_\_\_. 2000c. *Strategies for sustainable development: can country-level strategic planning frameworks converge to achieve sustainability and eliminate poverty?* DFID Background Briefing. London.

\_\_\_\_\_. 2001a. *Biodiversity – a crucial issue for the world's poorest*. London.

\_\_\_\_\_. 2001b. *Making government work for poor people. Strategies for achieving the international development targets*. London.

\_\_\_\_\_. 2002a. *Draft Land Policy Paper*. London.

\_\_\_\_\_. 2002b. *Review of the Inclusion of Poverty-Environment Issues in Selected Poverty Reduction Strategy Papers and Joint Staff Assessments*. Environmental Policy Department. London.

Diener, B.J. 1998. Portico, S.A. Strategic Decisions 1982-1997. In, *The Business of Sustainable Forestry: Case Studies*. A Project of the Sustainable Forestry Working Group.

Duraiappah, A.K., G. Ikiara, M. Manundu, W. Nyangena, R. Sinanga, H. Amman and D. Lamba. 2000. *CREED Policy Brief. Poverty-Environmental Degradation Nexus*, Mazingira Institute, Nairobi, Kenya.

EC (European Commission). 2001. Commission Staff Working document SEC(2001) 609 of 10 April 2001 on *Integrating the environment into EC economic and development co-operation*, and the respective Council Conclusions of 31 May 2001.

\_\_\_\_\_. 2002. *Towards a Global Partnership for Sustainable Development*, Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, 13 February 2002, COM(2002) 82 (final), Brussels.

Ekbom, A. and J. Bojö. 1999. *Poverty and Environment: Evidence of Links and Integration into the Country Assistance Strategy Process*. Environment Group, Africa Region, World Bank. Washington, D.C.

ERM (Environmental Resources Management). 1997. *Evaluation of the Environmental Performance of EC Programmes in Developing Countries*. Brussels.

ESD (Energy for Sustainable Development). 2000 *Poverty reduction aspects of successful improved household stoves programme* DFID knowledge and research paper. London.

EU (European Union Delegation). 1999. *Evaluation of the EU Contribution for Financial Year 1998/1999 to the Sector Support Programme for Community Water Supply and Sanitation, Pretoria, South Africa*. European Union Delegation.

Ezzati, M, and D.M. Kammen. 2001. Indoor air pollution from biomass combustion and acute respiratory infections in Kenya: an exposure-response study. *The Lancet*, 358(9282).

Flint, M., P. Balogun, A. Gordon, R. Hoare, D. Smith, B. Voysey and A. Ziegler. 2000. *Environmental Evaluation Synthesis Study. Environment: Mainstreamed or Sidelined? Main Report, Volume 1. Evaluation Report EV626* Department for International Development, London.

Gilbert, R. and A. Kreimer. 1999. *Learning from the World Bank's Experience of Natural Disaster Related Assistance*. Disaster Management Facility, Urban and Local Government, World Bank, Washington, D.C.

Giovannuci, D. 2001. *Sustainable Coffee Survey of the North American Specialty Coffee Industry*. Conducted for The Summit Foundation, The Nature Conservancy, North American Commission for Environment Cooperation, Specialty Coffee Association of America, and the World Bank (available at <http://www.scaa.org>).

GEF (Global Environment Facility). 1998. *GEF Evaluation of Experience with Conservation Trust Funds*. GEF/C.12/Inf.6. Washington, D.C.

Ghimire, K.B. and M.P. Pimbert. 1997. *Social Change and Conservation*. Earthscan Publications, London.

Global Witness. 2001 and 2000. A number of references are provided on the Global Witness web site (<http://www.oneworld.org/globalwitness/>).

Goldman, L. and N. Tran. 2002. *Toxics and Poverty*. World Bank, Washington, D.C. Processed.

GRI (Global Reporting Initiative). 2000. *Sustainability Reporting Guidelines on Economic, Environmental, and Social Performance*. Boston, Massachusetts.

GRID/Arendal. 1997. *Mapping Indicators of Poverty in West Africa*. DEIA/TR.97-8. Technical Advisory Committee Working Document, CGIAR, FAO, Rome.

Hardoy J., D. Mitlin and D. Satterthwaite. 2001. *Environmental Problems in an Urbanising World*. Earthscan Publications, London.

Hazell, P. and J.L. Garrett. 1996. *Reducing Poverty and Protecting the Environment: The Overlooked Potential of Less-favored Lands*. 2020 Brief 39. IFPRI (International Food Policy Research Institute), Washington, D.C.

Heinrich Böll Foundation. 2002. *The Jo'burg Memo: Fairness in a Fragile World*. Memorandum for the World Summit on Sustainable Development. Washington, DC. [check reference is correct]

Henninger, N. and A. Hammond. 2000. *A Strategy for the World Bank: Environmental Indicators Relevant to Poverty Reduction*. World Resources Institute, Washington, D.C.

Hodess, R. (ed.). 2001. *Global Corruption Report 2001*. Transparency International, Berlin.

Huber, R.M., J. Ruitenbeek and R. Seroa da Motta. 1998. *Market Based Instruments for Environmental Policymaking in Latin America and the Caribbean: Lessons from Eleven Countries*. World Bank Discussion Paper No. 381. Washington, D.C.

Iannariello, M.P., P. Stedman-Edwards, R. Blair and D. Reed. 2001. *Environmental Impact Assessment for Macroeconomic Reform Programs*. Macroeconomics Program Office, World Wildlife Fund, Washington, D.C.

ICRC (International Committee of the Red Cross). 1999. *Annual Report*. Geneva.

\_\_\_\_\_. 2001. *World Disasters Report 2000. Focus on Recovery*. International Federation of Red Cross and Red Crescent Societies, Geneva.

IFAD (International Fund for Agricultural Development). 2001. *Rural Poverty Report 2001*. Rome.

IFREMER. 1999. *Evaluation of Fisheries Agreements Concluded by the European Community*. Summary Report.

IIASA (International Institute for Applied Systems Analysis). 2001. *Global Agro-ecological Assessment for Agriculture in the 21<sup>st</sup> Century*. Vienna.

IIED (International Institute for Environment and Development). 2000. *Evaluating Eden: Exploring the myths and realities of community-based wildlife management*. Evaluating Eden Series No. 8. London.

\_\_\_\_\_. 2000. *Rural Livelihoods and Carbon Management*. IIED Natural Resource Issues Paper. London.

\_\_\_\_\_. 2002. *Drawers of Water II*. In collaboration with Community Management and Training Services Ltd. (Kenya), Institute of Resource Assessment of the University of Dar es Salaam (Tanzania), Department of Pediatrics and Child Health of Makerere University Medical School (Uganda). London.

IIED and WBCSD (World Business Council for Sustainable Development). 2002. *Mining, Minerals and Sustainable Development* (Draft Report). London.

IMF (International Monetary Fund), World Bank and UNEP (United Nations Environment Programme). 2002. *Financing for Sustainable Development: An input to the World Summit on Sustainable Development*. Revised Consultation Draft.

IPCC (International Panel on Climate Change). 2001. *Summary for Policymakers. Climate Change 2001: Impacts, Adaptation, and Vulnerability*. A Report of Working Group II of the IPCC. Geneva.

ISDR Secretariat (International Strategy for Disaster Reduction). 2002. *Disaster Risk and Sustainable Development: understanding the links between development, environment and natural hazards leading to disasters*. Draft Background Document for the World Summit on Sustainable Development (revised version 14 April 2002). Bonn.

Jodha, N.S. 1986. Common property resources and rural poor in dry regions of India. *Economic and Political Weekly*, 21(27): 1169-1181.

Johnstone, N., L. Wood and R. Hearne. 1999. *The Regulation of Private Sector Participation in Urban Water Supply and Sanitation: Realising Social and Environmental Objectives in Developing Countries*. Discussion Paper 99-01, Environmental Economics Programme, International Institute for Environment and Development, London.

Koziell, I. and J. Saunders. 2001. *Living off Biodiversity: Exploring Livelihoods and Biodiversity*. Issues in Natural Resources Management. IIED, London

- Leighton, M. 1999. Environmental Degradation and Migration. In *Drylands, Poverty and Development*. Proceedings of the World Bank Round Table. World Bank, Washington, D.C.
- Lele, S. 2001. *Godsend, slight of hand or just muddling through: Joint water and forest management in India*. ODI Natural Resource Perspectives. Overseas Development Institute, London.
- Lemos, M. 1998. The politics of pollution control in Brazil: state actors and social movements cleaning up Cubatao. *World Development*, 26(1): 75-87.
- Lewis, Connie. 1996. *Managing Conflicts in Protected Areas*. IUCN-The World Conservation Union, Gland, Switzerland.
- Loftus, A.J. and D. McDonald. 2001. Of liquid dreams: a political ecology of water privatization in Buenos Aires. *Environment & Urbanization*, 13(2): .
- Lvovsky, K. 2001. *Health and Environment*. Environment Strategy Papers, No. 1. Environment Department, World Bank, Washington, D.C.
- MRAG (Marine Resources Advisory Group). 2000. *The impact of fisheries subsidies on developing countries*. Prepared in association with Cambridge Resource Economics and International Institute for Environment and Development. London.
- Morris, E. and S.C. Rajan. 1999. *Energy as it Relates to Poverty Alleviation and Environmental Protection*. Poverty and Environment Initiative Background Paper 4. UNDP (United Nations Development Programme), New York.
- Munasinghe, M. and W. Cruz. 1995. *Economy-wide Policies and the Environment: Lessons from Experience*. World Bank, Washington, D.C.
- Munasinghe, J. Warford, A. Schwab, W. Cruz and S. Hansen. 1994. *The Evolution of Environmental Concerns in Adjustment Lending: A Review*. World Bank, Washington, D.C.
- Murray, C. and A. Lopez. 1996. *The Global Burden of Disease*. Harvard University Press, Cambridge, MA.
- Myers, N. and J. Kent. 2001. *Perverse Subsidies: How Tax Dollars Can Undercut the Environment and the Economy*. Island Press, Washington, D.C.
- Narayan, D., with R. Patel, K. Schafft, A. Rademacher and S. Koch-Schulte. 2000. *Voices of the Poor: Can Anyone Hear Us?* World Bank, Washington, D.C.
- Nickson, A. and R. Franceys. 2001. *Tapping the Market: Can Private Enterprise Supply Water to the Poor?* ID21.
- Nordhaus and Kokkelenberg (eds.). 2001. *Nature's Numbers: Expanding the National Economic Accounts to Include the Environment*. National Research Council, National Academy Press, Washington, D.C.
- Nunan, F. with U. Grant, G. Bahigwa, T. Muramira, P. Bajracharya, D. Pritchard and M. Jose Vargas. 2002. *Poverty and the Environment: Measuring the Links. A Study of Poverty-Environment Indicators with Case Studies from Nepal, Nicaragua and Uganda*. Environment Policy Department, Issue Paper No. 2. Department for International Development, London.
- OECD (Organization for Economic Cooperation and Development). 2000. *The OECD Guidelines for Multinational Enterprises, Revision 2000*. Paris.
- \_\_\_\_\_. 2001a. *Poverty-Environment Linkages*. Working Party on Development Cooperation and the Environment (February 14, 2001). Paris.

- \_\_\_\_\_. 2001b. *Sustainable Development, Critical Issues*. Paris.
- \_\_\_\_\_. 2001c. *The DAC Guidelines. Strategies for Sustainable Development: Guidance for Development Cooperation*. Paris.
- Ostrom, E. 1990. *Governing the Commons: the Evolution of Institutions for Collective Actions*. Cambridge University Press, Cambridge.
- Osuntogun, A. 2002. *Applied Poverty-Environment Indicators: The Case of Nigeria*. Report submitted to the Environment Department, World Bank. Abuja. Processed.
- Oxfam. 2002. *Poverty in the midst of Wealth: The Democratic Republic of Congo*. Oxfam Policy Papers, Oxfam Briefing Paper. Oxford.
- Payne, G. 2002. *Land, Rights and Innovation: Improving Tenure Security for the Urban Poor*. ITDG Publishing, London.
- Pillai, P. 2000. *The State and Collective Action: Successful Adjustment by the Tamil Nadu Leather Cluster to German Environmental Standards*. Unpublished MCP Thesis, Massachusetts Institute of Technology.
- Quisumbing, A.R., E. Payongayong, J.B. Aidoo and K. Otsuka. 2001. Women's land rights in the transition to individualized ownership: implications for tree-resource management in western Ghana. *Economic Development and Cultural Change*, 50(1).
- Read, T. and L. Cortesi. 2001. *Stories at the Forest Edge: The KEMALA Approach to Crafting Good Governance and Sustainable Futures*. Biodiversity Support Program, Washington, D.C.
- Reed, D. (ed.). 1992. *Structural Adjustment and the Environment*. Earthscan Publications, London.
- Reed, D. (ed.). 1996. *Structural Adjustment, the Environment and Sustainable Development*. Earthscan Publications, London.
- Reed, D. and H. Rosa. 1999. *Economic Reforms, Globalization, Poverty and the Environment*. Poverty and Environment Initiative Background Paper 5. UNDP (United Nations Development Programme), New York.
- Reij, C. and A. Waters-Bayer (eds.). 2001. *Farmer Innovation in Africa*. Earthscan Publications, London.
- Satterthwaite, D. 1999. *Links Between Poverty and the Environment in Urban Areas of Africa, Asia and Latin America*. Poverty and Environment Initiative Background Paper 1. UNDP (United Nations Development Programme), New York.
- Scherr, S. 1999. *Poverty-Environment Interactions in Agriculture: Key Factors and Policy Implications*. Poverty and Environment Initiative Background Paper 3. UNDP (United Nations Development Programme), New York.
- Shepherd, G. 1991. The communal management of forests in the semi-arid and sub-humid regions of Africa. *Development Policy Review*, 9:151-76.
- Shively, G. 2001. Poverty, consumption risk and soil conservation. *Journal of Development Economics*, 65: 267-290.
- Shyamsundar, P. 2002. *Poverty-Environment Indicators*. Environment Department Paper No. 84. World Bank, Washington, D.C.
- Smith, K.R. 1999. *Pollution Management in Focus*. Indoor Air Pollution Discussion Paper No. 4, Environment Department, World Bank. Washington, DC.

- Smith, K.R. 2000. National Burden of Disease in India from Indoor Air Pollution. In *Proceedings of the National Academy of Sciences of the United States of America*, PNAS 2000 97: 13286-13293.
- Songsore, J. and G. McGranahan. 1993. Environment, Wealth and Health: Towards an analysis of intra-urban differentials within the Greater Accra Metropolitan Area, Ghana. *Environment and Urbanization*, 5(2): 10-34.
- Third World Network. 2001. *International Environmental Governance: some issues from a developing country perspective*. Working Paper prepared for the Chairman of G77. Penang, Malaysia.
- Tiffen, M., M. Mortimore and F. Gichuki. 1994. *More People, Less Erosion: Environmental Recovery in Kenya*. Chichester, New York.
- UNCHS (United Nations Centre for Human Settlements). 1996. *An Urbanizing World: Global Report on Human Settlements*. Oxford University Press, Oxford.
- UNDESA (United Nations Department for Economic and Social Affairs). 2002. *Guidance in Preparing a National Sustainable Development Strategy: Managing Sustainable Development in a New Millennium*. WSSD Second Preparatory Session, Background Paper No. 13 (DESA/DSD/PC2/BP13). New York.
- UNDP (United Nations Development Programme). 1995. *Human Development Report 1995*. Oxford University Press, New York and Oxford.
- \_\_\_\_\_. 1997. *Reconceptualising Governance*. New York.
- \_\_\_\_\_. 1999a. *A Better Life... With Nature's Help: Success Stories*. Poverty and Environment Initiative. New York.
- \_\_\_\_\_. 1999b. *Attacking Poverty While Protecting the Environment: Towards Win-win Policy Options*. J. Ambler (ed.). Poverty and Environment Initiative Synthesis Paper. New York.
- \_\_\_\_\_. 2001. *Disaster Profiles of the Least Developed Countries*. Emergency Response Division, UNDP, New York.
- UNDP, UNDESA (United Nations Department for Economic and Social Affairs) and World Energy Council. 2000. *World Energy Assessment*. UNDP, New York.
- UNEP (United Nations Environment Programme). 1999. *Trade Liberalization and the Environment: Lessons Learned from Bangladesh, Chile, India, Philippines, Romania and Uganda*. Environment and Trade Unit, Geneva.
- \_\_\_\_\_. 2002a. *Fisheries subsidies and marine resource management: lessons learned from studies in Argentina and Senegal*. UNEP/ETU/2001/7 (Vol. II). Environment and Trade Unit, Geneva.
- \_\_\_\_\_. 2002b. *Global Environment Outlook 3: Past, Present and Future Perspectives*. Earthscan Publications, London.
- Waddell, S. 2001. *Emerging Models for Developing Water Systems for the Rural Poor: From Contracts to Co-production*. Business Partners for Development Water and Sanitation Cluster, London.
- Wang, L. 2002. *Health Outcomes in Poor Countries and Policy Options: Empirical Findings from Demographic and Health Surveys*. World Bank Environment Department, Policy Research Working Paper 2831. World Bank, Washington, D.C.
- Warhurst, A. (ed.). 1998. *Mining and the Environment: Case Studies from the Americas*. International Development Research Center, Ottawa.



Warner, M. 2000. *Tri-sector partnerships for social investment within the oil, gas and mining sector – an analytical framework*. Working Paper No 2, Business Partners for Development.

WHO (World Health Organization). 1997. *World Health Report*. Geneva.

World Bank. 1992. *World Development Report 1992: Development and the Environment*. Oxford University Press, Oxford.

\_\_\_\_\_. 1996. *Energy for Rural Development in China*. ESMAP (Energy Sector Management Assistance Programme), World Bank, Washington, D.C.

\_\_\_\_\_. 1996. *Pakistan: Economic Policies, Institutions, and the Environment*. Report No. 15781-PAK, Agriculture and Natural Resources Division, Country Department I, South Asia Region, Washington, D.C.

\_\_\_\_\_. 1997. *Five years after Rio: Innovations in Environmental Policy*. Environmentally Sustainable Development Studies and Monographs Series No. 18. Washington, D.C.

\_\_\_\_\_. 1998. *Assessing Aid: What Works, What Doesn't, and Why*. A World Bank Policy Research Report. Oxford University Press, Oxford.

\_\_\_\_\_. 2000a. *A Review of the World Bank's 1991 Forest Strategy and Its Implementation*. Operations Evaluation Department, Washington, D.C.

\_\_\_\_\_. 2000b. *Greening Industry: New Roles for Communities, Markets, and Governments*. Washington, D.C.

\_\_\_\_\_. 2000c. Indonesia Integrated Pest Management Training Project. Implementation Completion Report. Washington, D.C.

\_\_\_\_\_. 2000d. *The Quality of Growth*. Oxford University Press, Oxford.

\_\_\_\_\_. 2001a. *Economic Causes of Civil Conflict and their Implications for Policy*. Washington, D.C.

\_\_\_\_\_. 2001b. *Engendering Development: Through Gender Equality in Rights, Resources, and Voice*. A World Bank Policy Research Report. Oxford University Press, Oxford.

\_\_\_\_\_. 2001c. *Making Sustainable Commitments: An Environment Strategy for the World Bank*. Washington, D.C.

\_\_\_\_\_. 2001d. *Poverty Reduction Strategy Sourcebook*. Washington, D.C.

\_\_\_\_\_. 2001e. *World Development Indicators*. Washington, D.C.

\_\_\_\_\_. 2001e. *World Development Report 2000/2001 Attacking Poverty*. Washington, D.C.

\_\_\_\_\_. 2002a. *Globalization, Growth, and Poverty: Building an Inclusive World Economy*. A World Bank Policy Research Report. Oxford University Press, Oxford.

\_\_\_\_\_. 2002b. *Water Resources Strategy: Strategic Directions for World Bank Engagement*. Draft for discussion (March 25, 2002). Washington, D.C.

\_\_\_\_\_. 2002c. *World Development Indicators 2002*. Washington, D.C.

\_\_\_\_\_. 2002d. *World Development Report 2003. Sustainable Development in a Dynamic Economy*. Washington, D.C.

WRI (World Resources Institute). 1996. *World Resources 1996-1997. The Urban Environment*. Oxford University Press, Oxford.

\_\_\_\_\_. 2000. *World Resources 2000-2001. People and Ecosystems*. Washington, D.C.

WTO (World Trade Organization). 1998. *Report of the Appellate Body, United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/Appellate Body/R (October 12, 1998).

\_\_\_\_\_. 2001. *Ministerial Declaration* on 14 November 2001 of the Ministerial Conference Fourth Session, November 9-14, 2001. Doha.

World Water Council. 2000. *A Water Secure World. Vision for Water, Life and the Environment*. World Water Vision Commission Report. Marseille.

Yaron, G. and White, J. 2002. *Mainstreaming cross cutting themes in programme and sector aid: the case of environmental issues*. ODI Natural Resource Perspectives, No. 77. Overseas Development Institute, London.

Zarsky, L. 1999. "Havens, Halos and Spaghetti: Untangling Evidence about Foreign Direct Investment and the Environment." In *Foreign Direct Investment and the Environment*. Organization for Economic Cooperation and Development, Paris.

Zedillo, E.Z., A. Y. Al-Hamad, D. Bryer, M. Chinery-Hesse, J. Delors, R. Grynspan, A.Y. Livshits, A.M. Osman, R. Rubin, M. Singh, and M. Son. 2001. *Technical Report of the High-Level Panel on Financing for Development*. United Nations, New York.