



Biodiversity, Development and Poverty Alleviation

**Recognizing
the Role of
Biodiversity
for Human
Well-being**



Convention on
Biological Diversity



2010 International Year of Biodiversity

INTERNATIONAL DAY for BIOLOGICAL DIVERSITY

Biodiversity, Development and Poverty Alleviation

Recognizing the Role of Biodiversity for Human Well-being

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International Day
for Biological Diversity
22 May 2010





Concerned by the continued loss of biological diversity, the United Nations General Assembly declared 2010 the **International Year of Biodiversity** (IYB). The year coincides with the target adopted by governments in 2002 to achieve, by 2010, significant reduction in the current rate of loss of biodiversity. The General Assembly designated the Secretariat of the Convention on Biological Diversity (CBD) to serve as the focal point for the observance of the IYB, "... with a view to bringing greater international attention to bear on the issue of the continued loss of biodiversity". Promoting a message, *Biodiversity is life, Biodiversity is our life*, the year will be celebrated through numerous events, actions and initiatives carried out by a variety of actors and organizations around the world. In September 2010 in New York, a high-level meeting on biodiversity will be held prior to the opening of the general debate of the sixty-fifth session of the United Nations General Assembly. In December 2010 in Kanazawa, Ishikawa Prefecture, Japan, a ceremony will be held to mark the closure of the IYB and serve as prelude to the opening of the 2011 International Year of Forests.

www.cbd.int/2010

BIODIVERSITY FOR DEVELOPMENT AND POVERTY ALLEVIATION

The **International Day for Biological Diversity**, observed annually on 22 May, commemorates the adoption of the text of the Convention on 22 May 1992 by the Nairobi Final Act of the Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity. The theme of the International Day for Biological Diversity in 2010 is *Biodiversity for Development and Poverty Alleviation*. Celebration on this theme provides unique opportunity to raise public awareness on the importance of biodiversity to sustainable development and the attainment of the Millennium Development Goals (MDG). The theme is particularly pertinent in 2010. In 2002, Parties to the Convention on Biological Diversity (CBD) committed to achieve by 2010 a significant reduction of the current rate of biodiversity loss as a contribution to poverty alleviation and to the benefit of all life on Earth. Actions to achieve the 2010 Biodiversity Target were incorporated in the Plan of Implementation of the World Summit on Sustainable Development adopted in Johannesburg in September 2002 and later endorsed by the United Nations General Assembly. Subsequently, the 2010 Biodiversity Target was incorporated as a new target under Goal 7 (to "Ensure environmental sustainability") of the MDG. At the tenth meeting of the Conference of the Parties to the CBD, in Nagoya, Japan in October 2010, Parties to the CBD will review progress towards attainment of the 2010 Biodiversity Target and seek strengthened commitment to new strategy and targets, and their means of implementation, post-2010.

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FOREWORD



The implementation of the three objectives of the Convention on Biological Diversity (CBD) is critical to achieving the Millennium Development Goals and to combating poverty. For this reason, the 2010 biodiversity target adopted at the World Summit on Sustainable Development has been integrated into the Millennium Development Goals. Poor rural

communities depend on biodiversity and ecosystem services for health and nutrition, for crop development, and as a safety net when faced with climate variability and natural disasters. Urban dwellers the world over depend on water provision and purification performed by forests and wetlands. Healthy ecosystems like forests and bogs contain massive carbon reservoirs and are vital to regulating the global climate.

Biodiversity loss threatens to increase poverty and undermine development. Under a Memorandum of Understanding signed at the margins of the ninth Meeting of the Conference of the Parties (COP9) held in May 2008 in Bonn, Germany, the United Nations Development Programme and the Secretariat of the CBD are collaborating to share knowledge and experience in the mainstreaming of biodiversity in development. This collaboration aims to ensure that the production practices employed by large, medium, and small enterprises in major economic sectors such as forestry, agriculture, fisheries, and tourism are compatible with biodiversity conservation objectives. A key focus is strengthening the management and economic benefits derived from the world's protected areas and indigenous and community conservation areas. This involves policy development, support to institutional strengthening, investments, and enabling on-the-ground activities to showcase effective biodiversity management approaches.

With this booklet on biodiversity, development and poverty alleviation we aim to encourage development outlooks and practices that conserve and sustainably use biodiversity and promote access and benefit sharing arising from the use of genetic resources.

Ahmed Djoghlaoui
Executive Secretary
Convention on Biological Diversity



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Martine Perret

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ONE

Introduction: Biodiversity Underpins Human Well-being

Biodiversity conservation and sustainable use with equitable sharing of benefits derived from its natural services are the basis of human well-being. Vital signs for biodiversity are plummeting and the related ecosystem services seriously undermined. Biodiversity benefits are being threatened by development choices that ignore the full value of these natural services to us all and particularly the poorest. Reversing this negative trend is not only possible, but essential to human well-being.



UN Photo/Eskinder Debebe

natural resources, and pollution'. Climate change is now adding its effects to the cumulative pressures. In the last century we have lost 35% of mangroves, 40% of forests and 50% of wetlands². Due to human actions, species are being lost at a rate that is estimated to be up to 100 times the natural rate of extinction. The IUCN Red List (2009), reports that of the 44,837 species they have assessed, 38% are threatened and 804 are extinct. There is growing consensus that most of the vital signs of biodiversity are plummeting and that biodiversity loss is moving ecosystems ever closer to thresholds, or tipping points, beyond which their services-providing capabilities will be seriously undermined.

Deteriorations in ecosystem services that result from biodiversity loss have severe consequences for human societies and economies and for the future of life on the planet. The poor are particularly vulnerable to these consequences because they are often directly dependent on biodiversity for their day to day survival and are generally not in a position to afford substitutes. 70% of the world's poor live in rural areas and depend directly on biodiversity for their survival and well-being. The urban poor also rely heavily on biodiversity.

Though human well-being is dependent on the continued provision of ecosystem services, biodiversity is very rarely included in our economic outlook because it is mainly a public good, sending no signals through markets. Yet basic indicators such as employment rates, GDP, inflation, and financial and economic outlooks are sending clear messages on the absence of sustainability in development

Biodiversity is the term used to describe life on earth — the variety of living things, the places they inhabit and the interactions between them. These interactions provide us with a number of essential natural services (“ecosystem services”) — such as food production, soil fertility, climate regulation, carbon storage — that are the foundation of human well-being.

Ecosystem services can shape the development paths of a country, region, or locality — e.g. whether it chooses to pursue agriculture, timber production, fishing, tourism or any combination of these or other productive sectors. Development choices in turn determine the fate and state of biodiversity and ecosystem services. Yet the way we organise, control, and govern our development processes too often ignore this reality. Consequently, across the planet, biodiversity is being eroded and ecosystem services degraded.

The most important threats to biodiversity have long been habitat loss, due to large scale conversion of land to agriculture and urban centres, introduction of invasive alien species, overexploitation of



FAO/G. Bizzarri



UN Photo/Kay Muldoon

processes. Reality across the planet is likely much worse than what we measure and track as many people and communities function in informal systems outside of mainstream economic ones. Conventional economic and monetary values provide crude and limited indicators of human well-being. Nevertheless, what we know is enough to call for urgent action.

As the effects of the financial and economic crisis and of climate change continue to mount, countries everywhere are struggling to sustain their development achievements. Climate change is a manifestation and symptom of the lack of adequate consideration of environmental sustainability in development pathways. Biodiversity both affects and is affected by climate change: on the one hand climate change is a major cause of biodiversity loss, on the other, the conservation and sustainable use of biodiversity offers resilience to climate variability and natural disasters. The climate change, food production and economic crisis are wake up calls to the need for factoring in sustainability in development choices. This is an opportune time to reflect on root causes of these crises, and more importantly to shift policies, investments and day to day actions to those most effective for the conservation and sustainable use of biodiversity and ecosystem

Box 1.1 Biodiversity and Human Well-being Facts and Figures

ECONOMIC BENEFITS OF BIODIVERSITY ASSETS

- Percentage of pharmaceutical sector's turnover (\$650 billion annually) derived from genetic resources: **20 to 50%**.
- Namibia's protected areas contribute 6% of GDP in tourism alone with a significant potential for growth'. Income from Namibia's conservancies (and conservancy-related activities): **US\$ 4.1 million**². Percentage of total export from foreign tourist spending: **estimated 24%**³.
- Contribution of the Great Barrier Reef to the Australian economy (value of tourism, other recreational activities and commercial fishing): **AUS 6 billion**⁴.
- **Sixty percent** of ecosystem services have been degraded in fifty years and the cost of failure to halt biodiversity loss on land alone in last 10 years is estimated to be **\$500 billion**⁵.
- Giga tons of carbon stored in Canadian national parks: **4.43** (billion metric tonnes). Value of this service: **US\$ 11bn – US\$ 2.2 trillion** depending on the market price of carbon.
- Years of Mexico's (2004) carbon dioxide emissions offset by its protected areas: **more than 5**. Value of this service: **US\$ 12.2 billion**.

LIVELIHOODS AND EMPLOYMENT

- **Nearly a sixth** of the world's population depend on protected areas for significant percent of their livelihoods⁶.
- **Over a billion** people in developing countries rely on fish as a major source of food and **80%** of the world fisheries are fully or overexploited⁷.
- Cost of global network of marine protected areas conserving **20–30%** of the world's seas: **up to \$19 billion** annually creating **around one million jobs**⁸.
- Wetlands of Okavango Delta generate **32 million \$** per year to local households of Botswana mainly through tourism. Total economic output: **145 million \$ — 2.6%** of Botswana GNP.
- Number of people in the world who rely on timber and non-timber forest products: **1.6 billion**⁹ and annual rate of deforestation: **13 million hectares** (or roughly the area of Bangladesh)¹⁰.

HEALTH, NUTRITION AND VULNERABILITY

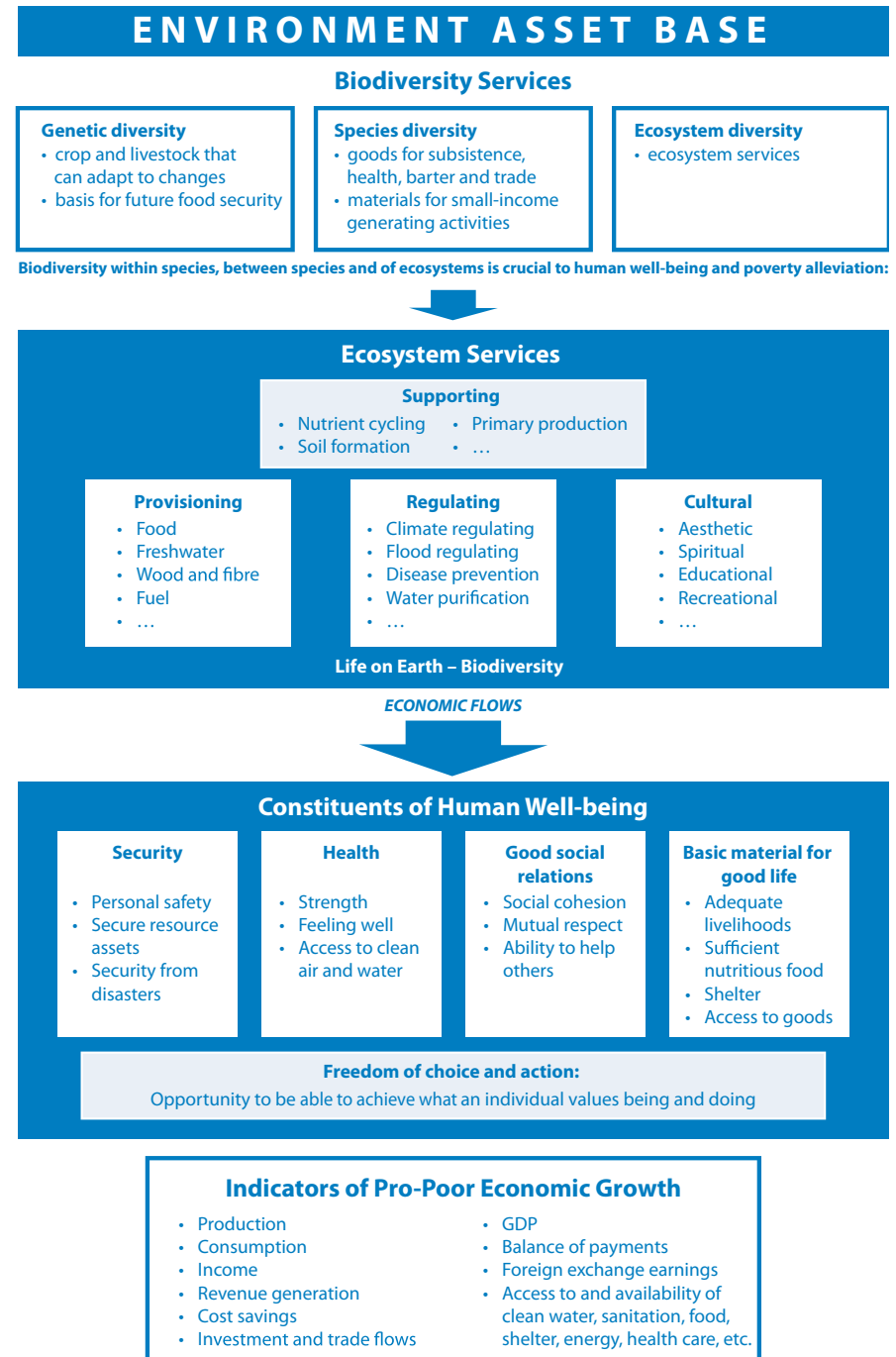
- Percentage of people in Africa estimated by WHO to rely on traditional medicines (plants and animals) as the main source of their health care needs: **80%**.
- Number of people worldwide who depend on drugs derived from forest plants for their medicinal needs: **1 billion**¹¹.
- About **8%** of the **52,000** medicinal plants used today are threatened with extinction¹².
- Number of times more likely a person living in a poor country is to be hit by a climate change-related disaster than someone from a rich country: **79**¹³.

services. Development strategies and choices need to recognise and systematically include biodiversity conservation and sustainable use in order to achieve sustainable development and significantly reduce world poverty.

What is in This Booklet?

This booklet aims to demystify and illustrate biodiversity’s contribution to development in its various dimensions and to offer some avenues for human and economic development that recognise, maintain and restore biodiversity. Section 2 outlines how biodiversity contributes to human development and the Millennium Development Agenda while Section 3 points out how biodiversity and its ecosystem services contribute to economic sector development with a focus on agriculture and food production, fisheries, forest management and tourism. A perspective on the critical hinge of development cooperation to strengthen country systems for biodiversity management and some avenues to consider in dealing with the challenge and crisis of biodiversity loss are offered in Section 4. Case examples are provided of innovative initiatives in improving the management of biodiversity.

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Source: Adapted from MA 2005.



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TWO

Biodiversity for Advancing Human Development and the MDG Agenda

Conservation and sustainable use of biodiversity creates opportunity for reducing poverty and improving human well-being. Reversing biodiversity loss is a key dimension of the MDG agenda and contributes to progress on MDG goals of ending extreme poverty and hunger, ensuring health and education for all, achieving environmental sustainability and international cooperation.

Conservation and Sustainable Use of Biodiversity – A Foundation for Human Development

Conservation and sustainable use of biodiversity creates opportunity for reducing poverty and for improving human well-being. The linkages between poverty, the bio-physical environment and human development have been highlighted as early as in UNDP's Human Development Report of 1992:

One of the greatest threats to sustainable human and economic development comes from the downward spiral of poverty and environmental degradation that threatens current and future generations... the poor are disproportionately threatened by the environmental hazards and health risks posed by pollution, inadequate housing, poor sanitation, polluted water and a lack of other basic services. Many of these already deprived people also live in the most ecologically vulnerable areas¹⁶.

Furthermore, the 1994 Human Development Report emphasized the link between human development and sustainability. It stressed that human development is not a one-time goal, but one that should be assured equally for present, and for future generations, that the development we strive toward must be sustainable, and that there is no contradiction between the goals of development and those of ecological conservation. Today, the global report of 2008 on Human Development and Climate Change outlines the mechanisms through which climate change could stall and reverse human development: reduced agricultural productivity and food security; heightened water stress and insecurity; increased exposure to coastal flooding and extreme weather events; the collapse of ecosystems and extinction of species; and increased human health risks.

Several countries have included environmental considerations in their National Human Development Reports. Uganda's 2005 report, titled *Linking Environment to Human Development: A Deliberate Choice*, stresses that actions to deliver on MDG 7 (of ensuring environmental sustainability) have also given results for the other MDGs, and vice versa.



UN Photo/
Evan Schneider

Box 2.1 Ecological Diversity and Resilience in Bhutan's Gross National Happiness Index¹⁸

Human development is the process of enlarging people's choices and enhancing human freedoms and the range of things people can be and do. The goal is for all to live long and healthy lives, acquiring knowledge and having access to the resources needed for a decent standard of living. Human Development is also about people participating in the life of their community and decisions affecting their lives, while preserving a quality of life for future generations and achieving equality for all women and men.

The Royal Government of Bhutan adopted the Gross National Happiness Index (GNH Index) putting happiness and well-being at the centre of their societal progress, or development. The GNH Index is composed of nine equally weighted dimensions: 1) Psychological Well-being, 2) Time Use, 3) Community Vitality, 4) Culture, 5) Health, 6) Education, 7) Ecological Diversity and Resilience, 8) Living Standard, and 9) Governance. It considers the state of Bhutan's natural resources, the pressures on ecosystems, different management responses, and perceptual data on ecology. The indicators used within this dimension include indicators of ecological degradation, knowledge and afforestation. The index guides Bhutan's planners in their development of policies and programs.

Enlarging people's choices implies selecting and developing policies, investments and actions. This involves institutional capacity development and empowerment to inform decisions about biodiversity and growth, especially in local context and debates on trade-offs, vulnerability, equity, sustainability, and recognition of the value of eco-services.

What we measure ultimately determines what we collectively strive toward; and conversely, what we pursue shapes what we measure. Following this line, many have looked for the measurement of societal

well-being. A recent effort is from the Commission on the Measurement of Economic Performance and Social Progress¹⁷ which is developing a statistical system that complements the measurement of economic production with measures that account for people's well-being and for sustainability. Key measures are environmental factors. In particular, the Commission sees a need to develop an indicator of societies' proximity to dangerous levels of environmental deterioration such as those associated with climate change and the depletion of fish stocks.

Making Sustainable Development Choices to Advance Human and Economic Progress and the MDG Agenda.

The Millennium Development agenda to address peace, security, development and fundamental freedoms focuses on ending extreme poverty and hunger, ensuring health and education for all, and achieving environmental sustainability and international cooperation. Biodiversity and the ecosystem goods and services it provides are critical to achieving the MDGs, and reversing the trend in loss of biodiversity is an integral part of this agenda.

MDG 7 on environmental sustainability reaffirms the principles of sustainable development adopted in the Rio Earth Summit. Its target is to "Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources". Thus it states that the future outlook of biodiversity is not predetermined and reinforces the global recognition that reversing biodiversity loss is a key stepping stone to development and that biodiversity conservation and sustainable use underpin progress on all the MDGs.

The extent of linkages between the ecosystem services provided by biodiversity and the development goals of ending poverty, hunger and disease and improving the health of children and mothers is deep and broad. The diversity and quality of ecosystem goods and services depends on societal, institutional and individual choices made in our development processes. These choices are typically expressed in national policies and implemented in programs at national and sub-national levels. Given the continued loss of biodiversity, this is a call for policy reforms, institutional strengthening and concomitant investments.

Box 2.2 Environment for the Millennium Development Goals¹⁸

The Poverty-Environment Partnership (PEP) is a network of international development and environment agencies and NGO's including UNDP, UNEP, IIED, IUCN and WRI. In 2005 it brought a message to the World Summit in New York, based on a body of analytical work and consultations aimed at making clear the complex relationships between poverty reduction and environmental sustainability: "The world's poor depend critically on fertile soil, clean water and healthy ecosystems for their livelihoods and well-being". The Partnership recommended that donor support be focused to the following areas:

- Greatly expanded **investment** in environmental assets.
- Strengthened **local institutions**
- **Integrated approaches** developed to put pro-poor investments at the heart of national development — and poverty reduction strategies and sectoral planning at all levels
- **Pro-poor changes in environmental governance**
- Innovative **market-based instruments** to encourage pro-poor investments in environmental management and the provision of environmental services
- A **strengthened information base** for decision making

Investing in biodiversity conservation is not only about maximizing development benefits; it is also about preventing national, regional and global losses on MDG progress due to environmental degradation and climatic disasters. The loss of biodiversity has extensive consequences for poverty alleviation and makes the attainment of the MDGs difficult. For example, Haiti, a country that was once fully forested, has lost 97% of its forest cover. It is now the poorest country in the Western Hemisphere, with 65% of Haitians living on less than \$1/day. The country also has the highest rates of infant, under-five and maternal mortality in the Western hemisphere (with diarrhoea as one of the leading causes of death), and 90% of its children are chronically infected with intestinal parasites, which they acquire from the water they drink. This tragic situation is linked to the loss of ecosystem services (rainfall, prevention of soil erosion, water purification) provided by forests.

Biodiversity and Health and Nutrition

Scientific research is revealing an increasing number of links between biodiversity and human health and well-being. The existence of a variety of ecosystems, of different species and of genetic diversity is essential to maintaining human health, in terms of food security and



FAO/G. Bizzarri

adequate nutrition, resistance to infectious and vector borne diseases, mental health, and reduction of disaster risk. Not least, biodiversity provides the material from which all traditional medicines and many synthetic drugs are derived.

Crop genetic diversity is humanity's key to maintaining crop resistance to pests and diseases, and to adapting agricultural systems to climate change. As the basis for the development of new crop varieties, and for the improvement of existing ones, genetic diversity will become increasingly important to food security at different scales. Our ability to continue to grow enough food, critical to the achievement of MDG 1, will depend on how we manage agricultural ecosystems and crop diversity — at the species genetic and landscape levels.

Eradicating and averting hunger is not enough to assure good health. The lack of key micronutrients such as iodine, vitamin A and iron is also an important cause of poor health. Moreover, diseases such as obesity, cardiovascular disease, type II diabetes and cancers, often associated with affluence, are becoming more frequent among poorer people both in industrialised and developing countries. Unable to afford healthier food choices and having abandoned the diversity of local vegetables and traditional varieties of crops which often have higher nutritional value than modern varieties, these people's diets are increasingly based on refined carbohydrates and fats.

With regards to disease, the change and disruption of ecosystems can leave people more vulnerable as the habitats and life-cycles of disease-causing organisms change.

Human impacts on the environment have been associated with outbreaks of malaria, hemorrhagic dengue, SARS, Ebola, Marburg, Hantavirus pulmonary syndrome, avian influenza, and echinococcus.

The importance of biodiversity in mitigating the occurrence of disease and poor health is clear. Various studies show that:

- in areas where there was a greater variety of birdlife, people were less likely to contract West Nile Virus
- greater diversity of vertebrate species can reduce the incidence of Lyme disease (spread mainly by mice)
- in the Peruvian Amazon, mosquitoes associated with malaria were observed to bite people 278 times more frequently in deforested areas than those in areas still predominantly forested
- communities living near the Ruteng Park, Indonesia, have fewer cases of malaria and dysentery, fewer school days missed due to illness, and less hunger associated with crop failure than nearby communities without intact forests nearby. Villages near the park also have better water quality²⁰.

Biodiversity is also important to human health through its provision of materials to treat and cure diseases. Three quarters of the world population depend on natural traditional medicine from plants. In addition, it has been estimated that approximately half the synthetic drugs used in the world today have natural origin. Hundreds of these plants are threatened with extinction²¹.

The 500 acre Atlantic Forest reserve surrounded by the Brazilian city of Joao Pessoa harbors over 480 medicinal plants in addition to providing some 10% of the city's water supply.

The cultural services provided by ecosystems have important mental health benefits for people. For indigenous and local communities whose cultures and ways of life are intricately linked to nature and natural places, the disruption of ecosystems and the loss of components of



Nathan Dappen
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biodiversity can be devastating, not only materially, but also psychologically and spiritually. In urban centers increasing numbers of people worldwide are recurring to green spaces and parks for recreation and sport, which contribute indisputably to their mental as well as their physical health.

Connecting Biodiversity and Climate Change Mitigation and Adaptation

Climate change is a manifestation and symptom of lack of adequate consideration for environmental sustainability in development pathways. Climate change impacts people, ecosystems and economies. According to the Inter-governmental Panel on Climate Change (IPCC), an average temperature rise of more than 1.5 to 2.5 degrees C would put 20% to 30% species at risk of extinction²². Climate change also adds to the vulnerability of the rural poor as they are often dependent on rainfall patterns and are severely affected by droughts, storms, and floods.

The climate change is a wake up call to the need to factor sustainability into development choices. Dealing with the interrelated challenges of climate change and biodiversity can be considered the new development paradigm which highlights the following eight dimensions:²³

- 1.** Climate change and biodiversity are interconnected: climate change affects biodiversity, and changes in biodiversity affect climate change.
- 2.** Observed changes in climate have already adversely affected biodiversity at the species and ecosystem level; further changes in biodiversity are inevitable with further changes in climate.
- 3.** The resilience of biodiversity to climate change can be enhanced by reducing non-climatic stresses in combination with conservation, restoration and sustainable management strategies.
- 4.** Ecosystem-Based Adaptation integrating biodiversity and ecosystem services into an overall climate change adaptation strategy can be cost-effective and generate social, economic and cultural benefits.
- 5.** A set of land use management activities including Reducing Emissions from Deforestation and Forest Degradation (REDD) can provide a cost-effective way to mitigate climate change and conserve biodiversity.

6. Activities to adapt to the impacts of climate change can have positive or negative effects on biodiversity, but tools are available to increase the positive and decrease the negative effects.
7. Renewable energy sources, which displace the use of fossil fuels, and geo-engineering techniques, can have adverse effects on biodiversity depending on design and implementation.
8. The consideration of economic and non-economic values of biodiversity and ecosystem services, and related incentives and instruments can be beneficial when implementing climate change related activities.

Climate change is a key driver of biodiversity loss, and moderating climate change will, in the long term, safeguard ecosystem services. Protecting biodiversity will in turn help to moderate climate change and to adapt to its unavoidable consequences.

The conservation and sustainable use of biodiversity offers resilience to climate variability and natural disasters. Biodiversity improves the capacity of a social-ecological system both to withstand perturbations (from climate or economic shocks) and to rebuild and renew itself afterwards. Very few policy and decision makers are aware of this important contribution of biodiversity. Recognising the opportunities that healthy ecosystems provide to adapt to global change is crucial. The Commission on Climate Change and Development²⁴ states that: “Highlighting the role of ecosystems in adaptation suggests a number of possible win-win options. These are related to increasing the flow of ecosystem services and helping disadvantaged groups deal with future impacts of climate change. These strategies can lead to risk reduction and can also contribute to attempts to promote a transition to sustainable poverty alleviation in rural communities.”

Conservation of mangrove forests, wetlands and coral reefs protects coastal zones against weather-related catastrophes.

Protected Areas: Cornerstone of Biodiversity Conservation

Protected areas (e.g. parks and nature reserves) have been the cornerstone of efforts to conserve the world’s species and ecosystems. They also play a key role in sustaining local livelihoods and contributing to



Martin Sharman,
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/14929270/in/set-222534/

economic and social well-being. Protected areas also have an important role in reducing risks from natural disasters and in helping counteract climate change impacts with avoided deforestation and support to maintaining ecosystem services within and beyond their boundaries. Designating an area as protected is only a partial first step however. Protected areas need to be carefully planned, and properly managed in order to ensure biodiversity and people benefits. It is important to address pollution, climate change, irresponsible tourism, poorly located infrastructure and increased demand for land and water resources, all of which exert continued pressure on protected areas and the ecosystem services that they provide. When well planned and implemented carefully, the benefits of protected areas greatly outweigh the costs.

The area of land and sea that is protected has grown substantially in the past years, reaching by 2008 12% of the planet (12 million square kilometres of land and some 3 million square kilometres of marine areas). Still there is a need to extend protected areas, particularly to ecosystems that are currently under-represented or not represented at all.

The principles of equity, participation, governance and sharing of costs and benefits are increasingly being considered at national levels and being incorporated into national policies.

- **Colombia** has encouraged the creation and incorporation of a complex set of regional and local reserves, indigenous territories, collaboratively managed protected areas, private protected areas, and community conserved areas.
- **Australia** has established 22 indigenous protected areas covering 14 million hectares and implementing new forms of conservation programs.
- **Canada** has established First Nations protected areas.
- **Madagascar** has moved into diversifying governance types of protected areas
- **India** is in the process of including those that could be managed in a collaborative manner with various government departments and local communities, and those to be managed by local communities themselves²⁵.

Governance of protected areas and national systems with effective management of tradeoffs benefiting local communities and indigenous communities remains a challenge and involves diversifying governance with more collaborative and community-based regimes.

UNDP is supporting the Programme of Work of the Convention on Biological Diversity on Protected Areas by linking protected area management more tightly to the development agenda. This investment in Protected Areas — largely financed by the Global Environment Facility

UN Photo/Oddbjorn Monsen



(GEF) — has led to the creation of 127 new protected areas covering 10.02 million hectares, while an additional 163 new protected areas covering 8.6 million hectares are being established. Local communities are involved as co-managers of protected areas, helping to improve social equity and to ensure the long-term social sustainability of parks. Because land and livelihoods are intimately connected, 90% of these projects are significantly focusing on poverty reduction.

Box 2.3 Protected Areas Benefiting People and Biodiversity

- **Namibia's Conservancies**, born out of a 1996 governance reform that started the Community Based Natural Resource Management Program, now cover 11.9 million hectares of that country's world-renowned wildlife-rich plains. The conservancies have benefited more than 230,000 people in the form of jobs, cash dividends, game meat, skill building, and various social development projects. They have also permitted the recovery of various wildlife species including elephant, zebra, oryx, kudu and springbok²⁶.
- Local tour guides in **Tortuguero National Park, Costa Rica**, earn 2 to 4 times the minimum wage in a five-month period. 359 ecotourism related jobs have been created, and a local high school, clinic, and improved water and waste treatment facility have been established²⁷.
- Between 2003 and 2005, tourism in four protected areas in **New Zealand (West Coast, Abel Tasman National Park, Queen Charlotte Track, and Fiordland National Park)** generated 4000 jobs (the equivalent of 15% of all jobs in the four areas), NZ\$130 million in direct household income, and NZ\$560 million of revenue²⁸.
- **A sea turtle conservation initiative implemented in two communities in Brazil and Mexico**, besides protecting the remaining sea turtle population in the two communities, has significantly improved local household welfare: family incomes, the percentage of homes with piped water, sewage and electricity, and the number of schools and clinics in each community had all increased since the beginning of the initiatives. Food and nutritional intake had also increased, as had the value of land in both areas²⁹.
- The **Torghar Conservation Program**³⁰, initiated by tribal elders, established a wildlife conservation and trophy hunting area in the **Torghar mountains in north-western Pakistan**. Since the establishment of the program, trophy hunting has generated US\$ 1,716,800. Funds have been used to improve water supply and health care in local communities, to provide education and vocational training, and to improve agricultural systems, including the establishment of fruit and firewood sapling trees for orchards.



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THREE

The Contribution of Biodiversity and its Ecosystem Services to Poverty Reduction and Economic Sector Development

The contribution of biodiversity to human and economic well-being is particularly important in major productive sectors like fisheries, agriculture, forestry, and in tourism. The adequate management and governance of these sectors, recognising biodiversity dependencies and the ecosystem services on which they rely, is crucial to ensure continued benefits to people and opportunities for poverty reduction and economic development.



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“The well-being of every population in the world is fundamentally and directly dependent on ecosystem services”³¹. The world’s poor, particularly in rural areas, depend on biological resources for as much as 90% of their needs, including food, fuel, medicine, shelter and transportation. For the 1.1 billion people living in extreme poverty, maintaining ecosystem goods and services is critical for daily survival.

In Burkina Faso, 92% of the active work force is employed in agriculture and fisheries; hence their well-being depends on sustainable agriculture and fisheries, which also provide opportunities to improve their livelihoods.

The condition, management and governance of ecosystems, in all regions, particularly Sub Saharan Africa, is a dominant factor affecting the chances of success in fighting poverty and in attaining human development. Countries like Zambia recognize biodiversity for the high-yield asset which it is. Over the last decade the country has been contending with some of the ripple effects of increasing poverty: over-hunting, the loss of forests, and the transformation of wetlands and natural grasslands for agriculture. Faced with these challenges, the Government of Zambia has teamed up with UNDP and other partners to make protecting biodiversity a top priority. It has identified national protected areas comprising several aspects of Zambia’s ecosystems, and will work to ensure that these areas are effectively safeguarded from human-induced pressures through effective management.

The world economy and national and sub-national economies are also largely dependent on biodiversity and its ecosystem services. Agriculture

and food production, fisheries, forestry, tourism — all contribute significantly to economic development and all depend on the currently undervalued biodiversity. Many developing countries rely on the export of natural resources such as agricultural commodities, raw materials and ecotourism services. When properly managed and governed, these biodiversity based assets can yield significant economic benefits, ensure “the rich do not turn poor”, and help pave the way out of poverty.

In developing countries, natural capital is estimated to be a quarter of total wealth as compared to 13% in middle income countries and 2% in high income OECD countries³².

Agriculture and Food Production

Agriculture is vitally important for developed and developing countries alike. It is both a source of basic sustenance (nutrients and calories) for people, and of raw materials for industries. Agriculture is central to the livelihoods of the rural poor and, with over a billion workers worldwide, it is the largest economic sector in terms of employment. It is also the sector where the majority of the world’s poor and extremely poor are concentrated³³.

Agriculture is fundamentally dependant on biodiversity and on ecosystem services. Species of crops and livestock and their genetic diversity are the basis of agriculture. Crop genetic diversity provides the materials for human societies to adapt to climate change. Species of earthworms, fungi, soil micro-organisms, flora and fauna surrounding agricultural areas underpin ecosystem services that sustain agriculture, such as pollination and nutrient cycling.

“The way the world grows its food will have to change radically to better serve the poor and hungry if the world is to cope with a growing population and climate change while avoiding social breakdown and environmental collapse”³⁴.

In order to ensure that farms are a sustainable source of food, fibre, and livelihoods, and breeding grounds for biodiversity as well as sinks for carbon, increased investments in sustainable agriculture are needed. Sustainable agriculture is an effective strategy for improving food security and reducing poverty. It promotes food production without depleting the earth’s resources or polluting the environment.

Box 3.1 Organic Agriculture³⁵

Organic production contributes to soil, water, and biodiversity conservation while providing the diversity necessary for healthy nutrition, making use of local resources and traditional knowledge and thus strengthening farming communities.

- **Current extent:** 32.2 million hectares of agricultural land are managed organically by more than 1.2 million producers, including smallholders in 141 countries around the world³⁶.
- **Productivity:** An analysis of 114 cases of conversion to organic or near-organic production methods in Africa showed an increase of 116% in farm productivity and improved levels of natural, human, social, and financial capital.
- **Export opportunities for developing countries:** Globally, there has been an increased demand for organic products with sales increasing by over US\$5 billion a year. International organic food and drink sales tripled between 1999 and 2007 and crossed the US\$46 billion mark³⁷.
- **Price premiums and increased incomes:** In Uganda, the farm gate prices of organic pineapples, ginger, and cotton, are 80%, 185%, and 33% respectively, higher than conventional products.
- **Climate change:** It is estimated that CO₂ emissions per hectare of organic agriculture systems are 48–68% lower than in conventional systems³⁸; also, organic fields sequester 3–8 tonnes more carbon per hectare than conventional agriculture. “Converting the U.S.’s 160 million corn and soybean acres to organic production would sequester enough carbon to satisfy 73% of the Kyoto targets for CO₂ reduction in the U.S.”³⁹
- **Employment and job creation:** On average, organic agriculture uses 30% more labour than conventional production, resulting in the creation of 172,000 jobs per year. In Mexico, the number of jobs created through organic agriculture was 172,251 in 2007 in comparison to 13,785 jobs created in 1996.

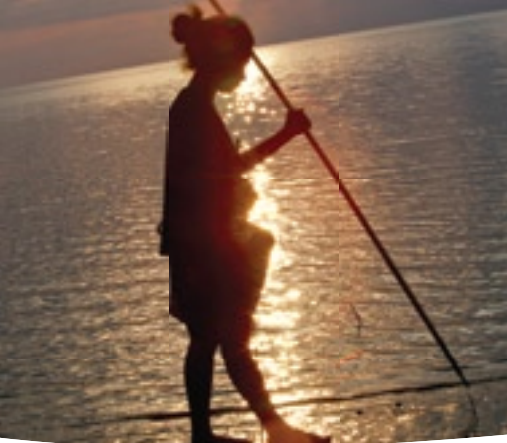
Sustainable agriculture provides food security to the poor and small-holder farmers, offers trade opportunities for developing countries, and restores and improves ecosystems.

Shade grown coffee is a good example of sustainable agriculture. It offers significantly more biodiversity and development benefits than sun-exposed coffee cultivation because coffee is planted among canopies of native tropical trees and vegetation that provide the habitat for song-birds, bats and numerous other species. The trees and vegetation also provide fruits and other products that allow farmers to diversify their diets and incomes. The nutrient cycling, erosion prevention and water retention services of tropical vegetation allow coffee to be cultivated with little need for chemical fertilizers and herbicides. Shade grown coffee also benefits biodiversity by supporting the genetic diversity of tropical forests. In recent years certified shade grown coffee has increased in popularity and has boosted the incomes of coffee farmers. In 2005 the Rainforest Alliance had certified 92,000 ha of land as producing shade grown coffee. By 2008 the amount had increased to 160,000 ha.

Fisheries

More than 3 billion people depend on marine and coastal biodiversity for their livelihoods particularly in developing countries where fishing is a main subsistence and commercial activity⁴⁰. An estimated one billion people, mostly in low-income countries, depend on fish as their primary source of food. On a global scale, marine fisheries provide 16% of all protein consumed⁴¹. Fisheries also play an essential role in the livelihoods of millions of people around the world. An estimated 38 million people are employed directly by fishing and many more in the processing stages⁴².

Fisheries are an important source of economic benefits. The FAO estimates that the first-sale value of global fisheries (marine and inland) is US\$ 91.2 billion⁴³. Freshwater systems have a large economic value with tropical rivers and inland fisheries estimated to generate \$5.58 billion annually while the goods and services derived from wetlands have an estimated value of \$70 billion per year⁴⁴. Recreational fishing is an increasingly important source of revenue. Anglers in the EU presently spend an estimated €25 billion a year, almost equivalent to the value (€20 billion) of commercial landings in 1998⁴⁵.



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Martine Perret

UN Photo/Martine Perret

Species diversity is fundamental to the productivity and resilience of marine fisheries⁴⁶. Genetic diversity in fisheries is also important in terms of wild fish stocks' resilience to change and in terms of possible future farming of marine species⁴⁷. Ecosystems such as coral reefs, seamounts, seagrass meadows, mangroves, estuaries and coastal wetlands directly support fisheries providing areas for breeding, nurseries, refuge and feeding.

The FAO estimates that more than three quarters of the world fisheries have already been fished to their biological limit or beyond. Perhaps the most well known example of this is the collapse of the cod fishery off the coast of Newfoundland, Canada during the 1990's which caused a \$200 million dollar reduction per year in the cod catch and the loss of 35,000 jobs.

The removal of subsidies that enable harmful practices should be a priority. "Arguably the most important opportunity for achieving this is the current WTO negotiations on limiting fisheries subsidies. Fishery subsidies are estimated at US\$ 15–35 billion annually and include such items as direct cash grants, tax breaks, and loan guarantees. Although some fisheries subsidies, such as subsidies directed at fisheries management, promote responsible fishing practices, most subsidies directly contribute to over fishing⁴⁸".

Another important area of action is the establishment of marine and coastal protected areas. It has been estimated that conserving 20-30% of global oceans through a network of Marine Protected Areas could create a million jobs, and sustain a marine fish catch worth US\$70-80 billion/year. A study of 80 MPAs found that fish populations, size and

biomass all dramatically increased inside reserves, allowing spillover to nearby fishing grounds. For example, 73% of the US haddock catch are taken within 5 km of a fishery closed area, off the New England Coast⁴⁹. Apo Island, the first community-based marine reserve in the Philippines protects 650 species of fish and 400 species of coral. Average fish catch per person hour has risen 8-fold from 1980–81 to 1997–2000⁵⁰.

An example of good practice with regard to fisheries is the Marine Stewardship Council's blue eco-label which promotes "the best environmental choice in seafood". The eco-label indicates to fish consumers that the source fishery operates in an environmentally responsible way. As of April 2009, there are over 2,400 seafood products available with the MSC eco-label sold in 49 countries around the world. 51 fisheries have been independently certified as meeting the MSC's environmental standard for sustainable fishing and over 110 are currently undergoing assessment. Nearly 1,000 companies have met the MSC Chain of Custody standard for seafood traceability.

Efforts to improve the governance of fisheries with the aim of securing and enhancing coastal communities' livelihoods and conserving biodiversity include the granting of exclusive fishing rights within designated areas (usually within the 200 mile limit) to coastal communities:

- In 2008 Norway implemented such a policy to protect the fishing rights of the Coast Sami population inside the Norwegian fjords⁵¹.
- In Brazil, the creation of marine extractive reserves, in which artisanal fisher people co-manage extractive reserves with the government, is making strides toward the reconciliation of conservation, resource rights, and livelihoods. Marine extractive reserves presently encompass 1,659,690 ha of sea space and include 28,250 artisanal fishers.
- Chilean benthic fisheries involve thousands of artisanal fishers, a coast-line spanning 38 latitudinal degrees and about 50 target species, most significantly "loco". An overfishing crisis led to a closure of the "loco" fishery (1989–1992), and to the incorporation of territorial use rights in fisheries (TURFs) into fisheries legislation, allowing organizations of artisanal fishers to co-manage

parcels of seabed with the state. Abundance and legal catch within TURFs (which presently encompass 36% of the prime habitat that contributed close to 82% of historical yield) is now re-established and stabilized³².

Forest Management

Timber production has been regarded as the dominant function of forests. However, in recent years this perception has shifted to a more multi-functional and balanced view. Today it is understood that forest biodiversity underpins a wide range of goods and services critical for human well-being. Forests provide food and a vast array of materials for medicinal, cultural and spiritual purposes, as well as building materials and firewood. They also store and purify drinking water, protect watersheds, mitigate natural disasters, control erosion, cycle nutrients, help to store carbon and to regulate climate, and provide habitat to the vast majority of terrestrial species, many of which are crucial for human consumption. Forests are also vital to national and regional economies, both directly through revenues, value-added and employment provided by the forestry sector³³, and indirectly through their provision of services such as water supply to agriculture and to industry.

UN Photo/ P Johnson



Box 3.2:

Community Participation in Forests Management

In Tanzania, the Shinyanga Soil Conservation Programme revived and adapted an indigenous woodland management system known as “ngitili” whereby the agro-pastoralist Sukuma people temporarily enclose areas allowing vegetation used as fodder to recover. Through the programme, local rights to use and sell forest products from ngitili are recognized, and technical support is provided to improve productivity. By 2004, at least 350,000 hectares of ngitili were restored or created in 833 villages, encompassing a population of 2.8 million. It has been estimated that the benefit per person per month of ngitili is US\$14. Income from ngitili has also been used to support schools and other forms of rural development⁵⁷.

Communities living in the Uluguru Mountains⁵⁸, which are an important source of water for the city of Dar El Salaam and part of the Eastern Arc Mountains protected area network in Tanzania, will receive payments for their sound management of their land and natural resources as a result of a funding agreement with Coca Cola Company. The Eastern Arc Mountains also hold great potential for payments for carbon storage and sequestration as it is estimated that their forests store 151.7 million tons of carbon.

The World Bank estimates that 60 million indigenous people are totally dependent on forests, 350 million people are highly forest-dependent, and 1.2 billion are dependent on agro-forestry⁵⁴.

Sustainable forestry management ensures that forest practices avoid shrinking and degrading forests compromising their provision of ecosystem services. Experience is showing that options for sustainable forest management exist for timber and non-timber products. Reduced Impact Logging (RIL) for example reduces timber wastage, biodiversity loss, and damage to residual trees and soil while also reducing carbon emissions from logging by up to 40 tons/ha of forest⁵⁵. RIL is widely practiced today in some production forests, such as those in Malaysia⁵⁶. However it has yet to become a widespread practice.

Another promising avenue for sustaining forests and the services they provide is through the active participation of local people in natural resource management. Also, an important development in the effort to conserve forests is through the valuation of forests and the payments for services that they provide. Oftentimes, these payments are given to communities that manage forests, forgoing shorter term, and in many cases, lesser incomes that they could derive from unsustainable forestry practices.

Tourism

Tourism is a significant contributor to national and local economies. On a global scale, the sector accounts for 10% of the job market, and in 2007 it generated US\$ 856 billion⁵⁹. Tourism is one of the most dynamic economic sectors and many developing countries are steadily increasing their share of the international tourism market. Tourism is particularly important for women as they compose 46% of the global tourism labour force⁶⁰.

Biodiversity is a vital asset to the tourism industry. National parks, coastal areas, mountains, forests and other ecosystems are tourist attractions in-and-of-themselves. A study in Western Australia⁶¹ shows that tourism provided AU\$ 207 million to the Southern Forest and Gascoyne Coast Region, of which 88% and 92% respectively is associated with the national parks in these areas. Many of the developing countries rich in biodiversity such as South Africa, Peru, Mexico and Brazil are popular tourist destinations receiving over 5 million international arrivals per year⁶². Tourism, associated with national parks that protect Mountain Gorillas, is one of Rwanda's largest sources of foreign exchange, earning US\$ 42 million in 2007. A new policy has been agreed that will enable the channelling of tourism receipts to forest-edge communities giving them a direct benefit from, and stake in, conservation⁶³. Ecotourism is a growing sub-sector of the tourism industry and is becoming an attractive livelihood option for rural communities.

Poorly planned and unregulated tourism development can have significant adverse impacts on biodiversity related to infrastructure altering natural habitats, unsustainable consumption of energy and fresh water, pollution, over-harvesting of local plant and animal biodiversity, and the unsustainable use of ecosystems such as coral reefs and forests⁶⁴. Without inclusive planning and governance considering its biodiversity assets, tourism investments can undermine the biodiversity and ecosystem it depends on as well as the livelihoods of local communities.

Sustainable tourism factoring in biodiversity and community livelihoods can contribute to biodiversity conservation and the growth of local economies. For example, tourism is a major source of revenue and support for protected areas and surrounding communities. Public



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policies and governance involving local and business actors are instrumental in making existing tourism more biodiversity friendly and more beneficial to local people, and in stimulating and facilitating local biodiversity based tourism.

As an example of good practice, Fair Trade in Tourism South Africa (FTTSA) administers a voluntary certification programme, which awards the use of the FTTSA certification mark to tourism establishments in South Africa adhering to the principles of fair share, democracy, respect, reliability, transparency and sustainability. As of 2008, 34 establishments were certified under FTTSA, including 6 community-owned enterprises

A country rarely pursues one productive sector alone but rather a combination of development opportunities based on their asset base. The challenge is achieving a balance between sectors in manners that maximise benefits to its people.



UN Photo/Fred Noy

FOUR

Integrating Biodiversity and Development: A Call for Development Cooperation

Global responses to biodiversity loss and the strategies for its conservation need to be reinforced and re-tooled to reverse the current trend of continued loss. The conservation, sustainable use, and equitable sharing of the benefits of biodiversity require integration across policy reforms and institutional strengthening. Country leadership and increased support from development cooperation are critical for the implementation of the Convention on Biological Diversity.

Human well-being is the purpose and overall goal of the Convention on Biological Diversity, its *raison d'être*; and if one could measure all human development benefits from investing in the conservation and sustainable use of biodiversity, it would come out as an investment with high human development yields. Yet, implementation of both the spirit and letter of the Convention is lagging. More critically, biodiversity losses continue, with few significant signs of reversal. Clearly, the global responses need to be re-adjusted and the strategies to ensure effective actions re-tooled and reinforced. Country leadership and actions are critical to effective implementation.

While the loss of biodiversity and its ecosystem services is of global extent and concern, most of its deleterious effects are felt and lived at the local level. Meanwhile, much of the legitimacy and accountability for responsive actions to prevent, stop or reverse biodiversity loss lie with nation states. Nation states cannot resolve these problems on their own however. They need the close collaboration of sub-national levels of government and local and indigenous communities, and the guidance from experience of other countries. In the case of most developing countries, they also need help in financing. Halting and reversing the loss of biodiversity and related ecosystem services thus requires genuine cooperation both on a national and international level.

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Box 4.1 Applying Strategic Environmental Assessment

Identifying and addressing trade-offs requires systematic application of decision-support tools such as Strategic Environmental Assessment (SEA). SEA is an anticipatory and proactive process of analysing and weighing the environmental opportunities and constraints of policies, programs and projects before they are approved and implemented. SEA is also about being ready to deal with situations that defy planning by building in resilience and adopting adaptive management policies and practices. Development benefits are amplified when policy decisions consider, and are based on, short and long term impacts. In order to reap both development and environment benefits, SEA practice must go beyond a safeguard, “do no harm” approach, to a collective approach to restore, enhance and use biodiversity sustainably. A growing number of countries including South Africa, Ghana, Benin and Vietnam are applying SEA to improve their policy plans and programs. The OECD guidance on Strategic Environmental Assessment in Development Cooperation targets both donor and partner countries practices.

In order to conserve biodiversity while reducing poverty and increasing human well-being and development, biodiversity must become part of government development policies. Likewise, development and poverty reduction need to be an integral part of environmental and biodiversity conservation policies and programs. Sound development choices more often than not offer positive outcomes on multiple social, economic and environmental fronts, invariably involving some trade-off. The key is managing tradeoffs in ways that maintain and/or restore the capacity of ecosystems to provide the full range of services to humans, and contribute to reducing poverty. Instruments such as National Biodiversity Strategies and Action Plans (NBSAPs) and Poverty Reduction Strategy Papers (PRSPs) as well as strategies to attain the UN Millennium Development Goals (MDGs) need to be mutually reinforcing. NBSAPs are the country level vanguard instrument for guiding country implementation the CBD. There is a need for renewed outlook on NBSAPs to ensure they facilitate the mainstreaming of biodiversity across development processes and factor in nature-based responses to climate change. Close cooperation between environment and development cooperation ministries and agencies is essential.

Investment in biodiversity conservation will render long term development and poverty reduction benefits, and as such should become part of national development planning and budget processes. Diversified sources of financing are important to ensure sustainability including



UN Photo/Jean Pierre Laffont

national public investments, market-based private sector investments, and international funds. However, for many developing countries, the main source of funds for biodiversity conservation is mainly the international community. There continues to be a gap between developed countries' commitment of dedicating 0,7% of their Gross National Income to ODA and their current ODA allocations, let alone the proportion of international financing targeted to biodiversity.

The aid marked as contributing to biodiversity has increased from 1 billion to some 3 billion annually. In 2007 total aid amounted to US\$3.128 billion from 21 countries and the European Community. A total of approximately US\$9 billion dollars of biodiversity-related donor assistance were provided for the period 1998–2005. As percentage of official development assistance, marked biodiversity aid is under 3%. Financial support to biodiversity remains a small fraction of the needs⁶⁵.

With regards to the implementation of the convention, there has so far been most effort and success on the conservation of biodiversity components e.g. protected areas and species. Addressing threats such as pollution and invasive alien species was done so far without much attention to underlying causes and consequently with not much success. Lesser efforts have so far been dedicated to sustainable use;

Box 4.2 Integrating Biodiversity into European Development Cooperation⁶⁶

In 2006, both OECD Development and Environment Ministers and European Union Institutions highlighted that they will support the efforts undertaken by partner countries to incorporate environmental considerations into development and Poverty Reduction Strategy Papers (PRSPs). The message from Paris outlines key areas for the European Commission and its member states to support partner countries to move from commitment to actions:

SUPPORTING MAINSTREAMING IN PARTNER COUNTRIES

- Promote sustainable rural development using biodiversity as an asset for rural poverty reduction, thus minimizing risk, improving food security, nutrition and health;
- Develop and support the use of innovative financial mechanisms for the conservation and sustainable use of biodiversity and poverty reduction;
- Strengthen civil society, in particular local communities and indigenous people, in order to build the domestic constituency for the integration of environment and development;
- Integrate environmental issues in national planning strategies for poverty reduction and macroeconomic policy instruments (PRSPs), and monitor progress in turning policy into action.

GOVERNANCE

Equitable, transparent and effective governance systems are essential for both poverty reduction and the conservation and sustainable use of biodiversity.

- Incorporate effective measures in Country Strategy Papers and sector policies to strengthen policies and institutions that support the formal recognition of rural and indigenous peoples' rights to manage natural resources and benefit from them;
- Systematically seek inputs and opinions from civil society, in particular the poor and indigenous peoples, as well as government viewpoints, in setting country-level priorities for aid programmes.

INSTRUMENTS AND POLICY COHERENCE

- Make full use of the opportunities presented by instruments such as budget support, SWAPs, and others to advance the mainstreaming of environmental concerns in development, including through high level policy dialogue;
- Support the systematic use of strategic environmental assessments in support of mainstreaming
- Improve coherence between EU policies and economic partnership agreements in relation to environment and development, trade, agriculture, fisheries, tourism, transport, and infrastructure;
- Provide leadership and means to support partner countries in creating a level playing field where sustainable business can be an effective partner in delivering conservation and development;

Box 4.2 cont.

- Support knowledge development and participatory research;
- Act on the demand-side, especially by means of legislation, to reduce the ecological footprint of trade and European consumption on the world's forests and ocean resources;
- At international level, work with partner countries to reform global governance as well as strengthening UNEP, MEAS, and their enforcement mechanisms.

RECOGNITION OF BIODIVERSITY IN OVERSEAS COUNTRIES AND TERRITORIES

Developing a coherent framework for environment in OCTs, to promote sustainable management of their important biodiversity areas.

therefore the need to do much more. Innovative solutions are at arm's reach of citizens, policy makers, industry and businesses. Examples of experiences show sustainable use can often be less costly than the status quo and conventional choices.

Economic sectors and the business community need to recognize their biodiversity dependency and to incorporate it into their development programs. These actors also have an important role to play in supporting and promoting financial incentive measures to maintain services such as carbon sequestration and clean water. Payments for Ecosystem Services (PES) can be beneficial to poor communities. These incentive mechanisms are effective in as much as they address issues of property rights, land use conflicts and tradeoffs as well as management and financing.

The management of land and resource use is often more effective when it involves enhancing people's rights to land, resources, and ecosystem services. Sharing the benefits that arise from their management with local people is also essential for effective biodiversity conservation and poverty alleviation. Emphasis is needed on fostering locally based environmental management, ensuring access to biodiversity resources, land reform and the acknowledgement of customary tenure. Programs aimed at the protection of biodiversity and the alleviation of poverty need to also address the human rights of all, and those of the poor in particular.

Box 4.3 Engaging the Business Community in Biodiversity⁶⁷

Numerous initiatives around the world demonstrate the possibility of combining business and biodiversity:

- Fysna Pty Ltd., the South African cut flower industry which, in 2007, registered annual sales over US\$ 5 million, while contributing to the conservation of the Cape Floristic Region and maintaining socially responsible labour and employment conditions.
- The Banco Centro Americano de Integración Económica, UNDP and GEF are partnering to support small, micro or medium-sized enterprises in Central America, change current productive and service sector practices and encouraging more sustainable and biodiversity-friendly activities and production to the benefit of forest, mountain and coastal and marine ecosystems⁶⁸.
- At global level, the Jakarta Charter on Business and Biodiversity to be submitted for adoption at the tenth meeting of Conference of the Parties is a biodiversity complement to the UN Global Compact. Open for signature to all companies in the world, the Jakarta Charter on Business sets a series of principles for company engagement in the conservation and sustainable use of biodiversity.

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Box 4.4 Biodiversity Driving Technological Innovations⁶⁹

An important contribution of biodiversity to the private sector and to development more generally is its provision of the ideas, designs and models that can be used to solve human problems and challenges. Biomimicry is a rapidly growing field that is harnessing the genius of biodiversity for the development of sustainable technologies, infrastructures, processes and modes of organization. Examples include:

- The **Shinkansen Bullet Train**, the fastest train in the world, was designed emulating the beak of kingfishers in order to reduce noise associated with pressure changes in tunnels. The new design also allows the train to use 15% less electricity and to travel 10% faster than the original model.
- **Flue stack filters**, inspired by the carbon dioxide removal function of human lungs, are capable of preventing the release of over 90% of the carbon dioxide released by conventional flue stacks.
- The air conditioning system of the **Eastgate Building** in Harare, Zimbabwe, is modeled on the temperature-regulating mounds built by termites. The building uses 90% less energy for ventilation than conventional buildings its size and has saved \$3.5 million dollars in air conditioning costs due to this cooling system.
- The patterns on **Galapagos shark skin denticles** are being copied onto hospital surfaces to prevent bacteria from adhering, thereby averting the use of anti-bacterials and harsh cleansers, and the increasing incidence of hospital acquired infections.



Box 4.5 Local and Indigenous Communities Leading Development

Local action—action that reflects the perspectives, and commitment of local actors—is critical for successful biodiversity management and sustainable use, and to achievement of international targets like the MDGs. Local and indigenous actors make the vast majority of daily environmental decisions. Working on the front lines of environment and poverty challenges they are critical to successful development solutions centered on biodiversity and natural resources.

The UNDP Equator Initiative rewards grassroots communities working to reduce poverty through the conservation and sustainable use of biodiversity. Some examples from the 2008 Equator Prize include:

- **Serraniagua Corporation** in Colombia connects the conservation corridors of the Tatamá National Park and the Serrania de los Paragua through a series of sixty community-managed nature reserves. They work with cocoa, coffee and sugar producers, eco-tourism operators, environment and conservation groups, rural schools, and women's associations to manage reserves.
- **Nguna-Pele Marine Protected Area Network (NPMPA)** in Indonesia is a joint initiative between 16-villages spanning two islands. The network is involved in environmental education, waste management, renewable energy projects, eco-tourism, mariculture, and environmental assessments, which have seen significant increases in fish biomass and marine invertebrate abundance in community reserves, live coral cover, and giant clams and trochus.
- **The Sri Lanka Community Development Centre (CDC)** works to preserve, conserve, and expand the cultivation of indigenous root and tuber crops through seed banks. The CDC has identified over sixty indigenous varieties of roots and tubers, successfully promoted agricultural biodiversity through seed banks and community farms, and promoted organic pest management practices across the country.
- The **Indonesian Community-based Marine Management Foundation (PLKL)** works with communities in Papua, West Papua, and the Moluccas Islands to create and actively manage community-based marine managed areas.

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WHAT TO DO? Policies, Investments and Actions for Country and Global Progress

WHY IS BIODIVERSITY CRITICAL?

MDG 1 ERADICATE EXTREME POVERTY AND HUNGER/END POVERTY AND HUNGER

TARGET 1:
Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day.

- The poor depend on biological resources for as much as 90% of their livelihood needs. Loss of biodiversity compromises income and livelihood of poor people, in all regions, particularly Sub Saharan Africa.
- The poorest regions of the World are also experiencing significant ecosystem degradation. Biodiversity is concentrated in the poorer regions of the world, and can be used in myriad ways to improve peoples' and societies' incomes and well-being.
- Biodiversity sustainable use initiatives are demonstrating positive gains in poverty reduction in many parts of the world.
- Biodiversity plays a central role in many climate change adaptation strategies aimed at protecting poor people's livelihoods and food security. Poor people are most vulnerable to climate change.

- Investment in ecosystem services to produce synergistic effects across several targets. For example, investment in watershed protection provides benefits in terms of water availability and soil conservation for agriculture. (MDG 1. 3 targets), and clean water, reduction of waterborne diseases and flood protection (MDGs 4, 5, 6).
- Governance reform to ensure poor people's access to resources and land tenure.
- Decentralization of responsibility for managing natural resources.
- Convergence of National Biodiversity Strategies and Action Plans (NBSAPs) with national development strategies such as PRSPs for sustainable development.
- Consideration of biodiversity impacts (both negative and positive) in shaping of policies, programs and projects, with strategic environmental assessment.

TARGET 2:
Achieve full and productive employment and decent work for all, including women and young people.

- Since many poor people's livelihoods depend on biodiversity, the loss of biodiversity could lead to a loss of these livelihoods and thus to more people joining the ranks of the unemployed.
- Sustainable use of biodiversity in agriculture, forest management, wildlife management, or biodiversity-based product development offers a source of stable secure job creation.

- Sustainable use for sustainability of income.
- Select or develop policies and actions that maximise the number of employed over time.

TARGET 3:
Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

- Biodiversity is the source of all food production and thus is critical to the 800 million people suffering from hunger.
- Ecosystem degradation in agricultural systems leads to lower yields, and higher food prices, reversing poverty reduction gains both in rural and urban areas, and pushing millions deeper into poverty.
- Biodiversity related ecosystem services such as watershed protection, pest control, nutrient recycling, and pollination sustain productivity in agricultural systems.
- A majority of country actions and reports on progress with the MDGs recognise the direct dependency between environment and food.
- Genetic diversity is what allows adaptation to climate change, to crop pest, and diseases.

- Reduce subsidies that lead to unsustainable agriculture.
- Promote markets for biodiversity-friendly agricultural goods.
- Incorporate ecosystem considerations in agricultural policies.
- Empower people with knowledge on sustainable agricultural systems.
- Protect and restore ecosystems.
- Promote integrated pest management.
- Encourage local actions for responsible "shopping" in the forest for food and construction materials, kitchen utensils, wrapping, toys, etc.

MDG 2 ACHIEVE UNIVERSAL PRIMARY EDUCATION

TARGET 1:
Ensure that, by 2015, all boys and girls are able to complete a full course of primary schooling.

- Ecosystem degradation and the loss of biodiversity is associated with more time being spent by women and children collecting resources such as fuel and potable water. This reduces time spent at school.
- Through its link with food and livelihood security (MDG 1) and health (MDG 6), biodiversity has implications for people's ability to afford education and thus on education rates and people's school attendance and cognitive capacities affecting quality of learning.

- Include biodiversity within primary school curriculum.

MDG 3 PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

TARGET 1:
Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015.

- Women have unequal and insecure access to land and other natural resources, limiting their opportunities and ability to access productive assets.

- Integrated strategies to promote gender equality and environment.
- Enhanced women's role in decision making at all levels.
- Factor in gender equality in resource tenure reforms.

MDG 4 REDUCE CHILD MORTALITY

TARGET 1:
Reduce by two thirds, between 1990 and 2015, the under-five mortality rate.

- 25% of global disease burden and 33% of childhood disease burden is associated to environmental factors, yet those factors are not yet factored in prevention and cure.
- Availability of clean water is essential to health and the sustained provision of clean water is largely dependant on biodiversity.
- Vaccines, developed with biological diversity, have slashed deaths from measles.
- Child mortality is often caused by malnutrition and under-nourishment.

- Increasing water quality and treatment potential, sanitation and waste management.
- Invest in biodiversity based watershed protection for improved access to clean water and means to prevent water related diseases, such as diarrhoea.

MDG 6 COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES

TARGET 3:
Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

- Human health is highly dependent on a healthy well functioning environment; maintaining and restoring biodiversity opens up much needed options to combat major diseases such as malaria and hemorrhagic dengue.
- Health care needs of the majority of people continue to be met primarily with traditional medicines. Herbs in particular remaining an important medicinal staple worldwide and most plant species continue to be harvested from the wild.
- Availability of safe drinking water provided by ecosystem services is essential to health and partly due to biodiversity loss.
- Biodiversity filters toxic substances from air, water and soil and breaks down waste that can cause poor health.

- Environmental improvements.
- Expanded development for biodiversity based health treatment options.
- Increase understanding of potential impacts of climate change on medicinal plants and on major vectors and their distributions.

MDG 7 ENSURE ENVIRONMENTAL SUSTAINABILITY

TARGET 1:
Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.

- Immediate action is needed to contain rising greenhouse gas emissions; deforestation and forest degradation contribute 20% of greenhouse gas emissions.
- Biodiversity is key to the functioning of ecosystems.

- Strengthening the implementation of the Convention on Biological Diversity. Further develop national capacities to set environmental priorities — recognising biodiversity and other ecosystem services, and to mainstream biodiversity in development processes.
- Build in Ecosystem Based Adaptation in development plans.
- Designate forest and other land for multiple benefits of biodiversity conservation and reduced emissions.

TARGET 2:
Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.

- Biodiversity loss directly affects the quality and quantity of ecosystem services such as carbon sequestration, watershed protection, soil fertility, recycling of nutrients, control of erosion and pollination of crops and trees.

- Increase marine areas conservation and other protected areas.
- Improve fisheries management to reduce depletion of fish stocks.
- Address direct drivers and pressures of biodiversity loss.

TARGET 3:
Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation.

- Half of the world's population continue to face a scarcity of water.
- Clean water and effective sanitation is largely dependent on biodiversity.

- Increase nature based technologies offering low cost feasible solutions to urban and rural areas access to water and sanitation.
- Improved integrated water management.
- Double efforts to meet the global sanitation target.

TARGET 4:
By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

MDG 8 DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT

TARGET 1:
Address the special needs of least developed countries, landlocked countries and small island developing states.

- Development aid has been falling, in general and in particular for environmental sustainability, jeopardizing commitments to double aid to Africa for 2010.

TARGET 2:
Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.

- Market access for most developing countries is so far little improved. Trade-related assistance is too small and can contribute to biodiversity loss. Subsidies such as some agricultural subsidies can contribute to reduce biodiversity and do not always promote good practices. Money spent on domestic agricultural subsidies overshadow money spent on development aid.

TARGET 3:
Deal comprehensively with developing countries' debt.

- While poor availability and high prices are barriers to access to essential drugs in developing countries, local plant sources are the basis for pharmaceuticals and their access and benefit sharing is a fundamental objective of the Convention on Biological Diversity.

TARGET 4:
In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.

- Development assistance to increase substantially to meet the MDG commitment related to environmental sustainability.

- Aid responsive to Country priorities, empowering country systems to integrate environmental sustainability in development.

- Ensure climate change financing offers a new development outlook reversing the loss and restoring biodiversity and related ecosystems.

- Redirect flows from subsidies to aid ensuring coherence to avoid unintended consequences on biodiversity loss.

- Support the development of biodiversity-based markets to offer a source of in-country finance income and help developing countries shoulder less debt, such as for example, the cut flower market of South Africa.

- Support the development of a global mechanism for Biodiversity access and benefits sharing regimes.