



# ACTION FOR BIODIVERSITY

*Towards a society in harmony with nature*



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# Preface

The Third Global Biodiversity Outlook (GBO3), produced by the Convention on Biological Diversity (CBD), delivered some sobering warnings for the global community:

- ❖ *The target agreed by all governments in 2002, “to achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional and national level”, has not been met.*
- ❖ *The principal pressures directly driving biodiversity loss are all either constant or increasing in intensity.*
- ❖ *Most future scenarios project continuing high levels of extinctions and loss of habitats throughout this century, with associated decline of some ecosystem services important to human well-being.*
- ❖ *There is a high risk of dramatic biodiversity loss and accompanying degradation of a broad range of ecosystem services if ecosystems are pushed beyond certain thresholds or tipping points.*

GBO3 also noted that the existence of the 2010 Biodiversity Target had stimulated many positive actions around the world with significant and measurable results. These actions have not been enough, and they are often undermined by conflicting policies, a lack of resources and incentives that fail to take biodiversity into account. Nevertheless, biodiversity loss may yet be halted, and in some aspects reversed, if urgent, concerted and effective action is initiated now in support of a long-term vision.

The tenth meeting of the Conference of Parties to the CBD, at Nagoya, Aichi Prefecture, Japan in October 2010 has before it a proposed new Strategic Plan to guide biodiversity actions for the next decade.

With sufficient ownership from government leaders, wider society and the business community, the strategic goals and smart, ambitious and time-bound targets under discussion offer a real chance of putting us on the right track, and in balance with the Earth’s life support systems on which we each depend.

This booklet brings together examples from around the world that help illustrate the range of measures being taken in support of conservation and sustainable use of biodiversity. They show that



**The world now has a unique opportunity to define that vision and set in motion the actions needed to make it a reality.**

the tools already exist to meet the proposed targets, achieve the goals and, eventually, realize the vision of human society co-existing in harmony with nature. Drawing mostly from the Fourth National Reports to the CBD, the booklet highlights actions that, if widely replicated and scaled up, would enable the global community to avert the most pessimistic scenarios outlined in GBO3.

A handwritten signature in black ink, appearing to read 'Ahmed Djoghlaoui'. The signature is stylized and fluid.

Ahmed Djoghlaoui  
Assistant Secretary-General  
and Executive Secretary  
Convention on Biological Diversity

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## *About this booklet*

The 2010 Biodiversity Target has served a vitally important purpose, even though it has not been achieved at the global level. It has been the inspiration for a wide range of activities carried out by Parties to the CBD, partners in the NGO and private sectors, and many other groups. As we move on from the 2010 milestone, it is essential that these efforts are given recognition and built upon. They help point the way towards the practical steps needed to achieve the new Strategic Plan of the CBD.

The examples included in the following pages are predominantly drawn from the wealth of information contained in the Fourth National Reports to the CBD. These reports collectively formed an important part of the source material for the conclusions of GBO3. By highlighting individual case studies included in the national reports, as well as additional information collated by the CBD Secretariat for its case studies database<sup>1</sup>, this booklet can be seen as a companion volume to GBO3, particularly

the final section, *Towards a strategy for reducing biodiversity loss*<sup>2</sup>. It also complements an earlier CBD publication, *Mainstreaming Biodiversity*<sup>3</sup>.

The actions and case studies are organized according to the proposed strategic goals of the new CBD Strategic Plan, and themes that may form the basis of the new targets. This structure helps guide future action by showing where practical steps have been taken towards the full range of targets under discussion.

The illustrations of action in this booklet reinforce the point that continuing biodiversity loss is not inevitable: we can already see progress in many areas, and we now need the will and resources to scale up these examples so that they become standard practice at the local to the global scales.

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1 <http://www.cbd.int/case-studies/>

2 <http://gbo3.cbd.int/>

3 <http://www.cbd.int/doc/publications/cbd-brochure-nbsap-ws-en.pdf>





Tea and forest mosaic in Tamil Nadu, India.  
*Simon Collard-Wexler*

# *Strategic goals and examples of progress*



Children fascinated by the diversity of insects  
Edward Baker/www.flickr.com

## *Proposed strategic goal A*

**Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.**

The failure to meet the 2010 Biodiversity Target was in part due to slow progress in mainstreaming: in other words, integrating biodiversity concerns into the full range of decision-making across governments, businesses and wider society. As a result, the underlying causes or indirect drivers of biodiversity loss have continued to hamper many of our efforts to reduce the rate of loss. If our vision is for human societies to live in harmony with nature, we must start to break some of the links that until now have seemed inevitable: between economic growth and habitat destruction; between trade expansion and alien species invasions; and between human population increase and ecosystem degradation, to name but a few.

Breaking these links, or “decoupling” indirect drivers from biodiversity loss, requires an awareness of the issues across society and in sectors that hitherto have paid little attention to them. Willingness to make the required changes in behaviour will only come through a much wider understanding of the importance of biodiversity to our everyday needs and quality of life, and of the consequences of its loss. Crucially,

it requires the true values of biodiversity and the ecosystem services it underpins to be reflected in the economic background to decision-making. Incentives need to promote efficiencies in the use of natural resources, not to encourage profligate use of them for short-term and often poorly distributed benefits.

Biodiversity “mainstreaming” is therefore critical to achieving the long-term vision of a better balance between human activities and the biological resources that sustain them. The examples highlighted in this section indicate some of the areas where mainstreaming can help to reduce the underlying pressures: changing public attitudes; linking conservation with poverty reduction; smarter spatial planning to protect areas of particular importance to biodiversity and ecosystem services; use of the tax system and other incentives to promote positive action; ensuring that impacts on biodiversity are routinely evaluated for policies across government departments; and developing strategies to make consumption and production more sustainable, including consideration of a country’s impact on distant ecosystems.





## Theme

Greater awareness among people of the values of biodiversity and the steps they can take to conserve and use it sustainably.



### GERMANY: COMMUNICATING BIODIVERSITY ACROSS SECTORS

Biodiversity is one of the four focal themes of the Federal Environment Ministry's education activities. Teaching materials on biodiversity are provided free of charge for primary and secondary schools. Up-to-date information and suggestions on educational activities are also made available through the ministry's website. A number of additional internet-based resources have been developed as part of "Nature Detective", a multimedia project for children and youth run by the Federal Agency for Nature Conservations (BfN).

The Federal Ministry for Economic Cooperation and Development (BMZ) is also supporting a number of communication activities in Germany and in partner countries, and special attention is being focused on the links between biodiversity, development, food security and poverty reduction. The activities include exhibitions, brochures for schoolchildren, a poster series on biodiversity and the Millennium Development Goals, and international media action days.



A child discovering a mantis  
Wha'ppen/www.flickr.com

One year before Germany hosted the ninth meeting of the Conference of the Parties to the CBD in May 2008, the Federal Environment Ministry launched an awareness-raising campaign on biological diversity. It involved a wide range of activities to draw public attention to the importance and benefits of biodiversity, ranging from advertising in cinemas, print publications and billboards, to educational film matinees for teachers, cultural programmes, competitions for children and teenagers. A "Nature Alliance" was formed, bringing together leaders from all sectors of society including politicians, non-governmental organizations, industry, media, academia and cultural organizations.

Source: Fourth National Report to the CBD, Germany



## Theme

Integration of the values of biodiversity into national accounts, local development and poverty reduction strategies and planning processes.

### BENIN: GREENING POVERTY REDUCTION POLICIES

Benin's *Stratégie de Croissance pour la Réduction de la Pauvreté* (SCRP) is the country's second Poverty Reduction Strategy. It places the environment among five thematic pillars aimed at enabling the country's transformation into an emerging economy. In addition to continuing the National Environmental Management Program (PNGE), begun in 2002, the strategy puts in place several important measures to protect Benin's biodiversity including the improvement of the legal framework for sustainable natural resource management and the approval of laws on land tenure. It will also develop and implement a national reforestation program, strengthen local environmental management capacities, and create community-level biological reserves.

An aspect of the SCRP that is particularly important for biodiversity is the decision to use Strategic Environmental Assessment (SEA) to integrate environmental considerations into all relevant plans, programs and projects derived from the SCRP. SEA is an anticipatory and proactive process of analysing and weighing the environmental opportunities and constraints of policies before they are approved and implemented. The use of SEA permits Benin's decision-makers to include environmental and sustainability concerns, on an equal footing with economic and social concerns, right from the beginning of the policy-making process.

The "greening" of Benin's SCRP involved setting up a group responsible for ensuring that environmental concerns were adequately integrated into eight other thematic reports defining the strategy. This identified and prioritized the environmental challenges at hand. In a later phase, the main pillars and priorities established by the plan were analysed for their environmental implications, and indicators were developed to monitor environmental outcomes.

Among the preliminary results of "greening" Benin's SCRP are:

- ❖ A diagnosis of the environmental situation of Benin
- ❖ The identification of environmental priorities of the strategy
- ❖ An increase in the environmental credibility of the SCRP
- ❖ Greater coherence between existing environmental policy and poverty reduction measures
- ❖ Integration of environmental measures into the five strategic pillars of the SCRP
- ❖ An increase of more than 250% in the provisional budget for environmental protection between 2007 and 2009

Sources: Fourth National Report to the CBD, Benin; L'Intégration de la Diversité Biologique Dans les Politiques, Plans et Programmes Sectoriels: L'expérience du Bénin. Presentation given by Mr. Bonaventure Guedegbe, Directeur des Evaluations et de L'Intégration Environnementales, Agence Béninoise pour l'Environnement at Regional and Sub-Regional Capacity-Development Workshop on Implementing NBSAPs and Mainstreaming Biodiversity – West Africa.; Republic of Benin. 2008. Benin: Poverty Reduction Strategy Paper- Growth Strategy for Poverty Reduction, IMF: Washington.



Environmental volunteers in Cotonou, Benin  
Benoit Kubiak/www.flickr.com



## INDIA: USING VALUATION OF ECOSYSTEM SERVICES IN DECISION-MAKING

Around 3250 ha of floodplain between the Yamuna River and the landmass of the city of Delhi offer benefits such as the provision of water, fodder and other materials, fisheries, and recreation. Faced with pressures to convert the floodplain into areas suitable for habitation and industry, the decision-makers carried out a cost-benefit analysis of the options of converting and conserving the ecosystem. Value estimates for a range of services totalled US\$ 843/ha/year (2007 prices). The embankment of the Yamuna would virtually dry the floodplain, causing the disappearance of these services. The ecosystem benefits exceeded the opportunity costs of conservation (estimated from the land price, assumed to reflect the discounted value of 'development' benefits) for a range of discount rates from 2 percent to 12 percent, justifying the maintenance of the floodplain. The Delhi Government halted the embankment plan of the Yamuna.



Terrasse on the Yamuna  
Paolo Crosetto / www.flickr.com

Source: Kumar et al. 2001 cited from TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature 2009



## SOUTH AFRICA: PLANNING FOR BIODIVERSITY AND BUILDING INCENTIVES

South Africa has recognized the importance of spatial biodiversity planning to help prioritize conservation efforts and to avoid development in areas critical to biodiversity. The National Spatial Biodiversity Assessment (NSBA), begun in 2004 and revised every five years, uses systematic biodiversity planning techniques to provide a spatial picture of the location of South Africa's threatened and under-protected ecosystems. The assessment focuses attention on priority areas for biodiversity conservation. It deals with terrestrial, river, estuarine and marine environments.

The underlying principles of the assessment are representation (the need to conserve a representative sample of biodiversity patterns, including ecosystems, habitats and species) and persistence (the need to conserve ecological and evolutionary processes that allow biodiversity to persist over time). The intention is to include threatened ecosystems and critical biodiversity areas in municipal Integrated Development Plans and Spatial Development Frameworks required by local government legislation. Including biodiversity considerations in land-use planning and decision-making will seek to ensure that no further loss of natural habitat takes place in those priority biodiversity areas. The NSBA has helped to develop specific programmes for regions of South Africa of particular significance, such as the Cape Floristic Region, the Succulent Karoo Ecosystem, Sub-tropical Thicket Ecosystem and the Grasslands Biome.



Agriculture in South Africa  
Martin Sharman/www.flickr.com

South Africa is also developing fiscal incentives that encourage biodiversity-friendly management, including amendments to the tax legislation, effective from 2009, under which specified conservation costs are tax-deductible. For example, expenses incurred as a result of controlling alien and invasive vegetation are to be allowed as a deduction for farming purposes. Similar tax deductions are being applied to conservation and maintenance expenses for landowners with contracts to keep part of their property as nature reserves. The aim is to provide an impetus to expand the protected area network by incorporating private land with priority biodiversity, without the outright purchase of this land by government for which limited funds are available.

Source: Fourth National Report to the CBD, South Africa.



## Theme

**Elimination, phasing out or reform of incentives harmful to biodiversity, and promotion of positive incentives to conserve and use it sustainably.**



### NEW ZEALAND: REMOVAL OF AGRICULTURAL SUBSIDIES

Prior to 1984, agriculture in New Zealand was highly protected through subsidies, and support for farm prices and incomes. This led to market distortions, over-production and degradation of marginal lands. In 1984, the government faced a serious fiscal crisis and removed all agricultural subsidies (price and income support, and subsidies for fertilizer, transport and land development). Sectoral adjustment took some time, but the government supported the farming sector through the transition with loan restructuring and social welfare payments. Only about one per cent of farmers stopped farming. Today, the agriculture sector is larger than it was when it was heavily supported, and it is more profitable, efficient and innovative.



The support of farmers' organizations and consumer groups, and the engagement of all stakeholders at an early stage, contributed greatly to success of the reform. It had a positive impact on biodiversity by reducing the use of fertilizers and pesticides, decreasing pollution levels in rivers and reducing the farming of marginal land.

Sources: Vangelis in Organisation for Economic Co-operation and Development (2005) *Environmentally Harmful Subsidies: Challenges for Reform*. OECD, Paris.; TEEB – *The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature 2009*



## THE EUROPEAN UNION: “GREENING” THE COMMON AGRICULTURAL POLICY

Many of the biodiversity-rich habitats in need of conservation within the European Union are situated in, or close to, land devoted to agriculture. The recent reform of subsidies under the Common Agriculture Policy (CAP) has enabled further integration of biodiversity concerns into agricultural policy.

With the major CAP reform of 2003, a large number of subsidies previously linked to production were converted to direct payments to farmers, made conditional on complying with a range of EU directives on, for example, protection of birds and habitats, and regulation of nitrates and pesticides (cross-compliance).

In addition, a growing proportion of EU support for rural areas has been in the form of agri-environment schemes, under the Rural Development Programme. These schemes encourage farmers to protect and enhance the landscape and biodiversity, in ways that go beyond the minimum required by law. During the period 2000-2006, around a quarter of all agricultural land in the EU received funding through agri-environment payments. In the period 2007–2013, more than 20 billion Euros have been allocated to these schemes. Examples of their operation in two EU countries, Hungary and Spain, are given below.



A farmer applies fertilizer to his field  
*Eutrophication & hypoxia/www.flickr.com*

Source: Fourth National Report to the CBD, European Union.



## HUNGARY: POSITIVE INCENTIVES FOR FARMERS IN ENVIRONMENTALLY SENSITIVE AREAS

The Hungarian National Agri-Environmental Programme (NAEP), launched in 2002, was jointly prepared by the Ministry of Agriculture and Rural Development and the Ministry for the Environment and Water. As part of this programme, nearly 20,000 square kilometers of Hungary’s territory were identified as Environmentally-Sensitive Areas (ESAs). Farmers who voluntarily undertake actions favourable to the management of ESAs are entitled to receive area-based financial subsidies, and payments for the actions they carried out. The size of the payment is linked to the complexity of the measures taken, and to the expected impacts on the environment and on economic returns on production. Between 2004 and 2009, ESA measures were implemented in 15 sample areas, and successful applications were submitted for a total area of some 1,200 square kilometers, three times the size of the area covered by the scheme when it began in 2002. A similar programme has been established for forests.



Agricultural landscape in Hungary  
*Tamas Ring/www.flickr.com*

Source: Fourth National Report to the CBD, Hungary.



## SPAIN: ENCOURAGING BIRD-FRIENDLY RICE FARMING THROUGH GREEN INCENTIVES

Located on the northeast coast of Spain, the Ebro delta is one of the most important wetlands in the Mediterranean, and a major overwintering site for hundreds of thousands of waterbirds. Two-thirds of the delta is made up of paddy fields which produce around 100,000 tonnes of rice every year. Rice production is able to co-exist with the biodiversity of the delta thanks to the introduction of EU agri-environment schemes. Farmers receive additional financial support in exchange for applying measures that go beyond statutory requirements, such as restricting the use of pesticides or leaving water on the fields in winter for the birds. Although this means more work for the farmers, 80 % have signed up to the schemes within the delta. The high quality of their organic rice fetches twice the normal market price and is in great demand amongst Europe’s best restaurants. The area also benefits from increasing numbers of ecotourists who come specifically to see the spectacular wildlife in the delta.



Rice paddy, Spain  
*Julio González/www.flickr.com*

Source: Fourth National Report to the CBD, European Union.



## Theme

**Achievement of sustainable production and consumption, and keeping the impacts of natural resource use within safe ecological limits**



### THE NETHERLANDS: TARGETING ITS GLOBAL FOOTPRINT

The biodiversity strategy of the Netherlands recognises that the great majority of ecological impacts from the country's economic activity occur outside the country. The ecological footprint resulting from consumption in the Netherlands corresponds to an area about three times the size of the country, and the size of this footprint is expected to continue to grow. To address the situation, the Initiative for Sustainable Trade was launched in 2008, involving a government contribution of more than 30 million Euros. The initiative brings together business, non-governmental organisations and government to create sustainable production and trade chains on soya, timber, tea, cocoa, natural stone, tourism, cotton and aquaculture. As part of this outward-focused approach, the Netherlands aims to create a demand and supply mechanism for environmental goods and services, through support for innovative initiatives to integrate biodiversity concerns into its economic system. For example, support has been provided to schemes in various developing countries to introduce payments for ecosystem services. In support of the REDD Initiative (Reduced Emissions from Deforestation and Degradation), the Netherlands has contributed € 15 million for the period 2008–2012 to the Readiness Fund of the Forest Carbon Partnership Facility (FCPF) of the World Bank.



Source: Fourth National Report to the CBD, Netherlands

### RIO TINTO: OFFSETTING THE BIODIVERSITY IMPACTS OF MINING

The international mining company Rio Tinto adopted a policy of Net Positive Impact (NPI) for biodiversity in 2004. The first steps in the process are to take all available measures to avoid and minimize negative biodiversity impacts, and then to rehabilitate areas affected by the company's activities. Once the impacts are reduced as far as possible using these steps, offsetting and additional conservation actions are undertaken on a scale deemed to achieve a positive impact on biodiversity at least equal to the losses resulting from the company's activities.



As part of the implementation of this policy, Rio Tinto works in partnership with the non-governmental organization Fauna & Flora International (FFI), which provides technical assistance. In Madagascar, FFI and a partner NGO, Madagasikara Voakajy, are working to protect, monitor and raise awareness of three endemic fruit bat species threatened by habitat loss. The bats are vital to maintain forest processes and promote post-mining recovery of natural vegetation.

Also within Rio Tinto's Madagascar programme, FFI is producing recommendations to protect the important endemic reptile and amphibian fauna of the region. In partnership with Missouri Botanic Gardens, FFI is also working to protect one of the largest remaining fragments of coastal forest and assist in the development of tree nurseries to restore degraded areas.

Sources: TEEB — The Economics of Ecosystems and Biodiversity Report for Business — Executive Summary 2010



Coffee grown under forest canopy in Ethiopia  
*Trees For The Future/www.flickr.com*

## *Proposed strategic goal B*

### **Reduce the direct pressures on biodiversity and promote sustainable use.**

A key message from the analysis of indicators carried out for GBO3 was the persistence of the main pressures directly driving biodiversity loss. At a global scale, there is no sign that they are easing, and in some cases they are intensifying. Climate change and ocean acidification are projected to play an increasingly significant role in driving ecosystem change, as species ranges and seasonal responses are affected, and marine organisms become less able to form calcium carbonate skeletons.

An important accompanying message was that, even where time-lags between response and impact make the persistence of some direct drivers inevitable for the near future, addressing other pressures on the same ecosystem can increase resilience and limit the loss of services to people and communities. Targeting multiple drivers of change may also reduce the likelihood of tipping points being reached, and thus avert the dramatic loss of biodiversity and ecosystem services envisaged in some of the scenarios examined in GBO3.

Easing the direct pressures on biodiversity and promoting its sustainable use are, therefore, key milestones towards the vision proposed for the new Strategic Plan of the CBD. The national reports to the Convention outline a wide range of initiatives to tackle the direct drivers of change, including: reducing the loss, degradation and fragmentation of natural habitats; reducing over-exploitation and in particular overfishing; actively promoting sustainable agriculture, forestry and aquaculture; reducing the impacts of pollution, in particular the buildup of nutrients in aquatic and terrestrial ecosystems; and limiting the damage caused by invasive alien species, both by preventing them from taking hold and by eradicating them once they do.

The 2010 biodiversity indicators suggest that responses to these direct pressures are improving, but not yet to the extent that the pressures themselves are easing. To meet the goal of reducing the pressures, the next phase of biodiversity action must see a major scaling up of the kind of initiatives outlined in this section, accompanied by the mainstreaming measures outlined above.



## Theme

Reducing the rate of loss, degradation and fragmentation of natural habitats.

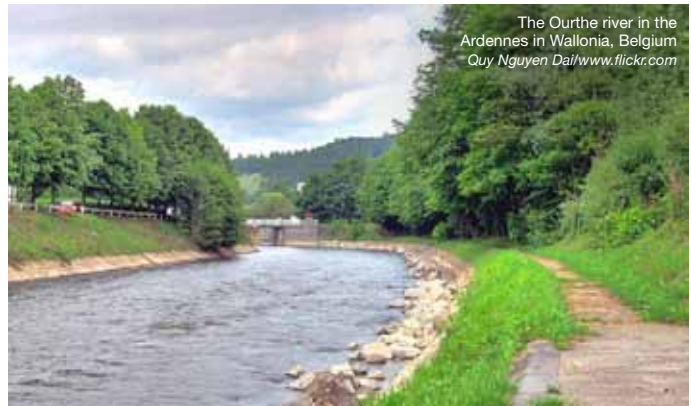


### BELGIUM: RECONNECTING FRAGMENTED RIVERS

The fragmentation of watercourses by weirs and sluices, together with the degradation of water and habitat quality, is an important problem for the conservation of aquatic species, in particular fish. In 1996, the Benelux countries (Belgium, Netherlands, Luxembourg) announced their intention of achieving free fish migration in all water catchments by 2010.

The Flemish Environmental Policy Plan (2003–2010) aimed to achieve free fish migration within a priority network of 3000 km that comprises the most important breeding sites and migration routes. An evaluation shows that restoration is in progress, but too slowly to achieve the 2010 target. A postponement to 2015 (90%) and 2021 (100%) is under preparation, synchronising the target with the European Water Framework Directive. By the end of 2007, 116 of the 796 barriers (15 %) along this network had been dealt with. If the present trend continues, the fish migration barriers on the priority network will only be removed by 2047. Obstacles to swifter achievement include lack of budget and work force. Meanwhile, migratory fish species are recovering slightly, probably as a result of improving water quality.

Source: Fourth National Report to the CBD, Belgium.







## BRAZIL: BRINGING DEFORESTATION UNDER CONTROL

The most recent satellite data show that annual deforestation of the Brazilian portion of the Amazon has slowed very significantly, from a peak of more than 27,000 square kilometres in 2003–2004 to just over 7,000 square kilometres in 2008–2009, the lowest rate recorded in more than 20 years of monitoring. Preliminary indications based on monthly observations suggest that this declining trend has continued for 2009–2010. It means that Brazil will have reduced Amazon deforestation by substantially more than the national target set in 2006: “decrease Amazon deforestation by 75% by 2010.”

Under the Brazilian National Climate Change Plan, established in 2008, the country set a further target of reducing Amazon deforestation by 30% every four years, compared to the previous period, until 2017; this was subsequently extended to 2020, when the rate is projected to fall to 80% below the 1996–2005 average. The ultimate goal is to reach zero illegal deforestation in the medium and long term.

The most recent reduction in deforestation may have been partly influenced by the worldwide economic recession. However, it has also followed a period of increased government action on monitoring, enforcement and control. The main focus of these efforts was the Amazon Deforestation Prevention and Control Plan, put in place in 2004, which has included the following elements:

- ❖ The strategic creation of protected areas in the “arc of deforestation” in the southern Amazon region, where previously only indigenous lands presented an obstacle to encroachment into unregulated public forest areas. To date, these new state and federal areas cover some 500,000 square kilometres, in addition to the ratification of 100,000 square kilometres of indigenous lands.
- ❖ The strategy has been supplemented with the suspension of 70,000 illegal land titles, reducing the scale of land-grabbing and commercialization of public lands.
- ❖ Enhanced monitoring with measures such as real-time satellite analysis, in which coarse-resolution imaging can alert authorities quickly to where “hotspots” are occurring, so that responses on the ground can be targeted at problem areas before detailed annual results are available.
- ❖ Strategic joint enforcement operations carried out by the federal environment agency IBAMA, in collaboration with the federal police, federal highway patrol and the army. This included intensified highway control operations to inhibit transportation of illegal timber, and an unprecedented anti-corruption operation which resulted in the detention of more than 600 public servants guilty of crimes against the environment.
- ❖ Investment in sustainable production and extractive activities, including the development of management plans for Extractive Reserves, the creation of funds and credit lines for sustainable forest livelihoods, and agreements with economic sectors, including soya producers, supermarkets and meat wholesalers to deter sourcing from recently-deforested areas.

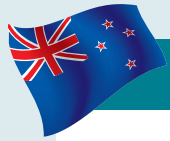


Source: Fourth National Report to the CBD, Brazil; INPE ([www.inpe.br](http://www.inpe.br))



## Theme

Reducing or eliminating overfishing and destructive fishing practices.



### NEW ZEALAND: PROTECTING MARINE RESOURCES FOR THE FUTURE

In 1986, New Zealand introduced the Quota Management System (QMS), a form of Individual Transferable Quotas in which fishing enterprises are allocated a fixed share of the total allowable catch of a particular fish stock. The system was considered the best means of preventing overfishing, which had become critical in some inshore waters, because it gives fishermen a stake in the health of the overall marine ecosystem. Variants of the management system have since been introduced in many other countries.

In 1996 New Zealand introduced its Fisheries Act, which provides for the utilization of fisheries resources, while ensuring sustainability. In the context of the Act, ensuring sustainability means 'maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations' and 'avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment'; while utilization means 'conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing'.

There are also a number of mechanisms in place that offer protection to the marine environment against particular types of impacts. For example:

- ❖ 30 percent of New Zealand's extensive marine environment is closed to mobile bottom fishing through Benthic Protected Areas, to protect seabed biodiversity;
- ❖ Seven per cent of the marine environment is protected by strict 'no take' marine reserves.
- ❖ Customary restrictions and closures also play an integral part in fisheries management. This includes the use of mataitai reserves and taiapure, coastal areas of importance to Maori people for food gathering.
- ❖ Fisheries closures are in place for sensitive habitats such as seamounts.

Source: Fourth National Report to the CBD, New Zealand.



Fishing boats in Viaduct Harbour, New Zealand  
Lynda W1/www.flickr.com



## BRAZIL: GIVING COASTAL COMMUNITIES A STAKE IN MARINE RESOURCES

Brazil's Marine Extractive Reserves (MERs) are a development of the concept of forest extractive reserves. The principle of extractive reserves is that local, traditional communities are given rights to make sustainable use of specific resources from an ecosystem, while the area remains protected from large-scale development or exploitation by outside interests. Marine Extractive Reserves emerged in part from conflicts between artisanal fishing communities and the authorities managing Marine Protected Areas (MPAs) along Brazil's Atlantic Ocean coast. In many cases, restrictions or bans imposed on fishing in these areas were seen as being in direct conflict with the ability of coastal communities to earn their livelihoods. Under current Brazilian law, Marine Extractive Reserves may be set up if they are requested by traditional coastal communities, fulfil certain biological, social and cultural criteria, reinforce traditional rights of access to fishery resources and improve the living conditions of local people, combine sustainable use of fish and shellfish with some "no-take" areas and are co-managed by government scientists and the communities concerned.

Some 20 MERs have so far been established in nine Brazilian states, and more than 60 additional reserves are under consideration. Among the most recent to be decreed is Cassarubá in the south of the state of Bahia, alongside the Abrolhos Marine Protected Area, which includes one of the most important coral systems of the South Atlantic and a major breeding ground for Humpback Whales (*Megaptera novaeangliae*).

Source: Antonio Carlos Diegues, 2008. Marine Protected Areas and Artisanal Fisheries in Brazil. Samudra Monograph: International Collective in Support of Fishworkers (ICSF). [http://icsf.net/icsf2006/uploads/publications/monograph/pdf/english/issue\\_99/ALL.pdf](http://icsf.net/icsf2006/uploads/publications/monograph/pdf/english/issue_99/ALL.pdf)



Fishermen on Santa Catarina Island, Brazil  
Adam Jones/www.flickr.com



## Theme

Sustainably managing agriculture, aquaculture and forestry.



### FINLAND: SETTING TARGETS FOR SUSTAINABLE FOREST MANAGEMENT

Finland's National Forest Programme 2015 aims to increase the welfare of Finnish citizens through the diverse use of forests in compliance with the principles of sustainable development. The underlying idea of the programme, introduced in 2008, is to combine economic competitiveness with ecological sustainability and social acceptability of forestry activities. The central vision is for Finland to become a world pioneer in sustainable forest management by 2015, providing new competitive products and services, with an increase in the use of domestic wood and an improvement in forest biodiversity. The programme is constructed on six priorities:

1. Securing a competitive operating environment for the forest industry and forest management;
2. Enhancing the climate- and energy-related benefits of forests;
3. Protecting the biological diversity and environmental benefits of forests;
4. Promoting the use of forests as a source of culture and recreation;
5. Strengthening skills, expertise and acceptability of the forest sector;
6. Promoting sustainable forest management in international forest policy

Each priority has its own specific objectives, and measures to achieve them have been proposed. The programme is financed by seven government ministries and the private sector. Implementation is co-ordinated by the Ministry of Agriculture and Forestry, which prepares an action plan subject to annual review and modification by Finland's National Forest Council.

Source: Fourth National Report to the CBD, Finland



A forest on the island of Kakskerta, Finland  
Magnus Franklin/www.flickr.com



## Theme

Reducing or eliminating the impact of pollution, including from excess nutrients, on ecosystem function and biodiversity.



### DENMARK: TACKLING ATMOSPHERIC NITROGEN DEPOSITION

Danish habitats such as heath, bog and meadows are vulnerable to deposition of nutrients, especially nitrogen (N), because plants adapted to poor soil conditions are driven out by other species when those conditions cease to prevail. Large quantities of nitrogen compounds ( $\text{NO}_x$  and  $\text{NH}_3$ ) are emitted to the atmosphere from livestock, industry and traffic. Most compounds are deposited close to their source, but the wind can also transport emissions some distance.

In 2007, foreign sources accounted for 69 per cent of nitrogen deposition on Danish land areas and 86 per cent on Danish sea areas. From 1990 to 2007, average nitrogen atmospheric emissions on Danish land and sea areas fell by 32 per cent. However, nitrogen pollution of the most vulnerable habitats consistently exceeds critical levels. The most sensitive raised bogs and Lobelia lakes (which are very poor in nutrients) have a tolerance limit of 5 kg nitrogen/ha/

year and this value was exceeded during the entire period from 1990 to 2007. The tolerance limit of 10 kg nitrogen/ha/year for the most sensitive heaths and chalky commons has also been continually exceeded since 1990.

Denmark undertook to reduce atmospheric nitrogen emissions by 55 per cent by 2010 in comparison to 1990. The government's Green Growth agreement of 2009 sets more stringent requirements with regard to the discharge of ammonia in order to protect especially sensitive habitats from nitrogen.

Source: Fourth National Report to CBD, Denmark.





## Theme

Identifying, controlling or eradicating invasive alien species and introducing measures to control pathways for their introduction and establishment.



### MAURITIUS: ISLAND BIODIVERSITY FIGHTING BACK AGAINST INVASIVE ALIEN SPECIES

Ile aux Aigrettes is a 25-hectare island just off the southeast coast of mainland Mauritius that contains the last remnant of Mauritian coastal ebony forest. The forest is rich in the endemic and critically endangered species of ebony (*Diospyros egrettarum*), the endangered Bois de Chandelle (*Dracaena concinna*), Bois de boeuf (*Gastonia mauritiana*) and a rare species of orchid (*Oeniella aphrodite*).

Exotic plant and animal species had driven the ecosystem to the brink of extinction by the 1980s. The Mauritian Wildlife Foundation (MWF), which leases and manages the island, began a restoration programme in 1984 with the removal of non-native plant species, revegetation with nursery-reared seedlings, and the eradication of rats, cats and mongooses. Several endemic and critically endangered species were subsequently reintroduced to the island, and monitoring has reflected steadily increasing populations. Monitoring and control of non-native plants are ongoing, and studies are currently underway to determine the most effective methods of eradicating the Indian house shrew, Indian wolf snake and giant African land snail, three alien species that have thus far eluded management attempts.

Since the start of the project, nearly 90% of the island (all but 5 ha) has been weeded at least once and replanted with native plants. Some 30 endangered native plant species have been reintroduced to the island, including the critically endangered Round Island Bottle Palm and the Round Island Hurricane Palm, of which only one adult tree remains in the wild.

The reintroduction of native fauna has been largely successful and has contributed significantly to stabilizing waning populations of important and critically endangered species, including Pink Pigeons whose numbers on the island have doubled to approximately 70, representing about one-fifth of the world's remaining population.

The lessons learned from this project have helped guide the development of restoration work on nearby Rodrigues Island and Round Island. In a couple of notable cases (e.g. Mauritius Fody), species reintroduced to Ile aux Aigrettes have even been used as a source population for the reintroduction of species in these other locations.



Sources: Fourth National Report to the CBD, Mauritius; Society for Ecological Restoration <http://www.globalrestorationnetwork.org/database/case-study/?id=265>



## Theme

**Minimizing the multiple pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification, so as to maintain their integrity and functioning.**



### EGYPT: REGULATING TOURISM TO PROTECT CORAL REEFS

Diving and tourism have been applying significant pressure to the coral reefs along the Egyptian Red Sea coast. An assessment of more than 60 diving sites found that the number of dives at each site ranged from 10,000 to 60,000 annually, while over the last 10 years there have been more than 600 violations of the rules governing the use of the area by hotels, tourism establishments, ships and individuals. These direct pressures have resulted in the destruction of coral reefs at many sites, with estimated costs running into hundreds of millions of dollars.

Procedures to protect the reefs have included creating and maintaining more than 1,500 fixed moorings, which prevent damage caused to reefs when boats drop their anchors. Additional measures include increased patrolling and tourist monitoring, enhanced law enforcement, and reviewing environmental impact assessments. More than 250 rangers, equipped with patrol and research vessels as well as cars, help to monitor the area.

The most recent data show that in some Red Sea reef areas, living coral cover increased by some 15% from 2001–2009, and suggest that the use of moorings and patrols has substantially reduced the physical damage caused by boats and divers.

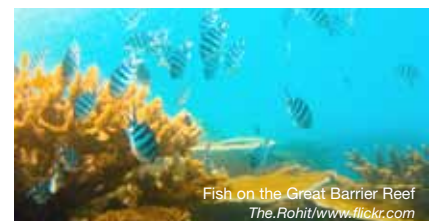
Source: Fourth National Report to the CBD, Egypt



### AUSTRALIA: LOOKING INLAND TO SAVE THE GREAT BARRIER REEF

The Great Barrier Reef, a World Heritage Area, is threatened by climate change and ocean acidification, and by increasing agricultural activities and coastal development in the catchments that join the reef. The Australian government's Reef Rescue programme aims to improve the quality of water entering the Great Barrier Reef lagoon, by changing land management practices to reduce nutrient, pesticide and sediment runoff from agricultural land. The investment of AUS\$200 million over five years is intended to build resilience into the world's most extensive coral system. The majority of the money will go towards Water Quality Grants to encourage sustainable farming practices in the state of Queensland, with additional funds going to indigenous groups, research, monitoring and reporting activities. Aquaculture and tourism will also be targeted under the programme.

Source: Fourth National Report to the CBD, Australia.





Mangrove restoration in Eastern Thailand  
wan\_hong/www.flickr.com

## *Proposed strategic goal C*

**To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.**

Among the most positive trends to be observed in the analysis of the 2010 biodiversity indicators is the increasing proportion of land and coastal waters that has been included in protected areas. In some cases, such as in Canada and the Brazilian Amazon, the expansion of the protected area network in the first decade of the new millennium has been truly dramatic. In the oceans, although the coverage of marine protected areas still lags far behind the terrestrial network, developments such as the expansion of locally-managed marine areas in the South Pacific represent a significant stepping up in the protection of marine ecosystems. Nevertheless, protected areas still fall short of their intended purpose of conserving a representative portion of the planet's biodiversity: major challenges remain in effective management of reserves and other protected areas, and in completing the network to cover all ecological regions and areas critical for the survival of threatened species and habitats.

Programmes targeted at particular species, often of charismatic or special cultural value, have also often been effective; although the durability of such efforts always depends on dealing with the underlying social and economic conditions that created the original threat. GBO3 also cautioned that the loss of genetic diversity in agricultural landscapes and livestock breeding could increase the vulnerability of many rural communities, especially in the face of climate change.

To achieve the vision of a balanced co-existence between human societies and nature, action must be stepped up and targeted at all three components of biodiversity: ecosystems, species and genetic diversity. The examples in this section illustrate recent action in support of all three of these components.





## Theme

Increasing coverage and effectiveness of protected areas.



### CANADA: PROTECTING THE WILD EXPANSES OF LAND AND FRESH WATER

Since 2006, Parks Canada, the federal agency responsible for the protection and presentation of nationally significant examples of Canada's natural and cultural heritage, added some 45,000 square kilometres of land and water to its network of national parks and national marine conservation areas. In addition, interim protection was provided for more than 40,000 square kilometers in Canada's North, as a key step towards the eventual creation of two more national parks.



A great blue heron (*Ardea herodias*) resting in a lagoon  
Kevin J. Woolley/www.flickr.com

As part of Canada's growing protected area network, the governments of Canada and the Provincial Government of Ontario announced an agreement to establish the Lake Superior National Marine Conservation Area (NMCA). More than 10,000 square kilometres of Lake Superior, including the lakebed and 60 square kilometres of islands and shore lands, make this the largest freshwater protected area in the world. More than 70 species of fish inhabit the waters of Lake Superior, the largest of the Great Lakes. Gulls, herons, eagles, and pelicans feed in these waters, while some also use island habitats for breeding. The area includes many other important features related to geology, geomorphology, flora and fauna as well as human history. Aboriginal presence in this area dates back at least 5000 years and continues to the present day.

Sources: Fourth National Report to the CBD, Canada; Parks Canada release [http://www.pc.gc.ca/apps/cp-nr/release\\_e.asp?id=1534&andor1=nr](http://www.pc.gc.ca/apps/cp-nr/release_e.asp?id=1534&andor1=nr)



### TOGO: A PRAGMATIC APPROACH TO PROTECTED AREAS MANAGEMENT



A village meeting in Togo  
vredeseilanden/www.flickr.com

From 1960 to 1980, protected areas, classified forests, national parks and animal reserves in Togo were managed with little consideration of local socioeconomic conditions, and with limited participation from local communities. As a result of these factors, respect for protected areas by surrounding communities diminished which led to the degradation of many protected areas.

A programme was begun in 1999 to rehabilitate Togo's protected areas, recognizing the complexity of establishing and managing them, and the need for local participation. A key element was the greater involvement of local communities in protected areas management. Through negotiation with communities, it was agreed that the size of some protected areas would be reduced, and that the released land would be available for use by the local people. In return, the communities agreed to respect the protected areas which remained.

As part of the consultation process, 60 village associations (Associations Villageoises de Gestion Participative des Aires Protégées) located around priority protected areas were formed, which are now grouped under eight participatory management unions (Unions d'Associations Villageoises de Gestion Participative des Aires Protégées). The purpose of the associations is to facilitate communication between local communities and the government and to encourage the implementation of joint activities.

Source: Fourth National Report to the CBD, Togo



## Theme

Increasing coverage and effectiveness of protected areas.

### SOUTH PACIFIC ISLANDS: USING LOCAL CUSTOMS TO PROTECT MARINE RESOURCES

In the past decade, the islands of the South Pacific have seen a remarkable proliferation of Locally Managed Marine Areas (LMMAs), areas of nearshore waters actively managed and controlled by coastal communities, using local knowledge and customary access and tenure practices. More than 500 communities, spanning 15 independent countries and territories, have established this form of marine protected area. The approaches being developed at national levels are built on the strengths of local knowledge and governance, combined with a strong local awareness of the need for action to prevent further loss of marine biodiversity.

The main driver for LMMAs in most cases is the desire of communities to maintain or improve livelihoods, often related to perceived threats to food security or local economic revenue. In the South Pacific, conservation and sustainable use are often seen as inseparable, as part of the surviving concepts of traditional environmental stewardship. The adoption of these community based management approaches comes at a time when the region faces enormous challenges in regard to food security, biodiversity and adaptation to climate change. In countries such as Fiji, a very significant portion of coastal waters is covered by LMMAs, including *tabu* areas where fishing is prohibited.

Source: Fourth National Report to the CBD, Fiji.





## Theme

Preventing the decline of threatened species, and improving their conservation status.



### PAKISTAN: CONSERVING THREATENED SPECIES THROUGH SUSTAINABLE HUNTING

Torghar, or Black Mountain, is in the northernmost part of the Toba Kakar Range of Pakistan's Baluchistan Province. The area is known for its abundant wildlife, and includes some of the few remaining habitats for two very rare species — the Suleiman Markhor (*Capra falconeri jerdoni*), a type of goat, and the Afghan Urial (*Ovis orientalis cyloceros*), an endemic species of sheep.

For centuries, communities living in Torghar depended on the mountain's wildlife for survival. From the mid-20th century hunting and poaching, exacerbated in the late 1970s and 1980s as the Afghan war made weapons and ammunition increasingly available, caused wildlife populations to dwindle.

Concerned with the decline of the Suleiman Markhor and Afghan Urial, tribal elders decided to ban hunting, and sought the help of biologists from abroad. Local tribesmen were recruited as game guards, and the ban was negotiated with and agreed by nomadic people who had hunted in the area for centuries during migrations to and from pasture lands in Afghanistan.

In order to generate sustained funding for the programme, a limited number of "tribal permits" were issued to foreign hunters, at an elevated price. Trophy fees have steadily increased, and in 2008 stood at US\$40,000 for a Suleiman Markhor, and US\$10,000 for an Afghan Urial. One-fifth of the fees are paid to the provincial government, and the remainder goes to fund the conservation programme.

The trophy hunts are limited to older males, which have the largest horns, and the reproduction cycle of the species is thus not affected. The number of animals permitted to be killed is set well below what is considered the "sustainable harvest".

The most recent evidence suggests that the conservation programme is working. A survey in December 2005 found there were 2540 Markhor, compared with just 700 surveyed by the US Fish and Wildlife Service in 1994. The 2005 survey estimated the number of Urial to be 3145, up from some 1200 estimated ten years earlier.

Source: Fourth National Report to the CBD, Pakistan; South, Southeast and East Asia Capacity-Building Workshops on Implementing NBSAPs and Mainstreaming Biodiversity; Bellon, L., STEP (Society for Torghar Environmental Protection). 2008. Sustainable Conservation and Grassroots Realities Lessons from the Conservation Programme in Torghar, Balochistan. In Best Practices in Sustainable Hunting: A guide to best practices from around the world. International Council for Game and Wildlife Conservation (CIC) Technical Series Publication No. 1. FAO; Sustainable Use of Biodiversity, The Torghar Model: Presentation given at COP Bonn, May 2008 [www.cic-wildlife.org/uploads/media/03\\_CICESUSG\\_Tareen.pdf](http://www.cic-wildlife.org/uploads/media/03_CICESUSG_Tareen.pdf)





## Theme

Preventing the decline of threatened species, and improving their conservation status.



### DOMINICA: BRINGING ENDANGERED PARROTS BACK FROM THE BRINK OF EXTINCTION

The Imperial Parrot (*Amazona imperialis*) is endemic to Dominica. It mainly inhabits montane and elfin forests (the latter are high-altitude forests characterized by diminutive species), and the parrot is highly sensitive to modifications of its habitat. As a result of habitat loss, in particular the conversion of forests to plantations and damage from hurricanes, as well hunting pressure for both food and the caged bird trade, the species declined dramatically.

In 1993, it was estimated that only between 80 and 100 individuals were left. As a result, the Imperial Parrot was listed as endangered on the IUCN Red List in 2000, and it has been listed under Appendices I and II of CITES, making it unlawful for any birds to be exported. Conservation action has included protecting the species under Dominican law, holding stakeholder workshops, protecting habitats and a programme of raising local awareness through education programmes.

Slowly, the status of this species has improved due to a considerable reduction of local trade in the species. By 2003 it was estimated that the number of birds had increased to 150, and it is currently estimated that there are some 250 mature individuals. Although the species is still listed as endangered, and faces threats by foreign bird collectors, the parrot's population is increasing, and if current trends persist it may be downlisted to vulnerable.

Source: Fourth National Report to the CBD, Dominica; BirdLife International 2008. *Amazona imperialis*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.2.



Imperial parrot  
Paul R. Reillo



Imperial parrot  
Paul R. Reillo



Welcome sign to Morne Diablotin National Park, Dominica  
Paul R. Reillo



A park ranger in Morne Diablotin National Park  
Paul R. Reillo



## Theme

Safeguarding genetic diversity in agricultural and natural systems.



### NORWAY: STORING AGRICULTURAL BIODIVERSITY FOR FUTURE GENERATIONS

The Svalbard Global Seed Vault was opened in 2008, and functions as a security store for the preservation of duplicates of seed collections, on behalf of the world's gene banks. Seed from the most important agricultural plants are maintained frozen in the vault.

It has the capacity to store all the unique varieties of seed that are stored in around 1400 gene banks located in more than 100 countries around the world. In addition, the seed vault will have the capacity to store new types of seed that will be collected in the future. Svalbard Global Seed Vault will, when in full use, represent the largest global collection of seed.

Source: Fourth National Report to the CBD, Norway.



### UNITED KINGDOM: CONSERVING THE DIVERSITY OF THE WORLD'S WILD PLANTS

The Millennium Seed Bank Project, hosted by the Royal Botanic Gardens (RBG) in Kew, London, is the largest *ex situ* conservation project ever conceived. The initial target of the project was to conserve 10% of the world's wild plants by 2010. These include the rarest, most threatened and most useful species known to people. The existing collection of nearly two billion seeds, from about 30,000 species, held by RBG Kew and its partners worldwide, are mostly from the drylands. The project aims to conserve 25% of wild plant species by 2020. The Millennium Seed Bank generally collects samples that are large enough to contain substantial genetic diversity.

Source: Fourth National Report to the CBD, United Kingdom of Great Britain and Northern Ireland; Royal Botanic Gardens Kew, <http://www.kew.org/index.htm>





## Theme

Safeguarding genetic diversity in agricultural and natural systems.



### KENYA: SAFEGUARDING THE GENETIC DIVERSITY OF FORESTS

The Kenya Forestry Seed Centre (KFSC) was established in 1985 to provide certificated, high-quality tree seeds. Seed collection is carried out by a network of eight collection centres distributed in all ecological zones of Kenya. The seeds are obtained from selected and established tree stands of both exotic and indigenous species. The Centre collects over 4,000 kg of clean seeds annually from more than 120 different species. KFSC holds the national forestry genetic collection in the form of bulk seed to meet seed demand for tree planting programmes. Seeds are dispatched to various clients including Kenya's Forest Department, individual farmers, local and international organizations involved in tree planting and environmental conservation.

Source: Fourth National Report to the CBD, Kenya



### NEPAL: ENHANCING COMMUNITIES' SECURITY THROUGH CROP DIVERSITY



A seed bank aimed at enhancing local seed security at Kachorwa, Bara District of Nepal, has been established with the participation of local communities. Its activities include the collection and identification of all available seeds of landraces or locally-adapted varieties. The collected seeds are stored by using locally available seed storage materials, and are distributed based on local custom.



To date 60 landraces of rice, five of sponge gourd, three of pigeon pea and two of finger millet seeds have been collected and stored in the seed house and this number is increasing. A series of 'elite' rice varieties have been developed, combining high yielding attributes along with traits preferred by farmers. The community seed bank is increasing farmers' access to quality seed as a means of conserving local crop diversity and maintaining them on-farm. The approach piloted in Kachorwa is now being extended to other districts of Nepal.

Source: Fourth National Report to the CBD, Nepal.



Terrace agriculture  
agricultural in,  
Yunnan, China  
Ngorcwg/www.flickr.com

## *Proposed strategic goal D*

### **Enhance the benefits to all from biodiversity and ecosystem services.**

A priority for the next phase of action on biodiversity must be a greater focus on the services provided to human societies by ecosystems. A worrying decline and in some cases collapse of essential ecosystem services has been projected by a number of models and scenarios since the publication of the Millennium Ecosystem Assessment, but policies have not yet been sufficiently targeted at this aspect of biodiversity. Neglecting measures to conserve and restore ecosystem services will jeopardize action to reduce poverty, including the fulfillment of the Millennium Development Goals.

A focus on ecosystem services is especially important in the face of climate change. Investing in ecosystems that bring proven benefits such as flood protection, water regulation and drought resilience can be a cost-effective form of climate adaptation; and it will often also be an important form of climate change mitigation through protection of carbon stocks and enhancing the removal of carbon dioxide from the atmosphere.

While it is always preferable to avoid degradation in the first place, analysis for The Economics of Ecosystems and Biodiversity study (TEEB) has

shown that ecosystem restoration can bring very significant returns, in terms of the value of restored ecosystem services to society compared with the investment undertaken.

Technological developments over the past decades have enabled the advancement of science and the capacity to identify the active compounds of genetic resources. Indeed, genetic resources, whether from plants, animals or microorganisms, can be used to develop a wide range of products and services for human benefit, including medicine and cosmetics, as well as agricultural and horticultural products.

If incentives for conserving and sustainably using biodiversity are to be maximized, it is essential that the right balance is found between allowing access to genetic resources and returning some of the ensuing benefits to the countries and communities in whose territory the resources are located.

The actions highlighted in this section illustrate the steps that have been taken in some countries towards the goal of enhancing the benefits of biodiversity and ecosystem services for all.



## Theme

Safeguarding and restoring ecosystems that provide essential services.



### VIETNAM: PROTECTING ECOSYSTEM SERVICES WITH GREEN CORRIDORS

Vietnam has established a green corridor in the forest belt linking Phong Dien Nature Reserve and Bach Ma National Park. The corridor covers an area of approximately 1,300 square kilometers, and includes both medium-sized and low mountains. The forest corridor was established to protect part of the Huong river's watershed which provides environmental services for the fishery sector, and reduces flooding. As part of the corridor project, economic incentives are provided to local stakeholders to encourage them to participate actively in natural forest management and biodiversity conservation. Other green corridors have been created to link protected areas in Thua Thien-Hue, Quang Nam, and Gia Lai.

Source: Fourth National Report to the CBD, Vietnam.







## Theme

Enhancing ecosystem resilience, contributing to climate change adaptation.



### SAMOA: INTEGRATING CLIMATE CHANGE ADAPTATION AND PROTECTION OF ISLAND ECOSYSTEMS

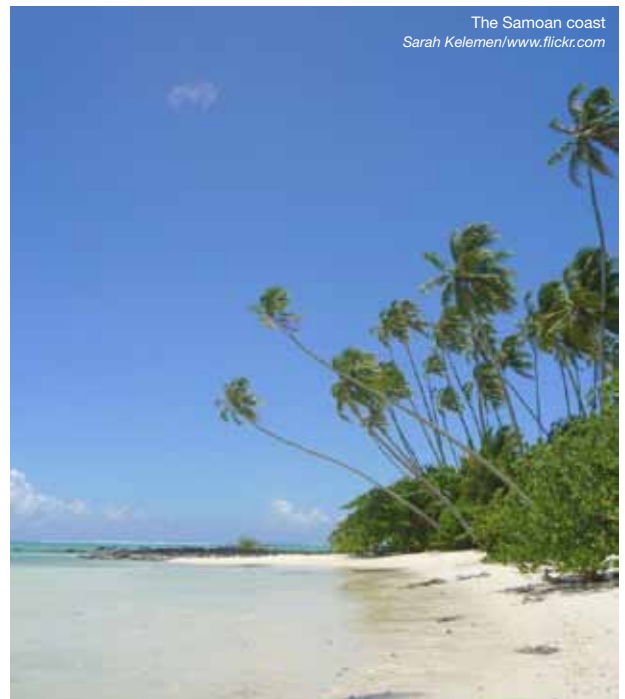
The small South Pacific island state of Samoa is particularly vulnerable to impacts associated with climate change such as sea level rise, more intense tropical cyclones, changes in precipitation patterns, and sudden outbreaks of pests and disease. Sea level rise is of particular concern in Samoa because 70% of its population and infrastructure are located on low-lying coastal areas.

Samoa has put biodiversity protection at the heart of its National Adaptation Programme of Action (NAPA). It focuses on safeguarding the livelihoods of communities threatened by the impacts of climate change and fluctuations. Among the priorities are the establishment of marine and terrestrial conservation areas, including systems for monitoring and enforcing their protection.

Biodiversity is also considered in the identification and selection of adaptation activities in various sectors, including forestry, water, tourism, transport, infrastructure, and in village communities. Activities include community forest fire prevention schemes, watershed management programmes for communities, and promotion of sustainable aquaculture and tourism.

Samoa's 41 district Coastal Infrastructure Management (CIM) plans, drawn up in consultation with villages, government agencies, NGOs and business, include a recognition of the importance of coral reefs and mangroves in the protection of coastal assets. The plans strongly endorse conservation and restoration of these ecosystems. Since the CIM plans help to target national infrastructure planning as well as the allocation of grants from international funding bodies, they contribute to bringing biodiversity concerns and the link with climate adaptation into the main stream of decision-making.

Sources: Third and Fourth National Reports to the CBD, Samoa





## Theme

Equitably sharing the benefits arising from access to genetic resources



### SAMOA: SHARING PROFITS FROM POSSIBLE HIV TREATMENT DERIVED FROM A NATIVE TREE

The mamala tree (*Homalanthus nutans*) has been used by local people in part of Samoa to treat hepatitis. In the 1980s, the species was investigated by an American ethnobotanist as a possible treatment for cancer. The National Cancer Institute (NCI) in the United States determined that the plant's compounds would be of little use for that purpose, but that it did have possible anti-viral properties.



In 1991, the anti-viral component, Protrastin, was isolated from bark and stemwood of the tree, and it was discovered that it prevented healthy cells from being infected by the HIV virus, allowing other HIV fighting drugs to better attack the virus. In 1996, a use patent on anti-viral uses of Protrastin was issued to the NCI, which agreed to share 30% of royalties from the patent with the local Samoan village from which the plant was obtained.

In 2001, the AIDS Research Alliance licensed Protrastin from NCI to further explore its anti-HIV properties and start clinical trials. In the same year, the Alliance entered into a royalty agreement with the Prime Minister of Samoa in which it agreed to share 20% of any commercial profits arising from Protrastin with the Samoan people.

In 2004, the University of California, Berkeley set out to clone the gene producing Protrastin, to ensure a constant and high-quality supply of the compound. The university signed a Memorandum of Understanding with the Samoan government allowing its scientists to clone the gene, and agreeing to share 50% of its proceeds with the Samoan people if a successful drug is developed. The higher percentage was negotiated because cloning the gene could remove the need to source the compound locally, and jeopardize potential earnings from cultivating the tree. The university also agreed to acknowledge the intellectual contribution of Samoa to its research in all press releases, and to name any new gene sequence discovered in such a way that the connection of the gene to Samoa would be clear.

Before these agreements were signed, the ethnobotanist who initiated the research and his associates signed a covenant with the local villagers in 1989, in which a proposed sale of logging rights was abandoned in return for a guarantee of equitable sharing of benefits from any drugs developed from plants in the village. Because of the long time delay and uncertainty associated with benefits of this kind, money was raised for the community in advance of royalties, and included a grant of \$85,000 to improve the local school and pay debts incurred from the logging company. A further \$400,000 was raised to build medical clinics, improve water supplies, create an endowment for the local rainforest and build a canopy walkway which later became a popular tourist attraction.

This case demonstrates that the use of genetic resources can involve a number of actors and processes. Indigenous and local communities are often holders of knowledge about local biodiversity and can guide scientists to microbes, plants or animals with interesting properties.

Source: Fourth National Report to the CBD, Samoa; MoU Between the Government of Samoa and the Regents of the University of California, Berkeley for Disposition of Future Revenue from Licensing of Prostratin Gene Sequences, an Anti-Viral Molecule, signed 13 August 2004. See [http://www.paclii.org/pits/en/treaty\\_database/2004/1.html](http://www.paclii.org/pits/en/treaty_database/2004/1.html), Consulted 5 June 2009; Institute for EthnoMedicine website: <http://208.106.229.203/research/prostratin.asp>, Consulted 5 June 2009; Cox, PA. Ensuring Equitable Benefits: The Falealupo Covenant and the Isolation of Anti-Viral Drug Prostratin from a Samoan Medicinal Plant. *Pharmaceutical Biology*. 2001; 39(1)Suppl.:33-40.



## ETHIOPIA: SHARING THE BENEFITS FROM COMMERCIAL USES OF AN ENDEMIC “WEED”

*Vernonia* (*Vernonia galamensis*) is a plant endemic to Ethiopia, a member of the Asteraceae family, which includes sunflowers and daisies. Also known as Ironweed, the plant has shiny black seeds rich in oil.

In the 1970s, the United States Department of Agriculture (USDA) carried out extensive research into *Vernonia* as a potentially important industrial crop for US farmers, as the oil is a potential source of plastic compounds currently made only from petrochemicals. More than 50 US patent applications were filed. However, efforts were abandoned when USDA concluded that *Vernonia* would not thrive in the United States.



Recently, a British-based start-up company called Vernique Biotech set out to commercialize *Vernonia* oil as a “green chemical”. An agreement was signed between Vernique and the Ethiopian government in August 2006, with a view to sharing the benefits of worldwide sales which the company believes could run into billions of dollars in the plastics, paints and adhesive industries.

In exchange for access to the genetic resources of *Vernonia*, the company undertakes to pay a mix of license fees, royalties and a share of profits to the Ethiopian government over a 10-year period. In addition, hundreds of local farmers will be paid to grow the plant.

The agreement stipulates that Ethiopia retains full sovereign rights over *Vernonia*'s genetic resources, and it prohibits the use or commercialization by the company of any traditional knowledge about the plant's properties, without explicit prior, informed consent from local communities. Vernique is also not permitted to make any claim about the plant that may affect its traditional uses.

Among the non-monetary benefits included in the agreement is a commitment to share research results and technologies with the Ethiopian authorities, so long as they do not affect Vernique's commercial advantage. Ethiopian institutions will be given priority for agronomic research on growing *Vernonia* in the country, and for the supply of seeds. At least three quarters of the seeds are to come from Ethiopia, and training will be given to local communities on methods of production. Acknowledgement is to be made in publications and in intellectual property applications that Ethiopia is the source of the *Vernonia* used.

The monetary benefits stipulated in the agreement were as follows:

- ❖ 35,000 Euros paid by the company up front on signing the agreement in 2006
- ❖ Annual royalty payments to the Ethiopian government ranging from 2% to 5% of the sale of products derived from *Vernonia*, depending on the price obtained.
- ❖ In addition, an annual royalty of 5% of the company's net profits after tax, arising from the commercialization of *Vernonia*.

A further clause in the agreement makes clear that Vernique does not hold intellectual property rights over *Vernonia* or any of its genetic components, but only on inventions, products or applications developed using the oil.

Source: Fourth National Report to the CBD, Ethiopia; Feaven Workeye; Institut of Biodiversity Conservation Ethiopia; Agreement on Access to, and Sharing Benefit from *Vernonia galamensis* L. See ET-*Vernonia-galamensis*-FW-2007-06.ppt; Text of the agreement: [http://ibc-et.org/ibc/geneticM/files/Vernonia\\_ABS\\_agreement\\_revised\\_final\\_1\\_Dr%5B1%5D.Tew.pdf](http://ibc-et.org/ibc/geneticM/files/Vernonia_ABS_agreement_revised_final_1_Dr%5B1%5D.Tew.pdf); Regassa Feyissa, 2006. Farmers' Rights in Ethiopia: A Case Study. The Farmers' Rights Project, The Fridtjof Nansen Institute, FNI report 7/2006, 64 pp. FNI-FarmersRights-Ethiopia.pdf



## Theme

Equitably sharing the benefits arising from access to genetic resources.



### COSTA RICA: ACCESS AND BENEFIT-SHARING CONTRIBUTING TO SUSTAINABLE DEVELOPMENT

Created in 1986, the National Institute of Biodiversity in Costa Rica (INBio) has been successful in linking the objectives of conservation, benefit sharing, and technology transfer for the benefit of all.

According to the requirements set out by INBio, bioprospecting projects deal with environmentally sound uses of biological resources and access to biological resources is controlled by establishing a limit on the quantity of material being collected and the number of authorized visits. Benefit-sharing agreements contribute to conservation through up-front payments, milestones and royalties, technology transfer or training of national scientists.

Over the years INBio has increased its capacity by negotiating technology transfer and training provisions with partners such as Diversa Corporation, the International Cooperative Biodiversity Groups and Merck&Co. Thanks to such arrangements INBio has been able to establish new laboratories that provide added value to present and future bioprospecting ventures.

The enhanced capacity and the transfer of technology which have resulted from these agreements have also enabled INBio to catalogue specific genetic samples of Costa Rica's biodiversity. Over the past 24 years, INBio has developed an extensive collection of the country's genetic resources.

INBio's relationship with users of genetic resources has set a precedent followed by other providers of genetic resources. Improvements in technical and scientific capacity as well as the development of a catalogue of genetic samples provide Costa Rica with a comparative advantage in the negotiation of ABS agreements with foreign users.

The system established by INBio provides certainty for users in access to genetic resources and increases incentives and means for biodiversity conservation while improving the country's capacity to utilize their own genetic resources.

Source: Fourth National Report to the CBD, Costa Rica; Access and Benefit-Sharing in practice: Trends in partnership across sectors. CBD Technical Series No. 38. SCBD; Contracting for ABS: The legal and scientific implications of bioprospecting contracts. IUCN. ABS Series No. 4



## *Proposed strategic goal E*

### **Enhance implementation through participatory planning, knowledge management and capacity building.**

An important challenge in meeting the 2010 Biodiversity Target has been a lack of scientific data available at the relevant scale of decision-making, to support action to conserve and sustainably use biodiversity. Even where scientific uncertainty remains, for example regarding the likelihood of certain thresholds or tipping points being reached, knowledge of the pressures, consequences and available solutions are sufficient to justify such action. Nevertheless, greatly improved systems of monitoring and information-sharing, as well as stronger links between science and policymakers, are essential if this challenge is to be overcome in the future. The creation of a new Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) may help to improve the science-policy interface at the global scale, in parallel with better mechanisms for collecting and sharing information at regional, national and local levels.

As action on biodiversity moves forward with the Convention's revised Strategic Plan, it will be important that countries maintain up to date National Biodiversity Strategies and Action Plans (NBSAPs), as these will include the national targets required to achieve the new vision for biodiversity.

A vital element for improving action on biodiversity must be the involvement and respect of indigenous and local communities. Conservation policies that ignore their livelihood needs and traditional knowledge are less likely to succeed, as they will not have the support of the people living alongside the ecosystems society is trying to protect. In various parts of the world, "top-down" and exclusionary approaches to biodiversity conservation are being replaced or supplemented with policies that involve the active participation of local communities. In many cases, national governments can play an enabling role by setting rules that allow local communities to develop workable systems of sustainable use, that support livelihoods while safeguarding wider ecosystem services.

To meet the goal of implementing the objectives of the CBD, major efforts are also needed to improve the capacity in many developing countries to carry out effective action in support of biodiversity. Programmes that share expertise and resources from wealthier countries will be essential and can be complemented by programmes which share experiences among developing countries.

Participatory mapping for  
resource use in Togo  
[ILRI/www.flickr.com](http://ILRI/www.flickr.com)





## Theme

Ensuring that all countries have developed national biodiversity strategies and action plans that are participatory and up to date.

### JAPAN AND SAINT LUCIA: KEEPING BIODIVERSITY ACTION UP TO DATE

National Biodiversity Strategies and Action Plans (NBSAPs) provide a framework under which to implement the CBD. Increasingly, they reflect broader national development and environmental objectives and are linked to national planning processes. Japan and Saint Lucia are among several countries to have revised their original NBSAPs, allowing for new challenges and issues to be addressed, and to respond to new CBD guidance and information regarding biodiversity.

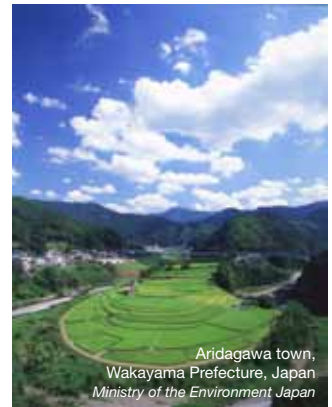
Japan's first NBSAP was developed in 1995. In 2002 it was drastically revised, and from this date Japan began a process of monitoring the implementation of the strategy four times every year. This information was used to help prepare the country's third Strategy in 2008. A fourth NBSAP was adopted in 2010 and further revisions are planned to take into account the Convention's new Strategic Plan.

In revising the NBSAP the Ministry of the Environment created several formal and informal review committees, soliciting opinions from the general public at meetings throughout Japan, and through hearings with government ministries, agencies, local governments, corporations, NGOs and academic communities. The third and fourth NBSAPs, are also given legal status through Japan's Basic Act on Biodiversity.

The fourth NBSAP focuses on the role biodiversity plays in supporting life and livelihoods, addresses some of the key drivers of biodiversity loss, and takes into account the global discussion on developing a post 2010 target. The NBSAP sets out a centennial vision for biodiversity and focuses on rebuilding the relationship between human beings and nature in local communities, securing linkages between key ecosystems including forests, countryside, rivers and the sea, and taking actions at the global level, including the science policy interface, promoting the Satoyama Initiative (named after Japan's traditional mixed agricultural landscapes), providing assistance to developing nations and integrating the economic base. The NBSAP sets out 720 actions to be undertaken for implementation of the strategy, with progress to be evaluated through 35 quantitative indicators.

Saint Lucia has also revised its NBSAP. The country began developing its first NBSAP in 1997 based on several studies and an extensive consultation process. The NBSAP focused on four thematic areas of particular importance to Saint Lucia: agriculture, forests, inland waters, and marine and coastal environments. The action plan detailed 22 projects, each with priority activities aimed at implementing the strategy. Since the NBSAP was adopted in 2000, 19 of the projects outlined in the NBSAP have been either completed or implemented. Those which were not implemented were the result of revised national priorities and/or financial constraints. Given the progress that has been made in implementing the first NBSAP, Saint Lucia began revising it in 2008. Amongst other things, the revised NBSAP is being developed to fill gaps identified in the first strategy, including: climate change, the Ecosystem Approach and invasive alien species.

Sources: Fourth National Reports to the CBD, Japan and Saint Lucia





## Theme

Putting in place systems that respect traditional knowledge, and the contribution of indigenous communities to conservation and sustainable use.



### CANADA: SHARING THE BENEFITS OF PROTECTED AREAS WITH INUIT COMMUNITIES

The Inuit Impact and Benefit Agreement, negotiated between the Government of Canada, Nunavut Tunngavik Inc. and four regional Inuit associations, allows for the creation of three new National Wildlife Areas on Baffin Island. They aim to protect local species and habitat, including a population of bowhead whale that has been assessed as threatened in Canada.

The agreement is based on co-management and collaboration, promoting conservation and sustainable use through the inclusion of critical Inuit traditional ecological knowledge in the development of any management plan. It provides for the preparation of cultural resources inventories, supporting the development of interpretative materials and management plans for the ten existing and three proposed protected areas in the Nunavut Settlement Area. Inuktitut place names for the protected areas will also be identified.

The Inuit Impact and Benefit Agreement aims to foster new means of economic development, such as eco-tourism, diversifying the Inuit economy, confirming the ecotourism value of National Wildlife Areas, and assisting the Inuit to adapt to evolving socio-economic conditions.

Source: Fourth National Report to the CBD, Canada.



Nunavut, Canada  
Alec Couros/www.flickr.com



Igloolik, Nunavut, Canada  
Chris Blonar/www.flickr.com



### MALAYSIA: DOCUMENTING TRADITIONAL KNOWLEDGE



Sorting plant specimens  
Min Sheng Khoo/www.flickr.com

A Traditional Knowledge Documentation Programme has been run by The Sarawak Biodiversity Centre (SBC) since 2001. It has involved consultative meetings and collections at 33 locations among 12 ethnic communities in Sarawak. The main objective is to help local indigenous communities in the State to preserve their traditional knowledge through proper recording or documenting techniques, and through the propagation and management of useful plants. The project also encourages local communities to cultivate useful indigenous plants for their own uses. This programme provides material for research on plants that may have potential in the development of products such as herbal therapies, nutritional and cosmetic products, and medication.

To support the Traditional Knowledge Documentation Programme, SBC provides a site for *ex-situ* conservation and also contributes to awareness raising activities. Achievements of the programme to date include documenting more than two thousand useful plant species; storing more than 3,700 plant specimen duplicates in a herbarium; and collecting nearly two thousand specimens of fungi.

Source: Fourth National Report to the CBD, Malaysia.



## Theme

Improving and sharing widely knowledge and the science base relating to biodiversity.



### MEXICO: SETTING THE STANDARD ON BIODIVERSITY KNOWLEDGE

Mexico's National Biodiversity Information System (SNIB) was created to compile, organize and distribute information on Mexican biodiversity, and to act as a crucial tool for science-based decision-making regarding its conservation and use. It is considered one of the most advanced national biodiversity databases in the world.

The SNIB is structured around primary data on thousands of specimens kept in biological collections. Each entry has a range of information including where and when the specimen was collected, and its scientific name. The data is presented in two different formats: one for experts, and another for non-specialist decision-makers and the general public.

The specimens are held in more than 190 national and 240 foreign collections, and a programme of repatriation was implemented to obtain information on Mexican biological specimens kept overseas.

Among the activities associated with the information system has been an ecosystem monitoring programme, to track quantitative and qualitative changes in vegetation distribution, using remote sensing; and setting up a network of national and international biodiversity experts, to help update, maintain and interpret the data held by SNIB.

Some of the products made available by the system include:

- ❖ Electronic catalogues of the correct names of more than 50,000 species found on Mexican territory;
- ❖ More than 4,000 satellite images and 1,500 aerial photographs;
- ❖ An automated system that locates heat points, relates their position to important sites such as protected areas and threatened forest ecosystems, and sends this information to institutions in charge of controlling and preventing forest fires.

The construction of Mexico's information system has helped support government decision-making on new environmental legislation, the granting (or not) of permits, and the selection of sites for new protected areas. It has also helped to prevent and control forest fires, evaluate possible invasion routes for exotic species, assess risks from the introduction of genetically-modified organisms, and has provided the basis for Mexico's position regarding international environmental treaties.

Source: Fourth National Report to the CBD, Mexico; CONABIO Biodiversity Portal <http://www.biodiversidad.gob.mx/>







## Theme

### Improving capacity to implement the CBD.



## UNITED KINGDOM: PROMOTING CAPACITY TO CONSERVE BIODIVERSITY WORLDWIDE

The Darwin Initiative is a small grants programme funded by the United Kingdom government's Department for Environment, Food and Rural Affairs (Defra) that aims to promote biodiversity conservation and sustainable use of resources around the world. It seeks to share UK expertise and each application for funding support must have a UK and foreign partner organisation.

The Initiative has 8 objectives:

- ❖ To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the CBD.
- ❖ To draw on British expertise in the field of biodiversity.
- ❖ Projects funded under the Initiative will be collaborative, involving either local institutions or communities in the host country.
- ❖ Projects will have a real impact on the ability of the host country to meet its obligations under the CBD.
- ❖ Projects will be of high quality and scientific (or other appropriate professional) excellence.
- ❖ Whenever possible, Darwin funding will be used as a catalyst to lever additional funding for project work, which would not otherwise be forthcoming.
- ❖ The outputs and outcomes from projects should be additional to that from work being funded through other mainstream environmental or research programmes.
- ❖ Projects funded under the Initiative will demonstrate good value for money.



Since it was started in 1992, the Darwin Initiative has invested nearly £80m in 725 projects, in 156 countries. Among the activities funded are river dolphin conservation in the Amazon, management of vulture declines in India, sustainable use of sea cucumbers in Egypt, and training of conservation professionals in Mongolia.

Sources: Fourth National Report to the CBD, United Kingdom; Darwin Initiative website, at <http://www.darwin.gov.uk/>.

## Conclusion

The examples highlighted in this document suggest that achieving a more harmonious relationship between human societies and nature is within our grasp. Actions are already taking place at many levels that will help towards achieving all of the targets likely to emerge from the new Strategic Plan of the CBD. These actions need to be urgently replicated and scaled up around the world. The International Year of Biodiversity is a once-only opportunity to make 2010 the moment that humanity not only woke up to the biodiversity crisis, but also

learned and acted upon the lessons of earlier successes and failures.

Failure to grasp this opportunity will have consequences that could severely damage the well-being of future generations, and jeopardize many social and economic objectives. The rewards of prompt and determined action will be great, and will give us a chance to bring human activities and ambitions back in line with the capacity of the planet's ability to support them.

A forest near Luvia, Finland  
David Jones/www.flickr.com



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