



UNDP ENVIRONMENT & ENERGY GROUP

# KEY RESULTS & LESSONS FROM THE UNDP-GEF BIODIVERSITY PORTFOLIO



## **UNDP 2010**

**Authors:** Sekhran, N. (ed.), Stock, P., Mee, J., Atallah, M., Carrizosa, S., D'Cruz, J., Dinu, A., Ferroukhi, L., Issler, F., Karki, S., Ndiaye, A., Negret, H., Remple, N., Vergeichik, M.

The authors are solely responsible for the content of this report. The views expressed in this report are those of its authors and do not necessarily represent those of UNDP.

The designation of geographical entities and the presentation of the material do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

**Designed** by Jessie Mee and Sandra Rojas

**Photos** by Aziz Rahhou, S.R. Stock, Nicolas Cégalerba, Fabiana Issler, Santiago Carrizosa, Adriana Dinu, Nik Sekhran, SANBI, and Tmatboey Community Protected Area Committee

**Cover page photos** by Adriana Dinu, Nik Sekhran and Santiago Carrizosa

Acronyms and Abbreviations	2
Introduction	3
<b>1. Background to UNDP’s Work on Biodiversity Management</b>	<b>4</b>
1.1 Biodiversity Loss: The Global Context	6
1.2 Biodiversity and Poverty Alleviation	9
1.3 Global Drivers of Biodiversity Loss	10
Direct Causes of Ecosystem Degradation: Climate Change	10
Direct Causes of Ecosystem Degradation: Unsustainable Natural Resource Use	11
Direct Causes of Ecosystem Degradation: Pollution	11
Direct Causes of Ecosystem Degradation: Species Introduction or Removal	12
Indirect Causes of Ecosystem Degradation	12
1.4 UNDP Strategies to Reduce Biodiversity Loss	14
<b>2. Protected Areas Management</b>	<b>16</b>
2.1 Global and Regional Impacts	20
2.2 Case Studies	22
Strengthening the Protected Area Network in Namibia (SPAN)	22
Conservation of Tugai Forest and Strengthening Protected Areas System in the Amu Darya Delta of Karakalpakstan in Uzbekistan	23
Biodiversity Management, Poverty Reduction and Gender Equality in Egypt: The Medicinal Plants Conservation Project (MPCP)	23
2.3 Results Achieved by Barrier Removal	25
Systemic Barriers	25
Institutional Barriers	26
Individual Barriers	28
Financial Barriers	28
Barriers to PA System Representation	29
<b>3. Mainstreaming Biodiversity Management in Production Sectors</b>	<b>30</b>
3.1 Global and Regional Impacts	34
3.2 Case Studies	37
Atoll Ecosystem Management and Coral Reef Conservation in the Maldives	37
Mainstreaming and Sustaining Biodiversity Conservation in Three Productive Sectors of the Sabana-Camagüey Ecosystem	37
Botswana: Building Local Capacity for Conservation and Sustainable Use of Biodiversity in the Okavango Delta	38
3.3 Results Achieved by Barrier Removal	40
Systemic Barriers	40
Institutional Barriers	41
Individual Barriers	41
Market Barriers	42
<b>4. Lessons and Future Challenges</b>	<b>44</b>
4.1 Lessons Learned in Protected Areas Management	47
4.2 Lessons Learned in Mainstreaming Biodiversity	51
4.3 Future Challenges for the Portfolio	54
The Development/Poverty-Biodiversity Nexus	55
Coping with Climate Change	55
Strengthening Environmental Financing for Biodiversity Management	57
References	60
Annex: List of Projects included in the Results Assessment, by Region	64

## ACRONYMS AND ABBREVIATIONS

AP	Asia and the Pacific
AS	Arab States
BR	Biosphere Reserve
CAPE	Cape Action for People and Environment Programme (South Africa)
CBD	Convention on Biological Diversity
CBO	Community-based organization
CBNRM	Community-based natural resources management
CCA	Community Conserved Area
CDM	Clean Development Mechanism
CIS	Commonwealth of Independent States
CZMP	Coastal Zone Management Plan
ECIS	Europe and the Commonwealth of Independent States
EU	European Union
FSC	Forestry Stewardship Council
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gases
GIS	Geographic Information Systems
ha	Hectare
IAS	Invasive Alien Species
ICZM	Integrated Coastal Zone Management
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
km <sup>2</sup>	Kilometers squared
LAC	Latin America and the Caribbean
MA	Millennium Ecosystem Assessment
MAP	Medicinal and Aromatic Plants
MCPC	Medicinal Plants Conservation Project (Egypt)
MDG	UN Millennium Development Goal
NGO	Non-government organization
NP	National Park
ODA	Official Development Assistance
PA	Protected Area
PES	Payment for Ecosystem Services
PoWPA	CBD Programme of Work on Protected Areas
REDD	Reducing emissions from deforestation and degradation
SEA	Southern and Eastern Africa
SIDS	Small Island Developing States
SINASIP	National System of Protected Wild Lands of Paraguay
SME	Small and Medium Enterprises
SP	Strategic Programme
SPAN	Strengthening the Protected Area Network in Namibia
TEEB	The Economics of Ecosystems and Biodiversity Report
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WCA	Western and Central Africa
WCMC	World Conservation Monitoring Centre
WWF	World Wide Fund for Nature



## INTRODUCTION

**This report** presents and evaluates the results and lessons mined from all GEF-funded UNDP biodiversity projects. The results and lessons documented have been distilled from projects in five regions, namely Africa, Arab States, Asia and Pacific, Europe and CIS, and Latin America and the Caribbean.

It concludes with a summary of some of the future challenges that confront UNDP programme countries in seeking to conserve their biodiversity while attaining their economic and social development objectives.

The report documents the results of projects in the period from 2004-2010, mining information from projects that had been under implementation for a minimum of one year as of June 30, 2009.

A list of the projects analyzed in the report forms an annex.



# Background to UNDP's Work on Biodiversity Management

1.1 Biodiversity loss: the global context

1.2 Biodiversity and poverty alleviation

1.3 Global drivers of biodiversity loss

1.4 UNDP strategies to reduce biodiversity loss

# 1.1 Biodiversity Loss: The Global Context

'Biological diversity' (commonly referred to as biodiversity) is the variety and variability of life on Earth. The United Nations Convention on Biological Diversity<sup>1</sup> describes biodiversity as:

**the variability among living organisms from all sources including, inter alia, terrestrial, marine and aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.**

The Earth supports a complex web of life comprising 3 million to 10 million species of plants and animals, of which only about 1.8 million have been scientifically described, plus an even greater number of microorganisms.

Biodiversity plays a vital role in almost every sphere of human life. Trees play an important role in absorbing greenhouse gases; forests also control soil erosion and purify water. Wetlands act as reservoirs in dry weather and help to filter and purify water. Coral reefs and mangrove swamps protect the land that they surround by stabilizing shorelines and buffering coasts from storm surges. Tropical forests, the tundra and wetlands such as peat swamps are important repositories of above and below-ground carbon.

Though billions of people around the world depend on ecosystem goods and services for their livelihoods and subsistence, and on the healthy 'flow' of these services through connected land and seascapes, these contributions are neither fully recognized nor valued in markets. As a consequence, biodiversity is being lost at an unparalleled pace as natural resources are used without consideration for their other values, with the result that the capacity of ecosystems to sustain the delivery of goods and services is being undermined.

Biodiversity loss has been vividly demonstrated in a number of recent studies, summarized below.

For example, global assessments of coral reefs of the world report drastic and rapid rates of decline. According to the 2008 global update of the world's reef status<sup>2</sup> compiled by the Global Coral Reef Monitoring Network (GCMRN), the world has effectively lost 19 percent of

its original area of coral reefs; 15 percent are seriously threatened with loss within the next 10 to 20 years; and 20 percent are under threat of loss in 20 to 40 years. The latter two estimates have been made under the Intergovernmental Panel on Climate Change's (IPCC) 'business as usual' emissions scenario, which does not consider the looming threats posed by global climate change or the potential positive benefits gained through effective future management. If current trends in carbon dioxide emissions continue, it is possible that many of the remaining reefs may be lost over the next 20 to 40 years. A major concern is that the majority of marine species will not be able to evolve or adapt to changes in ocean chemistry that result from acidification caused by increased uptake of carbon dioxide by the oceans. The very survival of these ecosystems is at risk.<sup>3</sup>

The loss of coral reefs will have huge economic impacts, will threaten the balance of global biodiversity and will endanger the food security of hundreds of millions of people relying heavily on oceanic natural resources in tropical areas.

According to the *Global Biodiversity Outlook*,<sup>4</sup> the loss of primary forest since 1991 has been estimated at six million hectares annually; deforestation in general

**An estimated** 80,000 edible plants are found in the world; one in every three mouthfuls of the food we eat is prepared from plants pollinated by wild insects and animals. Plants and animals also provide people with medicine. Forty percent of all prescriptions written today are composed from the natural compounds found in different species. One of the most famous examples is *digitalin*, which is derived from the foxglove plant and is used to treat heart conditions. *Vincristine*, taken from the rosy periwinkle of Madagascar, is used to treat childhood leukemia. Many more medicines have been derived from species found in rainforest areas, and it is possible that many species could provide cures for humanity's ills in the future.

Source:  
[www.foodplantsinternational.com](http://www.foodplantsinternational.com)



has been occurring at a rate of approximately 13 million hectares per year (there are significant regional differences: Africa and South America have the largest net loss of forests, while the forest area in Europe and some of Asia is expanding slowly). Recent evidence indicates a growing frequency and impact of natural, damaging disturbances—such as fire, insect outbreaks and disease—in boreal forests.<sup>5</sup>

The increasing fragmentation of natural habitats is also a problem. Of the 292 large river systems assessed by the Global Biodiversity Outlook, 88 percent were affected by the development and/or use of dams. Other ecosystems—such as Mediterranean forests, woodlands and scrub; tropical and sub-tropical grasslands, savannas and scrublands; and desert ecosystems—have been lost at alarming rates. Since 1990, approximately 70 percent, 50 percent and 30 percent of those ecosystems have been lost, respectively. In non-polar regions, snow cover on high mountains has decreased by about ten percent in the last four decades. Around 20 percent of Arctic summer sea ice has been lost in that same time period.<sup>6</sup>

In terms of species, conservation biologists are publishing evidence from all corners of the world suggesting that humanity is living through the sixth and greatest planetary extinction event of all time.<sup>7</sup> Scientists estimate that we are losing species at 100 to 1,000 times the background rate.<sup>8</sup> The global extinction trend is reflected in every major vertebrate group that is being monitored. According to the 2009 *IUCN Red List of Threatened Species*<sup>9</sup>—which ranks species according to their population status and threat levels—more than a third of the world's known animals and plants (at least 17,291 species out of the 47,677 assessed species) are at risk of disappearing forever. Updates to the list show that 21 percent of all known mammals, 30 percent of all known amphibians, 12 percent of all known birds, and 28 percent of reptiles assessed so far are at risk. All of these figures were based on a comprehensive assessment of the status of every known species of amphibian, bird, conifer, mammal, reef-building coral and shark, with efforts continuing to complete assessments of populations of all fishes, reptiles, and certain groups of invertebrates and plants.<sup>10</sup> Of the world's 5,490 mammals, for example, the Red List documents 79 species as extinct or extinct in the wild, with 188 critically endangered, 449 endangered and 505 vulnerable.

**The concentration** of carbon dioxide (CO<sub>2</sub>) in the Earth's atmosphere now exceeds 380 parts per million (ppm); estimates of future atmospheric CO<sub>2</sub> concentrations indicate that atmospheric CO<sub>2</sub> concentrations could exceed 500ppm by 2050 and 800ppm before 2100 (IPCC 2007). A corresponding increase in ocean acidity (as a result of chemical processes triggered by the uptake of CO<sub>2</sub> by the oceans) by 0.3-0.4 pH units to pH 7.9 is predicted, which would reduce the availability of carbonate minerals (important building blocks for calcifying marine organisms) by up to 50 percent during this period.<sup>1</sup>

Global temperatures are also projected to increase by 1.8 to 4°C above today's average temperatures with implications for the survival of thermally sensitive species.<sup>2</sup> As the world's oceans become less saturated with carbonate minerals over time, corals and associated organisms are expected to build weaker skeletons and shells, and experience slower growth rates, which will make it increasingly difficult for them to retain a competitive advantage over other marine organisms, such as macro-algae.<sup>3</sup> Experimental studies have suggested that coral reef calcification and growth rates could decrease by up to 30 percent at atmospheric CO<sub>2</sub> concentrations of 560ppm.

<sup>1</sup> CBD (in press 2009). Scientific Synthesis on the Impacts of Ocean Acidification on Marine Biodiversity.

<sup>2</sup> Hoegh-Guldberg, O. et al (2007). Coral reefs under rapid climate change and ocean acidification. *Science* 318, 1737-1742.

<sup>3</sup> Langdon, C., and M.J. Atkinson. 2005. Effect of elevated pCO<sub>2</sub> on photosynthesis and calcification of corals and interactions with seasonal change in temperature/irradiance and nutrient enrichment. *Journal of Geophysical Research*.

<sup>1</sup> Article 2 of the Convention on Biological Diversity (CBD).

<sup>2</sup> Status of Coral Reefs of the World: 2008. For further information, see [www.gcrmn.org](http://www.gcrmn.org)

<sup>3</sup> Source: International Coral Reef Action Network; [www.icran.org](http://www.icran.org)

<sup>4</sup> Global Biodiversity Outlook 3 is under preparation. To review a draft, please visit [www.cbd.int/gbo3](http://www.cbd.int/gbo3)

<sup>5</sup> Global Biodiversity Outlook 2, CBD 2006 (pages 23-24).

<sup>6</sup> Global Biodiversity Outlook 2, CBD 2006 (pages 23-25).

<sup>7</sup> Thomas et al. American Museum of Natural History, 2005.

<sup>8</sup> Chivian, E. and A. Bernstein (eds.). 2008. *Sustaining life: How human health depends on biodiversity*. Center for Health and the Global Environment. Oxford University Press, New York.

<sup>9</sup> "State of the World's Species," 2009 [www.iucnredlist.org/](http://www.iucnredlist.org/)

<sup>10</sup> "The IUCN Red List of Threatened Species: A Key Conservation Tool," 2009 [www.iucnredlist.org](http://www.iucnredlist.org)

The *Living Planet Index*,<sup>11</sup> published biennially by the World Wide Fund for Nature (WWF) and its partners, has recorded a consistent decline in average species abundance by about 30 percent between 1970 and 2003. Brazil, China, Indonesia and Mexico have particularly large numbers of threatened species. Colombia, India, Malaysia, Myanmar, New Caledonia, Papua New Guinea, the Philippines and South Africa have high numbers of threatened endemics for at least one taxonomic group. Madagascar, São Tomé and Príncipe, and the Seychelles have particularly high proportions of threatened species across multiple taxa.

The Global Amphibian Assessment<sup>12</sup> reports that amphibians are declining on a global scale faster than any other vertebrate group, with over 32 percent of all surviving species being threatened with extinction. Serious concerns also exist about taxonomic groups that fail to garner the same degree of attention and concern as vertebrates, including fungi, lichen, plant and insect communities. The greatest bulk of biomass on land is found in plants, which are often codependent with insects that provide pollination services vital to plant reproduction. The great ecological value of insects—which outnumber all other living groups in measure of species richness—cannot be ignored. In recent years, for example, the demise of honey bee populations (*Apis mellifera*) has puzzled scientists. Honey bees provide indispensable ecological services by pollinating a huge array of agricultural crops. The sudden recent plunge in bee populations in some areas of the world as a result of a condition known as colony collapse disorder is therefore a matter of great concern. Pests, pesticides and climate change are all being considered as possible causes.

However, on a positive note, the results of some studies show that effective conservation can bring species back from the brink of extinction, with five percent of currently threatened mammals showing signs of recovery in the wild.

In 2001, the Millennium Ecosystem Assessment<sup>13</sup> (MA) was launched by then UN Secretary General Kofi Annan to examine and assess ecosystem changes in recent decades, and project those changes into the future. Building on an explosion of research on ecosystem health at a variety of scales—forest, watershed, national, regional, and global—the MA, for the first time, wove those studies together to present a holistic view of the status of ecosystems and the implications of their degradation for human well-being. In 2005, the MA released the results of these studies in a major report. In order to link the functioning of ecosystems to human

welfare, the MA focused on ecosystem services – the benefits people obtain from ecosystems (mediated through complex biological, chemical and physical interactions).

The MA framework posits five major categories of ecosystem services:

- *Provisioning*, such as the production of food and water;
- *Regulating*, such as the control of climate and disease;
- *Supporting*, such as nutrient cycles and crop pollination;
- *Cultural*, such as spiritual and recreational benefits; and
- *Preserving*, such as the maintenance of diversity.

Assessments of the current trend in the global state of major services provided by ecosystems reveal that the main drivers of degradation of these services are land-use conversion (most often to agriculture or aquaculture), excess nutrient supply to ecosystems and anthropogenic climate change. It is expected that these problems, unless addressed, will seriously diminish the benefits that future generations will obtain from ecosystems and hinder efforts to reduce global poverty and achieve the Millennium Development Goals (MDGs). Many of the regions facing the greatest challenges in achieving the 2015 poverty reduction targets coincide with regions facing the greatest incidence of ecosystem degradation. The findings are corroborated by the results of the 18 approved sub-global assessments and 15 associated sub-global assessments undertaken as part of the MA process.<sup>14</sup>

**Four** of the eight MDGs are relevant to the biodiversity management work of the UNDP-GEF:  
 Goal 1: Eradicate extreme poverty and hunger  
 Goal 3: Promote gender equality and empower women  
 Goal 7: Ensure environmental sustainability  
 Goal 8: Develop a global partnership for development)

<sup>11</sup> [www.panda.org/about\\_our\\_earth/all\\_publications/living\\_planet\\_report/living\\_planet\\_index/](http://www.panda.org/about_our_earth/all_publications/living_planet_report/living_planet_index/)

<sup>12</sup> For more information, visit <http://www.iucnredlist.org/initiatives/amphibians>

<sup>13</sup> See [www.millenniumassessment.org](http://www.millenniumassessment.org) for further information.

<sup>14</sup> The 18 approved sub-global assessments and 15 associated sub-global assessments were undertaken as part of the MA process to meet needs of decision-makers at the scale at which they are undertaken, and strengthen the global findings of the MA by providing an on-the-ground reality check. [www.millenniumassessment.org](http://www.millenniumassessment.org)

## 1.2 Biodiversity and Poverty Alleviation

Poor people, especially those living in areas with low agricultural productivity, depend heavily and directly on genetic, species and ecosystem diversity to support their livelihoods. This support includes contributions to health and nutrition, reduced vulnerability to climate variability and natural disasters, crop and stock development, and off-farm resource use. As a consequence, biodiversity loss undermines efforts to reduce poverty and can be a cause of impoverishment. The 2008 TEEB report<sup>15</sup> on the economics of ecosystems provides sobering evidence of the likely impacts of biodiversity loss—and the destabilization of ecosystem services—on human welfare. While rich societies may be able to replace ecosystem services with engineered solutions, the loss of ecosystem buffering services will make poor communities more vulnerable to the impacts of climate change, with enormous social costs.

A study from India, reported by TEEB, showed that ecosystem services contribute up to 57 percent of the GDP of the poor. It also revealed that, unlike the rich, the poor are unable to replace ecosystem services with built infrastructure (for example, by building flood control infrastructure once natural flood defenses provided by forests and wetlands have been lost).

In a vicious cycle, poverty may also lead to biodiversity loss. The poor, living on the margin, are unable to forego uses of natural resources harvested from natural ecosystems, as so doing might have life and death consequences (at the very least adverse welfare impacts) if there are no alternatives available. They are unlikely to be receptive to measures to change land and resource use practices if the immediate risks and costs are high. Part of the problem is that the benefits provided by 'intact' ecosystems tend to be shared and occur over the long term; the costs of managing ecosystems and the opportunity costs of foregoing resource use must, on the other hand, be borne immediately.

The temporal mismatch between the incidence of the costs and benefits of ecosystem management is a major challenge in seeking to address the impacts of poverty on biodiversity. A further challenge arises because the poor receive only a fraction of the benefits derived from the extraction of natural resources, for example, the price poor fishermen are paid for fish, or the price poor forest communities obtain for timber. This may

mean that the poor may be forced to harvest natural resources beyond their sustainable use thresholds in order to meet their target incomes. The distribution of land and natural resources may also be a problem; where these resources are controlled by a few, the poor may not have alternative means to eking out an existence but to encroach on natural ecosystems. This is a particular problem for the landless poor, and in many parts of the world is directly leading to ecosystem conversion to permanent agriculture and/or other forms of functional degradation.

Biodiversity loss may also foreclose future development options in poor countries with limited development opportunities. These may include the option to develop the tourism industry, or the option to maintain natural resource sectors such as forestry, agriculture and fisheries that are dependent on ecological goods. Without such opportunities, these countries may not be able to lift the poor out of poverty. Attenuating biodiversity loss is thus a critical strategy for mitigating poverty and achieving sustainable development: ultimately, the only real solution for eradicating poverty.

**In 2005**, a UNDP-funded study showed that local communities living in the wetlands of northern Botswana earn up to US\$1,500 per household per year in imputed income from the harvest of fish, thatch for construction or for basket weaving, employment in the nature tourism industry, and grazing of cattle in the nutrient-rich flood plains. While the incidence of poverty is high in northern Botswana, measured on the basis of cash incomes, there is little absolute poverty in the wetlands as communities enjoy 'subsistence affluence' through the harvest of natural resources.

<sup>15</sup> The Economics of Ecosystems and Biodiversity, known as the TEEB Report, published by the European Commission and the German Federal Ministry for the Environment in 2008. [www.teebweb.org](http://www.teebweb.org)

## 1.3 Global Drivers of Biodiversity Loss

Natural or human-induced factors that directly or indirectly cause a change in an ecosystem are referred to as “drivers.” A direct driver unequivocally influences ecosystem processes. An indirect driver operates more diffusely, by altering one or more direct drivers. Drivers affect ecosystem services and human well-being at different spatial and temporal scales, which makes both their assessment and their management complex. Climate change may operate on a global or a large regional spatial scale; political change may operate at the scale of a nation or a municipal district. Socio-cultural change typically occurs slowly, on a time scale of decades (although abrupt changes can sometimes occur, as in the case of wars or political regime changes), while economic changes tend to occur more rapidly. As a result, the forces that appear to be most significant at a particular location and time may not be the most significant over larger (or smaller) regions or time scales.<sup>16</sup> Important direct drivers include habitat change, climate change, invasive species, overexploitation and pollution.

Most of the direct drivers of degradation in ecosystems and biodiversity currently remain constant or are growing in intensity.

### Direct Causes of Ecosystem Degradation: Climate Change

Experts agree that anthropogenic climate change is likely to become the dominant direct driver of biodiversity loss by the end of the 21<sup>st</sup> century. Computer models predict an average global temperature increase of 1.4 to 5.8 degrees Centigrade by the year 2100.<sup>17</sup> Climate change is exacerbating and being accelerated by biodiversity loss and ecosystem degradation. It is projected to increase environmental variability, which—depending on the region—will be manifest in, among other phenomena, increasing storm frequency and intensity, coastal inundation from storm surges, and changes in spatial and temporal rainfall distribution patterns, leading to flooding and drought. Projected changes in climate, combined with land-use change and the spread of invasive alien species, are likely to limit the capability of some species to migrate and therefore will accelerate species loss. It is highly probable that climate change is *already* affecting terrestrial and marine ecosystems and that these changes will increase in both rate and severity during the century.

The Fourth Assessment Report of the IPCC published in 2007 draws on more than 29,000 observational data series from 75 studies.<sup>18</sup> The results show significant changes in many physical and biological systems; more than 89 percent are consistent with climate change. Overall the analysis led the IPCC to conclude, “*Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases.*” Consequences of climate change on the species component of biodiversity include:

- Changes in distribution;
- Increased extinction rates;
- Changes in reproduction timings; and
- Changes in length of growing seasons for plants.

Some species that are already threatened are particularly vulnerable to the impacts of climate change, including Australia’s Great Barrier Reef—which could lose up to 95 percent of its living coral by 2050 due to changes in ocean temperature and chemistry—Asian tigers, African elephants, and frogs (which are dependent on water to

**The TEEB Report’s** *Climate Update* (published mid-2009 in preparation for the climate change conference (COP10) in Copenhagen in December 2009) makes three important conclusions about the consequences of climate change, with sobering commentary on the expected imminent loss of coral reefs due to climate change and the serious ecological, social, and economic consequences this will entail. The report notes that forests perform a valuable function in capturing and storing carbon, and thus recommends an early and appropriate agreement on forest carbon to provide a significant opportunity to mitigate emissions leading to climate change and set the stage for related mechanisms to reward other ecosystem services from forests. In addition, there is a compelling cost-benefit case for public investment in ecological infrastructure (especially restoring and conserving forests, mangroves, river basins, wetlands, etc.), particularly because of its significant potential as a means of adaptation to climate change.

[www.teebweb.org](http://www.teebweb.org)

breed; any reduction or change in rainfall could reduce frog reproductive success). Moreover, rising temperatures are closely linked to outbreaks of a fungal disease that contributes to the decline of amphibian populations, especially frogs in Latin America.<sup>19</sup>

While climate change already poses an immense challenge today, the continued degradation of critical ecosystems threatens to increase greenhouse gas emissions and intensify the negative effects of climate change in the future.

The effects of climate change on natural ecosystems will affect all societies adversely, but it will affect the poor disproportionately. Already vulnerable, the living conditions of rural farmers, fisher folk and forest-dependent communities will almost certainly worsen. Successful efforts at fighting climate change will require a dramatic increase in support to developing countries for capacity development, technology transfer and investment to maintain the capacity of ecosystems to supply vital ecosystem services, including carbon sequestration.

The maintenance of ecosystem resilience from hilltops to deep oceans (at the land and seascape levels) will be critical if the ecosystem functions that underpin ecosystem service delivery are to be sustained. This needs to be melded as a priority into national adaptation and mitigation strategies.<sup>20</sup>

## Direct Causes of Ecosystem Degradation: Unsustainable Natural Resource Use

The rate of ecosystem change has accelerated over the past 50 years as a result of the growing demand for food, freshwater, timber, fiber and fuel.<sup>21</sup> More land has been converted to agriculture since 1945 than in the 18<sup>th</sup> and 19<sup>th</sup> centuries combined. An accelerating global demand for raw materials – both renewable resources harvested from the wild and non-renewable commodities like metals and petroleum – is leading to unsustainable extraction pressures in wild places across the planet. This threat is compounded by population expansion and immigration into these areas. Only areas unsuited to crop plants, such as deserts, boreal forests, and tundra, remain largely untransformed by human action.

In marine ecosystems, the impact of fishing has been particularly significant in coastal areas and is now also affecting the open oceans. About half of the commercially

exploited wild marine fish stocks for which information is available are fully exploited and without scope for increased catches. In freshwater ecosystems, water regime changes (such as those following the construction of large dams) combined with invasive species and high levels of nutrient loading, have led to species extinction and pollution.<sup>22</sup>

**Coastal ecosystems** are affected by multiple direct drivers. Worldwide, nearly 40 percent of people live on the thin fringe of land within 50 kilometers of the ocean. Fishing pressures in those systems are linked to a wide array of other drivers including land-, river- and ocean-based pollution, habitat loss, invasive species, and nutrient loading. The greatest threat to coastal ecosystems is the conversion of coastal habitats through coastal urban sprawl, resort and port development, aquaculture, and industrialization.

MA 2005

## Direct Causes of Ecosystem Degradation: Pollution

Over the past four decades, excessive levels of nutrients in soil and water have emerged as one of the most important direct drivers of ecosystem change in terrestrial, freshwater and marine ecosystems. For example, the use of fertilizers can increase crop productivity, but it can have significant adverse effects in other ecosystems. High concentrations of nutrients—from the runoff of these fertilizers—in aquatic ecosystems can lead to excessive plant and algae growth (a process known as eutrophication) and to changes in the ecosystems. These changes can in turn reduce or eliminate fish populations, increase outbreaks of microbes, increase the cost of water purification, and degrade cultural services by keeping people from swimming, boating, and otherwise enjoying bodies of water.

<sup>16</sup> Millennium Ecosystem Assessment Synthesis Report 2005, Chapter 4, p.64

<sup>17</sup> [www.grida.no/climate/ipcc\\_tar/wg1/339.htm](http://www.grida.no/climate/ipcc_tar/wg1/339.htm)

<sup>18</sup> Pachauri, R. K. and A. Reisinger (Eds.) (2007); Climate Change 2007: Synthesis Report, IPCC, Geneva, Switzerland, pp 104

<sup>19</sup> WWF. Climate Change. Nature at risk. Threatened species, accessed online at [www.panda.org/about\\_wwf/what\\_we\\_do/climate\\_change/problems/impacts/species/index.cfm](http://www.panda.org/about_wwf/what_we_do/climate_change/problems/impacts/species/index.cfm)

<sup>20</sup> Adaptation is the adjustment in the response of societies to climate-induced environmental variability, aimed at moderating the impact.

<sup>21</sup> Current estimates of three billion more people and a quadrupling of the world economy by 2050 imply a formidable increase in the demand for biological and physical resources from ecosystems, as well as escalating impacts on ecosystems and the services they provide.

<sup>22</sup> Millennium Ecosystem Assessment. 2005. Summary at [www.greenfacts.org](http://www.greenfacts.org)

## Direct Causes of Ecosystem Degradation: Species Introduction or Removal

Biotic invasion is one of the top drivers of global biodiversity loss and is increasing because of tourism and globalization. Biological species invasions alter ecosystems in a multitude of ways. Worldwide, an estimated 80 percent of endangered species could suffer losses by competition with or predation by invasive species. Land clearing and human habitation put significant pressure on local species. The disturbed habitat is prone to invasions that can have adverse effects on local ecosystems and change ecosystem functions. For example, invasive plants can alter the fire regime, nutrient cycling and hydrology of native ecosystems. Natural wild species can also be threatened with extinction through the process of genetic pollution, where hybrids swamp the wild gene pool.<sup>23</sup>

## Indirect Causes of Ecosystem Degradation

The causes of biodiversity loss are almost always multiple and interactive, so that a one-to-one linkage between particular driving forces and particular changes in ecosystems rarely exists. The five most common indirect drivers that influence ecosystems and ecosystem services are:

- *Human population change:* This includes population growth and migration. World population has doubled in the past 40 years, reaching six billion in 2000, with most of the growth taking place in developing countries.
- *Change in economic activity:* Global economic activity has increased nearly seven-fold in the last 50 years. As per capita income grows, demand for many ecosystem services increases and the structure of consumption also changes.
- *Socio-political factors:* These factors include decision-making processes and the extent of public participation in them.
- *Cultural and religious factors:* In this context, culture can be defined as the values, beliefs, and norms that a group of people share. It conditions individuals' perceptions of the world, and suggests courses of action which can have important impacts on other drivers such as consumption behavior.
- *Science and technology:* The 20<sup>th</sup> century saw tremendous advances in the understanding of how the world works and in the technical applications of that knowledge. Much of the

increase in agricultural output over the past 40 years has come from an increase in yields per hectare rather than an expansion of area. At the same time, technological advances can also lead to degradation of ecosystem services. Advances in fishing technologies, for example, have contributed significantly to the depletion of marine fish stocks.<sup>24</sup>

There are two key factors that will ultimately determine the success or failure of human societies to manage their biodiversity, and to avoid impoverishing the poor and already vulnerable segments of society: the strength of **environmental governance systems** and the ability to address **market failure**.

A primary reason for biodiversity loss—and in particular the components of biodiversity that provide human kind with beneficial services—lies in the failure of society to manage the trade and consumption of scarce natural resources in the wider public interest.

**Weak environmental governance** often leads to the unequal application of rules, limited accountability and a high degree of centralization in decision-making. The value of ecosystem services is rarely considered in economic policy. This makes the cost of environmental stewardship generally high, since government policies often encourage destructive land uses, thereby making harmful practices economically feasible, socially acceptable and even desirable. Undefined property and usufruct rights on communal lands are also symptoms of weak environmental governance, which compound ecological problems and keep many communities in poverty.

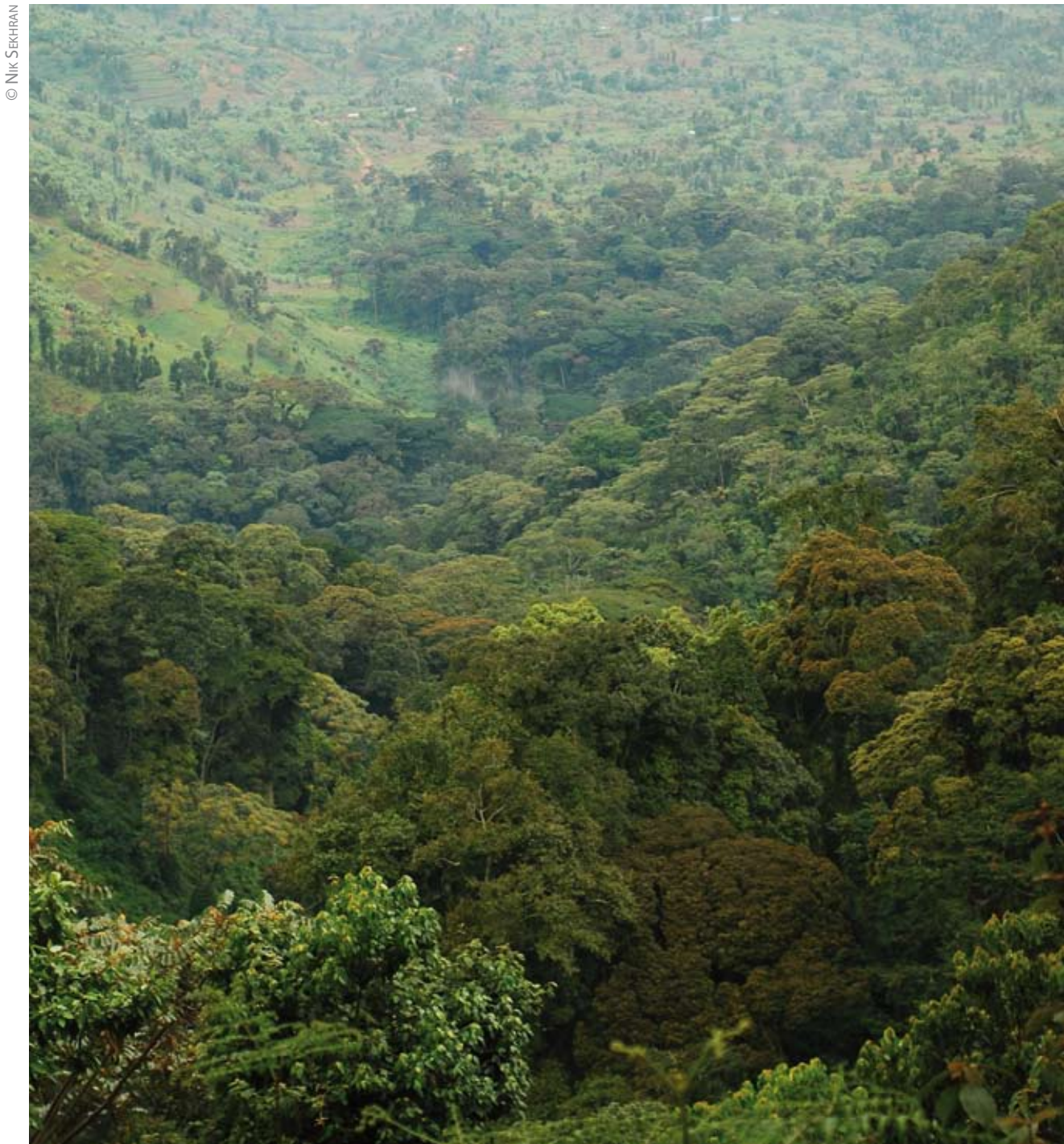
Strong governance systems are pivotal; such systems mean that the country has the policies and regulations, effective institutions, accountable decision making systems, and property rights needed to manage ecosystems effectively, and the society has the capacity and the will to ensure equitable development and forego consumption of natural resources—so as to avoid larger long-term costs associated with ecosystem loss.

<sup>23</sup> See [www.cbd.int/invasive/](http://www.cbd.int/invasive/) for further information.

<sup>24</sup> See [www.greenfacts.org](http://www.greenfacts.org) for further analysis.

**Market failure** is a second key factor in the determination of the success or failure of environmental management. Trade in ecosystem services magnifies the effect of governance, regulations and management practices, both good and bad. International trade is an important source of economic gain, as it enables comparative advantages to be exploited and accelerates the diffusion of more efficient technologies and practices. Yet increased trade can accelerate degradation of ecosystem services in exporting countries if their policy, regulatory, and

management systems are inadequate. In this context, market failure arises when the many values of ecosystem goods and services are not accounted for – or are undervalued – in market transactions, whether local, domestic or international. Such short-sighted accounting often leads to the conversion of ecosystems (such as from forest to farm land with market value) or the overharvest of economically important components of ecosystems (such as fish) without consideration of the broader ecosystem values that are being forfeited as a consequence.



© NIK SEHRAN

## 1.4 UNDP Strategies to Reduce Biodiversity Loss

UNDP is the largest source of technical assistance on environment and energy in the UN system.<sup>25</sup> UNDP's portfolio of biodiversity projects, mainly funded by the Global Environment Facility (GEF), consists of 115 projects under implementation, with a total value of US\$1.95 billion, which includes US\$466 million in GEF funding and US\$1,151 million in other finance attached to these projects.

UNDP's biodiversity management work is aligned with the four Key Results of the Strategic Priority on Environment and Sustainable Development, agreed in UNDP's Strategic Plan for 2008-2011. Those four Key Results are:

- i. Mainstreaming environment and energy in MDG-based policy and planning frameworks at the national level;
- ii. Generating new environment-based sources of finance to significantly scale-up investment in environment and energy to achieve the MDGs;
- iii. Promoting adaptation to climate change in order to lower the risks to the poor in developing countries and enable the attainment of the MDGs; and
- iv. Expanding access to environmental and energy services for the poor as a foundation for poverty reduction and economic growth.

Additionally, UNDP's 2008-2011 Strategic Plan includes the strategic priority *Environment and Sustainable Development for the Millennium Development Goals (MDGs)*.

As the financial mechanism for the Convention on Biological Diversity, and in accordance with its mandate "to assist in the protection of the global environment and promote thereby environmentally sound and sustainable economic development,"<sup>26</sup> the GEF provides incremental financing to developing countries to assist them in the conservation of biodiversity, sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. GEF-funded projects and activities are fully integrated into UNDP's programme of work on environment and energy.<sup>27</sup>

UNDP interventions in the biodiversity focal area are designed to address the threats to biodiversity by lifting barriers to country actions needed to address the root causes of biodiversity loss, improve the state of biodiversity over the long-term, and maintain and enhance the beneficial services provided by natural ecosystems in order to secure livelihoods, food, water and health security, to reduce vulnerability to climate change, store carbon, and avoid emissions from land use and land use change.

UNDP-GEF spearheads its biodiversity projects under the umbrella of two Signature Programmes, focusing interventions in areas where UNDP has a clear comparative advantage. These Signature Programmes are closely aligned with GEF Strategic Objectives 1 and 2 for biodiversity.

*UNDP's portfolio of biodiversity projects, mainly funded by the Global Environment Facility (GEF), consists of 115 projects under implementation, with a total value of US\$1.95 billion.*

<sup>25</sup> A number of other UNDP environment programmes also contribute towards biodiversity management, including the Poverty-Environment Initiative, the UN REDD Programme, the Equator Initiative and initiatives

<sup>26</sup> GEF 1994. Instrument for the Establishment of the Restructured Global Environment Facility.

<sup>27</sup> [www.undp.org/energyandenvironment/about.htm](http://www.undp.org/energyandenvironment/about.htm)

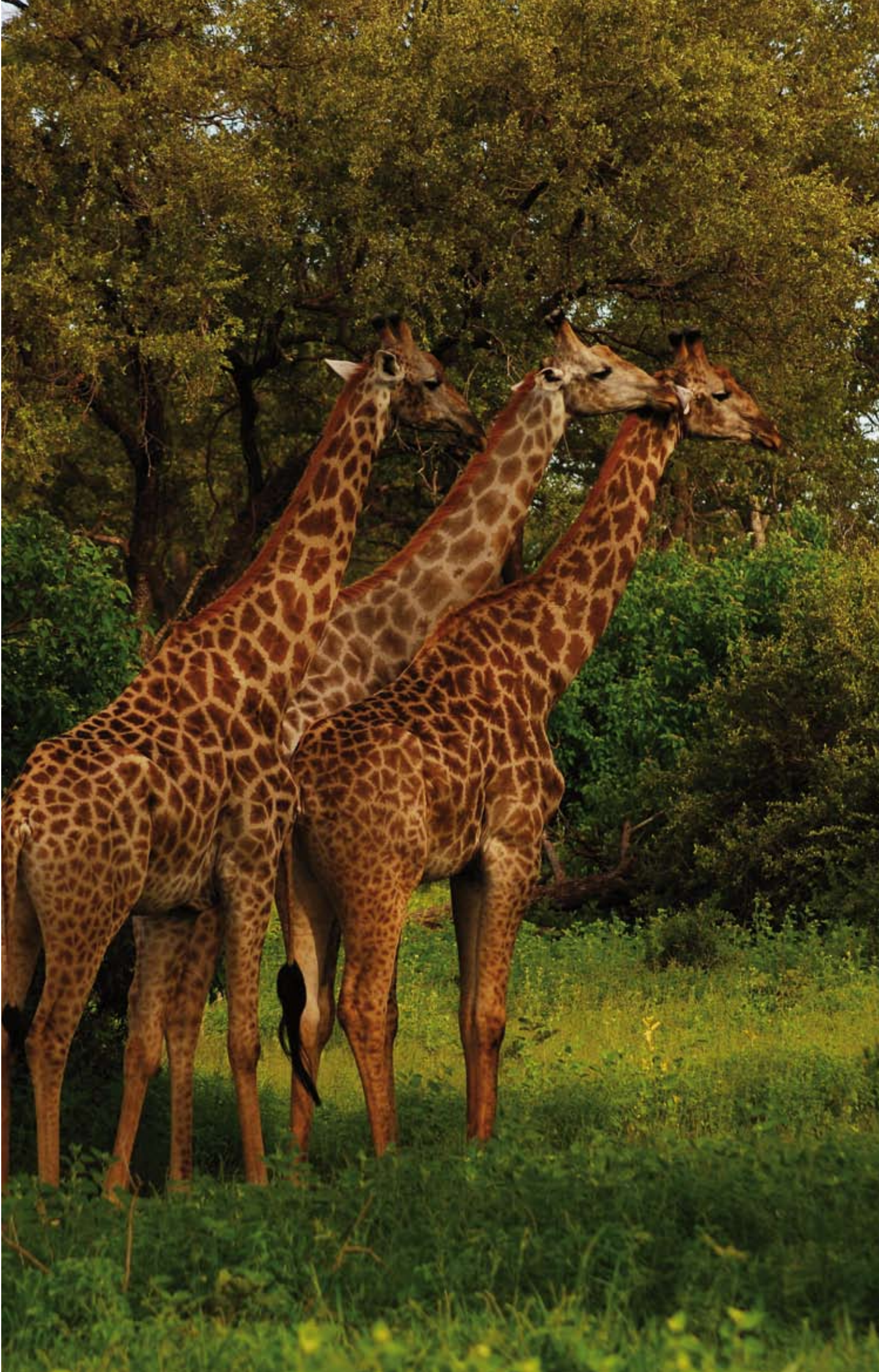


GEF Strategic Objectives and UNDP Strategic Programmes

GEF Strategic Objective	UNDP Strategic Programme
<p><b>Strategic Objective 1</b> To catalyze sustainability of Protected Area systems</p>	<p>Unleash the economic potential of Protected Areas (22 percent of the Earth’s surface area, including indigenous and community conservation areas), so that they are able to fulfill their management functions, are sustainably financed and contribute towards sustainable development.</p>
<p><b>Strategic Objective 2</b> To mainstream biodiversity in production land/seascapes and sectors</p>	<p>Mainstream biodiversity management objectives into economic sector activities, to ensure that production processes maintain essential ecosystem functions that sustain human welfare.</p>

© NIK SEKHAN





# Protected Areas Management

2.1 Global and Regional Impacts

2.2 Case Studies

2.3 Results Achieved by Barrier Removal

Protected areas (PAs) are widely recognized as cornerstones of biodiversity management and sustainable development. A comprehensive, effectively managed and ecologically representative global network of protected areas is crucial to the reduction of the rate of biodiversity loss. At the end of 2008, over 120,000 protected areas had been established covering 12.2 percent of the Earth's land area, 5.9 percent of the territorial seas, but only 0.5 percent of the extraterritorial seas.<sup>28</sup>

Despite the large coverage, the global PA estate is not representative of all ecosystems. A recent report on the CBD's Programme of Work on Protected Areas (PoWPA) found that the target of effectively conserving (via PA coverage) at least 10 percent of each of the world's ecological regions is unlikely to be achieved by 2010/2012.<sup>29</sup>

While individual differences exist between countries and regions, some general deficiencies in PA estates can be characterized, including: inadequate bio-geographic coverage, weak management effectiveness and weak financial sustainability.

Generally, PAs range from 100 hectares (ha) to over 97,000,000 ha in size,<sup>30</sup> but many are too small and fragmented to ensure maintenance of ecosystem integrity. However, there are substantial differences in coverage between different biomes, ecosystems and habitats. At present, some critical biomes—such as freshwater, marine, and grasslands—are underrepresented in protected area systems.

Moreover, many PAs are managed ineffectively and lack the financial resources to ensure sustainability. Many protected areas have not been legally established and have little or no management capacity. Others do not work to the benefit of indigenous and local communities – alienating them from conservation efforts and increasing the cost of managing sites.

Climate change will also alter the distribution of species, and protected areas—many of which are already islands in anthropogenically modified landscapes—will lose species. Certain ecosystems, such as alpine ecosystems in the tropics, are likely to disappear altogether. However, PAs will likely play a major role in engendering greater ecosystem resilience at a landscape level and sustaining vital ecosystem functions. To achieve this, PAs would

need to be conceived and managed as part of a matrix of land uses at the landscape level, managed to maintain ecosystem functions.

In many cases, these problems can be traced to a perceived disconnect between PAs and the sustainable development agenda. UNDP assists countries to establish the governance frameworks needed to strengthen PA management at the systems level, and unleash their economic potential by harnessing values (such as sustainable tourism or from the harvest of natural resources) or sustaining ecosystem services.

UNDP's strategy is to address gaps through country-specific interventions that seek to strengthen management of protected area systems by addressing existing barriers at *systemic, institutional, individual* and *financial levels*. UNDP works through strategic partnerships mobilized with governments and private sectors, non-government organizations (NGOs) and community-based organizations (CBOs) that build on their respective strengths. This approach aims to strengthen PA systems by leveraging management know-how. Importantly, UNDP also takes a rights-based approach by ensuring that local communities are treated as partners—not antagonists—with clear rights and responsibilities in PA management.

Key PA barrier removal activities at the *systemic* level include broad-based consensus-building among stakeholders, strengthening the policy and legal framework, establishing systems to facilitate institutional cooperation across government agencies, civil society and the private sector, and establishing knowledge networks that build the capacity to mobilize and apply information to improve PA management and improve the public profile of PAs.

At an *institutional level*, barrier removal activities generally focus on strengthening the capacity of PA authorities and other agencies so that they can perform basic functions, such as planning, monitoring, enforcement and reporting, implement appropriate policies and adapt their management strategies to address changing threat profiles within the PA network.

<sup>28</sup> UNEP-WCMC (2008). State of the world's protected areas: An annual review of global conservation progress. UNEP-WCMC, Cambridge, UK.

<sup>29</sup> Coad L., Burgess, N.D., Bomhard, B. and Besancon, C. 2009. Progress towards the Convention on Biological Diversity's 2010 and 2012 Targets for Protected Area Coverage. A technical report for the IUCN international workshop "Looking to the Future of the CBD Programme of Work on Protected Areas," Jeju Island, Republic of Korea, 14-17 September 2009. UNEP-WCMC, Cambridge, UK.

[http://www.unep-wcmc.org/protected\\_areas/pubs.htm](http://www.unep-wcmc.org/protected_areas/pubs.htm)

<sup>30</sup> World Database on Protected Areas: <http://sea.unep-wcmc.org/wdbpa>.

In order to make the global PA system more *representative* of all threatened biodiversity, UNDP works through the GEF partnership with the aim of achieving a new management paradigm based on co-management between resident communities, government and, in some instances, the private sector. Many new PAs are being established as Community Conservation Areas (CCAs).

*Individual level* activities are designed to enhance staff skills in PA authorities, as well as community institutions made responsible for PA co-management. *Financial*

barriers are an important target area for UNDP work: many PAs are capable of generating economic value from tourism and ecosystem services. However, these values are rarely considered in the cost-benefit calculus employed when making budgetary allocations to the PA system and, as a result many PA systems are under-funded. A key UNDP strategy is to assist programme countries to capture these financial benefits and ensure that PAs are widely recognized as cornerstones of biodiversity management and sustainable development.

<sup>31</sup> Recommendation 5.16 of World Parks Congress

## Barrier Category and Description: Protected Areas

**Systemic level:** The policy framework needed to manage the PA system effectively and ensure its integration within core development strategies may be inadequate. This leads to various consequences, including the poor integration of PAs under different management categories and ownership regimes (such as co-management and different tenure regimes) into a common framework to meet national goals. This may be compounded by the lack of a robust management and operational planning system, measures to distill and disseminate knowledge to improve systems management, and weak public acceptance of the development function of PA systems.

**Institutional level:** This barrier relates to gaps in the PA governance system. Highly centralized PA administration tends to cause a disconnect between management and needs on the ground. Institutional arrangements for PA governance may be complex with overlapping mandates between different institutions. These complexities impede the definition of clear goals and standards, increase costs and reduce efficiencies. Weak governance can impede successful partnerships, which may be essential to plug existing institutional capacity deficits. Achieving effective management of PAs requires adopting appropriate management objectives and governance systems, adequate and appropriate resourcing, and the timely implementation of appropriate management strategies and processes. The degree to which PAs meet conservation objectives, contribute to the well-being of society and achieve broad social, economic and environmental goals is closely related to the quality of their governance.<sup>31</sup>

**Individual level:** There may be limited capacity amongst PA managers to perform basic PA functions, from planning, to bookkeeping and reporting to field surveys, social outreach, boundary demarcation and enforcement. Staff competencies and profile assessments indicate significant deficiencies with regard to limited financial and planning skills at site level and capacities for conflict resolution and community participation.

**Financial barriers:** Budgetary allocations within PA systems are often made independently of actual PA site management requirements. PA systems are generally under-funded. Key problems include: the benefits of PAs are often not accommodated in the cost-benefit calculus for decision-making regarding development, either because they are non-monetary, and therefore discounted, or because their contributions to the economy (such as tourism) are not well understood. The ability of PA authorities to define costs and identify and execute ways to meet those costs tends to be limited. There has been inadequate investment in capturing cost efficiencies in management. On the revenue side, few PA systems have graduated beyond a dependence on public, donor and NGO finance to address their funding needs by establishing user-pays systems for PA access. These budgetary constraints translate into under-staffed institutions and/or institutions with posts at too junior a level, making the attraction and retention of skilled staff difficult.

**PA System representation:** The ability of the PA system to conserve biodiversity will depend on whether it is bio-geographically representative in the first place. Some countries have dedicated extremely large areas of their territory to the national PA estate. However, important samples of biodiversity may nevertheless be excluded from the national PA system, undermining its effectiveness as a vehicle for biodiversity protection.

## 2.1 Global and Regional Impacts

The UNDP-GEF biodiversity portfolio includes 67 active protected areas projects working in 55 countries. This portfolio has registered the following achievements in the period 2004 to 2010:

- 128 new PAs, covering 11.1 million hectares, have been established;
- 197 PAs, covering 4.2 million hectares, are in the process of being established; and
- 453 existing PAs, covering 85.2 million hectares, have been strengthened.

The distribution of PAs targeted under the portfolio is presented in the tables below, which show the total number and total spatial coverage (area) of PAs supported under the portfolio.

Distribution of Protected Areas by Area (ha)				
UNDP Region	Newly Established PAs	New PAs in Progress	Strengthened PAs	Total PAs Impacted
Pan-Africa	4,170,015	1,890,937	56,721,291	62,782,243
Arab States	37,758	0	7,140,418	7,178,176
Asia & Pacific	2,405,139	688,700	5,331,555	8,425,394
Europe & CIS	2,612,368	805,322	9,686,540	13,104,230
Latin America & Caribbean	1,895,393	878,711	6,296,161	9,070,265
<b>Global Totals</b>	<b>11,120,673</b>	<b>4,263,669</b>	<b>85,175,965</b>	<b>100,560,307</b>

Distribution of Protected Areas by Quantity (number of PAs)				
UNDP Region	Newly Established PAs	New PAs in Progress	Strengthened PAs	Total PAs Impacted
Pan-Africa	60	49	212	321
Arab States	3	0	6	9
Asia & Pacific	11	4	24	39
Europe & CIS	19	85	126	230
Latin America & Caribbean	35	59	85	179
<b>Global Totals</b>	<b>128</b>	<b>197</b>	<b>453</b>	<b>778</b>

## Pan-Africa

Efforts to conserve biodiversity by increasing PA coverage and improving PA management effectiveness in Pan-Africa are taking place in 18 countries (nine in Southern and Eastern Africa, and nine in West and Central Africa) through 19 projects, covering an area of approximately 62.8 million hectares. Of this coverage, 30 million hectares are in Southern and Eastern Africa (SEA) and 32.75 million hectares are in West and Central Africa (WCA). This may be disaggregated as follows:

- 60 newly established PAs, occupying a total area of 4.2 million hectares;
- 49 PAs in the process of being established, occupying an area of 1.9 million hectares; and
- 212 existing PAs strengthened with a total area of 56.7 million hectares.

## Arab States

This region has three biodiversity projects that support PA management in three different countries. A total area of 7.2 million hectares is benefiting from PA management interventions in the region, comprising:

- 3 newly established PAs, occupying 0.037 million hectares, by 1 project; and
- 6 existing PAs strengthened, occupying 7.1 million hectares, by 2 projects.

## Asia and the Pacific

In this region, work to improve the sustainability of protected areas continues to be a major theme of the portfolio. Ten projects across eight countries cumulatively impact approximately 8.4 million hectares of protected area. The total area includes:

- 11 new PAs established, totaling 2.4 million hectares;
- 4 PAs in the process of being established, occupying an area of 0.7 million hectares; and
- 24 existing PAs strengthened, occupying 5.3 million hectares.

## Europe and the CIS

In this region, 20 projects in 14 countries address protected areas covering a total area of 13.1 million hectares. The impacts of the portfolio in ECIS include:

- 19 new PAs established, totaling 2.6 million hectares;
- 85 PAs in the process of being established, totaling 0.81 million hectares; and
- 126 existing PAs strengthened, totaling 9.7 million hectares.

## Latin America and the Caribbean

The LAC portfolio supports PAs through 15 projects in 12 countries, encompassing a total of 9 million hectares. This collection of projects has had significant impacts on PAs:

- 35 new PAs established, totaling 1.9 million hectares;
- 59 PAs in the process of being established, totaling 0.88 million hectares; and
- 85 existing PAs strengthened, totaling 6.3 million hectares.

## 2.2 Case Studies

In order to capture best practice and analyze the overall impacts of a number of outstanding projects, including their contribution to achievement of the MDGs, several case studies are spotlighted below.

### Strengthening the Protected Area Network in Namibia (SPAN)

In order to achieve Goal 7 of the MDGs, areas that are protected for the purposes of biodiversity management must be expanded, and the management effectiveness of these areas must be improved. This project is designed to address a number of existing barriers that hinder effective management of the national protected area system. One such barrier is the undervaluation of the economic values of the PAs and subsequent under-investment in PA management. Without sufficient financial resources, management effectiveness cannot be ensured. The project therefore aims to establish sustainable financing mechanisms for the PA system.

In Namibia, before the project intervention in 2004, the annual budget for park management by the Ministry of Environment and Tourism (MET) was around US\$ 7 million. This budget was considered to be a fraction of what was necessary to adequately manage the PA system, which now accounts for 17 percent of the country's land surface area (14,039,400 hectares). The actual cost of managing parks was not adequately known and there was no correlation between the budget amount and what was really required to manage each park and the national PA system as a whole. With regard to revenues from PAs, visitor entrance fees were paid to the Government Treasury; however, there was no earmarking of revenues to be reinvested in park management. This resulted in a lack of motivation on the part of park managers to increase and diversify revenue from PAs. In addition, there was a significant backlog of park management infrastructure maintenance, resulting in dilapidated facilities.

This project has made tremendous progress in its effort to secure sustainable financing for the PAs. A comprehensive economic analysis of the PA system was funded in 2004. The results indicated that the PA system contributed up to six percent of GDP through park-based tourism only,

### MDG 7: Ensure environmental sustainability.

- Target 7b: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.
- Indicator 7.6: Proportion of terrestrial and marine areas protected.

without including other ecosystem service values, and the economic rate of return on the government investment over 20 years was as much as 23 percent. Using these study results, the MET has managed to increase the annual budget for park management and development by 310 percent in the last four years. Earmarking of the 25 percent of the park entrance revenue was also agreed by the Ministry of Finance and is being implemented. These funds are reinvested in park and wildlife management through a trust fund, providing up to US\$ 2 million additional sustainable financing per annum.

The study also led to successful mobilization of a large amount of additional donor funding for PAs, including US\$ 67 million from the US Government's Millennium Challenge Account (MCA) with a US\$ 40.5 million direct investment in infrastructure in Etosha National Park. The SPAN project has also catalysed a significant amount of German Government support for the Bwabwata, Mudmu and Mamili (BMM) Parks, one of the four field demonstration sites of the project. In addition to the originally pledged co-financing of € 2.5 million for park management, planning and infrastructure development in the BMM Parks, the KfW Bankengruppe recently approved an additional amount of € 9.5 million to complete the required infrastructure development.

Moreover, the National Policy on Tourism and Wildlife Concessions on State Land was approved by the Cabinet in 2007. In order to implement the Policy, the Concession Unit was established within the MET and a multi-agency Concession Committee was also established to review concession applications. In the last two years since the concession unit was established, in excess of 20 new tourism and hunting concessions were approved, generating over US\$ one million per year as concession fees payable to the Government. A majority of these



concession rights in PAs are granted to communities neighbouring PAs, directly benefiting local people from concession revenue and jobs created by the concessions. Furthermore, park business plans were developed for six national parks, enabling the park managers to define costs and identify and execute ways to cover those costs.

## Conservation of Tugai Forest and Strengthening Protected Areas System in the Amu Darya Delta of Karakalpakstan in Uzbekistan

Many protected areas in Uzbekistan are considered too small to maintain ecological integrity, are widely dispersed, have no linking corridors and are largely surrounded by areas of low biodiversity value. The overall PA system of Uzbekistan is 20,520 km<sup>2</sup>, which equals about 4.6 percent of the Republic's territory; therefore most ecosystems are poorly represented or not represented at all. The globally significant Tugai gallery forests ecosystem is one of the most dramatic examples of this. The project aims to improve the coverage of the regional PA system to include Tugai ecosystems. The project is demonstrating new approaches and models for the effective management of the protected areas system by helping to establish a new multi-zoned PA and by introducing an efficient enabling environment for biodiversity conservation and sustainable natural resource management in the Autonomous Republic of Karakalpakstan within Uzbekistan.

The project has five outcomes:

- A new mixed use protected area—a National Park (NP) or Biosphere Reserve (BR)—is established and fully incorporated into the Karakalpakstan PA system.
- An improved legal and regulatory framework and a better understanding of biodiversity values enable institutions, farmers and other stakeholders to manage the protected areas system in a sustainable manner.
- New viable co-management approaches and sustainable land use practices within NP/BR buffer zones are demonstrated and documented for further replication.
- Local and regional government institutions and NGOs have the capacity to effectively manage the NP/BR and support sustainable approaches to natural resource utilization.

- Lessons and best practices on biodiversity management in the Tugai protected area are replicated throughout the protected areas system in Karakalpakstan and in Uzbekistan as a whole.

The project has been very successful in addressing the direct threats faced by the Tugai forest resulting from illegal felling of trees for firewood by implementing a two-pronged approach: supporting community forestry by facilitating the development of village woodlots on land leased from local Forestry Farms; and developing a partnership with the regional Gaz administration to provide fuel. Most of the villages are either disconnected from the gas supply network or possess gas distribution stations that have been long out of order, which drives local communities to cut trees for heating. The project identified hotspot areas where the threat has been the most severe, and in partnership with the Regional Gas Administration purchased and installed six gas control points serving over 60 households. The National Government is planning to extend coverage to cover all communities by 2014.

## Biodiversity Management, Poverty Reduction and Gender Equality in Egypt: The Medicinal Plants Conservation Project (MPCP)

This project is directly contributing to the MDGs dealing with biodiversity management, poverty reduction and gender equality. Livelihood strategies and the food security of the poor often depend directly on functioning ecosystems for goods and services. The poor routinely have insecure rights to natural resources and inadequate access to environmental information, markets and

**In 2000**, world leaders adopted the United Nations Millennium Declaration, which committed their nations to a new global partnership to reduce extreme poverty by achievement of the MDGs by 2015. The goals set out to eradicate extreme poverty by reducing income poverty, hunger, disease, lack of adequate shelter and exclusion, while promoting environmental sustainability, gender equality, and human rights. **Egypt: MPCP** is contributing to the following MDGs: Eradicate extreme poverty and hunger; Promote gender equality and empower women; Develop global partnership for development; and Ensure environmental sustainability.

decision-making, which limits their capacity to protect the environment and to improve their livelihoods and well-being. Women are often particularly affected; they often have unequal rights and insecure access to land and other natural resources, limiting their opportunities and ability to access other productive assets. Moreover, due to the social norms and traditions of the Bedouin community, many women face difficulties in becoming active, empowered participants in the community.

The Saint Katherine Protectorate (SKP) is noted for its diversity of medicinal plants. Among the present 472 species, 19 are of global significance and more than a hundred species are used for medicinal purposes. The Bedouin communities who live in SKP have developed an extensive knowledge over the past millennia of the various ways in which medicinal plant species can be used. This in turn has formed a part of their integral economic value while living in a delicately balanced environment.

The MPCP is working to address threats to medicinal plants in the SKP arising from the over harvest of plants from the wild by empowering the Bedouin community to use these resources in a sustainable manner. The project is developing the capacity of the Bedouin community to cultivate and sustainably harvest wild medicinal and aromatic plants (MAP) in abandoned orchards and gardens inside the nature protectorate, so as to take pressures off wild stocks. Participatory approaches (with special emphasis on the inclusion of women) to adaptive management have led to the successful establishment of a community-based natural resource management (CBNRM) system by which the SKP Bedouins share control over the MAPs. Through this project, they also garner tangible community benefits that incentivise the sustainable use and management of these globally significant resources. In addition, the project has established and is operating several sub-projects that help to achieve project outcomes including in-situ and ex-situ conservation, public awareness-raising, and biodiversity education.

© AZIZ RAHHOU



## 2.3 Results Achieved by Barrier Removal

### Systemic Barriers

A total of 56 projects are addressing systemic barriers. Barrier removal activities include the following:

- i. Establishing a clear PA system agenda and programme founded on broad based consensus building among stakeholders.
- ii. Strengthening the policy and legal framework where necessary (for instance, to nest PA management more effectively in local area planning).
- iii. Establishing systems to facilitate institutional cooperation across government agencies (including production sector agencies), civil society and the private sector.
- iv. Establishing knowledge networks that build the capacity to mobilize and apply information to improve PA management and improving the public profile of PAs through media outreach (this support is generally a focus of all UNDP-GEF's protected areas projects).
- v. Ensuring that PA systems are designed to maintain biodiversity patterns and processes, the latter including carbon sequestration.

In terms of influence on national legislation regarding PAs, 41 projects have removed systemic barriers by contributing to the drafting and/or amendment of PA legislation in 35 countries, effectively impacting over 535 million hectares of PA in those countries. 27 projects have contributed to drafting policies on PA financing, while 16 projects have contributed to drafting policies on property rights. In 18 countries, 19 projects have contributed to the ratification of relevant international conventions.

In the **Pan-Africa** region, specific results from removal of this barrier include **Uganda: Albertine Rift Valley Forests**. This project has supported a number of regulations and policies that are now being enforced, including the National Forestry Authority Business Plan and Forest Nature Conservation Master Plan. **Ethiopia: Sustainable Development of the Protected Area System** aims at strengthening capacities to manage the Ethiopian Protected Area estate, in order to improve the sustainability of the protected area system. The project recently commissioned an economic assessment of

the contribution of Ethiopia's Protected Area Systems to the economy. The assessment found that the main value of protected areas is found in the environmental services they provide to poor rural communities, many of whom are food insecure. It calculated the value of select environmental services: US\$13 million for medicinal plants; US\$432 million for hydrological services; and potentially US\$2,659.59 million for water quality control services, such as reducing sedimentation and nutrient recycling. These values dwarf the annual value of the PAs in terms of park entrance fees, which was US\$19,000 for 2008-09. Overall, the results clearly show that the economic value of protected areas is of immense importance to the sustainable development of the Ethiopian economy and plays a significant role in the fight against poverty. The results of the report are being incorporated into the Ethiopia Poverty Strategy, or PASDEP—which sets the frame for development and guides government and donor funding flows.

In the **Asia and Pacific** region, **Iran: Conservation of the Asiatic Cheetah, its Natural Habitat and Associated Biota** has been instrumental in substantially raising the fine for killing cheetahs as well as lobbying the judiciary for more systematic approaches to apprehend poachers and violators. **Pakistan: Arid and Semi-arid Ecosystems Conservation** has supported the drafting of a Forest Act to accommodate participatory conservation paradigms. This will give communities better rights to manage natural areas for conservation and sustainable livelihoods. **Philippines: Samar Island Biodiversity Project**, which started in July 2000, has initially supported the passage of several laws in Congress and supported its implementation in the project sites. These laws include the Wildlife Resources Conservation and Protection Act (2001) and the Cave Management Act (2002).

In **Europe and the Commonwealth of Independent States**, projects have had direct input into changes to or establishment of new national protected area laws in Belarus, Kazakhstan, Romania, Russia, Slovakia, Tajikistan and Uzbekistan. They have influenced changes in natural resource legislation affecting protected areas in Russia (fisheries) and Romania (forestry and regional development); and PA management has been integrated into county and municipal development planning in Romania.

In **Latin America and the Caribbean**, support to remove systemic barriers includes the development of PA policy frameworks in those few countries without existing PA policies, and the review and update of existing frameworks in those countries where deficiencies have been identified. Special focus has been placed on developing policy, legal and regulatory frameworks to maximize state, municipal, indigenous and private PA contributions to national conservation goals and co-management strategies, particularly through public-private partnerships.

Another focus has been the consolidation of PA categories for sustainable use management that combine conservation goals and development needs of marginal and traditional groups. The issue of indigenous lands is paramount for LAC. Nine LAC projects work with indigenous communities of various ethnic groups, including Rikbatsa, Zoro and Arara (Brazil); Melillanca Huanqui, Trafunko los Bados, and Huilliches (Chile); Pame (Mexico); Pykasu, Ñu Guasu, Jukeri, Arroyo Claro (Paraguay); Kekchi and Mopan (Belize); and Warao (Venezuela). These groups are the main beneficiaries of the projects and have been involved in the development of management plans for PAs in Belize, Guatemala, and Chile, as well as in productive initiatives in buffer zones geared at increasing sustainable livelihood options in Brazil, Chile, Mexico, Paraguay, and Venezuela. By increasing the participation of indigenous peoples in the governance structures being developed for PA systems, an opportunity is provided for them to access other financing options such as REDD.

Examples of results to improve management through strengthened regulation and policies include:

- **Chile: Chilean Coast Marine Protected Areas**, where legal status has been afforded to Multiple-use Marine and Coastal Protected Areas (MUMPA) by joining existing laws under a single instrument to form PAs with core zones zoned for restricted-use as well as adjacent sustainable use areas.
- **Argentina: Patagonia Coastal Zone Management Programme (CZMP)** has placed emphasis on defining and implementing common planning approaches to determine management effectiveness and guidelines for site level planning. These have been applied throughout the coastal protected areas, and to date 75 percent of all protected areas have management plans in different stages of development, approval and implementation. In addition, the project

has affected PA policy on the coast of Patagonia with regards to tourism, efforts to reduce by-catch in coastal fisheries, and the promotion of conservation education.

- **Paraguay: Paraguayan Wildlands Protection Initiative** has provided inputs to developing the policy framework for more effective PA management. The 1995 Master Plan has been updated with a new sustainability strategy for the public PA system (SINASIP) policy, based on the foundational work in project PA sites and advances in knowledge on PA management worldwide.

## Institutional Barriers

Strategies to remove institutional barriers often focus on strengthening the capacity of PA authorities to perform basic functions, such as planning, monitoring,

There are at least three examples of long term capacity building efforts for protected areas systems in the **Latin America and Caribbean** region: Cuba, Uruguay and Argentina. In each case, UNDP has provided over a decade of support through projects illustrating the point that capacity building takes time and trust. Key activities and results include:

**Cuba:** a) Providing the science and knowledge to identify key sites for protection in the Sabana Camagüey Ecosystem; b) setting up PAs in these locations; and c) working in the productive landscape around the areas to reduce pressures on them, thus making them more viable in the future.

**Uruguay:** a) Protecting core areas of the Bañados del Este Biosphere Reserve; b) consolidating this reserve by working on land-use issues in adjacent areas and taking the debate on PAs to a national level; and c) building systemic, institutional and individual capacities for setting up and implementing a national system of protected areas.

**Argentina:** a) Identifying the key locations, institutions and processes needed for conservation of coastal biodiversity in Patagonia; b) setting up PAs in the key locations and working with key nearby sectors to reduce pressures; and c) setting up an inter-provincial coastal and marine system nationally and in pilot areas, expanding seaward to conserve feeding areas of coastal and marine habitats (up-scaling from region to nation and from coast to ocean).

enforcement, and reporting, and to ensure timely and cost effective activity delivery. Activities are normally designed to enhance the efficiency of PA institutions to implement policies and adapt management strategies to address changing pressure profiles within protected areas. Activities may also focus on establishing the institutional *modus operandi* for co-management, so as to widen stakeholder participation in PA management.

In working to remove institutional barriers, 53 projects have strengthened the authority of institutions responsible for PAs: 21 at the national level; 11 at the regional level; and 21 at the local level (with some projects addressing this barrier at more than one level). Additionally, 45 projects supported or established institutions for the co-management of PAs in 37 countries.

In **Pan-Africa**, institutional barrier removal activities focus on strengthening the capacity of PA authorities to perform basic functions such as planning, monitoring, enforcement and reporting, and to ensure timely and cost effective activity delivery. Projects seek to enhance the efficiency of PA institutions to implement policies and adapt management strategies to address changing pressure profiles within protected areas. Activities may also focus on establishing the institutional *modus operandi* for co-management, to widen stakeholder participation in PA management, and to cultivate private sector investment and expertise. Specific project achievements include **South Africa: C.A.P.E. Project**, which has strengthened the protected area mandates of national (South African National Parks) and provincial institutions (such as CapeNature, Eastern Cape Parks Board). The goals and mandates of these institutions overlap and a rationalization process (not funded through the project) is underway in South Africa to resolve some of these issues. **Kenya: Coastal Forests** has sought to define clearly the goals and mandates of the Forestry and Environment agencies to facilitate more effective project and Task Force management.

In the **Asia and the Pacific region**, five PA projects are addressing this barrier. Examples of specific project activities to address institutional barriers include **Malaysia: Coastal and Marine Biodiversity**, which has invested substantial effort to build the capacity of local community groups to participate in the enforcement of MPA regulations, and the development of tourism with the private sector.

In the **Arab States**, most projects in the portfolio address the strengthening of institutional level capacities. However, only a few projects address institutional strengthening at the central level. Most are designed to build capacities at site level for the effective management of PA sites.

In **Latin America and the Caribbean**, the institutional arrangements for PA governance can often be complex with overlapping mandates apparent between different institutions. For example, in the LAC countries where environmental management is decentralized, regional institutions might have authority over buffer zones of national PAs. In others, functions vital to the effective management of PAs might be divided across diverse institutions: for example, surveillance and enforcement under one institution and PA management under another. Similarly, different PA management categories can fall under the authority of different institutions. These complexities impede the definition of clear goals and standards, and increase costs and reduce efficiencies. In almost all cases and countries, LAC PA governance institutions have sub-optimal staffing and equipment levels, and many have significant deficiencies in terms of institutional procedures and performance standards.

The LAC strategy thus supports institutional reforms to improve efficiencies in PA governance either through clarification of mandates and increasing coordination between institutions or by reengineering and redistributing functions. It is increasingly placing emphasis on strengthening regional (provincial and municipal) institutional frameworks to deliver basic functions such as planning and ensuring timely and cost-effective activity delivery. Activities also include the demonstration of the institutional *modus operandi* for co-management of PAs—particularly in terms of public-private partnerships—the management of indigenous lands for conservation, and the setting up of concession systems and standards for increasing private sector investment in PA management.

Examples of specific project results include **Paraguay: Wildlands Protection Initiative**, which has supported the functioning of the Directorship of Protected Areas. Striving for decentralization, the project has worked to create and support the operations of local management committees by working with populations located within buffer areas, and facilitating processes for the installation of a PA office within a municipality. The project focused largely on governance of four target PAs: all have been formally decreed and gazetted; all have basic operational

equipment and three have basic infrastructure; and governance structures for management have been defined through the establishment and legal recognition of Local Management Committees for each area, enabling more participation of a wider range of stakeholders in decision making on PA management. Furthermore, a significant achievement has involved the government paying for expropriated properties to secure land tenure for one PA (US\$ 20 million), which is a milestone in the history of PA management in Paraguay.

Further inter-institutional cooperation was reached in **Mexico: Sierra Gorda Biosphere Reserve** with the signing of the coordination agreement among five municipalities for the application of municipal regulations regarding the environment and prevention of illegal activities. The project addressed the limited institutional capacity of the government in the area through the engagement of local communities and local authorities in the management decisions of the Reserve.

## Individual Barriers

Barrier removal activities are designed to enhance staff skills. All projects have a training component comprising learning-by-doing complemented by in-house training. For example, in the **Arab States, Egypt: Sustainable Use of Medicinal Plants** has collaborated with the St. Katherine Medicinal Plants Association, providing it with technical support for registration, organic certification, marketing, preparation of a business plan and identification of key criteria for projects receiving revolving funds. The project team has worked through the CBNRM component of the project to set up the “Green Gold Association.” This association is the community-based organization that will be responsible for the management of wild medicinal plants; 40 of its 42 members are female medicinal plant collectors from the region.

## Financial Barriers

A total of 45 projects have addressed financial barriers. These projects created or strengthened financial mechanisms for PAs in a range of countries. In **Latin America and the Caribbean**, financing and management of biodiversity, and particularly of protected areas, has historically been perceived as the responsibility of the public sector. The main instruments have been direct resource ownership and management by government agencies. However, public finance in LAC, as elsewhere,

is facing a crisis, and sources of finance have stagnated. Thus, as is common in many other regions, PA systems throughout LAC are severely underfunded. Other problems include the lack of capacity of PA authorities to define costs and execute ways to cover those costs. In general, there has been inadequate investment in capturing cost efficiencies in PA management.

Specific project results in the region include **Paraguay: Paraguayan Wildlands Protection Initiative**, where a Debt-for-Nature-Swap has been achieved partially through project financing. The project is also funding the financial sustainability strategy for the public PA system (SINASIP). In **Costa Rica: Cocos Island Conservation Area**, voluntary donations by divers are contributing to PA management. Similarly in **Guatemala: Guatemala’s Western High Plateau**, payments for access to ecological trails in municipal parks have been institutionalized. **Argentina: Patagonia CZMP** has also secured increased budgets for PAs, and the province is committed to providing the necessary funding for the development of the Golfo San Jorge National Park, an opportunity for strengthening PA management on the coast of Patagonia with federal involvement. **Mexico: Sierra Gorda Biosphere Reserve** has been successful in attracting co-funding through the voluntary carbon market to the extent that it has ensured financial sustainability for operations after GEF funding expires.

In **Pan-Africa**, the region’s PA estate generates economic values in the form of tourism, ecosystem services and use values for local communities where sustainable use activities are permitted within PAs. However, these values are rarely considered in the cost-benefit calculus employed when making budgetary allocations to the PA system. This fact implies that the PA estate is underfunded. A key strategy of UNDP in the region is to uncover economic benefits and institute business planning and development systems in PAs with a view to capturing financial benefits, and ensuring that they are retained for management purposes; this is a focus of interventions in Namibia, Rwanda, South Africa and Zambia, and to a less extent in Cape Verde, where these ideas are only nascent. Interventions can include economic assessments to uncover the economic benefits of PAs and ancillary financial assessments to justify investment. On the demand side, projects also seek to improve the capacities of PA managers to make strategic financial decisions such as re-allocating spending to match management priorities, and identifying cost reductions to enhance operational cost efficiencies. Cost efficiencies can be further secured by defining

the optimum level of enforcement needed to deter malfeasance, or managing clusters of PAs from a central point to reduce duplication in PA functions. On the supply side, capacities to implement innovative revenue raising schemes are being developed.

In **Europe and the CIS, Macedonia: National Protected Area System** has supported the inclusion of the Article on Payments for Environmental Services in a draft amendment to the Law on Nature Protection, which could thus become a new financial mechanism for PAs in Macedonia.

## Barriers to PA System Representation

Barrier removal activities seek to engineer the strategic expansion or reconfiguration of the PA system to ensure it is more representative. This work might include:

- Development of innovative management schemes (such as public private partnerships) attuned to the socio-economic and institutional fundamentals in lands targeted for inclusion in the PA system.
- Undertaking ecological and socio-economic surveys to inform expansion plans.
- Development of overarching systems plans.
- Development of proposals for PA zoning and permissible resource use.
- Securing stakeholder buy in and involvement in the process.

These activities are generally accompanied by efforts to address capacity and finance barriers so as not to stretch the ability of PA authorities to manage the existing PA estate.

In **Pan-Africa**, a number of projects have been working on expanding PAs in underrepresented habitats; however, the PA estate as a whole is not yet representative of all biodiversity. For example, while Uganda has set up an impressive network of PAs in tropical moist forests and the savannah biome, the country's biologically significant wetlands are underrepresented in the PA estate. Similarly, coastal and afro-montane forest biomes are underrepresented in Mozambique's large PA system. There is thus a need to expand strategic coverage of the PA estate. However, the traditional PA management paradigm—based on “command and control” of PAs under socially exclusionary systems managed by state authorities—will not work in most cases, as the target areas are also home to communities that depend on

natural resources for their livelihoods. There is a clear need for a new PA management paradigm based on co-management among resident communities, government authorities and, in some instances, the private sector. The development of such models is a key focus of UNDP interventions in the Pan-Africa region; this support is being provided in Madagascar, Cape Verde, Democratic Republic of Congo, Mauritius, Namibia and South Africa.

Similarly, PA system representation is still poor in the **Arab States**. New management models are needed to expand PAs in light of existing capacity limitations. In Jordan, PA management at one site has been delegated to a conservation NGO affiliated with IUCN and BirdLife International. PA management systems are drawing upon international practice from countries such as Egypt, where nature conservation is well established, and has been an ancillary beneficiary of the extensive archeological studies conducted in the country. Other countries in the region are in the process of conducting their national assessments, many of which are driven by the Important Bird Areas programme, given the importance of the region as a flyway.

A number of projects have been working on expanding PAs in underrepresented habitats in **Europe and the CIS**. This work includes coverage of tundra and boreal forests in Russia; **Taimyr Peninsula project** is extending the size of the Putoranski *zapovednik*, or reserve, by adding the globally significant Purinski *zakaznik*, which is a concentration point of wetland species and part of a reindeer migration corridor. The project plans to sign a contract with the Putoranski *zapovednik* management unit to finalize all ecological, economic and legal studies to upgrade the status of the Purinski *zakaznik* and officially include it into the Putoranski *zapovednik*. The legal proclamation of the extension is expected by mid-2010. **Turkey: Forest Protected Areas** has only been operating for one year. It is in the process of setting up the basic regulatory and operational mechanisms to ensure conservation of old-growth forest and grasslands covering 421,000 ha. 66 percent of forest hotspots are being moved under legal protection, up from ten percent. **Belarus: Polesie** focuses on strengthening wetland protected areas. During 2009, it developed tools for wetland reserve management, which were incorporated in the National Strategy and Action Plan for Conservation of Wetlands. The project prepared and published a manual for the elaboration of management plans for protected areas and to promote replication. Furthermore, a transboundary Ramsar site with Ukraine (Prostyr-Stokhid) is in the process of being established.





# Mainstreaming Biodiversity Management in Production Sectors

3.1 Global and Regional Impacts

3.2 Case Studies

3.3 Results Achieved by Barrier Removal

Most biodiversity in the world resides outside PAs in lands dedicated to various production activities, including agriculture, forestry, fisheries, mining and tourism. The integration, or 'mainstreaming,' of biodiversity-friendly objectives into these production sectors constitutes a key vehicle for achieving sound biodiversity management objectives. If these industries see biodiversity maintenance as a negative balance sheet item, then these ecosystems will likely be transformed and their biodiversity lost. Communities and businesses need to be persuaded that there is a link between the value of ecosystem goods and services and sustainable economic development. UNDP is tackling this need through pilot activities in a number of production sectors in which there are receptive private businesses and communities ready to invest in conservation.

Key mainstreaming activities in the biodiversity portfolio include *systemic level* interventions that aim to influence the policy framework governing production sectors, as well as *institutional level* interventions designed to enhance capacity to address biodiversity management needs in economic sectors. Barriers are addressed by: funding the development of more integrated planning systems; strengthening industry watchdogs; building management expertise; and strengthening monitoring and reporting capacities.

At an *individual level*, UNDP works to increase skills to determine sustainable off-take rates for wild resources, and establish and adapt management strategies and mechanisms. Barrier removal activities can also include building skills at *individual level* to design and pilot integrated land management models. The focus here is on working with champions in each sector who have shown willingness to engage around conservation issues and who may serve as role models for the production sector and stimulate replication of successful interventions. Since traditional *financial* capital markets will not usually finance biodiversity-friendly production activities if their performance remains unproven, UNDP works to sensitize financial managers to the investment opportunities offered by eco-friendly businesses. It also empowers communities by building their capacity, often

through cooperatives, so that they can apply to credit institutions for funding or establish their own micro-credit facilities. UNDP also stimulates the development of Payment for Ecosystem Services (PES) schemes, to compensate resource managers for the costs they incur in protecting biodiversity. Such schemes aim at internalizing the benefits derived from better biodiversity management in production practices to provide an incentive for sound stewardship. At the same time, these schemes assist communities and entrepreneurs to access 'green' markets that value commodities that have been produced in a biodiversity-friendly manner.

Where the cost-benefit calculus for the maintenance of biodiversity is negative—or perceived as such—ecosystems will likely be transformed in ways that are incompatible with the maintenance of biodiversity values. The linkages between the value of ecosystem goods and services, and sustainable economic development need to be made. A key challenge is to manage tradeoffs successfully and identify win-win solutions that benefit production enterprises while also maintaining biodiversity. UNDP is tackling this need through experimental activities in the above-mentioned sectors, targeting a number of production sectors where there is a receptive private sector ready to invest in conservation management.

*A key challenge is to manage tradeoffs successfully and identify win-win solutions that benefit production enterprises while also maintaining biodiversity.*

## Barrier Category and Description: Mainstreaming Biodiversity Management

**Systemic level:** There may be weaknesses in the policy framework governing conservation and production that impedes pursuit of nested approaches (conservation within production). The failure to clarify property or use rights/responsibilities may create disincentives for good stewardship of resources on production lands.

**Institutional level:** The capacity of institutions outside of the conservation arena to pursue conservation objectives may be limited. This includes government regulatory agencies and industry associations. Coordination capacity may be limited.

**Individual level:** This barrier relates to the capacity of individuals to manage production in ways that are compatible with biodiversity objectives. The lack of information on the carrying capacity of an ecosystem for given livelihood activities may handicap efforts to engender sustainability. The absence of capacities to manage ecosystems in ways that improve productivity while protecting biodiversity is also a handicap.

**Market :** The lack of information on market conditions can impede the ability of entrepreneurs to access markets for commodities produced in a manner that is compatible with biodiversity management, or profit from higher prices obtainable in niche markets (to compensate for the marginal costs of mainstreaming).



## 3.1 Global and Regional Impacts

The UNDP-GEF biodiversity portfolio supports 45 projects in 50 countries that demonstrate significant achievements:

- approximately 81 million hectares directly covered;<sup>32</sup>
- approximately 375.5 million hectares indirectly covered;
- 108 set asides and easements in the process of being established; and
- 46 PAs established and 296 PAs strengthened by 33 projects, which are targeting PAs as part of their mainstreaming strategy.

These projects address biodiversity that resides outside PAs in lands dedicated to various production sectors. In total, the mainstreaming portfolio has projects that address the threats to biodiversity emerging from 18 distinct production sectors.

Commonly Targeted Production Sectors, by Region (number of projects)						
UNDP Region	Agriculture	Animal Husbandry/ Livestock	Fishery	Forestry	Travel/ Tourism	Water Resources
Pan-Africa	2	2	2	3	5	1
Arab States	2	0	0	0	2	0
Asia & Pacific	13	3	4	11	7	4
Europe & CIS	7	0	6	4	7	2
Latin America & Caribbean	4	0	4	2	5	0
<b>Global Totals</b>	<b>28</b>	<b>5</b>	<b>16</b>	<b>20</b>	<b>26</b>	<b>7</b>

Information on the spatial coverage of mainstreaming projects is presented below.

Number of Projects Working in Production Sectors			
Production Sector	Global Totals (# of projects)	Production Sector	Global Totals (# of projects)
Agriculture	28	Infrastructure Development	1
Animal Husbandry/Livestock	5	Land Use Planning	2
Apiculture	1	Mining	1
Energy	3	Trade	1
Fishery	16	Transport	1
Forestry	20	Travel/Tourism/Ecotourism	26
Health	1	Urban	1
Horticulture	1	Waste	1
Hunting	3	Water	7

Project Coverage (ha)			
UNDP Region	Direct Coverage	Indirect Coverage	Total Area Impacted
Pan-Africa	10,687,954	157,689,644	168,377,597
Arab States	6,370,000	54,000,000	60,370,000
Asia & Pacific	4,372,353	40,602,107	44,974,460
Europe & CIS	55,575,821	115,896,990	171,472,811
Latin America & Caribbean	3,824,074	6,866,322	10,690,396
<b>Global Totals</b>	<b>81,124,101</b>	<b>375,489,763</b>	<b>456,613,864</b>

For those projects that are contributing to the expansion and effective management of protected areas, the tables below list the number and area of newly established PAs, new PAs in the process of being established, and existing PAs that are being strengthened.

Contributions to Protected Areas (number)				
UNDP Region	New Established PAs	New in Progress	Strengthened PAs	Total PAs Impacted
Pan-Africa	5	77	69	151
Arab States	0	9	4	13
Asia & Pacific	31	17	105	153
Europe & CIS	8	2	108	118
Latin America & Caribbean	2	3	10	15
<b>Global Totals</b>	<b>46</b>	<b>108</b>	<b>296</b>	<b>450</b>

Contributions to Protected Areas (ha)				
UNDP Region	New Established PAs	New in Progress	Strengthened PAs	Total PAs Impacted
Pan-Africa	84,067	828,802	2,821,464	3,734,333
Arab States	0	78,816	357,350	436,166
Asia & Pacific	1,291,845	220,181	4,532,270	6,044,296
Europe & CIS	1,270,712	1,012,500	10,345,150	12,628,362
Latin America & Caribbean	121,551	TBD	376,962	498,513
<b>Global Totals</b>	<b>2,768,175</b>	<b>2,140,299</b>	<b>18,433,195</b>	<b>23,341,670</b>

<sup>32</sup> Direct coverage includes demonstration activities, whereas indirect coverage includes the reform of policies, strategies and institutional structures. Direct coverage alludes to projects that have had a direct impact on biodiversity management by directly taking measures at a specific location to address threats to biodiversity, while indirect coverage alludes to projects that are adapting the policy, regulatory and institutional frameworks governing production sectors but which are not taking any other measures to reform production measures at a specific location.

## Pan-Africa

Activities in Pan-Africa aim to modify production methods by piloting and adapting production measures that satisfy both development and conservation fundamentals (or that do so at acceptable levels of tradeoff). The portfolio has supported efforts to mainstream biodiversity into production systems through eight biodiversity projects in ten countries. The portfolio covers a number of sectors, notably tourism, agri-business (including livestock) and fisheries. Notable figures of the region's portfolio include:

- 10.7 million hectares directly covered;
- 157.7 million hectares indirectly covered;
- 12 unique production sectors covered, by 8 projects;
- 77 set asides/easements in the process of being established, covering 0.8 million ha; and
- 69 existing PAs strengthened, covering 2.8 million ha.

## Arab States

The two projects in this region that are operating under this Signature Programme have made the following impacts:

- 6.37 million hectares directly covered;
- 54 million hectares indirectly covered;
- 6 unique production sectors covered;
- 9 set asides/easements in the process of being established, covering 0.08 million ha; and
- 4 existing PAs strengthened, covering 0.36 million ha.

## Asia and the Pacific

The portfolio is supporting mainstreaming efforts through 18 projects in 14 countries in the Asia and Pacific region. The impacts include:

- 4.4 million hectares directly covered;
- 40.6 million hectares indirectly covered;
- 9 unique production sectors covered;
- 17 set asides/easements in the process of being established, covering 0.22 million ha;
- 31 new PAs established, covering 1.3 million ha; and
- 105 existing PAs strengthened, covering 4.5 million ha.

## Europe and the CIS

UNDP-GEF is supporting efforts to mainstream biodiversity in production systems through nine projects in seven countries. Impacts in the portfolio include:

- 55.6 million hectares directly covered;
- 115.9 million hectares indirectly covered;
- 6 production sectors covered;
- 2 set asides/easements in the process of being established, covering 1 million ha;
- 8 new PAs established, covering 1.27 million ha; and
- 108 existing PAs strengthened, covering 10.35 million ha.

## Latin America and the Caribbean

The LAC mainstreaming portfolio contains seven projects in 14 countries. The impacts of these projects include:

- 3.8 million hectares directly covered;
- 6.86 million hectares indirectly covered;
- 5 production sectors covered by 8 different projects; and
- 10 existing PAs strengthened, covering 0.38 million ha.

## 3.2 Case Studies

### Atoll Ecosystem Management and Coral Reef Conservation in the Maldives

The Republic of Maldives is an island state and is extremely rich in marine biodiversity. It comprises 26 atolls, which are great ring-shaped reef structures that rise to the sea's surface from the ocean depths. Constructed over a period of some 55-60 million years, these atolls form unique marine and terrestrial ecosystems. The Maldivian atolls are particularly significant because they are by far the largest group of coral reefs in the Indian Ocean. Indeed, the word "atoll" comes from Dhivehi, the Maldivian language. Altogether they have an area in excess of 2,100,000 ha, and a total reef area in excess of 300,500 ha. Due to their position along an 860 kilometer north-south axis in the centre of the Indian Ocean, the Maldivian atolls act as stepping-stones for the transport of planktonic larvae of reef organisms from both the western and eastern Indian Ocean (a feature recognized as the Maldives-Chagos Stricture). Maldivian coral reefs are thus believed to play a significant role in the distribution and maintenance of coral reef biodiversity throughout the Indian Ocean.

Habitat degradation and unsustainable exploitation of wild species pose threats to the atoll ecosystems. Rapid social and economic changes that outpace institutional capacities to adapt and adequately manage these resource-use pressures result in biodiversity loss. Poor cross-agency coordination and weakened policy implementation are underlying causes of inappropriate coastal modification. Some problems stem from an institutional failure to accommodate biodiversity considerations within the development agenda, including a failure to account for ecological capital values when siting infrastructure such as jetties and harbors, or failure to invest sufficiently in maintaining ecosystem services. An additional underlying cause is simply that maintaining ecosystem integrity is not a priority of many developers. The value and benefits of biodiversity are not well articulated or understood, and often are not perceived to be sufficiently real or immediate. This hampers the processes of accounting effectively for these values and integrating conservation into development resource-use practice, such as coastal modification, sand mining, fishing, or waste management. The designation of protected status to many of the ecosystems does not afford protection in part because local stakeholders

perceive little benefit from these "protected" areas, and economic benefits of biodiversity are not fully articulated or understood.

Against this background, the project seeks to achieve the conservation and sustainable use of globally significant biodiversity in the Maldives' Baa Atoll. The project's three-pronged strategy is to: (1) mainstream biodiversity management objectives into sectoral policies and programs, and reinforce multi-sectoral institutional fora; (2) conserve biodiversity "in the water" and "on the ground" by establishing protected areas and managing them through innovative national-local and public-private partnerships in Baa Atoll; and (3) relieve livelihood-related pressures on biodiversity by enabling local people to pursue more sustainable, alternative livelihoods. It is hoped that modified sectoral policies and programmes will enable institutions to more effectively manage biodiversity. Government, local communities and the private sector have become partners to secure the long-term management of three PAs in Baa Atoll. Local people are applying new knowledge and accessing new sources of financing in pursuit of alternative livelihoods. A major output of the project has been the Economic and Financial Valuation of the Maldives' Coastal and Marine Biodiversity. In addition, as a result of the project, the Government has designated Hanifaru and Agafaru as two new PAs under the Environment Act. The creation of these PAs is a major conservation outcome of the project, and will conserve important seabird nesting and roosting sites.

### Mainstreaming and Sustaining Biodiversity Conservation in Three Productive Sectors of the Sabana-Camagüey Ecosystem

The Cuban archipelago is located in the Greater Antilles and comprises 4,196 islands and keys covering an area of 11,092,100 ha. It has the highest species diversity in the West Indies: over 6,500 species of higher plants (possibly 2.2 percent of the world total); 350 species of birds, including many migratory species; 147 species of reptiles and amphibians; 42 species of mammals; and perhaps as many as 13,000 species of invertebrates. Endemism is particularly high among the vascular plants and herpetofauna, and is also significant among other taxonomic groups, including spiders and mollusks. The

coastal-marine ecosystems—characterized by their high species richness and endemism—are in a relatively good state, particularly as compared with similar ecosystems elsewhere in the Caribbean. Nevertheless, a number of factors continue to threaten coastal and marine ecosystems both in the northern and the southern archipelagos, including: impacts of increased tourism development (such as the creation of infrastructure, and visitor impacts), particularly in coastal zones; pollution and sedimentation from upstream forestry, agriculture and livestock activities (including within PAs); illegal hunting and fishing; unsustainable levels of legal fishing; and invasions of exotic flora and fauna (due in part to tourism development). In certain areas, habitat loss, overfishing and pollution are threatening some species with global extinction.

The Sabana-Camagüey Ecosystem (SCE) in the northern part of the country is a complex of terrestrial and marine ecosystems. Actions in the mainland have significant influence on the ecological condition of inshore water bodies (such as lagoons) as well as coral reefs and other important habitat. On the other hand, disturbances in natural hydrographic cycles have produced impacts on the terrestrial environment, for instance by causing mangrove mortality in some cays and mainland coasts. Currently, the SCE includes a mosaic of ecosystems under varying degrees of pressure, with undisturbed mainland, marine and cay ecosystems intermixed with areas affected significantly by human activities, such as tourism, fisheries, mining, agriculture, livestock, forestry, industry, human settlements, transportation, and infrastructure. The most significant threats to biodiversity within the Sabana-Camagüey Ecosystem come from activities associated with the tourism, fishery and agricultural/livestock sectors, all of which play an important role in the local and national economies.

In this context, the project addresses the main barriers undermining sound management effectiveness of these ecosystems and the effective implementation of long term sustainable development strategies. These barriers include:

- i. limited integrated planning and institutional coordination;
- ii. incomplete regulatory framework and guidelines governing sectoral impacts on biodiversity;
- iii. information gaps on biodiversity and integrated coastal management;

- iv. weak awareness and understanding of biodiversity issues and sustainable development options;
- v. productive sectors' priorities focused on short-term economic benefits; and
- vi. the absence of models for biodiversity-friendly alternative livelihoods.

The project is addressing these barriers simultaneously in three key production sectors: agriculture, tourism and fisheries. The project has registered progress mainly in the following areas:

- Ten Municipal Integrated Coastal Management (ICM) bureaus have been established in the Sabana-Camagüey region (SCR). The project has also participated in the design of the new national legal framework for the “Declaration and Certification of Zones under Integrated Coastal Management Regimes” (ZICMR) and is supporting implementation in five coastal municipalities within the SCR. Twelve municipalities now have education and training centers to support capacity development in ICM. Members of the tourism sector have been trained on different modalities to access payment for ecosystem services (PES) schemes, and a Centre for Sustainable Tourism Development has been established.
- Information about coral bleaching and invasive species (specifically lionfish) has been produced and disseminated by the “Coral Reef Volunteer Monitoring Network,” which was established by the project.
- Large fishing areas, where bottom trawling was forbidden and abandoned, were converted into “Zones under Special Regimes of Use and Protection” with the support of the project. Building upon activities implemented in the previous two phases of this project, the coordination team is developing strategies for alternative livelihoods and fishing practices for fishers affected by the prohibition. Positive results have already been reported in terms of reduced fishing mortality.

### Botswana: Building Local Capacity for Conservation and Sustainable Use of Biodiversity in the Okavango Delta

This project was designed to create the governance systems, institutions, economic incentives and know-how to configure production practices within the Okavango



Delta in three areas—water resource use, tourism, and fisheries—to ensure that they are compatible with sound biodiversity management objectives. Ecosystem processes are critical to the livelihoods of the human populations dependent on the ecosystem goods and services provided by the dynamic wetland systems of the Okavango Delta (such as nutrient enrichment for livestock grazing, provision of food, medicinal plants and building materials for local communities, and the sustenance of wildlife populations, on which the economically important tourism sector rests). However, the direct and indirect use of wetland resources, unless carefully managed, threaten to undermine ecosystem processes – and could lead to a loss of species richness in the wetlands and the destabilization of beneficial ecosystem services.

The project is pursuing its mainstreaming objectives firstly by removing barriers at the systemic and institutional level to good governance, and secondly by demonstrating good field management practices for the target sectors. The success of mainstreaming depends on the extent to which attitudes change among the institutions and individuals of the major production sectors. The project is implemented through partnerships among Government, civil society, academia and the private sector – each of which has different mandates, needs and expectations. In addition to those arrangements, the project deals with a number of complex issues that have a direct bearing on resource access and use rights, and on management responsibilities for companies and households. Even though faced with these complexities, the project has made good progress towards achieving mainstreaming.

The project has been instrumental in the development of policies and guidelines that include: the Okavango

Delta Aquaculture Guidelines; Botswana Ecotourism Certification System; Assessment of Liquid Waste Systems; Code of Conduct for Operations of Joint Management Committees; tourism-related sites identification in the Okavango Delta; and the Botswana Ecotourism Best Practices Manual.

The revitalization of the Okavango Fishers' Association and of the Okavango Fisheries Management Committee has been critical to building institutional capacity for fisheries management. The project also offers training courses in fish identification and monitoring systems, which will help determine fish stocks, off-take and the impact of the newly promulgated Fish Protection Regulations. The project is assisting the Division of Fisheries of the Department of Wildlife and Protected Areas in sensitizing the fishers to the new regulations. Following a review of the potential impacts of aquaculture in the Delta, guidelines to ensure safeguards have been completed and could form an important component of the national environmental impact assessment (EIA) regulations.

The existence of conflicts over access to resources and opportunities in the Delta has been a significant barrier to effective biodiversity management in some areas. The project has initiated interventions to bring parties together to resolve these conflicts, with promising results. The project also helped to establish Joint Management Committees to support implementation of sustainable fisheries and veld product use; the formation of these Committees is an important achievement because they will serve as an instrument to deal with future conflicts. The nature of the incentives for parties to participate in joint structures requires additional attention, particularly those for local community members in an area with limited employment opportunities.

© ADRIANA DINU



## 3.3 Results Achieved by Barrier Removal

### Systemic Barriers

Barrier removal activities often seek to influence the policy framework governing production sectors and governance structures (such as institutional coordination and accountability) to address externalities. Where property rights are a concern, barrier removal can include a reconfiguration of rights in ways that further conservation and the establishment of institutional mechanisms to manage the transfer of rights and ensure that land management obligations are enforced. In general, 43 projects have addressed systemic level barriers. These projects have contributed to the development of policies and/or regulations to include measures to conserve biodiversity in 18 different production sectors in 49 countries. Additionally, 33 projects have brought about changes to practices that had been detrimental to biodiversity in specific locations—ranging from agrochemical use to pipeline construction.

In **Pan-Africa, South Africa: C.A.P.E. Project** has contributed to efforts to strengthen planning and management systems governing the agriculture and tourism sectors. The project is supporting the development of business cases for two provincial conservation agencies and, in so doing, is assisting these agencies to clarify and secure finance for their mandates. The project has also supported the development of cooperative working arrangements between C.A.P.E. partner institutions, both at the level of the biome and in various landscape initiatives. In several areas, managers across partner institutions now cooperate to develop farm plans and assess land-use conversion applications by farmers. As a result of this practice, environmental impact and land-use planning processes have now improved access to spatial biodiversity information, which is being used as a critical input to decision-making.

**South Africa: Conservation of Globally Important Grasslands** is working in the forestry, agriculture, coal mining and urban development sectors (in public, private and civil society agencies of these sectors) to achieve two primary anticipated changes. The first change is that development in each of these sectors will avoid critical biodiversity areas when possible. If avoidance is not possible, and minimization and mitigation fail to achieve the desired biodiversity gains, then the sector

will implement offsets in areas with biodiversity profiles similar to those where the development occurs in order to secure that biodiversity. Second, development carried out by these sectors will employ production practices that reduce the overall impact. Changes have been also made to the institutional arrangements and mandates in target sectors, including forestry (a conservation planning tool and GIS-based screening tool have been developed); the urban sector; and agriculture (veld management guidelines are under development).

In **Asia and the Pacific**, projects have influenced sectoral policies and regulations to include measures to conserve biodiversity. The policies are primarily within the sector covered by the project or in closely linked sectors. For example, **Cambodia: Northern Plains of Cambodia** has influenced a wide range of sectoral policies relating to forestry, agriculture, tourism, and infrastructure development. In 2009, the project focused its work on improving national and provincial capacity to demarcate the permanent forest estate to serve as a model for similar initiatives. With demarcation, the project has been able to reduce land grabbing and speculation within those sites. Changes in institutional arrangements have reduced ad hoc clearance of land for agriculture and other purposes.

In **Europe and the CIS**, many projects in the portfolio are finding that project success depends, more or less, on engagement with and influence on the wider policy environment. For example, the **Russia: Kamchatka Salmonid project** has contributed to the conservation of biodiversity in the fisheries sector. Specifically, the project has brought about changes to the federal law “fisheries and preservation of aquatic biological resources,” which introduces a new category of PAs to protect spawning areas.

In **Latin America and the Caribbean**, projects seek to develop legislation in order to promote multiple use management of timber and non-timber forest products in extractive reserves (such as in Brazil).

## Institutional Barriers

In **Pan-Africa**, barrier removal activities aim to enhance institutional capacity to address biodiversity management amongst industry regulatory bodies, and industry associations as conduits for enterprises. This may include the provision of funding to develop more integrated planning systems, strengthening industry watchdogs, building management know-how, and strengthening monitoring and reporting. For example, **Seychelles: Alien Invasive Species** is addressing threats to biodiversity posed by the trade, travel, transport and tourism sectors. The project is helping to set up the new Plant and Animal Health Services (PAHS) inspectorate, which will ensure effective biosecurity for the whole country.

In **Asia and the Pacific**, the landscape conservation approach adopted by **Nepal: Terai Landscapes** required a supportive institutional structure. A Landscape Coordination Committee (LCC) was formed for regional level coordination and integration of landscape management issues. It is composed of regional representatives from different stakeholder groups. Below the LCC are District Coordination Committees, which were established in three districts for the integrated planning, management and monitoring of natural resource management activities. Activities on the ground—such as management and rehabilitation of biological corridors, and anti-poaching operations—are undertaken by resident communities. A participatory development approach at the district level is being supported in **Pakistan: Juniper Forests**. Co-management has helped in building strong ties among the line departments of Government of Balochistan (such as the Forest and Wildlife Department, Irrigation and Power Department, and Livestock and Dairy Development Department). For effective participation in this endeavor, local communities have been organized into formal structures called Community Conservation Organizations.

In **Latin America and the Caribbean**, the integration of actions between different institutions to promote biodiversity friendly production practices has been piloted in many countries. Through **Cuba: Mainstreaming Biodiversity Conservation in Sabana Camagüey**, information about coral bleaching and invasive species (lionfish) has been produced and disseminated by the “Coral Reef Volunteer Monitoring Network” established by the project. A thorough study on existing fishery regulations was compiled and updated. A database on capture levels of different species—including an analysis

of the type of fishing gear used—was developed. An analysis of species composition per fishing gear and an inventory of historical fishing volumes were completed, and will be used by the project to support improvement of the existing fishery regulations.

In **Europe and the CIS, Georgia: Agrobiodiversity** has contributed to the conservation of biodiversity in the agriculture sector. The project has helped the Ministry of Agriculture to develop a new law promoting organic farming, which is now being implemented. The project has led to the conservation of local land races through improved institutional cooperation. Seeds and planting material of land races and local varieties have been collected, multiplied and distributed to farmers. A farmers’ association and seed rotation fund were established in the Samtskhe-Javakheti pilot region to sustain project achievements. The model of farmer-based conservation demonstrated by the project has been replicated in three other regions in Georgia. Georgian farmers are often regarded as the poorest stratum of society. With project support, 189 households are cultivating land races and local varieties using sustainable farming methods that sustain biodiversity, prevent land degradation and restore land; more than 80% of these households report higher pulse diversity on-farm, diversification of the family diet, and higher nutrition levels. For the last three years, the volume of sales has almost doubled every year. In addition to the increased sales revenue for farmers, financial returns are also realized through reduced application of synthetic fertilizers on farms.

## Individual Barriers

Individual-level competencies to address biodiversity management needs are being developed in the majority of projects. Barrier removal activities include increasing skills to determine sustainable off-take rates for wild resources, to study ecological processes, and to establish and adapt management strategies and mechanisms. Barrier removal activities can also include building skills to design and pilot integrated land management models. The focus here is on working with champions in each sector: companies that have shown willingness to engage with conservation issues, and that could possibly serve as models for their industry and stimuli for replication.

In **Latin America and the Caribbean**, projects seek to support capacity building mechanisms that enhance both productivity and biodiversity management. In Brazil

and Peru, farmers have been trained in good production practices to ensure the management of forestry and agrobiodiversity systems. These practices take into account the carrying capacity of ecosystems. Capacity building is an integral component of many of the LAC biodiversity projects striving to stimulate a shift away from conservation practices. **Regional: Biodiversity Conservation in Coffee Production**—which works in Brazil, Colombia, El Salvador, Guatemala, Honduras and Peru—facilitates the incorporation of sustainable production practices in coffee-growing regions. Change occurs at the level of individual farmers and farming communities as they are trained in sustainable practices and learn about related markets.

## Market Barriers

Barrier removal interventions can include market research, building the capacities of small to medium enterprises to negotiate higher prices for produce marketed to intermediaries, and basic product promotional activities in key markets. They can also include the development of certification and verification systems to engineer access to niche markets that demand documented compliance with set environmental standards. A total of 34 projects have been working to address market barriers. Changes to encourage more biodiversity-friendly practices have occurred through 31 projects and include agriculture, tourism, and fisheries sectors. Of those projects, growth in the market or profitability was reported for many biodiversity-based products, including medicinal plants, coffee, legumes, meat, dairy, fish, and livestock. Similarly, 22 projects have made improvements in markets or profitability for biodiversity or biodiversity-based products. Additionally, 12 projects have developed certification systems for biodiversity-based products including coffee, timber and other forestry products, handicrafts, flax oil, mangrove duck eggs, honey, fruits, and herbal tea.

In **Pan-Africa, Regional: West Africa Endemic Livestock** is seeking to remove barriers to the commercialization and marketing of endemic livestock and its products. The outcome is heavily co-financed by the African Development Bank. The project is improving markets through the support and facilitation of market development for commercialization of meat and milk from endemic livestock in the area.

**South Africa: Conservation of Globally Important Grasslands** has supported market changes for more

biodiversity-friendly practice: in the agriculture sector, a red meat certification system is in the planning stage to incentivize better land use management practices to benefit biodiversity; and in the forestry sector, Forestry Stewardship Council (FSC) certification for timber production will mean that grasslands biodiversity is not lost due to afforestation.

In **Asia and the Pacific**, four projects addressed market barriers in 2009. There are some interesting innovative approaches that could provide good models for projects in other countries and regions, including an approach by **Cambodia: Northern Plains of Cambodia**. Ibis-friendly rice was developed with the support of the Wildlife Conservation Society to benefit communities that agree to land-use plans within the protected area. Farmers who follow locally developed land-use plans and no-hunting rules are allowed to sell their rice to a marketing association through the village committee responsible for the management of the land-use plan. The association offers preferential prices to the farmers, which is made possible by selling directly to the national market centers and to tourist hotels under the “Wildlife Friendly” certification system—a new global brand. The association also provides start-up capital and training in new agricultural techniques. All profits are shared among the farmers and the village organizations. Payments to farmers are linked to the farms’ compliance with the land-use plan and no-hunting rules, which is monitored by the village committee. The sale of wildlife-friendly rice has increased farmers’ income and benefited endangered wildlife in the landscape.

In **Europe and the CIS**, as a result of **Georgia: Agrobiodiversity**, five packed products (legume crops: chick pea, cow pea, grass pea, lentil and faba beans) and one processed product (flax oil) are being sold on the local market. A local company Begeli, working together with four local farmers’ groups, have created the Elkana/Begeli trademark and branded their products as “traditional.” In general, sales of land races and local varieties are increasing. Farmers cultivate the land races and local varieties without use of heavy inputs characteristic of high-input/output systems, which thus benefits the biodiversity of the region.

**Bulgaria: Rhodope Mountains project** promotes forest certification practices, which have opened the market for Forestry Stewardship Council (FSC) certified timber. By June 2009, over 20,000 ha of forest were certified. While providing opportunities to achieve higher timber prices, forest certification requires the application of

sustainable forestry practices, which are expected to lead to the conservation of important species and habitats, and the maintenance of ecosystem services. Similarly, in the agricultural sector, the project has promoted organic farming certification; by June 2009, 17 farms had converted to organic farming as a result of project interventions. Based on a survey implemented by the project aimed at identifying ways to integrate biodiversity management into the activities of SMEs, the project engaged in a dialogue with the private sector to find ways in which business can support biodiversity management.

In **Latin America and the Caribbean**, projects work to improve access to information on and entry to niche

markets. **Regional: Biodiversity Conservation in Coffee Production** is establishing market demand for products grown under sustainable conditions, providing incentives for biodiversity protection in production landscapes. Certification is crucial, as higher prices and better conditions are offered to growers of certified sustainably produced coffee. Sustainable coffee farms with shade trees that resemble a natural forest canopy can serve as habitat for a large number of species, and as buffer zones and biological corridors between natural areas; thus biodiversity is protected in diverse coffee production landscapes. The project makes it feasible for farmers to protect biodiversity on farms while staying competitive on international coffee markets.



© ADRIANA DINU



# Lessons and Future Challenges

- 4.1 Lessons Learned in Protected Areas Management
- 4.2 Lessons Learned in Mainstreaming Biodiversity
- 4.3 Future Challenges for the Portfolio

UNDP routinely scans lessons emerging within the context of the regional strategy, with a view to informing project design, and—where possible—improving management of ongoing projects.

This section draws out universal lessons, discrete regional experiences, and relevant management responses. Though a substantial body of literature exists on protected areas management, limited information is available on mainstreaming biodiversity, as it is a relatively new arena for intervention.

This section also sets out the future challenges for the Biodiversity portfolio, which are grouped broadly under the following categories:

- The poverty-biodiversity nexus;
- Coping with climate change (adaptation and mitigation); and
- Strengthening environmental financing for biodiversity management.

© SANTIAGO CARRIZOSA





# 4.1 Lessons Learned in Protected Areas Management

While not denying the importance of other conservation strategies, the UNDP Biodiversity portfolio has underlined the critical need to establish and effectively manage representative protected area estates to provide refuge for flora and fauna, and an ecological safeguard in case biodiversity is degraded in production landscapes. As mentioned above and reported in previous years, the portfolio is dominated by initiatives aimed at strengthening national systems of protected areas.

Demand and supply related determinants have, historically, led the GEF to favor PA initiatives, with an emphasis on action in areas with charismatic species. Though there tends to be high demand for such interventions, a key lesson from the portfolio is that site action alone is insufficient to address all the barriers to PA management effectiveness. Many of the problems that afflict PAs have their genesis in larger systemic or institutional weaknesses. Unless addressed, these problems may potentially prevent site action from becoming sustainable.

Thus, the portfolio demonstrates how projects address such potential barriers through well-planned design and implementation. This approach does not foreclose site action; indeed, virtually all of the PA projects in the portfolio include site-based interventions. These interventions, however, tend to be designed as demonstration activities rather than as the focus of projects.

A total of 14 lessons have been identified and can be summarized as follows:

1. Incentive-based biodiversity management is vital to ensure meaningful and lasting impacts at the site level.

The twin goals of conservation and development in site-level biodiversity management can only be realized by strengthening their mutual dependencies—especially in poor rural communities. Livelihood benefits constitute the primary economic incentive to secure short- and long-term support for project activities from local communities. Making livelihoods fully dependent on the

health of ecosystems provides a lasting motivation for local conservation.

However, careful analysis is required before including the “alternative livelihoods approach” in the project framework. The approach has considerable support amongst conservationists because it offers “non-consumptive” alternatives to rural livelihoods, which can impact upon biodiversity or on a particular resource significant for conservation. Equal consideration should be given to ‘sustainable use’ as a mechanism for conservation management. Other types of incentives include tenure instruments. These provide local communities with legal rights to common property resources and can help to secure conservation benefits.

**In the Asia-Pacific region**, the development and implementation of livelihood strategies strengthens community engagement in conservation activities (**Cambodia: CALM in the Northern Plains**). When local communities become direct beneficiaries of improvements in the status of conserved species—for example, through ecotourism (**Pakistan: Conservation of Habitats and Species in Arid and Semi-Arid Ecosystems in Balochistan**)—projects become more sustainable. Awareness-raising strengthens the message of ‘mutual dependence’ and promotes sustainable livelihood practices among local people (**India: Multi-sectoral and integrated systems approach to the conservation, management and sustainable utilization of coastal biodiversity**). In many instances, local communities become conservationists if there is a sufficient monetary incentive. Some projects (including **Bangladesh: Coastal and Wetland Biodiversity Management**) have created livelihood funds or credit schemes with favorable terms. The design of the facilities ties access by households to the direct impact of their efforts to improve the status of biodiversity.

---

## 2. Partnerships are pivotal.

The implementation of biodiversity management projects can be a daunting task, particularly for PAs covering wide tracts of forest, coastal and marine ecosystems. This work is complicated by the need to address threats emanating from various sectors: unsustainable harvesting and trade, conversion of land and foreshore areas to other uses, weak capacity of institutions, and inappropriate policies.

Therefore, project partners should include the key actors whose actions directly and indirectly affect the achievement of conservation objectives. These actors would include, from the bottom up: local communities, local governments, interest groups, private sector, national government, and often bilateral, multilateral and global institutions. Depending on the issue to be addressed, various groups need to be drawn in, such as academia to provide scientific advice for informed decision-making, religious groups to strengthen advocacy for legislative actions, and local NGOs to mobilize support among communities. Local communities are key partners for most projects.

---

## 3. Agreements among partners should be set out in detail prior to project initiation.

Partnerships usually constitute formal arrangements among communities and concerned institutions with defined roles and responsibilities. Agreements among all project partners should be set out prior to project initiation and should be as detailed and as clear as possible in relation to the institutional framework of the protected area.

Clear agreements with local community representatives are particularly essential. These should address issues including rights to resources, resource-use, traditional knowledge management, and benefit sharing, among others. Any gray areas left in agreements when they are signed—not least in the management plans for the PAs in question—could lead to future conflicts as a result of differentiated interpretation. As a general rule, better management of stakeholder expectations improves stakeholder relations.

Involvement of key institutions from the early stages is vital, and personal connections and informal discussions on how to achieve key project outputs are essential. Stakeholder understanding of the need for the project,

and their benefits and responsibilities in connection with project-related interventions, must be in place before successful cooperation can be achieved.

---

## 4. When dealing with politically sensitive issues (such as indigenous land rights), there is a need for inclusive planning and management as well as the elaboration and execution of a comprehensive communications strategy.

When tensions grow among certain factions, in particular between local indigenous peoples and government, disruption of project actions can be circumvented through strategic meetings with community groups and key agencies. Inclusion of a community representative on the Project Steering Committee who can offer advice to the project and encourage activities to strengthen relationships with local communities is a first step. Communities should be invited to provide inputs into PA management plans and strategies, thus enabling them to: identify conservation opportunities that are consistent with traditional practices; suggest land zoning models that support traditional practices and community uses; and engage with initiatives that deliver quick benefits.

---

## 5. Decentralization of PA management responsibilities is important, but the devolution process should take into account the capacities of local governments and communities.

The path towards effective devolution and decentralization can be long and arduous. Local governments with weak capacity can be overwhelmed by responsibilities previously exercised by national agencies. Institutional modifications as a result of devolution must be carried out based on competent cost/benefit analyses to determine the applicable level of decentralization. This emerging issue warrants further discussion as new projects tackling systemic capacity gaps (as opposed to site-level projects) come on-stream.

In *Pan-Africa*, the existing institutional culture in many countries favors centralized decision-making, which is easier and cheaper to implement. Long-term, successful, sustainable management of natural resources requires the development of a strong sense of ownership by all stakeholders—in particular at the local level—and projects generally develop and maintain participatory decision-making and implementation mechanisms for all aspects of PA management. With the full involvement of relevant government sectors and

participation of local authorities and communities in all stages of implementation, projects capitalize on a wide knowledge-base and experience. Adequate budgeting and implementation of mechanisms to support the participatory approach must be secured.

---

6. Lack of livelihood options and insecurity of land tenure can turn into obstacles for effective project implementation.

A landscape-level management approach to conservation requires that the socio-economic environment be viewed as equally important as the ecological features of the area. Most conservation entities are strong in the field of conservation, but weak in the social sciences; if care is not taken, plans can be skewed towards conservation and become unworkable. Sustainable livelihood and use initiatives, through active investment in the community, can ensure that more effective biodiversity management remains the primary outcome of a project while meeting the needs and priorities of local communities.

---

7. Involving and motivating project “champions” within project partners and stakeholder groups facilitates project understanding.

Working with champions ultimately increases a project’s chances of success and of long-term sustainability. Projects should take opportunities to use emerging priorities and situations that strengthen recognition of the role of biodiversity and ecosystem management within the broader framework of economic development. Such opportunistic approaches not only support achievement of project objectives, but also afford project teams and national institutions an opportunity to contribute to key national processes. Grounding biodiversity management in economic analyses and demonstrating the economic values and contributions of effective biodiversity management—to job creation, premium pricing and the generation of financial revenues at sectoral or individual levels—provides champions with important tools to influence policy and decision-making.

---

8. Informed decision-making should be based on the latest science and technical information.

This lesson not only applies to the design of projects but, more importantly, to management. Ideally, accurate

information should be made accessible to project managers on a timely basis. The type and format of information should consider application of the latest technologies (such as Geographic Information Systems (GIS)). A common component of projects is the development of information management systems for knowledge capture and for timely monitoring and evaluation. However, this work has been a challenge particularly in areas where familiarity with and capacity to use computer-based technologies are limited. Remoteness of project sites compounds the problems that relate to effective information systems development. Sharing of expertise across projects through South-South exchanges could be useful to ensure the more effective design of PA information and decision-making systems.

---

9. PA management should anticipate emerging problems, such as climate change, in order to institute adaptation measures.

Where projects have demonstrated a clear link between climate change and trends in biodiversity, analysis of vulnerabilities to climate change impacts is important. These assessments can pave the way for identification and prioritization of concrete measures for climate change adaptation. The criteria for prioritization should include cost-effectiveness. The feasibility of project retrofits to address climate change should be assessed to ensure lasting conservation impacts.

The need for more climate information to support project planning is commonly articulated. However, facilitating effective community-based adaptation is not a simple process and requires detailed understanding of the local context. The biological, physical and expected climate change impacts might seem simple to quantify at first glance, but the social and political context can complicate the local adaptation response. Any proposed adaptation activity is unlikely to be sustainable and provide genuine long-term community benefits—unless communities are involved in identifying the problem, articulating it in a way that makes sense to them locally, and responding to it by building on existing local coping strategies.

---

10. The spheres of influence of projects can expand beyond originally intended boundaries.

Projects viewed locally as successful can lead to petitions by adjacent communities to be included in the project because of their close proximity; this response is a positive

project spin-off. However, if this interest is ignored by the communities in these areas, then there is the potential for frustration of achievements in which poaching resumes, wildfires are started, or communities re-encroach into the corridor area. Equally, the transfrontier implications of actions taken as part of project implementation should be considered during project design.

---

11. Constructive dialogue is important to contain threats from illegal activities within protected areas.

Powerful interest groups with competing demands on resources (including timber, wildlife and land) inside protected areas can undermine conservation activities. Confronting these powerful groups is a daunting task. Through dialogue and support from other sectors in government, potentially counterproductive confrontations can be avoided.

---

12. Achieving financial sustainability in PA management should be a focus of exit strategies.

Development of sustainable financing schemes for biodiversity management should be pursued vigorously by all projects to ensure that activities are sustained well after financial support from the GEF and other donors ends. Increasingly, projects have sought 'internal' sources of funds for this purpose, through the collection of fees from users of PA resources (such as tourists and hunters). Financial flows from REDD and PES mechanisms are being assessed and initiated in a number of projects. There is a need to diversify sources of revenues so that sufficient amounts are available when needed. At this stage, private sector support remains relatively untapped. The establishment of conservation trust funds could provide a solution, but—with financial resources becoming

scarce in the face of global recession—opportunities are decreasing. Alternatives need to be identified by project teams.

---

13. A good and feasible exit strategy is important for securing continuity and sustainability of a project's achievements.

The sustainability and continuity of project results should be secured during design and implementation processes. The absence of an adequate exit strategy for a project can result in the degradation of results and even adverse impacts following termination. A project's design and budgeting should focus on sustainability-inducing activities, and include a feasible exit strategy for each of its outcomes. In particular, a strategic approach to project budgeting should be built into the project design, and evaluated and revised throughout the project's implementation. Financial planning should include sustainability-inducing expenditures, thereby preventing and resolving significant unexpected expenditures, minimizing costs of infrastructure and services, and enabling attractive work conditions for qualified staff and their continuation following the project's termination.

---

14. It is not always appropriate to look for "recipes for replication" since their application could actually lead to serious problems in other sites and, instead of supporting conservation, might even cause further deterioration.

Rather, any model for management must be tailored to the specific context of the area. Models for conservation management need to be specific to circumstances defined by ecological, social, political and economic conditions of a country or region.

© SAMBI



## 4.2 Lessons Learned in Mainstreaming Biodiversity

A number of innovative and promising efforts to mainstream biodiversity management in production sectors are underway. In time, the portfolio will likely include a more even balance between initiatives in the arena of PA management and those concerned with mainstreaming. A total of 11 lessons have been summarized below.

---

### 1. Mainstreaming actions need to be predicated on the needs of specific sectors.

Sectors dependent on biodiversity goods (such as fisheries) or amenity values (such as tourism) can set prima facie incentives to ensure that production practices are compatible with biodiversity management. Sectors dependent on ecosystem services (such as water supplies) similarly can have reason to collaborate with efforts to mainstream biodiversity, although spatial disconnects between costs and benefits complicate factors (for example, where downstream farmers benefit from water supplies secured by sound land stewardship practices upstream).

Market fundamentals (such as environmental certification or fair-trade systems) that circumscribe market access for produce harvested in environmentally incompatible ways can also become instrumental in spawning receptivity to action on the part of businesses. Many industries (such as mining) can be motivated by risk – including liabilities attributable to environmental malfeasance, risk to reputation (which may circumscribe access to finance and land) and shareholder activism. These risks can provide an impetus for business engagement.

---

### 2. There is a need to establish long-term incentive mechanisms to compensate private individuals and communities for the attributes of interventions relating to global public goods.

UNDP addresses this by undertaking analyses during project preparation to establish the cost-benefit calculus for conservation-compatible versus -incompatible land uses. The barriers to improving the net present value of conservation-compatible land uses are also being

investigated. The outcomes of these assessments will establish whether the planned objective is feasible and will guide the design of interventions that improve the private benefits accruing from conservation. These design options include:

- Vesting property or usufruct rights in user groups.
- Developing certification and verification systems to allow producers to access markets that place a premium on environmental sustainability.
- Instituting environmental fiscal reforms that reward 'good' behavior.

### South Africa: Conservation of Globally Important Grasslands.

Forestry South Africa (FSA), the industry representative body for the forestry sector in South Africa, has provided a valuable platform for engaging the small, medium and large growers in South Africa's forestry sector. FSA has been a critical champion through which the Grasslands Programme has been able to make significant gains in mainstreaming biodiversity into the forestry sector. Results include a partnership with the national development program (the Eastern Cape chapter of the Accelerated and Shared Growth Initiative of South Africa or ASGISA-EC) to develop a biodiversity screening tool to eliminate areas of biodiversity importance from future afforestation. This work has helped to streamline and increase the efficiency of forestry authorization processes. Through FSA, the Grasslands Programme has also partnered with a major forestry company (PG Bison) to develop a fine-scale planning tool that aligns forestry company planning tools with the national biodiversity monitoring and reporting system. This alignment enables biodiversity assets on forestry-owned land to be included in national reporting processes in future. Through FSA, the Grasslands Programme is also working to add significantly to the protected area estate in the grasslands biome through stewardship on forestry-owned land.

- 
3. Effective mainstreaming requires the existence of a vibrant private sector working through transparent rules based on systems free of excessive patron-client relationships.

As environmental concerns grow, multinational companies may be forced by consumers' concern about their social responsibility and other fundamentals to better integrate biodiversity objectives into their operations. The international market could thus provide a potent agent for change.

- 
4. The key challenge is to identify 'win-win' solutions in which production enterprises benefit and biodiversity is maintained.

Where the costs of the maintenance of biodiversity exceed the benefits—or where that perception thrives—the land will likely be converted by the production sector in ways that cause the degradation of biodiversity. UNDP tackles this challenge through experimental activities that target a number of production sectors, such as agriculture, tourism, and fisheries.

- 
5. Any change in the scope of the project should be weighed against available resources and should not be arbitrarily revised without the benefit of lessons from implementation.

There are tendencies for project proponents to expand the scope of the project even during the inception phase, perhaps due to enthusiasm or to take advantage of available resources. With no corresponding increase in resources, there are risks that the project might be spreading itself too thin, potentially compromising the timely delivery and quality of its outputs and outcomes.

Project proponents should recognize the advantages for phased approaches before embarking on expansion early on to minimize risks, even with additional resources becoming available. The rationale for pilot or demonstration sites, which is usually the first phase, is to be able to test new models of biodiversity management. In subsequent phases, the lessons learned can then be applied to a bigger number of sites through replication and up-scaling. This approach would not only ensure better chances of success but also contribute to cost-effectiveness in project implementation.

- 
6. Risks and uncertainty pervade multi-year, multi-stakeholder and geographically expansive projects.

Timeframes for implementation of mainstreaming projects do not usually account for unexpected delays (due to political and legislative change, management problems, natural disasters or socio-political unrest) that may require last-minute extensions to deliver project outcomes. As part of risk analysis and prudent management, the likelihood of factors and events that could delay completion of project activities should be assessed regularly. Imminent problems should be immediately addressed and adaptation measures should be put in place to adjust to these changes. Where project extensions become necessary, these should be planned early on rather than requested ad hoc or at the last minute.

- 
7. Inclusive and participatory management should be encouraged but judiciously implemented.

Efforts to establish a broad base of stakeholders in mainstreaming projects can lead to the organization of Project Steering Committees with too many members, which make meetings difficult and expensive to convene. This situation slows project implementation and reduces buy-in from critical institutional and organizational partners. Where large (that is more than 25-plus member) Steering Committees have been created, it is often impossible to scale down membership without alienating excluded parties. Projects should consider establishing executive sub-committees or other similar 'core' management structures consisting of critical stakeholders to address immediate project management issues while maintaining the broader Committee composition through reduced meetings, or through communication via email, telephone or proxy systems.

- 
8. In mainstreaming projects, policy-related outcomes and outputs are common. However, the intricacies of influencing policy processes are not often recognized in project frameworks.

Policy reforms are largely determined by the political process. When the stakes are high and competing interests determine resource utilization, the process could be complicated and drawn out, delaying delivery of project outputs that are dependent on the enactment

or approval of supportive policies. Projects should therefore take the political process into account in their design, particularly regarding the delivery of outcomes and outputs. If possible, activities should not be totally dependent on approval of policies. Alternative courses of action should be recognized at the outset so as not to delay the entire project. An extension of the duration of the project should be a last resort.

---

### 9. Mainstreaming is difficult.

The concept is novel, usually poorly articulated and communicated, and can be a barrier rather than a solution. But the concept is fundamental to achieving biodiversity management success beyond the boundaries of formal protected areas. Compared to site level PA projects, mainstreaming can take longer to implement and routinely requires the direct on-the-job training and mentoring of target stakeholders, beyond one-off courses and user manuals. Mainstreaming is not a technology; it is a philosophy and a process that must lead to long-lasting economic and social changes that reduce threats to biodiversity posed by the process of 'production.'

---

### 10. Ensuring financial sustainability through alternative mechanisms for continued revenue generation and expansion is important.

When a project has established considerable capacity to manage a growing certification program for products (such as coffee), concern arises on how to maintain this capacity after project funds end. NGOs, in particular, do not have revenue streams to support expanded teams. Through dialogue among executing partners, alternative mechanisms can be designed whereby companies that purchase certified products pay a minor administration fee to cover the expenses of administering the program. This fee mechanism has the potential of covering the increasing cost of managing a growing program, thus creating a truly sustainable financing solution.

---

### 11. Local capacity to facilitate the development of biodiversity markets is important.

Projects in the design phase should not underestimate the complexity of procedures for adoption and implementation of new financial instruments in a region where little or no prior experience exists. Specifically, all authority levels and institutional roles need to be very clear from the beginning of project implementation. Projects introducing new financial instruments require realistic approaches and planning, as they often entail complex procedures. The incorporation of key institutional personnel is important to facilitate knowledge of new financial instruments and internal approval processes.

© FABIANA ISSLER



## 4.3 Future Challenges for the Portfolio

Biodiversity loss is a major concern to humankind as it underpins human survival and wellbeing. Almost all natural ecosystems in the world today are shaped by human activities – many of which are leading to their degradation, both directly and indirectly. Anthropogenic climate change is compounding ecosystem destruction and is likely to change the environmental conditions in which species have evolved – leading to a mass extinction of species unable to adapt and to changes in the flows of water and energy within ecosystems, thus altering ecosystem functions.

Looking forward, three high priority action areas for the UNDP Biodiversity portfolio can be identified:

### Balancing biodiversity management with development and poverty reduction

The mandate of UNDP is to assist developing and transition countries to develop the capacities needed to achieve sustainable economic, social and environmentally sound development. From an ecosystems management perspective, this translates into developing national capacities to manage biodiversity and sustain the supply of ecosystem services that underpin development (such as livelihoods, food security, human health and other fundamentals).

### Coping with climate change

Climate change is the defining human development issue of our generation. The importance of acting decisively now is highlighted in the UNDP Human Development Report for 2007/2008.<sup>33</sup> The way the world deals with climate change today will have a direct bearing on the human development prospects of a large section of humanity. Successful climate change management will require a dramatic scaling up of mitigation and adaptation efforts at all levels, enabled by a coordinated mix of policy and financial instruments. It calls for a new development paradigm that mainstreams climate change into strategies and plans, and that links policy setting with the financing of solutions. Going forward, UNDP will support the efforts of developing countries and vulnerable groups to scale up mitigation and adaptation action to

successfully meet the climate change challenge and achieve the MDGs.<sup>34</sup>

### Strengthening environmental financing for biodiversity management

Most developing countries and countries in transition have a huge unmet need for environmental finance. Given climate change and the pace of biodiversity loss (and accompanying destabilization of ecosystem functions and their derivative services), the demand for environmental finance is increasing exponentially. A variety of new market-based financing instruments have been established—including the Clean Development Mechanism and Carbon Auctions—and others are likely to be introduced in the future (including a market for reducing emissions from deforestation and degradation, or REDD). As is the case with foreign direct private investment, most market-based mechanisms have tended to favor emerging economies with stable governments, and strong property rights, respect for law, and institutions (although not necessarily democratic institutions). As a multilateral agency with a mandate to service the needs of all countries, UNDP has a role to play in developing the capacity of countries without these fundamentals. This work will be critically important in the case of REDD, as many tropical forest countries with high deforestation rates have notably weak governance systems and institutional capacities.

The following sections examine these three areas of focus in more detail.

## The Development/Poverty-Biodiversity Nexus

UNDP has an important role to play in addressing the effective integration of biodiversity management with development and poverty alleviation efforts, particularly in poorer countries. Poverty Reduction Strategies decide to a large extent how public moneys, donor moneys and moneys saved through debt relief get allocated.

<sup>33</sup> UNDP. Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World, Palgrave Macmillan.

<sup>34</sup> UNDP's Climate Change Strategy. Climate Change at UNDP: Scaling Up to Meet the Challenge. 2008



Unless the benefits of biodiversity management can be measured in terms of its contribution to this agenda, biodiversity management will continue to get eclipsed.

In seeking to integrate biodiversity management into the development framework, UNDP support will address the root causes of threats to biodiversity, including governance and market failures. It will identify the long-term solution(s) for addressing the root causes to biodiversity loss, which could include strengthening the PA system in ecologically vulnerable areas that supply important goods and services, or re-gearing production practices that underpin biodiversity loss to make them more 'biodiversity-friendly' (known as biodiversity mainstreaming).

Going forward, UNDP will play an important role by advocating policies for biodiversity management and pro-poor development that:

- Strengthen weak governance and address market failures within a pro-poor development strategy;
- Assist countries to build institutions that can enforce policies in the public interest;
- Establish property rights regimen for common property resources that give poor communities a utilitarian incentive to manage biodiversity;
- Build a broad-based societal consensus for action; and
- Leverage finance to meet the environmental finance needs of countries, as they move to address governance and market failures, and to compensate the current costs of foregoing resource-use.

Emphasis on barrier removal (including policy, institutional, and skills barriers, market, finance and know-how constraints) and valuing the cost of removing these barriers will be critical.

Analysis of the dynamics between biodiversity loss, development and poverty must also be prioritized. Questions relating to the benefits obtained by the poor from biodiversity, the distribution of benefits and the timeline during which the benefits occur (immediately or over the long-term) are central. Other key questions include: what costs are imposed on the poor by biodiversity management, and who will bear the costs when they are incurred (immediately or over the long-term)? Also, what will be the impacts and costs of biodiversity loss on the poor, now and in the future? And

what options are open to the poor to obtain benefits from ecosystems in a sustainable way?

The answers here will be complicated and context-specific, and will depend on the causes of biodiversity loss and the nature of the poverty-biodiversity loss equation. It may lie in providing the poor with regulated property and use rights, together with responsibilities for environmental management. It might involve the redistribution of the share of benefits from use of natural resources from the rich to the poor (for instance, by paying the poor more for the resources they harvest). Alternatives to consumptive uses of natural resources (for instance, growing village woodlots to compensate foregone use of fuelwood from forests) will need to be identified. The costs of developing the alternatives for and the capacity of the poor to absorb the costs would need to be assessed. If the poor cannot pay, then there is a role for State intervention to ensure the supply of a public good (non-excludable ecosystem services).

## Coping with Climate Change

Natural ecosystems buffer society from background environmental variability, including storms and droughts. Climate change is projected to increase environmental variability, which—depending on the region—will be manifest in increasing storm frequency and intensity, coastal inundation from storm surges, changes in spatial and temporal rainfall distributions leading to flooding and drought, and other phenomena.

## Adaptation and Biodiversity Management

Ecosystem-based adaptation solutions to climate change cannot be pursued *ad hoc*, but need to be assessed and developed as part of comprehensive national adaptation strategies. The key challenge for the UNDP projects addressing biodiversity management is to assess the available ecosystem-based options, and examine existing scientific evidence to show that these options are feasible and suitable in the local socio-economic and ecological context. This challenge also applies to projects advocating engineered and behavior-based solutions, where analysis of the feasibility, costs and benefits of the suggested solutions is also required.

Various options to facilitate adaptation to climate change exist. Protected area establishment is commonly advocated, in which case questions arise as to what design and management system is appropriate. Other

pertinent questions, also applicable to other strategies, include how to facilitate ecosystem restoration and how to manage mainstreaming, which refers to adjusting production practices employed by economic sectors to reduce threats to ecosystems. Decision-making depends on the capacity to assess the comparative costs and benefits of ecosystem-based adaptation versus other adaptation options and must factor the opportunity costs of conservation into the overall equation. Consideration of incentives to sustain ecosystem-based adaptation—which may include tax credits, Payments for Ecosystem Services, and insurance schemes—is also necessary.

Evidence to demonstrate that ecosystem-based adaptation is feasible and cost-effective relative to other adaptation measures is scanty. More efforts are needed to justify the approach. Nevertheless, at this stage, the precautionary principle would dictate that existing (non-climate related) stressors to ecosystems that provide critical services, which might help buffer the impacts of climate change, must be reduced.

In this regard, UNDP can play a key role in helping countries to develop climate change adaptation strategies as part of their broad development frameworks, which integrate cost-effective, locally appropriate ecosystem-based adaptation options based on the available science.

The development of ecosystem-based adaptation strategies thus requires careful consideration of the following key issues:

- What are the ecosystem-based options available, and what scientific evidence exists to show these options are feasible? What are the thresholds for failure when buffering risks? This question also applies to engineered solutions: for example, what is the maximum rainfall that wetlands can absorb without leading to catastrophic flooding? What measures are needed to maintain resilience?
- What other adaptation options exist? This issue would require that the feasibility, costs and benefits of engineered solutions or behavior-based solutions be addressed.
- What ecosystem management options exist? Which option is most suitable given the local socio-economic and ecological context? Options could include: protected area establishment, in which case the question arises as to what PA design and management system is appropriate; ecosystem restoration; and mainstreaming,

which refers to gearing production practices employed by economic sectors to reduce threats to ecosystems.

- What are the comparative costs and benefits of ecosystem-based adaptation versus other adaptation options? The opportunity costs of conservation need to be factored into this equation. Moreover, the costs of ecosystem-based adaptation will depend on the management system employed.
- What incentives are needed to sustain ecosystem-based adaptation? These may include tax credits, Payments for Ecosystem Services, and insurance schemes.

By working with governments to develop ecosystem management strategies that are suited to the local context, UNDP can also help countries address the two main drivers of biodiversity loss: weak governance and market failures. Finally, UNDP has a role to play in assisting countries to identify, combine and sequence finance from multiple sources to meet their adaptation needs. While UNDP is not an investment facility, it can facilitate deal flows between investors and developing countries.

### Too Late to Mitigate?

Recent analysis of carbon budgets shows that the timing and scale of emission reductions needed to avert dangerous climate change are well beyond any national policy proposals or anticipated international agreement. In the future, therefore—and in the face of the scenarios posited by scientists that suggest that global growth in greenhouse gas emissions is much higher than anticipated a few years ago—UNDP will need to play a key role in:

- Assisting countries to put in place sound policy measures and remove policy distortions that lead to ecosystem loss – and attendant greenhouse gas emissions.
- Formalizing property rights and responsibilities where open access to natural resources is causing ecosystem degradation and greenhouse gas emissions.
- Strengthening institutions responsible for planning and executing ecosystem management.
- Enforcing laws aimed at securing the public interest with regard to the avoidance of greenhouse gas emissions from ecosystem degradation.

UNDP also has a role to play in addressing market failure by facilitating country access to carbon markets, including Clean Development Mechanism (CDM) or successor markets for afforestation and reforestation, voluntary markets for emissions reduction in wetlands, and REDD. In each case the supply chain for the service—whether carbon emissions reduction or sequestration—needs to be understood from production of the service through to monitoring and verification, marketing and payments distribution. UNDP will work with countries to establish effective governance systems at all stages of the supply chain.

## Strengthening Environmental Financing for Biodiversity Management

### New Environmental Finance for Biodiversity Management

Biodiversity management on the scale needed to successfully mitigate ecosystem loss will require new environmental finance. Many countries will need to identify—as well as access, combine and sequence—environmental finance in order to meet their biodiversity management needs. Finance is needed to improve environmental governance by developing national capacities at the systemic, institutional and individual levels, and to address market failure. It is also necessary for the construction and purchase of physical infrastructure and equipment needed to perform biodiversity management functions and, finally, to underwrite the costs of ecosystem rehabilitation where needed. Any strategy aimed at deepening environmental finance at the country level will need to start with an evaluation of costs. Several questions need to be answered in this regard:

- What are the root causes of threats to biodiversity, including governance and market failures?
- What is the long-term solution for addressing the root causes to biodiversity loss (in light of country-specific circumstances)? This solution could include strengthening the PA system in ecologically vulnerable areas that supply important goods and services. Or it could involve the strategy of mainstreaming biodiversity.
- What are the barriers, including policy, institutional, and skills barriers, and market, finance and know-how constraints? How much would it cost to remove these barriers? What other options are available?

- What are the coefficients for the delivery of basic biodiversity management functions against which cost-effectiveness can be assessed (such as planning, monitoring, enforcement and development of infrastructure)?

Once the costs have been projected, the revenue side of the funding equation can be addressed. The key question is: what sources of finance—including domestic finance, official development assistance (ODA) and market-based mechanisms—exist to allow the country to meet its biodiversity management needs? A large number of financing instruments potentially exist, including Endowment Funds, Debt for Nature Swaps, biodiversity offsets and the auctioning of tourism concessions. The strategies that need to be employed to tap into each of these sources of funds will vary considerably depending on the fund and the country in question. For instance, market-based instruments and innovative financing options might not be feasible in countries with a weak record of governance; they require the existence of capacitated institutions, strong systems for fiduciary management, and confidence on the part of the market that the funds will be employed effectively and secure results.

A one-size-fits-all strategy for environmental finance does not exist. A feasibility assessment of the options available must be undertaken, looking at country-specific needs and circumstances. It needs to assess the feasibility of different funding options and the policy interventions needed to make financing options viable, and to define how different funds can be accessed, combined and sequenced to meet financing needs (through a basket approach).

Three possible financing options include:

### National Budgetary Appropriations

Has a business case for investment in biodiversity management been established, covering the economic benefits from investment, the costs of inaction, and the costs of management? In many countries, economic assessments of the value of biodiversity have been pivotal in making the business case for public finance. However, economic assessments are not sufficient. A costed action plan and confidence that funds will be put to good use are also needed, which might require accompanying investment in building national institutional capacities.

## Donor Funding

Has biodiversity been registered as a country priority in national development plans, poverty reduction strategies, the World Bank Country Assistance Strategies, the United Nations Development Assistance Framework (UNDAF), adaptation strategies, and others? Countries that treat biodiversity management as a priority and articulate strong developmental reasons for financing biodiversity management tend to have the most success in securing ODA finance. This is also critical in terms of negotiating debt-for-nature swaps, where a creditor writes off international debt in return for investments in biodiversity management by the debtor country in local currency.

## Payments for Ecosystem Services (PES)

The objective of Payment for Ecosystem Services schemes is to monetize the cost of providing ecosystem services by creating new markets for the service in question or by internalizing the costs of supplying the service into the price of marketed goods and services (for example, the cost of clean water provision in a watershed can be internalized in the cost of timber harvested in it). PES is generally aimed at addressing market failure rather than leveraging new sources of environmental finance. Although finance is generated, rather than increase the tax burden, many countries use the finance to offset other taxes (so PES is revenue neutral). However, international PES—such as payments for reducing emissions from deforestation—can provide new sources of revenue to countries in addition to those leveraged domestically.

PES is only viable under certain conditions. A significant challenge exists in converting willingness to pay into actual service payments. In many countries, consumers are willing but unable to pay because they cannot afford to do so. The transaction costs in setting up a PES scheme could be significant, particularly where there are numerous suppliers of the service and numerous consumers. Finally, the feasibility and costs of supplying the service might be significant, and thus might outweigh the benefits. Where the risks of non-delivery of the service are very high, PES is unlikely to work. In countries with strong policies and institutions, and a demonstrated ability to enforce contracts, insurance systems can be developed to spread risk (such as the risk of lower than expected rainfall under a payment for water base flow scheme, based on guaranteed annual base flows). However, it is unlikely to work in countries with weak governance and insurance markets.

Environmental finance constitutes one of the main pillars of UNDP's work on environmental management. A major focus of UNDP work in the development arena is on improving governance and institutional performance, as well as public sector finance reform. This work is directly relevant to the task of deepening the finance base for biodiversity management.

*A one-size-fits-all strategy for environmental finance does not exist. A feasibility assessment of the options available must be undertaken, looking at country-specific needs and circumstances.*

In the future, UNDP biodiversity projects will play a major role in addressing cost management and supporting expenditure forecasting, as well as in assisting countries to meet their environmental finance needs by accessing and combining different funding streams. Depending on the country, this may require: investing in making the economic case for biodiversity management; developing capacity to make strategic financing decisions, such as reallocating spending to match management priorities and identifying appropriate cost reductions; building institutional capacities to develop and administer financial mechanisms; and brokering finance.

## Strengthening PA Finance

Most PA systems are under-financed, with the possible exceptions of some East and Southern African countries and some states in India. Improving PA finance balance sheets requires attention to cost management as well as revenue generation. On the cost side, cost coefficients for different PA operations need to be calculated (such as for planning, enforcement and monitoring) and measures instituted to ensure that operations are implemented as efficiently as possible. This work is critical to maximize the “bang for the buck” of any investment in PAs. On the revenue generation side, PA systems need to make a business case for investment (such as definition of the

mandate and showing how that mandate relates to the development agenda). Options for enhancing revenue generation include the negotiation of higher national budgetary appropriations, the negotiation of donor finance, and the development of a conservation economy – such as a vibrant nature tourism sector (which can be tapped for revenue through gate fees, concessions, bed taxes and other means).

Where PA systems are large enough to supply ecosystem services such as water quality regulation, Payments for Ecosystem Services provide another financing option. Other PA financing options include debt-for-nature swaps and environmental trust funds.

### Mainstreaming Biodiversity into Economic Development

Mainstreaming constitutes one strategy for strengthening environmental finance, either by reducing threats to biodiversity at source, and thus reducing the costs of management, or by leveraging funds, human and management capacity from production enterprises for biodiversity management purposes (in other words, the internalization of biodiversity management in production costs).

In the future, mainstreaming projects supported by UNDP will place further emphasis on helping countries

lift barriers to mainstreaming, either by addressing weaknesses in environmental governance (the policies, regulations, institutions and incentives to manage production activities), or in ‘fixing’ markets.

Mainstreaming at a specific landscape scale will generally address governance needs, such as land use planning and management systems.

Market-based reforms generally require interventions along the supply chain for the product: from production to distribution and retail. Once the production change sought has been defined, and the cost of the production reforms are known, the challenge is to ensure that markets compensate for the costs. Certification and verification systems can provide a means of recognizing environmental good practices in the market place; depending on the product, a premium may be payable for the product. However, not all certified products command premiums. In such cases, efforts to increase returns at the production gate could include direct sales of the product to the retail market, thus reducing the cut taken at the distribution and wholesale level of the market.

UNDP also has an important role to play in advising countries, and small and medium enterprises, on how to structure their supply chains to improve market returns and create the necessary incentives for sound biodiversity management.

**Mainstreaming strategies** require consideration of a complex range of factors, including:

What threat specifically does the sector, and production practices, pose to biodiversity?

- Why does the threat occur? Is it because the governance framework for the sector is weak (as when policies intended to reduce environmental impacts exist only on paper and are rarely enforced)? Or can the threat be traced to market failure? Or is it because the know-how or technology does not exist, or has not penetrated the market?
- What is the ideal scenario? What change in production practice is desired in order to mitigate threats to biodiversity? Does the know-how and technology exist to achieve this scenario? What is the cost?
- What are the trade-offs inherent in pursuing the desired production practice?
- What are the drivers for the production sector to change its behaviour and adopt biodiversity-friendly production practices? What risks does an industry face by failing to conserve biodiversity?
- Is governance and/or market reform needed? Sometimes mainstreaming requires improved governance: improved enforcement of existing laws aimed at strengthening environmental management, or improved accountability for decision-making within production sectors. Often a mix of governance and market reform is needed.





- Chivian, E. and Bernstein, A. (Eds.). (2008). *Sustaining life: How Human Health Depends on Biodiversity*. Center for Health and the Global Environment. Oxford University Press, New York. Available at: <http://www.cbd.int/doc/publications/cbd-ts-46-en.pdf>
- Coad L., Burgess, N.D., Bomhard, B. and Besancon, C. (2009). *Progress towards the Convention on Biological Diversity's 2010 and 2012 Targets for Protected Area Coverage: Technical report for the IUCN international workshop "Looking to the Future of the CBD Programme of Work on Protected Areas,"* Jeju Island, Republic of Korea, 14-17 September 2009. UNEP-WCMC, Cambridge, UK. Available at: [http://www.unep-wcmc.org/protected\\_areas/pubs.htm](http://www.unep-wcmc.org/protected_areas/pubs.htm)
- Food Plants International (website). [www.foodplantsinternational.com](http://www.foodplantsinternational.com)
- GEF (1994). *Instrument for the Establishment of the Restructured Global Environment Facility*. GEF, Washington DC.
- GreenFacts: Facts on Health and the Environment (website). Available at: [www.greenfacts.org](http://www.greenfacts.org)
- GRID-Arendal (2003). *IPCC's Third Assessment Report, Climate Change 2001 – Complete Online Version*. Available at: [www.grida.no/climate/ipcc\\_tar/wg1/339.htm](http://www.grida.no/climate/ipcc_tar/wg1/339.htm)
- Hoegh-Guldberg, O., et al. (2007). *Coral Reefs Under Rapid Climate Change and Ocean Acidification*. *Science* 318, 1737-1742.
- International Coral Reef Action Network (ICRAN). [www.icran.org](http://www.icran.org)
- IUCN Red List of Threatened Species (2008). *State of the World's Species*. Available at: [http://cmsdata.iucn.org/downloads/state\\_of\\_the\\_world\\_s\\_species\\_factsheet\\_en.pdf](http://cmsdata.iucn.org/downloads/state_of_the_world_s_species_factsheet_en.pdf)
- IUCN Red List of Threatened Species (2008). *Global Amphibian Assessment (GAA)*. Described at: <http://www.iucnredlist.org/initiatives/amphibians>
- Langdon, C., and Atkinson, M. J. (2005). *Effect of elevated pCO<sub>2</sub> on photosynthesis and calcification of corals and interactions with seasonal change in temperature/irradiance and nutrient enrichment*. *Journal of Geophysical Research*, 110.
- Millennium Ecosystem Assessment (2005). *Ecosystems and Human Well-being (Series and Synthesis Reports)*. Island Press, Washington. Available at: [www.millenniumassessment.org](http://www.millenniumassessment.org)
- Millennium Ecosystem Assessment (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC. Available at: <http://www.millenniumassessment.org/documents/document.356.aspx.pdf>
- Pachauri, R. K. and A. Reisinger (Eds.) (2007). *Climate Change 2007: Synthesis Report*. IPCC, Geneva, Switzerland, pp 104.
- Secretariat of the Convention on Biological Diversity (2002). *Decision VI/26*. [www.cbd.int](http://www.cbd.int)
- Secretariat of the Convention on Biological Diversity (2006). *Global Biodiversity Outlook 2*. Montreal, 81 + vii pages. Available at: <http://www.cbd.int/doc/gbo/gbo2/cbd-gbo2-en.pdf>
- Secretariat of the Convention on Biological Diversity (2009). *Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity*. Montreal, Technical Series No. 46, 61 pages.
- Secretariat of the Convention on Biological Diversity (website). *Invasive Alien Species*. Available at: <http://www.cbd.int/invasive/> and <http://www.cbd.int/invasive/WhatareIAS.shtml>
- TEEB (2008). *The Economics of Ecosystems and Biodiversity: An interim report*. European Commission, Brussels. Available at: [www.teebweb.org](http://www.teebweb.org)
- TEEB (2009). *Climate Update*. European Commission and the German Federal Ministry for the Environment. European Commission, Brussels. Available at: [www.teebweb.org](http://www.teebweb.org)
- Thomas et al. (2004). *Extinction Risk from Climate Change*. *Nature*, 427, 145-148.
- UNDP Environment and Energy Group (2008). *Climate Change at UNDP: Scaling Up to Meet the Challenge*. Available at: [http://www.undp.org/gef/documents/publications/CC\\_Strategy\\_WEB.pdf](http://www.undp.org/gef/documents/publications/CC_Strategy_WEB.pdf)
- UNDP Environment and Energy Group (website). [www.undp.org/energyandenvironment/about.htm](http://www.undp.org/energyandenvironment/about.htm)
- UNEP-WCMC (2008). *State of the World's Protected Areas: An Annual Review of Global Conservation Progress*. UNEP-WCMC, Cambridge, UK. Available at: [http://www.unep-wcmc.org/protected\\_areas/pdf/stateOfTheWorld%27sProtectedAreas.pdf](http://www.unep-wcmc.org/protected_areas/pdf/stateOfTheWorld%27sProtectedAreas.pdf)
- Watkins, K., et al. (2007). *Human Development Report 2007/2008 – Fighting Climate Change: Human Solidarity in a Divided World*. Palgrave Macmillan, New York. Available at: <http://hdr.undp.org/en/reports/global/hdr2007-2008/>



Wilkinson, C. (Ed.). (2008). Status of Coral Reefs of the World: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia. Available at: <http://www.gcrmn.org/status2008.aspx>

World Database on Protected Areas (website). Available at: <http://sea.unep-wcmc.org/wdbpa>

WWF (website). Species Threatened by Climate Change. Available at: [www.panda.org/about\\_wwf/what\\_we\\_do/climate\\_change/problems/impacts/species/index.cfm](http://www.panda.org/about_wwf/what_we_do/climate_change/problems/impacts/species/index.cfm)

WWF (2008). Living Planet Report: Living Planet Index. [www.panda.org/about\\_our\\_earth/all\\_publications/living\\_planet\\_report/living\\_planet\\_index/](http://www.panda.org/about_our_earth/all_publications/living_planet_report/living_planet_index/)





List of Projects included in the Results Assessment, by Region

Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
<b>Pan-Africa</b>				
Building Local Capacity for Conservation and Sustainable Use of Biodiversity in the Okavango Delta	Botswana	July '06	4.28	12.06
Cape Verde PAs - Phase I	Cape Verde	Apr '04	3.94	6.19
Conservation and sustainable use of biodiversity in the Moyen-Chari	Chad	July '06	1.66	1.64
Rehabilitation of protected areas	Congo, DR	Jan '04	5.94	10.94
Sustainable Development of the Protected Area System of Ethiopia	Ethiopia	Sept '08	9.00	22.43
Conservation of the biodiversity of the Nimba Mountains through integrated and participatory management	Guinea	June '05	3.99	7.78
Improved Conservation and Governance for Kenya Coastal Forest Protected Area System	Kenya	Mar '08	0.99	0.00
Third Environment Programme, Support to the Protected Area Network and Strategic Zones, Phase I	Madagascar	Aug '05	4.50	0.00
Biological Diversity Conservation through Participatory Rehabilitation of the Degraded Lands of the Arid and Semi-Arid Transboundary Areas of Mauritania and Senegal	Mauritania, Senegal (Regional)	Dec '00	8.39	4.37
The Management and Protection of the Endangered Marine Environment of the Republic of Mauritius	Mauritius	Mar '05	1.00	3.32
Strengthening the Protected Area Network (SPAN)	Namibia	Feb '06	8.55	33.68
In-situ conservation of endemic ruminant livestock in West Africa	Regional	Sep '07	10.50	19.59
Conservation of Transboundary Biodiversity in the Minkébé-Odzala-Dja Inter-zone in Gabon, Congo, and Cameroon	Regional	June '08	10.46	34.36
Enhancing the effectiveness and catalyzing the sustainability of the W-Arly-Pendjari (WAP) protected area system	Regional	Feb '08	5.62	18.59
Strengthening Biodiversity Conservation Capacity in the Forest Protected Area System of Rwanda	Rwanda	Nov '06	5.75	6.98
Mainstreaming biodiversity management into production sector Activities	Seychelles	Mar '08	3.90	8.15
Mainstreaming Prevention and Control Measures for Invasive Alien Species into Trade, Transport and Travel across the Production Landscape	Seychelles	Mar '08	2.00	3.43
Conservation and Sustainable Use of Biodiversity on the South African Wild Coast	South Africa	Nov '06	6.84	24.32
Agulhas Biodiversity Initiative	South Africa	Mar '04	3.23	29.97

Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
CAPE Programme: Biodiversity Conservation and Sustainable Development in the CFR	South Africa	Oct '04	2.00	0.00
National Grasslands Biodiversity Programme	South Africa	Aug '08	8.65	37.26
Eastern Arc Forest Conservation and Management	Tanzania	Oct '03	5.21	1.43
The Development and Management of the Selous-Niassa Wildlife Corridor in Tanzania	Tanzania	May '05	1.00	1.06
Uganda: Conservation of biodiversity in the Albertine Rift Forest Protected Areas	Uganda	Aug '08	3.75	8.10
Extending Wetland Protected Areas through Community Conservation Initiatives in Uganda	Uganda	July '08	0.83	1.77
Effective Management of the National Protected Areas System	Zambia	Feb '06	6.33	35.09
Conservation and Sustainable Use of Traditional Medicinal Plants in Zimbabwe	Zimbabwe	May '03	1.00	0.73
<b>Arab States</b>				
Conservation and sustainable use of globally significant biodiversity in the Tassili and Ahaggar National Parks (Phase I)	Algeria	Apr '04	3.72	2.53
Conservation and sustainable use of native biodiversity resources used for herbal, medicinal, pharmaceutical and cosmetic purposes	Egypt	Oct '02	4.29	4.27
Mainstreaming conservation of migratory soaring birds into key productive sectors along the Rift Valley/Red Sea flyway, Tranche 1	Jordan (Regional)	July '08	6.74	4.49
BD Conservation in S High Atlas	Morocco	Sep '01	4.37	5.39
Biodiversity Conservation and Protected Area Management	Syria	Mar '06	3.49	3.43
<b>Asia &amp; Pacific</b>				
Coastal and wetland biodiversity management	Bangladesh	Dec '02	5.52	3.34
Integrated Livestock and Crop Conservation Program	Bhutan	Oct '07	0.92	2.00
Establishing Conservation Areas Landscape Management(CALM) in the Northern Plains	Cambodia	Feb '06	2.51	2.17
Integrated Resource Management and Development in the Tonle Sap Region	Cambodia	Jan '05	3.60	15.54
Biodiversity Management in the Coastal Area of the China South Sea	China	Dec '05	3.52	9.23
Wetlands biodiversity conservation and sustainable use	China	May '00	12.03	24.73
Conservation and Sustainable Utilization of Wild Relatives of Crops	China	Dec '07	8.06	12.84
Multi-sectoral and integrated systems approach to the conservation, management and sustainable utilisation of coastal biodiversity	India	Jan '03	7.87	19.09

Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
Mainstreaming Conservation and Sustainable Use of Medicinal Plant Diversity in Three Indian States	India	Sep '08	5.28	6.48
Conservation of Biodiversity in the Central Zagros Landscape Conservation Zone	Iran	Feb '06	4.00	5.78
Conservation of Iranian Wetlands	Iran	Feb '05	3.29	9.79
Conservation of the Asiatic Cheetah, its Natural Habitat and Associated Biota in the I.R. of Iran	Iran	Nov '01	0.75	0.73
Conservation of Globally Significant Wetlands in the Republic of Korea	Korea ROK	Sep '04	2.47	1.10
Capacity building to support the implementation of the Cartagena protocol on Biosafety.	Malaysia	Mar '07	0.91	4.30
Conservation of Biological Diversity through Improved Forest Planning Tools	Malaysia	May '07	2.46	3.41
Conserving Marine Biodiversity through Enhanced Marine Park Management and Inclusive Sustainable Island Development	Malaysia	May '07	2.13	1.96
Tropical peat swamp forest and wetlands	Malaysia	June '02	6.30	7.68
Atoll Ecosystem Management & Coral Reef Conservation in the Maldives	Maldives	Sep '05	2.73	4.61
Community-based Conservation of Biological Diversity in the Mountain Landscapes of Mongolia's Altai Sayan Eco-region	Mongolia	Jan '07	3.07	1.87
Conservation and Sustainable Use of Wetlands in Nepal	Nepal	June '08	2.21	2.10
Creating Biodiversity Conservation Landscapes in Nepal's lowland Terai and Eastern Himal Areas	Nepal	Mar '06	3.55	9.52
Conservation of Habitats and Species in Arid and Semi-Arid Ecosystems in Balochistan	Pakistan	Dec '04	0.79	0.46
Mainstreaming Biodiversity Conservation in production systems in the Juniper Forest Ecosystem	Pakistan	Apr '07	1.00	0.00
Protection and Management of Pakistan Wetlands Project	Pakistan	Aug '05	3.33	8.80
Samar Island biodiversity conservation	Philippines	Mar '01	6.11	7.12
Contributing to the Conservation of the Unique Biodiversity in the Threatened Rain Forests of Southwest Sri Lanka	Sri Lanka	Aug '00	0.75	0.23
Facilitating and strengthening local resource management initiatives of traditional landholders & their communities to achieve biodiversity conservation objectives	Vanuatu	Apr '05	0.77	0.71
Coastal and Marine Biodiversity Conservation and Sustainable Use in the Con Dao Islands Region	Vietnam	Aug '06	0.99	0.85

Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
Making the Link: The Connection and Sustainable Management of Kon Ka Kinh and Kon Cha Rang Nature Reserves	Vietnam	Nov '06	0.90	2.09
<b>Europe &amp; Commonwealth of Independent States</b>				
Catalyzing sustainability of the wetland protected area system in Belarusian Polesie through increased management efficiency and realigned land use practices	Belarus	May '06	2.39	9.09
Renaturalization and sustainable management of peatlands in Belarus to combat land degradation, ensure conservation of globally valuable biodiversity, and mitigate climate change	Belarus	Feb '06	1.00	2.31
Conservation of Globally Significant Biodiversity in the Landscape of Bulgaria's Rhodope Mountains	Bulgaria	June '04	3.81	14.66
Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy	Bulgaria	Oct '07	1.00	1.87
Conservation and Sustainable Use of Biodiversity in the Dalmatian coast through greening coastal development	Croatia	Mar '07	7.31	24.33
Conservation of biological diversity of Carpathian Mountain grasslands in the Czech Republic through targeted application of new EU funding mechanisms	Czech Republic	Nov '05	0.99	9.45
Recovery, Conservation, and Sustainable Use of Georgia's Agrobiodiversity	Georgia	July '04	0.99	1.72
Conservation of the Globally Significant Biodiversity of the Tisza River Floodplain	Hungary	Oct '05	0.97	1.75
Conservation and Sustainable Use of Biodiversity in the Kazakhstani Sector of the Altai-Sayan Mountain Ecoregion	Kazakhstan	Feb '07	2.42	16.34
Integrated conservation of priority globally significant migratory bird wetland habitat: a demonstration on three sites	Kazakhstan	Oct '03	8.85	25.67
In-Situ Conservation of Kazakhstan Mountain Agrobiodiversity	Kazakhstan	Feb '06	3.02	19.55
Sustainable Management of Endemic Ichthyofauna of the Issyk-Kul Lake Basin	Kyrgyzstan	May '08	0.98	0.96
Biodiversity Protection in North Vidzeme Biosphere Reserve	Latvia	Aug '04	2.91	10.74
Conservation of Inland Wetland Biodiversity in Lithuania	Lithuania	May '04	3.44	8.96
Strengthening the ecological, institutional and financial sustainability of Macedonia's national protected areas system	Macedonia	Dec '07	1.00	4.16

Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
Biodiversity Conservation and Management in the Barycz Valley	Poland	Nov '05	0.99	10.24
Strengthening Romania's Protected Area System by Demonstrating Best Practices for Management of Small Protected Areas in Macin Mountains National Park.	Romania	Nov '05	1.00	2.10
Strengthening Romania's Protected Area System by Demonstrating Public-Private Partnership in Romania's Maramures Nature Park.	Romania	June '05	1.00	1.33
Demonstrating sustainable conservation of Biodiversity in four protected areas in Russia's Kamchatka Oblast, Phase II	Russia	May '06	5.50	9.93
Conservation of wetland biodiversity in the Lower Volga region	Russia	July '06	6.78	8.82
Conservation and Management of Wild Salmonid Diversity in Kamchatka, Phase I	Russia	Oct '03	3.29	9.75
Regional Biodiversity Conservation in the Altai-Sayan Mountain Ecoregion	Russia	Apr '06	3.87	11.66
Conservation and sustainable use of biological diversity in Russia's Taymir Peninsula: maintaining connectivity across the landscape	Russia	Oct '06	1.00	2.04
Conservation, Restoration and Wise Use of Calcareous Fens in the Slovak Republic	Slovak Republic	Mar '05	1.00	1.46
Demonstrating new approaches to protected areas and biodiversity management in the Gissar Mountains as a model for strengthening the national Tajikistan protected areas system	Tajikistan	Feb '06	1.00	0.73
Enhancing coverage and management effectiveness of the subsystem of forest protected areas in Turkey's national system of protected areas	Turkey	July '08	1.00	1.43
Conservation and Sustainable use of globally significant biological diversity in Khazar Nature Reserve on the Caspian Sea Coast.	Turkmenistan	July '06	1.43	1.60
Strengthening Governance and Financial Sustainability of the National Protected Area System	Ukraine	Apr '08	2.13	3.88
Conservation of "Tugai" Forest and Sustainable Land Use Development in the Amu Darya Delta of Karakalpakstan.	Uzbekistan	Oct '05	1.00	1.08
Uzbekistan: Enhancement of national strict nature reserves effectiveness by demonstrating new conservation management approaches in Surkhan Strict Nature Reserve	Uzbekistan	Sep '08	1.00	1.24
<b>Global</b>				
Supporting Country Early Action on Protected Areas	Global	Apr '07	9.47	40.36
Institutionalizing payments for ecosystem services	Global	Mar '08	5.77	12.03



Project Title	Country	Start Date	GEF Grant (US\$ million)	Other Funding (US\$ million)
<b>Latin America &amp; Caribbean</b>				
Consolidation and implementation of the Patagonian Coastal Zone Management Programme and biodiversity conservation	Argentina	Sep '00	8.00	12.70
In-situ Conservation of Andean Crops and Their Wild Relatives in the Humahuaca Valley, the Southernmost Extension of the Central Andes	Argentina	Nov '05	0.96	0.91
Integrating Protected Area and Landscape Management in the Golden Stream Watershed	Belize	Aug '06	1.00	1.12
Promoting biodiversity conservation and sustainable use in the frontier forest Mato-Grosso	Brazil	May '01	6.98	9.05
Demonstrations of integrated ecosystem and watershed management in the Caatinga	Brazil	Mar '04	4.10	22.32
Biodiversity Conservation in Altos de Cantillana, Chile	Chile	Aug '08	0.98	1.14
Regional System of Protected Areas for Sustainable Conservation and Use of Valdivian Temperate Rainforest	Chile	Dec '07	5.04	15.61
Conserving Globally Significant Biodiversity along the Chilean Coast	Chile	Aug '05	4.08	16.18
Central American Markets for Biodiversity (CAMBio): Mainstreaming biodiversity conservation and sustainable use within micro-, small, and medium-sized enterprise development and financing	Costa Rica (Regional)	Feb '07	1.02	17.32
Improved Management and Conservation Practices for the Coco Island Marine Conservation Area	Costa Rica	Jan '05	1.00	2.17
Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana-Camagüey Ecosystem	Cuba	July '08	4.32	23.35
Control of Invasive Species in Galapagos Archipelago	Ecuador	Nov '01	18.65	24.83
Consolidating a system of Municipal Regional Parks (MRPs) in Guatemala's Western Plateau	Guatemala	Sep '04	0.99	1.26
Biodiversity Conservation in Coffee: Transforming productive practices in the coffee sector by increasing market demand for certified sustainable coffee	Guatemala (Regional)	Oct '06	1.26	81.61
Promoting Integrated Ecosystem and Natural Resource Management in Honduras	Honduras	June '04	4.52	39.36
Biodiversity Conservation in the Sierra Gorda Biosphere Reserve	Mexico	Sep '01	6.73	13.92
Integrating ecosystem management in three priority ecoregions	Mexico	Aug '01	1.57	45.85
Conservation of Dry Forest and Coastal Biodiversity of the Pacific South of Nicaragua	Nicaragua	Dec '04	0.99	3.86
Paraguayan Wildlands Protection Initiative	Paraguay	July '01	8.90	0.00
Integrated Ecosystem Management in the Cotahuasi Basin	Peru	Nov '04	0.89	3.96
Catalyzing the implementation of Uruguay's national protected areas system	Uruguay	Sep '07	2.84	4.78
Biodiversity Conservation in the Productive Landscape of the Venezuelan Andes	Venezuela	Mar '07	7.70	29.55
Protection and sustainable use of biological diversity in the Orinoco Delta Wetlands	Venezuela	June '01	9.79	23.08



#### UNITED NATIONS DEVELOPMENT PROGRAMME

UNDP IS THE UN'S GLOBAL DEVELOPMENT NETWORK, ADVOCATING FOR CHANGE AND CONNECTING COUNTRIES TO KNOWLEDGE, EXPERIENCE AND RESOURCES TO HELP PEOPLE BUILD A BETTER LIFE. UNDP IS ON THE GROUND IN 166 COUNTRIES, WORKING WITH THEM ON THEIR OWN SOLUTIONS TO GLOBAL AND NATIONAL DEVELOPMENT CHALLENGES. [WWW.UNDP.ORG/BIODIVERSITY](http://WWW.UNDP.ORG/BIODIVERSITY)

#### GLOBAL ENVIRONMENT FACILITY

GEF UNITES 181 COUNTRIES IN PARTNERSHIP WITH INTERNATIONAL INSTITUTIONS, NGOs, AND THE PRIVATE SECTOR TO ADDRESS GLOBAL ENVIRONMENTAL ISSUES WHILE SUPPORTING NATIONAL SUSTAINABLE DEVELOPMENT INITIATIVES. TODAY THE GEF IS THE LARGEST PUBLIC FUNDER OF PROJECTS TO IMPROVE THE GLOBAL ENVIRONMENT. AN INDEPENDENT FINANCIAL ORGANIZATION, THE GEF PROVIDES GRANTS FOR PROJECTS RELATED TO BIODIVERSITY, CLIMATE CHANGE, INTERNATIONAL WATERS, LAND DEGRADATION, THE OZONE LAYER, AND PERSISTENT ORGANIC POLLUTANTS. [WWW.THEGEF.ORG](http://WWW.THEGEF.ORG)



UNDP Environment & Energy Group  
304 East 45th Street  
Room FF-982  
New York, NY 10017  
Phone: +1 (212) 906 5020