United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования,
науки и культуры

منظمة الأمم المتحدة
للتربية والعلم والثقافة

联合国教育、
科学及文化组织

BIODIVERSITY in UNESCO

Foreword by Mr Koïchiro Matsuura, Director-General of UNESCO

Biodiversity encompasses the wide variety of genetic resources and species, as well as ecosystems and landscapes. Provision of food, fuel and fibre, shelter and building materials, purification of air and water, detoxification of wastes, moderation of floods and droughts, stabilization of climate, control of pests and diseases, as well as cultural and aesthetic benefits: these are just some of the many services that biodiversity provides to sustain life on earth.

Yet, over the past decades, biodiversity has been lost at an unprecedented rate, mostly due to unsustainable human activities. Species are disappearing at 50 to 100 times the natural rate, their genetic diversity is being eroded, aquatic and terrestrial ecosystems are being seriously degraded worldwide and their structure and functioning is increasingly altered.

Given the importance of biodiversity to basic human well-being, the reversal of biodiversity loss has become one of the major challenges that society faces today. Governments around the world have thus committed themselves to significantly reduce the current rate of biodiversity loss by 2010 in order to achieve the Millennium Development Goals.

There is no doubt that biodiversity is a very complex issue that cuts across different sectors of society. Consequently, biodiversity issues should be addressed in an integrated interdisciplinary manner. It is crucial that different disciplines and competencies are brought together so as to develop urgently needed solutions to address the global challenge of biodiversity loss.

Since its early days, UNESCO has provided support and guidance to countries to help them conserve and sustainably and equitably use biodiversity. UNESCO's interdisciplinary and cross-sectoral action aims at setting standards, developing ethical frameworks and building capacity for efficient biodiversity governance. It focuses on addressing the educational, scientific, cultural and communication aspects of biodiversity in an integrated way.

UNESCO promotes international cooperation on biodiversity scientific research, monitoring and assessments, thus advancing knowledge on biodiversity. It builds bridges between the natural and social sciences, brings science into policy-making, and applies new and traditional knowledge in biodiversity management, thus contributing to a better understanding of the cultural and ethical aspects of biodiversity, as well as the links between biological and cultural diversity, which are increasingly recognized as a pre-requisite for sustainability.

As the lead agency for the United Nations Decade of Education for Sustainable Development (2005-2014), UNESCO is mobilizing its expertise in both formal and non-formal education, as well as its capacity to build networks and partnerships, in order to raise awareness on biodiversity and foster dialogue between a wide range of stakeholders.

Networking and building partnerships are indeed critical for UNESCO's interdisciplinary and cross-sectoral approach to biodiversity. UNESCO is thus working with governments, scientists, industry, and civil society in support of biodiversity activities.

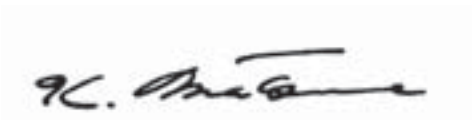
UNESCO also works on the ground to promote conservation of biodiversity as well as the sustainable management and the equitable distribution of its benefits. In UNESCO's World Heritage sites, biodiversity of outstanding universal value is conserved and promoted in line with the World Heritage Convention. In UNESCO's World Network of Biosphere Reserves, conservation of biodiversity is integrated with social and economic development of human populations and environmental research, monitoring and education.

UNESCO hosts the secretariat of the World Heritage Convention and is working closely with other multilateral environmental agreements dealing with biodiversity issues, including through the mechanism of the Biodiversity Liaison Group. Its biodiversity-related programmes, activities and initiatives directly and indirectly contribute to the development and implementation of programmes for these international treaties.

This booklet provides a brief overview of UNESCO's activities in support of global efforts to ensure environmental and socio-economic sustainability through conservation and sustainable use of biodiversity.

It is intended to demonstrate that the reversal of the current trend of biodiversity loss and degradation will only be possible if it is tackled in an integrated, interdisciplinary manner that combines different fields, especially those that lie within UNESCO's fields of competence, namely education, science, culture and communication.

UNESCO will continue to promote such an integrated multifaceted approach to biodiversity from the local to global level, giving particular focus to the country level within the framework of the One UN country approach aimed at providing coherent multilateral support to country efforts to achieve international development objectives, including the Millennium Development Goals.



Koïchiro Matsuura

A message by Assistant Director-Generals for Natural Sciences, Culture and Education

Since the links between biodiversity and human well-being have been elucidated, biodiversity change has become one of the main preoccupations of governments in both developing and developed countries.

Because of the multi-faceted character of the biodiversity issue, UNESCO's interdisciplinary and cross-sectoral approach to biodiversity is increasingly needed to help countries ensure the long-term sustainability and viability of the world's biodiversity.

Consistently with the 2010 Biodiversity Target, UNESCO builds on its mandate in culture, science, education and communication to advance and transfer knowledge on both adverse and positive impacts of human action on biodiversity and to find solutions for reducing the current rate of its loss, for the benefit of both the environment and human populations around the globe.

The cooperation between UNESCO's Cultural, Education and Natural Sciences Sectors is vital in providing options for integrated solutions to the problem of diminishing biodiversity. The biodiversity-related programmes and activities of UNESCO in the fields of education, science and culture address the needs of UNESCO Member States and support the implementation of relevant provisions under the main multilateral environmental agreements dealing with biodiversity, including the Convention on Biological Diversity. A UNESCO informal inter-sectoral biodiversity working group provides strategic advice to guide the development and implementation of these programmes and activities in an integrated manner.

This booklet provides a synopsis of the work of UNESCO in relation to biodiversity. It illustrates UNESCO's interdisciplinary approach to the issue, key partnerships and interventions. It is hoped that the information presented will permit improved linkages of the work of UNESCO with that of other key actors in the biodiversity arena so as to increase synergies in efforts aimed at reversing the current trend of biodiversity loss and degradation.

It is also hoped that the successful experience of bringing together a wide range of UNESCO competencies around the biodiversity theme will be repeated in relation to other, equally important, environmental and sustainable development challenges of the 21st Century.

Walter Erdelen
Assistant Director-General for Natural Sciences

Françoise Rivière
Assistant Director-General for Culture

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Deputy Assistant Director-General for Education
Programme Management

BIODIVERSITY
Science, Research and Monitoring

Through scientific cooperation programmes, UNESCO contributes to a better understanding of biodiversity from genes to landscapes, including marine, coastal, freshwater and terrestrial ecosystems. The main objectives of UNESCO's activities are to build the knowledge base needed to protect the components of biodiversity; ensure their sustainability; and assess the progress towards the 2010 Biodiversity Target by:

- Advancing knowledge on biodiversity composition, structure and functioning;
- Observing and monitoring biodiversity change, with increasing emphasis given to the impacts of global climate change; and
- Bringing biodiversity science into the policy arena.

Advancing Knowledge on Biodiversity

UNESCO has a long history of promoting international research efforts in the field of biodiversity. Major biodiversity-related scientific endeavours such as the Hylean Amazon Project (launched in 1947), the Arid Zone Research Programme (started in 1949), the Humid Tropics Research Programme (launched in 1954), programmes aimed at generating cartographic and scientific maps (climatic, oceanic, geological, soil and vegetation maps – as from 1947), the establishment of the Intergovernmental Oceanographic Commission (IOC) in 1960, the launching of the International Hydrological Decade in 1965 and others paved the way for further international scientific programmes on biodiversity to de developed.

Today, through its major intergovernmental and international scientific programmes such as the Man and the Biosphere Programme (MAB), International Hydrological Programme (IHP), International Geosciences Programme (IGCP) and International Basic Sciences Programme (IBSP), UNESCO promotes advances in research at all levels of biodiversity at different time and space scales (Boxes 1-2).

UNESCO, together with ICSU[1], SCOPE[2] and IUBS[3], co-sponsors *Diversitas* – an international programme of biodiversity science. Through *Diversitas*, UNESCO promotes national research efforts on functional, evolutionary, and monitoring aspects of biological diversity and provides a platform for integrating scientific knowledge on biodiversity. An important objective of UNESCO's involvement in *Diversitas* is the further involvement of developing country scientists in international biodiversity research efforts, promotion of capacity building and knowledge sharing. In the light of the increasing demand of policy for scientific findings, UNESCO supports *Diversitas* involvement in the consultative process aimed at establishing an International Mechanism on Scientific Expertise in Biodiversity (IMoSEB).

1. ICSU: International Council for Science
2. SCOPE: Scientific Committee on Problems on the Environment
3. IUBS: International Union of Biological Sciences

Observing and Monitoring Biodiversity Change

UNESCO promotes the participation of its Member States and scientists in international biodiversity monitoring programmes and global observing systems that focus on parameters and processes that affect biodiversity.

In particular, UNESCO supports the Global Terrestrial Observing System (GTOS) and the Global Ocean Observing System (GOOS) that focus on observations, modelling and analyses of terrestrial ecosystems to support sustainable development, and provide ocean observations, measurements and data that can be used by governments, industries and scientists to assess, understand, forecast and manage trends in the global ocean-atmospheric system.

UNESCO also contributes to the improvement, management and conservation of coral reefs and helps with finding funds for reef monitoring by supporting the Global Coral Reef Monitoring Network.

In partnership with space agencies and related institutions, UNESCO is bringing space technologies to developing countries and building capacity to improve the conservation of the world's cultural and natural heritage. Using various remote sensing technologies and data drawn from space, aerial photography and ground digital images, in coordination with field work, UNESCO is assisting developing countries in better monitoring, documenting and protecting their biodiversity (Box 3).

UNESCO encourages the integrated approach to biodiversity monitoring, which considers not only ecological parameters, but also social, economic and cultural factors that affect biodiversity (Box 4).

A notable example is the Global Water System Project (GWSP) which is based on the fundamental and multi-faceted question: How are humans changing the global water cycle, the associated biogeochemical cycles and the biological

Box 1 Microbial diversity network

UNESCO's Microbial Resources Network (MIRCEN) programme promotes international cooperation in managing microbial and rhizobial gene pools, in building capacity through training activities and in the development of new, inexpensive technologies native to specific regions. It also supports and promotes the development of clean and environmentally safe technologies. The MIRCEN network involves over 30 existing academic research centres in developed and developing countries that serve as repositories of microbial diversity and allow their proper management and safe use in research, industry and other fields.

- http://unesco.org/sciences/bes

Fossilized dragonfly. Nova Olinda, Araripe Geopark, Brazil.
Photo: © Santana Museum/URCA, Daniel Roman.

Box 2 Biodiversity evolution over geological periods

The International Geosciences Programme (IGCP) is a joint initiative of UNESCO and ICSU's International Union of Geological Sciences, which includes studies on Variscan terrestrial biotas and paleoenvironments, Triassic/Jurassic boundary events and Ordovician paleogeography and paleoclimate that are vital for understanding changes in biological diversity over geological time.

- http://www.unesco.org/science/earth/igcp.shtml

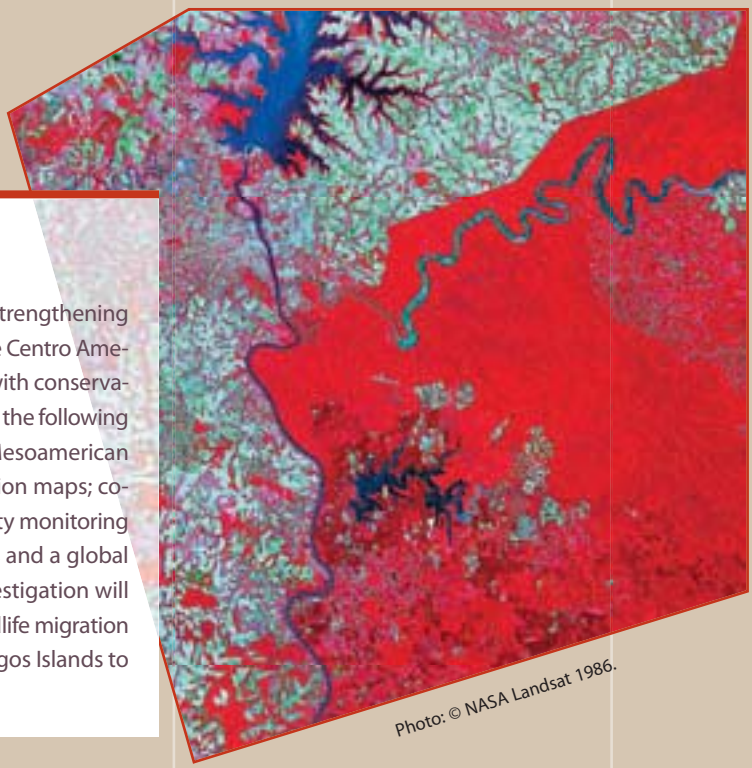


Photo: © NASA Landsat 1986.

Box 3 Space technologies for biodiversity monitoring and conservation

UNESCO in cooperation with the European Space Agency (ESA) has derived from satellite imagery accurate cartography, which is compatible with geo-positioning system (GPS) for the whole of the gorilla habitat in the Democratic Republic of the Congo. The new cartography is helping conservation authorities to identify park boundaries, map flora and fauna observations and plan gorilla associated tourism.

UNESCO and ESA are strengthening conservation efforts of the Centro American region by working with conservation authorities to provide the following products and services: Mesoamerican biological change detection maps; coral reef maps; ocean quality monitoring services; mangrove maps and a global map of dry lands. An investigation will also be carried out on wildlife migration patterns from the Galapagos Islands to Cocos Islands.

- http://www.unesco.org/science/remotesensing/?lang=en

components of the global water system, and what are the social feedbacks arising from these changes?

The agenda for the GWSP incorporates impact studies on water governance, land cover change, climate change, and nutrient and sediment flows. Linkages at different scales and the legacy of past human impacts are also included. To achieve its goal of integrative understanding of the global water system, the GWSP covers a wide range of scientific topics and disciplines.

Box 4 Biosphere Reserve Integrated Monitoring (BRIM)

The BRIM initiative was launched in 1991 with the aim to provide a platform for the promotion of harmonized monitoring methodologies, the integration of the resulting information and for further building capacity for conducting integrated observations in UNESCO's World Network of Biosphere Reserves. It has produced methodologies and indicators for monitoring biotic, abiotic and social changes in biosphere reserves.

BRIM has assisted biosphere reserves in standardizing biological inventory measures for management; integrating multiple databases related to monitoring; visualizing information through appropriate technology so as to assist decision-making; promoting systematic exchange of scientific information; facilitating access to information on biosphere reserves; and surveying the research and monitoring potential of biosphere reserves for the purpose of promoting their networking and mutual assistance.

● http://www.unesco.org/mab/BRs/BRIM.shtml

Under the auspices of the World Heritage Convention and through its World Heritage Centre, UNESCO provides the only systematic and statutory monitoring of the world's most outstanding network of protected areas – World Heritage sites. In addition to examining six-yearly periodic reports on the state of conservation of natural World Heritage sites, the World Heritage Committee has the mandate to request specific monitoring missions to particular World Heritage sites where there may be specific concerns over their conservation. These mechanisms support the constant updating of a dynamic database on the state of conservation of World Heritage sites.

Box 5 Global Ecosystem Dynamics (GLOBEC) Programme

The IOC-sponsored GLOBEC Programme coordinates international research to improve understanding of climate impacts on fisheries and to integrate ecosystem information into fisheries management. The Climate Impacts on Top Predators project works at identifying, characterizing and modelling key processes involved in the dynamics of oceanic pelagic ecosystems in the context of both climate variability and change, as well as intensive fishing of top predators, in order to develop reliable predictive capacity for single species and ecosystem dynamics at short, medium and long term scales.

● http://www.globec.org/

Addressing Climate Change Challenges to Biodiversity

UNESCO recognizes that the current climate change coupled with other human pressures is stressing biodiversity far beyond the levels imposed by the climatic changes that occurred in the recent evolutionary past. Climate change is now a priority issue in many UNESCO programme areas, and numerous climate-related activities have been developed and enhanced to address the climate-related concerns within the framework of its programmes. UNESCO's activities focus on those ecosystems that are particularly vulnerable to climate change, such as marine ecosystems (Box 5), coral reefs (Box 6), high mountain ecosystems (Box 7) and drylands (Box 8).

Although climate change is a global challenge, there are many adaptation and preventive measures that can be taken at the local scale, e.g. at the level of UNESCO-designated sites: Biosphere Reserves and World Heritage sites.

Photo: © Courtesy of United Nations Food and Agriculture Organization

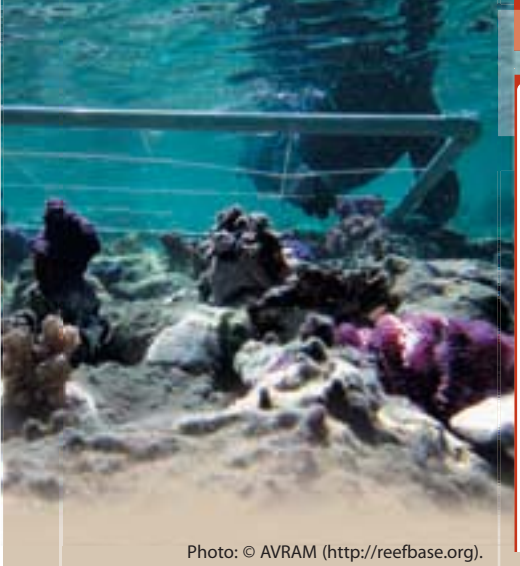


Photo: © AVRAM (http://reefbase.org).

Box 6 Collaborative research on coral bleaching

Corals are affected by heat stress, and a 1-2° C change in their local temperature above their normal summer maximum temperatures can lead to a phenomenon called 'bleaching', whereby the corals expel their vital algae, leaving coral tissues translucent. Over the past ten years, an increasing awareness of the importance of coral reefs has been evident, especially in light of their rapid decline in many regions and their significance to developing countries. The IOC sponsors the Coral Bleaching working group of the Global Environment Facility (GEF) / World Bank Coral Reef Targeted Research and Capacity Building Project. This group carries out research required to develop indicators specifically for coral bleaching, to examine specific physiological mechanisms for coral bleaching, as well as the local ecological factors that cause bleaching and its after-effects, and differences between direct human stresses and those related to climate change..

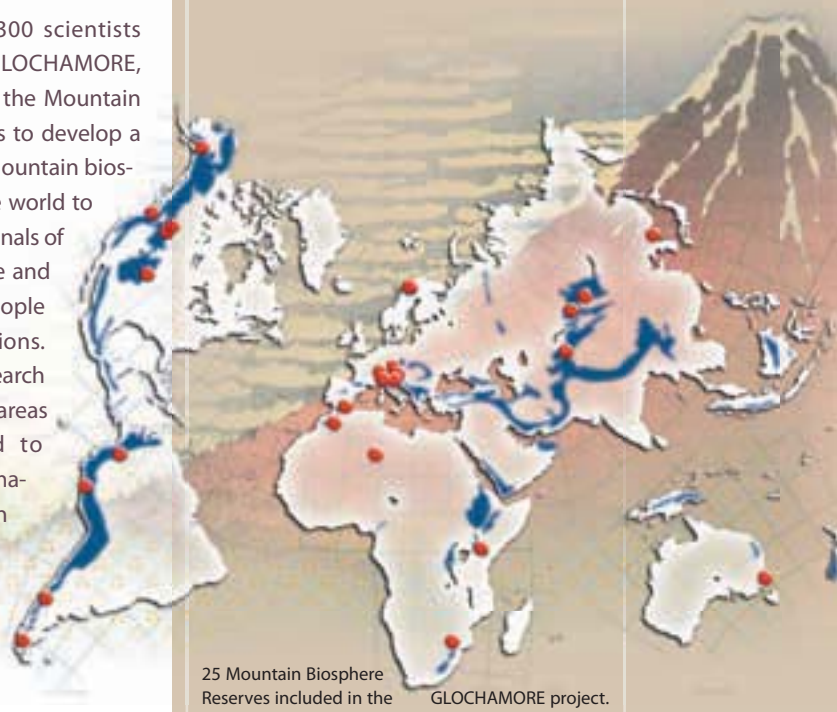
- **http://www.gefcoral.org/WorkingGroups/CoralBleaching/tabid/861/Default.aspx**

Box 7 Global Change in Mountain Regions (GLOCHAMORE) Project

Mountain landscapes are among the most complex and fragile ecosystems on Earth. Their mere verticality produces a huge range of habitats, whose composition varies dramatically with small changes in altitude.

Calculating and forecasting the effects of climate change on these environments, including on rare and endangered species, encompasses a demanding range of scientific inquiry. This is why the scientists participating in the GLOCHAMORE project developed a research strategy encompassing such diverse areas as land-use changes, the cryosphere, hydrological systems, grasslands and forests and aquatic ecosystems, wildlife, alien plant and animal species to name but a few.

Since 2003, some 300 scientists have participated in GLOCHAMORE, involving UNESCO and the Mountain Research Initiative so as to develop a network of sites in 25 mountain biosphere reserves over the world to observe and monitor signals of global change in nature and their impact on the people who inhabit these regions. The GLOCHAMORE Research Strategy highlights key areas for research needed to guide the sustainable management of mountain regions, particularly in mountain biosphere reserves.



25 Mountain Biosphere Reserves included in the GLOCHAMORE project.

- **http://www.unesco.org/mab/ecosyst/mountains/gcmbr.shtml**

Box 8 Sustainable Management of Marginal Drylands (SUMAMAD) Project

UNESCO has been the first UN agency to study the complexity of dryland ecosystems from an interdisciplinary scientific point of view since the 1950s. The MAB Programme has carried out numerous international dryland projects of which the Sustainable Management of Marginal Drylands (SUMAMAD) Project is the most recent one. This project strives to improve the living standards of dryland dwellers by rehabilitating degraded lands and stimulating productivity through a combination of traditional knowledge and scientific expertise. The approach is site-specific. Depending on the needs, new management practices may concern soil seed banks, improving grazing ranges, artificial recharge of groundwater, fruit and fuelwood plantations, soil fertility management, wind erosion control, etc. SUMAMAD was launched in 2002 by UNESCO-MAB. It involves a network of universities and research centres in land management in China, Egypt, Iran, Jordan, Syria, Tunisia, Pakistan and Uzbekistan.

- **http://www.unesco.org/mab/ecosyst/drylands/Sumamad.shtml**

Tuareg Caravan, Tassili N'Ajjer, Algeria, 2002.
Photo: © Olivier Brestin.

The World Heritage Network and the World Network of Biosphere Reserves are useful tools to share and promote lessons learnt and best practices, as well as to raise awareness regarding climate change impacts using their iconic value. Indeed, biosphere reserves are currently being promoted and used as reference sites to monitor climate change (Box 7), and studies are being conducted at several World Heritage sites to monitor climate change impacts and plan appropriate adaptation measures (Box 9). With the growing concern of the World Heritage Committee for protecting the outstanding universal value, integrity and authenticity of World Heritage sites from the adverse effects of climate change, the World Heritage Centre has become involved with several climate change-related activities. A meeting of experts was convened in 2006 resulting in a "Report on Predicting and Managing the Effects of Climate Change on World Heritage", as well as a "Strategy to Assist States Parties to Implement Appropriate Management Responses".

Box 9 **Adapting to climate change in the world's most outstanding protected areas – the example of the Great Barrier Reef in Australia**

The World Heritage Convention is an ideal platform for communicating the threats of climate change to the world's protected areas. In 2007 the World Heritage Centre published "Case Studies on Climate Change and World Heritage" highlighting the impacts of climate change on 26 natural and cultural World Heritage properties, along with ongoing and planned adaptation and mitigation measures. One example is The Great Barrier Reef listed under all four natural World Heritage criteria. It is the world's largest coral reef (2,300 km, 35 million ha and 2,900 individual reefs), and is also among the world's most diverse ecosystems (1,500 species of fish, 5,000 mollusc species and 350 species of hard reef coral). The sustainability of this World Heritage site is sensitive to any change in the following climate parameters: sea level rise, sea temperature increase, storm frequency and intensity, precipitation, drought, land run-off, changing oceanic circulation, and ocean acidity. Of central concern are the acute and cumulative impacts of coral bleaching, which are triggered by anomalously high water temperatures. The Climate Change Action Plan aims at sustaining ecosystems, industries and communities, and supporting policy and collaborations.

● http://whc.unesco.org/en/activities/&pattern=&search_theme=23

The Great Barrier Reef in Australia.
Photo: © UNESCO / Evergreen.

Bringing Biodiversity Science to Policy

UNESCO helps governments and policy-makers make informed decisions on biodiversity issues by collecting, peer-reviewing and 'packaging' scientific information in the form of scientific assessments and policy briefs (Box 10).

The Millennium Ecosystem Assessment (MA) was launched by the Secretary-General of the UN in 2001; it lasted four years, and benefited from the involvement of more than 1,300 scientists worldwide and from different disciplines.

The MA allowed – for the first time – to assess the status of ecosystem services worldwide (globally as well as sub-globally) and their effects on human well-being. It produced a conceptual framework, a methodology, a set of assessment tools and several reports intended for specific constituencies (biodiversity, wetlands, climate, business and industry, etc.). It is expected that the application of the MA approach will greatly assist in the context of programmes and activities in support of achieving the Millennium Development Goals (MDGs).

UNESCO, as a co-sponsor of the MA, is now engaged in a MA follow-up exercise, jointly with ICSU and the United Nations University (UNU), on identifying knowledge gaps identified by the MA and possible policy responses.

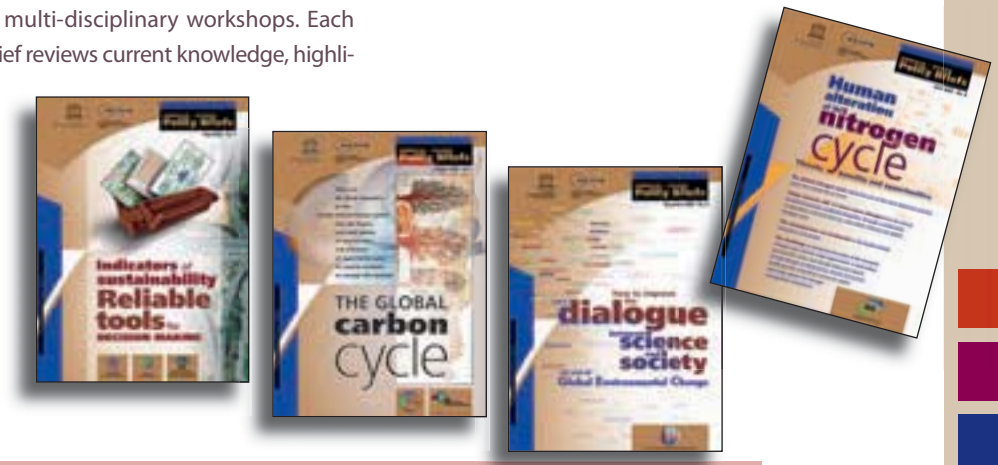
While work on assessing ecosystem services and well-being is continuing especially at the national level, there is a need for further mainstreaming its conceptual approach, methodology and findings into the environment and development agendas. In this regard, an important potential application is represented by the eight pilot countries agreed upon in the context of the "One UN approach".

Built upon the MA experience, the International Assessment of Agricultural Science and Technology for Development (IAASTD) was launched in September 2004 to assess how agricultural knowledge, science and technology can be more effectively used to reduce hunger and poverty, improve rural livelihoods, and facilitate equitable, environmentally, socially and economically sustainable development. UNESCO is one of the co-sponsors of the IAASTD, and along with the *Instituto Interamericano de Cooperación para la Agricultura* based in Costa Rica, it is co-ordinating the sub-global assessment for Latin America and the Caribbean.

The IAASTD is unique in that it is an intergovernmental process, but with a multi-stakeholder Bureau involving all relevant stakeholders who recognize the centrality of agriculture and science and technology to development and in particular to hunger and poverty alleviation, human health, and the environment. It provides a unique opportunity to develop a common vision for the future, critically assess information related to a number of contentious issues, and develop new partnerships. It is also intended to influence the direction of agricultural research and policy formulation and provide stakeholders with useful information on the interlinkages between biodiversity loss and agricultural practices as well as options to overcome the production vs. conservation dilemma. All the IAASTD reports will be issued at the beginning of 2008.

Box 10 **Science for policy-makers: UNESCO-SCOPE Policy Briefs**

UNESCO and SCOPE have recently launched a series of policy briefs on emerging and critical environmental issues, including biodiversity-related topics. These policy briefs provide 'at a glance' information, building on the contributions of international experts at multi-disciplinary workshops. Each brief reviews current knowledge, highlights trends and controversies, and opens perspectives for policy planners, decision makers and stakeholders in the community. This series of policy briefs is intended to concretely and significantly impact on the capacity of UNESCO's Member States to rely on scientifically-sound information for the purpose of decision-making.



● http://www.unesco.org/mab/biodiv/biodivSC.shtml#biodivGovernance

BIODIVERSITY
Conservation, Sustainable Use and Management

Significantly reducing the rate of biodiversity loss by 2010, thus achieving the CBD's 2010 Biodiversity Target, requires the development of good systems of knowledge and governance that permit to conserve biodiversity and use it in a sustainable and equitable manner. UNESCO's interdisciplinary approaches are used to help governments and policy makers to achieve these goals through actions aimed at:

- Sustaining biodiversity in UNESCO sites – World Heritage sites and Biosphere Reserves;
- Linking traditional knowledge to biodiversity management and governance;
- Building partnerships to prevent biodiversity loss and degradation; and
- Building dialogue to prevent conflicts and share benefits.

Sustaining Biodiversity in UNESCO Sites – World Heritage Sites and Biosphere Reserves

UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. This mission is embodied in the Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention), adopted by UNESCO in 1972. One of the most widely subscribed of the five Biodiversity Conventions (184 countries have ratified it), the Convention is the only international legal instrument that compels States Parties to implement conservation measures recommended by an intergovernmental group of peers, the World Heritage Committee, and to regularly report on the state of conservation of their sites.

The World Heritage Centre works closely with the technical advisory body, IUCN (The World Conservation Union), to ensure the long-term protection and conservation of inscribed natural heritage sites. This includes undertaking monitoring missions in cooperation with site management agencies to evaluate the state of conservation of World Heritage sites, providing technical assistance, and building capacity in the States Parties. In pursuance of these and other tasks, the Centre has increasingly attempted to mobilize international support from public and private sectors (Box 11). Currently, 186 sites, covering a variety of ecosystems,

Galápagos Islands World Heritage Site part of the Archipielágo de Colon (Galápagos) Biosphere Reserve.
Photo: © UNESCO/Evergreen.

Box 11 **Connecting corporate social responsibility to protected areas – the World Heritage platform**

World Heritage sites are selected through a rigorous technical process, and they are formally recognized by an intergovernmental process, itself governed by an international legal instrument (the World Heritage Convention). These qualities make them a politically attractive and environmentally effective vehicle when the time comes to defining corporate policy. The International Council on Mines and Metals, closely followed by Shell International, publicly committed not to carry out any activities in World Heritage sites. More recently, Goldman Sachs, and HSBC have made commitments not to finance projects that would take place within World Heritage sites. These examples demonstrate the growing global legitimacy of the World Heritage Convention and point to a much broader potential for the enlistment of great corporate support in the future.

● http://whc.unesco.org/

are inscribed on the World Heritage List for their natural heritage values. The World Heritage Forest Programme and the World Heritage Marine Programme are particularly focused on forest conservation and the maintenance of the marine areas respectively.

UNESCO's Man and the Biosphere Programme proposes an interdisciplinary research agenda and capacity building aiming to improve the relationship of people with their environment globally. It notably targets the ecological, social and economic dimensions of biodiversity loss and the reduction of this loss. It uses its World Network of Biosphere Reserves as vehicles for knowledge-sharing, research and monitoring, education and training, and participatory decision-making which innovate and demonstrate approaches to reconcile conservation and sustainable development based on sound science and local communities' efforts (Box 12).

Box 12 UNESCO Biosphere Reserves – Learning laboratories for sustainable development

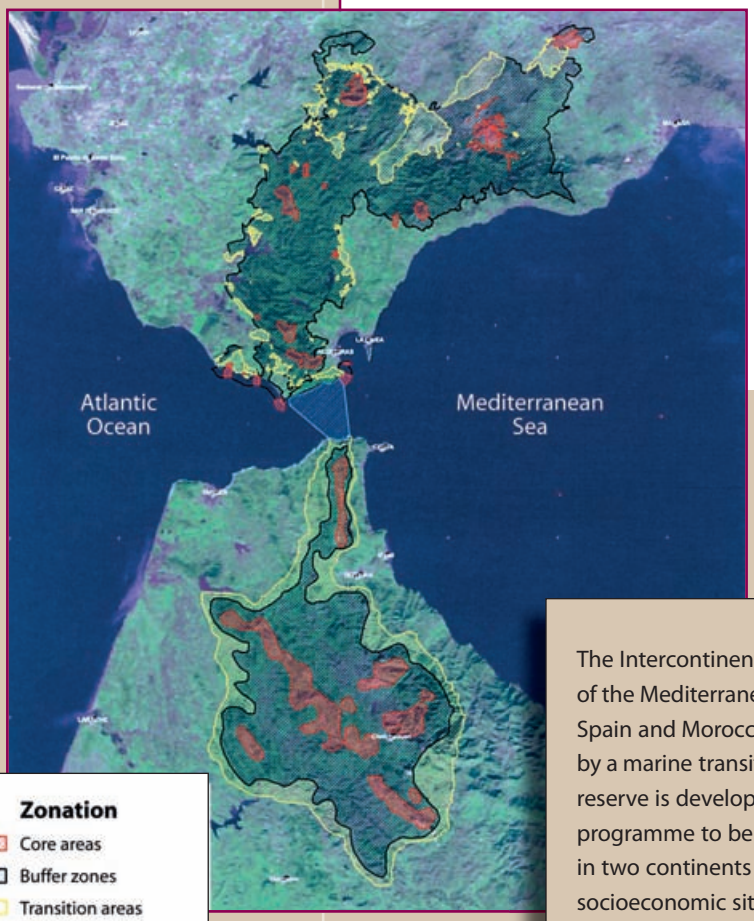
Nominated by national governments, biosphere reserves are areas of terrestrial and coastal ecosystems established to promote and demonstrate a balanced relationship between humans and the biosphere. They are developed as a means to integrate human development with biodiversity conservation, and sustainable use and management of natural resources. As such they serve as 'living laboratories' for testing out and demonstrating innovative approaches to reconcile conservation of biodiversity with social and economic development.

Each Biosphere reserve is intended to fulfil three complementary functions: conservation of biological and cultural diversity, sustainable development, and logistic support for education, training, research, and monitoring. To fulfil these functions, the biosphere reserves are organized in three interrelated zones: a legally constituted core area devoted to long-term protection; a buffer zone where activities compatible with the conservation objectives can take place and an outer transition area where sustainable resource management practices are promoted and developed.

Today, with 507 biosphere reserves in over 102 countries, including transboundary sites, the World Network of Biosphere Reserves provides context-specific opportunities to combine scientific knowledge and governance modalities to reduce biodiversity loss, improve livelihoods, enhance social, economic and cultural conditions for environmental sustainability, thus contributing to the pursuit of the MDGs and the 2010 Biodiversity Target.

In February 2008, Spain will host the III World Congress of Biosphere Reserves. The main objectives of the Congress are to valorize the progress made since the last World Congress held in Seville, Spain in 1995, to define the main challenges for the future, and to elaborate an Action Plan for 2008-2013.

- http://www.unesco.org/mab/BRs.shtml



The Intercontinental Biosphere Reserve of the Mediterranean. Stretching between Spain and Morocco, and connected by a marine transition area, the biosphere reserve is developing a joint management programme to benefit the two countries in two continents with very different socioeconomic situations and sharing a common natural and cultural heritage. Map: © The Intercontinental Biosphere Reserve of the Mediterranean.

Biosphere reserves are also used as pilot sites for testing new approaches to integrated management of natural resources, such as the ecohydrology approach developed by UNESCO's Ecohydrology Programme and implemented jointly by IHP and MAB. The ecohydrology approach is based on the assumption that ecosystem properties and water dynamics can be managed so as to maximize their synergistic interactions and to optimize ecosystems' resilience to human-induced stresses, while also reducing such stresses (Box 13).

Box 13 **Ecohydrology: towards a transdisciplinary approach to the solving of issues relating to water, environment and people**

UNESCO's Ecohydrology Programme is a scientific programme to understand and elucidate the dynamic relationships between hydrological, social and ecological systems; to consider how these act upon each other, and to seek new ways to balance human and environmental needs. The aims of the programme are to advance the integration of social, ecological and hydrological research; and to generate outcomes that will enable the development of effective policies and practices.

Launched in 1996, recent activities under the ecohydrology programme have focused on two major actions: strengthening the interdisciplinary character of ecohydrology by integrating it with other scientifically-related concepts and ecosystemic approaches; and verifying and validating the concept by applying it to solve existing problems affecting watersheds.

Ecohydrology demonstration projects—three in Latin America, two in Africa, and three in Europe—together highlight research that validates and quantifies the effectiveness of the ecohydrological approach on the ground in different circumstances around the world.

http://typo38.unesco.org/en/ecohydrology.html

Integrating biodiversity in water resource management is in the heart of UNESCO's IHP Hydrology for the Environment, Life and Policy (HELP) initiative that seeks to establish a global network of catchments to improve benefits to society from applying integrated water resources management. To date, HELP has established a global network of 67 basins in 56 developed and developing countries. Both physical (hydrological, climatological, ecological) and non-physical (sociological, economics, administrative) observations are made in these catchments to address the most critical policy and management issues as perceived by the basin stakeholders.

Throughout the world's vulnerable ecosystems, UNESCO supports sustainable tourism as a means to promote sustainable use and consumption of natural resources. These activities are consistent with the principles of conservation and sustainable use of biological diversity and include ecotourism, nature- and culture-based tourism in and around UNESCO sites.

The World Heritage Tourism Programme encourages sustainable tourism actions at World Heritage sites. The Programme uses tourism to contribute to environmental protection, limit negative socio-economic impacts and benefit local people economically and socially (Box 14).

Focusing on the valorization of ecosystem goods and services, projects to test the draft United Nations Environment Programme (UNEP)/CBD International Guidelines for Sustainable Tourism are carried out within the World Network of Biosphere Reserves. In 2002, the MAB Programme created a Task Force to develop quality economies based on local community action and entrepreneurship, sound science, public-private sector partnerships and networking. The Task Force provides policy advice and guidance on key biosphere reserves issues, such as labelling, branding and marketing of biosphere reserves goods and services, conservation finance, and sustainable tourism.

Linking Traditional Knowledge to Biodiversity Management and Governance

The environmental knowledge of local and indigenous peoples is now widely recognized as an essential building block for sustainable development and the conservation of biological and cultural diversity. Emerging on the international scene at the Earth Summit (Rio 1992), and through the Convention on Biodiversity, whose Article 8(j) incites State Parties to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities", the domain has rapidly gained prominence and momentum.

UNESCO launched the Local and Indigenous Knowledge Systems (LINKS) Programme in 2002 to empower local and indigenous peoples in biodiversity governance by advocating full recognition of their unique knowledge, know-how and practices. LINKS is led by UNESCO's Coastal Regions and Small Islands Platform and involves all five UNESCO programme sectors, as well as the UNESCO Offices in Apia, Bangkok, Dhaka, Hanoi, Montevideo and Moscow.

The LINKS Programme seeks to empower local and indigenous communities in biodiversity governance and to maintain the vitality of local knowledge within communities (Box 15). For example, in the Surin Islands in Thailand, LINKS is working with the Moken, a group of 'Chao Lay' or 'sea nomads'. The Surin Islands were designated as a National Park in 1981, which conflicted with Moken traditional resource harvesting patterns. Utilizing the Moken ecological knowledge, this project helps the Moken to work with park authorities in exploring sustainable development options that will allow them to maintain and enhance their lifestyle while conserving the biodiversity of the Surin Islands.

In biosphere reserves, recent years have seen a range of efforts to establish new kinds of multiple use areas based on partnership with indigenous peoples. In a number of countries, biosphere reserves have provided a focus for such alliances and arrangements. These include: Beni (Bolivia), the home of the Chimane Indians; the Rio Platano Biosphere Reserve (Honduras), territory of the Paya and Miskito peoples; the

Box 14 Linking biodiversity conservation and sustainable tourism at World Heritage sites

Since 2001 the World Heritage Tourism Programme has launched several projects and initiatives dealing with sustainable tourism and biodiversity conservation. World Heritage biodiversity projects are creating models for using tourism to promote the protection of important habitats by working with local communities and site managers to benefit from the growing tourism industry. Project activities include site-community planning, financing mechanisms to help cover ongoing site monitoring and conservation costs, awareness-building, training programs for local residents and site staff including training local guides, targeted marketing, policy recommendations, and cross-site learning and information sharing. Sites where activities are taking place include: El Vizcaíno (Mexico), Komodo (Indonesia), Río Plátano (Honduras), Sian Ka'an (Mexico), Tikal (Guatemala), Ujung Kulon (Indonesia), The Three Parallel Rivers (China), The Belize Barrier Reef (Belize), Canaima (Venezuela) and Noel Kempff Mercado (Bolivia).

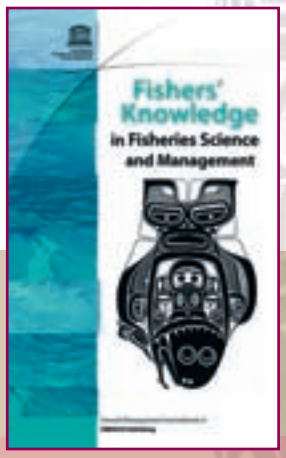
World Heritage Site Ujung Kulon National Park, Indonesia
Photo: © UNESCO / Evergreen

● http://whc.unesco.org/en/sustainabletourism/

Box 15 Fishers' knowledge in fisheries science and management

The volume entitled *Fishers' Knowledge in Fisheries Science and Management* (2007) has been recently published by UNESCO's LINKS Programme and the Coasts and Small Islands Platform. It focuses on how fishers' knowledge is contributing to the conservation and sustainable use of freshwater and marine biodiversity, notably by informing fisheries science and management.

Through case studies from around the world, the book illustrates how and where fishers' knowledge – indigenous and artisanal, as well as large and small-scale commercial – is being put to work in collaboration with scientists, government managers and non-governmental organizations. The publication represents an important contribution towards achieving the goal of establishing international responsibility for the ethical collection, preservation, dissemination and application of fishers' knowledge.



● http://portal.unesco.org/sc_nat/ev.php?URL_ID=5197&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1171374910

· · · CONSERVATION, SUSTAINABLE USE and MANAGEMENT · · ·

Vanuatu Sand Drawings (Vanuatu).
Photo: © Vanuatu National Cultural Council.

Box 16 **Safeguarding intangible heritage to sustain biodiversity**

Ongoing activities of the UNESCO Intangible Heritage Section serve to inspire safeguarding activities in the States Parties. Examples include the action plans developed for several of the Masterpieces of the Oral and Intangible Heritage of Humanity which concern examples of traditional knowledge of nature and universe, such as:

- Safeguarding of the Traditional Medicine Kallawaya Project started in 2007
- The Traditional Knowledge, Oral and Graphic Expressions of the Wajãpi in Amapá (Brazil) Project launched in 2006
- The Oral and Intangible Heritage of the Zápara community (Ecuador/Peru) project launched in 2004 focused on measures to safeguard the Zápara language in order to promote the transmission of their complex and varied knowledge of the natural environment.

In 2005, the Intangible Heritage Section, the Division of Cultural Policies and Intercultural Dialogue and the LINKS Programme jointly organized a meeting at Aichi Prefectural University in Japan. The meeting was founded on the recognition that indigenous and local cultures create, maintain and manage biodiversity in multiple and complex ways, and established methodologies by which the relationship between biological and cultural diversity might be maintained. A publication based on this event is currently being developed.

● http://www.unesco.org/culture/cih/ith/Masterpieces

transboundary La Amistad Biosphere Reserve (Costa Rica and Panama), which includes Bribri and Cabecar indigenous lands, and many others. In these and other traditional indigenous lands now recognized by the governments concerned, there are varying levels of indigenous involvement in reserve management.

"Knowledge and practices concerning nature and the universe" is one of the domains in which the intangible cultural heritage is manifested, according to UNESCO's 2003 Convention for the Safeguarding of the Intangible Cultural Heritage. With the entry into force of this Convention in April 2006, UNESCO has an international normative instrument allowing to safeguard traditional knowledge. For the purposes of the Convention, 'safeguarding' is defined as measures aiming at ensuring the viability of the intangible cultural heritage, including the identification, documentation, research, preservation, protection, promotion, enhancement, transmission, particularly through formal and non-formal education, as well as the revitalization of the various aspects of such heritage.

Consequently, UNESCO will assist Member States in developing activities and programmes designed to safeguard (a) knowledge and practices concerning nature and the universe and (b) languages, and in particular endangered languages, as vehicles of intangible cultural heritage in general and traditional knowledge in particular.

It is important to stress, in this connection, that the preamble of the Convention makes explicit reference to communities, in particular indigenous communities, bearers of traditional knowledge, recognizing that they play an important role in the production, safeguarding, maintenance and recreation of the intangible cultural heritage. While implementing this Convention, States Parties will have to ensure the widest possible participation of communities that create, maintain and transmit such heritage, and to involve them actively in its management (Box 16).

Building Partnerships to Prevent Biodiversity Loss and Degradation

Strengthening partnerships and mobilizing resources are increasingly seen as the most critical components for ensuring sustainability of biological diversity worldwide.

Together with governments, intergovernmental organizations, including other United Nations bodies and specialized agencies, non-governmental organizations, universities, the private sector and other partners, UNESCO is increasingly developing innovative ways to promote biodiversity conservation and sustainable use. Over the past several years UNESCO has broadened its range of partnerships and intervention strategies in support of biodiversity activities. The United Nations Foundation, and GEF, have played a key role in this effort, and the major international conservation non-governmental organizations like Conservation International, Fauna and Flora International, The Nature Conservancy, The Wildlife Conservation Society and the World Wide Fund for Nature (WWF) have figured in the expanding range of activities carried out by the World Heritage Centre and UNESCO's Programmes (Box 17).

The Great Apes Survival Project (GRASP) is an ambitious project of UNEP and UNESCO that aims at lifting the threat of imminent extinction faced by gorillas, chimpanzees, bonobos and orangutans across their ranges in equatorial African and South-East Asia. It is one of the examples of how long-term partnerships can be built to achieve the 2010 Biodiversity target (Boxes 18-20).

Box 19 Biosphere Connections

In 2007 the global airline coalition Star Alliance together with UNESCO-MAB, the Ramsar Convention on Wetlands and IUCN have joined forces under the "Biosphere Connections" programme to support biodiversity conservation and sustainable development.

Through Biosphere Connections, the Star Alliance will support UNESCO-MAB, Ramsar and IUCN in their conservation efforts. In return, UNESCO-MAB, Ramsar and IUCN will help Star Alliance airlines to further improve their environmental performance and their commitment to sustainable social and economic development, in the communities they serve and beyond. Over time, UNESCO-MAB will also encourage the development of carbon emission offsetting projects in biosphere reserves of interest to airlines and their customers.

- **http://www.unesco.org/mab/biosphereconnections/bc.shtml**

Box 17 The Rapid Response Facility: Providing critical financial support to World Heritage sites in times of crisis

The results of years of hard conservation work can sometimes be lost in a matter of days if a management agency cannot quickly respond to unexpected events, or sudden catastrophes. The international community is generally poorly equipped to provide rapid financial support to the beleaguered site managers – e.g. within days of the event. To fill this gap, the World Heritage Centre, with the United Nations Foundation and Fauna and Flora International have established the Rapid Response Facility (RRF). Without sacrificing transparency and accountability, the facility is designed to receive short requests for support, assess them using their international network of experts, and decide on the request, within six working days of having received it. To date, the RRF has supported nine projects in Indonesia, the Democratic Republic of the Congo, Brazil, India and Peru, among others.

RRF funded emergency fire brigades to combat wildfires at Emas National Park, Brazil, part of the Cerrado Protected Areas: Chapada dos Veadeiros and Emas National Parks World Heritage site. Photo: © RRF / RRF.

- **http://www.fauna-flora.org/rrf.php**

Box 18 Saving the great apes through UNESCO/UNEP GRASP project

Hosted by the Democratic Republic of the Congo and organized by UNESCO and UNEP, the first Intergovernmental Meeting on GRASP was held in Kinshasa in 2005.

Three vital documents were adopted at the meeting: the Kinshasa Declaration on the Survival of Great Apes, the Rules for the organization and management of the GRASP Partnership and the GRASP Partnership Outline Work Plan 2003-2007.

The "Kinshasa Declaration" represents the high-level political statement on the future of the great apes. The 22 Range States and several donors have signed this instrument, including Belgium, France, Italy, Sweden, United Kingdom, United States of America, European Union and the Commission of Forestry in Central Africa.

As follow-up to this Meeting, UNESCO continues to support the GRASP objectives through: allocating grants to encourage young scientists to pursue their scientific research and work related to great apes; supporting the organization of a series of regional exhibitions on GRASP in Eastern, Central and Western Africa and South East Asia; and translating into French the *World Atlas of Great Apes*.

- **http://www.unesco.org/mab/grasp/progr.shtml**

Box 20 **Developing a business planning toolkit for World Heritage site managers with Shell International**

The World Heritage Centre and Shell International, with support from the Shell Foundation, are developing a Business Planning Toolkit for World Heritage site managers. Starting with a private sector toolkit, experienced Shell business planning professionals have worked closely with the managers of three World Heritage sites (Aldabra Atoll in the Seychelles, Bwindi Impenetrable National Park in Uganda and the Tubbataha Reef Marine Park in the Philippines) and have adapted it to the real on-the-ground needs of actual World Heritage site managers.

Tubbataha Reef Marine Park, Philippines.
Photo: © UNESCO / Evergreen.

The UNESCO Office in Venice (ROSTE), UNDP (United Nations Development Programme), UNEP, WWF, IUCN and the Council of Europe have joined forces and created The Dinaric Arc Initiative to secure the long-term conservation and sustainable development of the Dinaric Arc region stretching through seven south-eastern European countries[4]. The partners of this initiative expect to reach these ambitious goals by encouraging the development of diversified activities and pilot projects, supporting policy and advocacy processes, building capacity of key stakeholders and promoting awareness and education campaigns in the countries of the region.

UNESCO's World Heritage Centre, IHP and MAB have strengthened their cooperation with the IPOGEA Research Centre on Traditional Knowledge in Matera, Italy. Such cooperation, developed principally through the UNESCO Regional Bureau for Science and Culture in Europe, established in Venice, already led to important results such as:

- The realization of a first worldwide inventory of traditional knowledge (TK) to combat desertification;
- The development of a prototype web-based tool for the management of the inventory and the promotion of innovative uses of TK;
- The publication in English and dissemination worldwide of P. Laureano's book *Water Atlas* (*Atlante d'acqua*).

4. Italy, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro and Albania.

Box 21 **Building dialogue for effective management of biodiversity in biosphere reserves**

In the framework of the MAB Programme, a research and training programme entitled "Dialogue and Concertation in Biosphere Reserves" began in 2005 with the following objectives:

- To determine the needs of the biosphere reserves in terms of conflict prevention and management;
- To identify and involve scientists from the concerned countries that work on these subjects;
- To analyse the practices of the different parties in terms of dialogue and concertation with the local stakeholders concerning efforts to seek a compromise between biodiversity conservation and development;
- To analyse and highlight certain biosphere reserve experiences that might been shared within the World Network;
- To encourage exchange among the biosphere reserves on this theme.

Since 2001, MAB has been implementing a project funded by the GEF to "Build Scientific and Technical Capacity for Effective Management and Sustainable Use of Biodiversity in Dryland Biosphere Reserves in West Africa". Emphasis of the project is laid on dialogue between stakeholders to prevent conflicts and elaborate agreed management rules in the six biosphere reserves of the West Sudano-Sahelian savannah biome[5].

In 2006, a study of dialogue practices in 11 biosphere reserves was carried out and the next step – which should be realized in 2007 - is to share practical and theoretical knowledge through a methodological guide on dialogue in biosphere reserves and a website.

- **http://unesdoc.unesco.org/images/0014/001465/146566e.pdf**

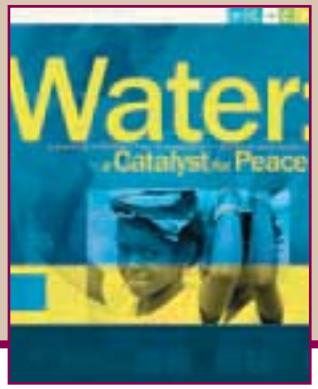
Project meeting with local stakeholders in Mare aux Hippopotames Biosphere Reserve, Burkina Faso.
Photo: © Meriem Bouamrane.

5. Benin (Pendjari), Burkina Faso (Mare aux Hippoptames), Côte d'Ivoire (Comoé), Mali (Boucle du Baoulé), Niger ('W') and Senegal (Niokolo Koba)

Building Dialogue to Prevent Conflicts and Share Benefits

Fostering dialogue and concertation among stakeholders under different cultural and social and economic contexts is of key importance to prevent conflicts and share benefits of biodiversity conservation and management in a sustainable development perspective.

UNESCO's MAB, WHC and IHP initiatives, research, training and capacity-building focus on prevention and management of conflicts linked to biological resources (Boxes 21-23). ◆



Box 23 From Potential Conflict to Cooperation Potential (PCCP)

"From Potential Conflict to Cooperation Potential" (PCCP) Project has been developed to nurture the idea of peace in human minds by preventing and resolving conflicts arising from the mismanagement of shared water resources.

A close look at the world's international basins gives a greater sense of their significance in terms of potential for area conflict - approximately one third of the 263 transboundary basins are shared by more than two countries and there is an escalating urgency to develop sustainable and equitable means of accessing to, and sharing water resources.

PCCP seeks to foster cooperation among the various stakeholders in the management of shared water resources; and should they need it, help them to negotiate their way towards sustainable agreements. In order to do so, PCCP develops educational material related to conflicts and cooperation in the field of shared water resources and provides current and future professionals, and decision makers, with the relevant training; it supports pertinent research initiatives and disseminates results and best practices. Finally it encourages and assists actual cooperation processes related to the use of shared water resources.

- http://www.unesco.org/water/wwap/pccp/

Box 22 Holding Down the Fort: Leveraging the World Heritage Convention to ensure dialogue in times of political turmoil and armed conflict

Protected areas are significantly affected during conflicts: park management authorities are neglected by central authorities, armed groups shelter in parks and use natural resources to survive, fleeing civilians also take refuge in parks where they hide and find food. Such circumstances result in intense pressure on local biodiversity and particularly wildlife. Often, many years of conservation work can be lost in just a short period of conflict – further justifying the need to maintain a conservation presence during such times. The project entitled "Biodiversity Conservation in Regions of Armed Conflict: Protecting World Natural Heritage in the Democratic Republic of the Congo" facilitates the work of the park management staff, and actively uses the Convention to gather support and maintain a dialogue with local military authorities, leaders of rebel movements, other States Parties involved in the conflict and the international peace-keeping force for conservation of these sites.

- http://whc.unesco.org/en/congobiodiversity/

BIODIVERSITY
Cultural and Ethical Dimensions

UNESCO contributes to the efforts aiming at preventing the present global trend of erosion of diversity, both biological and cultural. Recognizing that together, cultural and biological diversity holds the key for ensuring sustainable development, UNESCO seeks to develop innovative approaches to safeguard them both by:

- Enhancing the linkages between biodiversity and cultural diversity;
- Using cultural diversity to measure progress in reversing the trends of biodiversity loss; and
- Addressing ethical dimensions of biodiversity.

A Mayangna man fishing from a boat with a bow and arrow.
Photo: © Paule Gros.

Enhancing the Linkages between Biodiversity and Cultural Diversity

During the World Summit on Sustainable Development in 2002, UNESCO and UNEP convened the High-Level Round Table on "Cultural and biological diversity for sustainable development" and highlighted the importance of links between biological and cultural diversities and sustainable development. Since then, UNESCO's Culture, Natural Sciences and other sectors have worked together in order to develop new perspectives on sustaining diversities, both cultural and biological, with the primary objective of demonstrating that linkages and synergies between cultural and biological diversities are prerequisites for the safeguard of both, and are thus a key component of sustainable development.

A notable example of such joint interdisciplinary work is the Local and Indigenous Knowledge Systems (LINKS) Programme, launched by UNESCO in 2002. In a number of field projects established under the aegis of LINKS, including one in the Bosawas Biosphere Reserve in Nicaragua, the environmental knowledge of local and indigenous peoples has been used for the conservation of both biological and cultural diversity and recognized as an essential building block for sustainable development (Box 24).

Box 24 **Enhancing biodiversity conservation through Mayangna cultural patterns of traditional biological resource management**

Since 2004, the LINKS Programme has worked with the Mayangna peoples living in the Bosawas Biosphere Reserve in Nicaragua, at the heart of the Mesoamerican Biological Corridor. The interdependent biological and cultural diversities of this unique territory are today under threat from illegal logging, organized illicit trade of plant and animal species and the progression of the agricultural frontier. The Mayangna people have requested that their ecological knowledge be recorded in the form of an 'encyclopedia of nature' that will serve both to educate their children and affirm their status as knowers and managers of their lands and resources, with lifestyles relevant to the conservation of biological diversity. This is expected to recognize the Mayangna peoples as holders of precious local understanding of ecological processes and practitioners of traditional lifestyles relevant to the conservation of biological diversity and to strengthen their involvement in the management of the Bosawas Biosphere Reserve.

- **http://portal.unesco.org/sc_nat/ev.php?URL_ID=4573&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1118678191**

In recent years, UNESCO has strengthened its project on mapping cultural resources with indigenous communities as a way to explore in a participatory manner the spatial and territorial aspects of a community's cultural resources, making the link between memory, imagination, land and maps, while creating opportunities for intercultural dialogue and the building of mutual consent on enhancing cultural diversity and biological diversity in development strategies.

Other outcomes of UNESCO's interdisciplinary work on the cultural-biodiversity interface are the initiatives in cultural landscapes and sacred natural sites as areas of biodiversity conservation.

In 1992 the World Heritage Convention became the first international legal instrument to recognize and protect cultural landscapes. The cultural landscapes represent the "combined works of nature and of man" and are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal. Cultural landscapes often reflect specific techniques of sustainable land-use, considering the characteristics and limits of the natural environment they are established in, and a specific spiritual relation to nature. Since protection of cultural landscapes can contribute to modern techniques of sustainable land-use in maintaining or enhancing natural values in the landscape, the protection of traditional cultural landscapes is therefore helpful in maintaining biological diversity.

The World Heritage Committee at its 16th session adopted guidelines concerning the inclusion of cultural landscapes in the World Heritage List. To date, 54 properties on the World Heritage List have been classified as cultural landscapes (Box 25).

Box 25 **World Heritage Cultural Landscapes: sustainable land use and biodiversity conservation**

The definition of World Heritage has evolved over time and today a diversity of living cultural places, sacred sites and cultural landscapes is included on the World Heritage List.

Cultural landscapes are particularly vulnerable to social, economic and environmental changes. The maintenance of the fabric of societies, traditional knowledge and indigenous practices are vital to their survival. World Heritage cultural landscapes can be models in effective landscape management, excellence in conservation practices and innovation in legislative protection. They are places where we can learn about the relation between people, nature and ecosystems and how this shapes culture and identity, and enriches cultural, and in some cases, biological diversity.

At the Agave Landscape of Mexico, the Rice Terraces of the Philippine Cordilleras or the coastal terraced landscape of Cinque Terre in Italy, cultural diversity is intertwined with biological diversity. Cultural landscapes can provide the basis for the crops of tomorrow's world and their genetic pool and for the identity and beliefs of the people who live within.

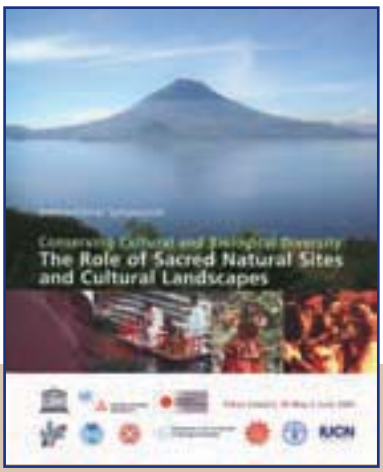
Their inclusion in UNESCO's World Heritage List not only provided an important step towards the international recognition of this type of sites, but also encouraged national and regional authorities to enhance conservation and protection measures.

Agave landscape, Mexico.
Photo: © UNESCO/Carlo Tomas.

● http://whc.unesco.org/en/activities

Box 26 Tokyo International Symposium "Conserving Cultural and Biological Diversity: The Role of Sacred Natural Sites and Cultural Landscapes"

Can sacred natural sites and cultural landscapes effectively contribute to biodiversity conservation? This and other related questions were discussed at the International Symposium which was held at the UNU in Tokyo. The Symposium was attended by over 150 participants from all world regions. It drew on previous and ongoing work of several UN bodies and international organizations with regard to conserving and managing sacred natural sites and cultural landscapes. The many symposium presentations at the interface of different world views or belief systems and traditional land management systems gave testimony to the need for integrated and holistic culture-conservation efforts.



The adopted "Tokyo Declaration" invites organizations and scientists to continue collaboration for safeguarding biological and cultural diversity embodied in natural sacred sites and cultural landscapes; and calls upon governments and protected area managers to consider the IUCN/UNESCO working guidelines for the conservation and management of sacred natural sites.

- **http://www.unesco.org/mab/biodiv/Cdiversity/symposium.shtml**

Furthermore, several World Heritage sites as well as UNESCO's Biosphere Reserves (e.g. Uluru-Kata Tjuta in Australia, Bogd Khan Uul in Mongolia, Nilgiri in India, Dinghushan and Xishuangbanna in China) encompass sites, such as woodlands, mountains, islets, caves, and rivers, which have been held 'sacred' for centuries by the local people. UNESCO sees these sites as a proof of a strong link between cultural diversity and biodiversity since they demonstrate the capacity of local societies and their symbolic systems to conserve biodiversity *in situ*.

One of the important events in 2005, the Tokyo symposium on "Conserving Cultural and Biological Diversity: The Role of Sacred Natural Sites and Cultural Landscapes" was organized by UNESCO with UNU, CBD, FAO, IUCN and United Nations Permanent Forum on Indigenous Issues (UNPFII) as partners. The symposium provided the floor for presenting case studies on sacred natural sites and cultural landscapes worldwide, adopted the "Tokyo declaration" and formulated recommendations on the use of guidelines for decision-makers for the management of sacred sites (Box 26).

Box 27 Quranic Botanic Gardens Network

Conserving plant species in the Arabian Peninsula is urgently needed since the rapid development and progressive lifestyle of the human population has put great strains on the naturally occurring species of the region. Conserving nature is in accordance with the traditions and the teachings of Islam, which is the prevalent religion of the people of the Arabian Peninsula. The UNESCO Office in Doha is gathering a team of architects, botanists, ecologists and Muslim scholars to generate a network of Botanical Gardens in the region with the focus on the regional flora, environment, cultural heritage and education.

Plants representing different regional ecosystems, as well as those mentioned in the Holy Quran and the medicinal plants, which have been used in the Islamic traditions, will be displayed in the garden. The design of the garden will respect the major landscaping concepts of the Islamic garden cultures.

Currently, the UNESCO Office in Doha is putting a Quranic Botanic Garden into practice in the Emirate of Sharjah. The Sharjah Garden will aim to include ex situ conservation of the flora of the entire Arabian Peninsula and Asian Arabia including several thousand species.

- **http://www.unesco.org/mab/biodiv/q_botanicgardens.shtml**

Sea lavender *Limonium axillare* from Al Thakeera, Qatar.
Photo: © UNESCO Doha Office.

Another good example of strong linkages between cultural heritage and biological diversity conservation can be seen in the project "Quranic Botanic Gardens Network" in the Arabian Peninsula developed by the UNESCO Office in Doha (Box 27) as well as the studies of the UNESCO Office in Cairo on the Relationship between Biological Diversity and Material Culture in Al-Chouf Cedar Biosphere Reserve (Lebanon) that presents low cost and innovative means of biodiversity conservation that rely mainly on the local knowledge and cultural practices.

Conserving both cultural and biological diversity is in the focus of the UNESCO-MAB Programme and its World Network of Biosphere Reserves. As demonstrated from several examples above, biosphere reserves are sites of excellence to explore human-nature relationships and to test innovative approaches to sustainable development aimed at conserving biodiversity and promoting social and economic development while maintaining associated cultural values.

Production of Tortillas in Popayan, Columbia, UNESCO's City of Gastronomy. Photo: © Carlos Humberto Illera.

UNESCO's Creative Cities Network aims to help unlock the creative, social and economic potential of cultural industries held by local actors and therefore promote UNESCO's goals of cultural diversity. UNESCO's Cities of Gastronomy, which belong to one of the seven sub-networks of the programme, more specifically aim at promoting gastronomy as a means to encourage conservation and sustainable use of biodiversity in relationship to food and cooking. The values embodied in gastronomy, such as the diversity and quality of local ingredients, preparation techniques, culinary traditions, and the creative skills of chefs, also serve as a living testimony to both cultural heritage and contemporary practices. In that respect, UNESCO's Creative Cities of Gastronomy have the potential to support a vision of food and gastronomy that simultaneously integrates cultural diversity and biodiversity.

Promoting bio-cultural interactions in local food systems is the focus of UNESCO's partnership with the France-based association "Terroirs et Cultures". As opposed to the commercial practice of large-scale, single-crop monoculture, a major potential effect and contribution of the 'Terroirs approach' could be to reconcile conservation of biodiversity and biological resources with their sustainable use while ensuring the preservation of cultural values in rural areas. Together with "Terroirs et Cultures" and other international partners, UNESCO is planning to develop a research programme on local rural systems and their potential contribution to more sustainable agricultural and food systems. This research programme will launch pilot studies in biosphere reserves and 'Terroirs'[6] across the world so that common principles guiding the management of 'Terroirs' could be identified, consolidated and further promoted as inspiring bases for sound rural development in wider regions of the world.

6. The concept of 'Terroir ' comes from a French word that designates 'local territorial systems' or 'local food systems' where intensive bio-cultural interactions take place between the people living in these spaces (generally small farmers) and their environment.
They are generally characterized by a wise use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.
These interactions between people with a specific culture, developing specific knowledge in a singular environment, often provides authenticity to locally based productions and products.

Building on the data, information and knowledge gathered and produced by UNESCO's initiatives on the culture-environment interface, UNESCO's future action in this area will be focusing on translating principles of cultural and biological diversity into proposals for policies and action. Frameworks and tools will be developed and shared, emphasizing the importance of diverse knowledge systems as a source for promoting sustainable development. As a first step in this process, it is envisaged that UNESCO works with experts to develop a set of guidelines for future integrated research on diversity and for translating the results of such research into proposals for policies and action needed to reverse today's trends of global diversity loss and degradation.

Using Cultural Diversity to Measure Progress in Reversing the Trends of Biodiversity Loss

UNESCO's Universal Declaration on Cultural Diversity (adopted in 2001) reflects an international consensus regarding cultural diversity and its links with sustainable development. On the other hand, the CBD recognizes the role played by culture in reducing the biodiversity loss and achieving the 2010 Biodiversity Target.

In order to use cultural diversity as a measure of biodiversity trends, UNESCO in partnership with UNEP is now preparing an indicator on "Status and trends in linguistic diversity and numbers of speakers of indigenous languages" in the framework of the 2010 Biodiversity target.

The CBD scientific body (SBSTTA) has adopted 22 'headline indicators' to measure progress towards the 2010 Target of the CBD. UNESCO's Intangible Heritage Section has been mandated by the States Parties to this Convention to coordinate the work on the indicator "Status and trends in linguistic diversity and numbers of speakers of indigenous languages" chosen to inform on the focal area "Status of traditional knowledge, innovations and practices", thus recognizing the fundamental linkage between language and traditional knowledge related to biodiversity. All institutions involved in developing one of the 22 indicators cooperate in the "2010 Biodiversity Indicators Partnership project". A common proposal for the Indicator Development Phase (2006-2009) was submitted for funding to GEF earlier this year and recently approved for funding.

Addressing Ethical Dimensions of Biodiversity

UNESCO recognizes that societal values, norms and traditions shape our relationships with the living world, and that ethics can help us to better understand and re-orient these relationships. Ethical questions related to biodiversity conservation, sustainable use and benefit sharing are among the issues to be addressed in the coming years.

In this context, UNESCO's Programme on the Ethics of Science and Technology aims to place science and technological progress in a context of ethical reflection rooted in the cultural, legal, philosophical and religious heritage of the various human communities.

Through its Bioethics Programme, UNESCO addresses the ethical, legal and social concerns stemming from advances in the life sciences, particularly in genetics.

Implementation of the Universal Declaration on Bioethics and Human Rights, exploration of ethical issues in relation to the environment, reflection on the principles of science ethics, as well as analysis and debate on the ethical issues of nanotechnologies, are amongst the current and planned features of UNESCO's action related to ethical dimensions of biodiversity. ◆

BIODIVERSITY
Education, Capacity building, and Communication

UNESCO recognizes that efforts focused on promoting education on biodiversity constitute key elements for achieving the Millennium Development Goals and the objectives of the CBD.
UNESCO thus works with a number of constituencies in promoting education on biodiversity focusing on the interlinking issues of biodiversity and sustainable development by:

- Promoting education on biodiversity in the context of the United Nations Decade of Education for Sustainable Development (UNDESD);
- Educating, training and building capacity on conservation and sustainable management of biodiversity;
- Enhancing communication, networking and outreach on biodiversity

Promoting Education on Biodiversity within the UN Decade of Education for Sustainable Development

Designated by the UN General Assembly, UNESCO is the leading agency for the UNDESD. Biodiversity is one of the main strategic perspectives to inform education and learning for sustainable development during the Decade.

Education for Sustainable Development (ESD) addresses biodiversity by focusing on the interlinking issues of biodiversity and livelihoods, agriculture, livestock, forestry, fisheries, and other topics. The Decade offers an opportunity to develop a better understanding of how consumption impacts biodiversity at local and global levels, to sensitize young people to their roles and responsibilities in this process and to advance progress made in human resource development, education and training to prevent habitat loss and degradation, species loss, and pollution. ESD thus permits discussions on the development of awareness and educational materials, as well as engaging youth and children on a wide range of biodiversity issues and actions and offering possibilities for more innovative ways of learning about biodiversity (Boxes 29-31).

One of the principal tools widely used for promoting biodiversity education in the context of the UNDESD is the UNESCO Associated Schools Network. Founded in 1953, this global network comprises some 7,900 educational institutions in 176 countries (ranging from pre-schools and primary to

Box 28 Global Initiative on Biodiversity Education

In 1999 UNESCO and the CBD jointly developed the Global Initiative on Biodiversity Education, which has led to the agreed CBD Programme of Work on Biodiversity Education and Public Awareness. The main elements of this programme focus on:

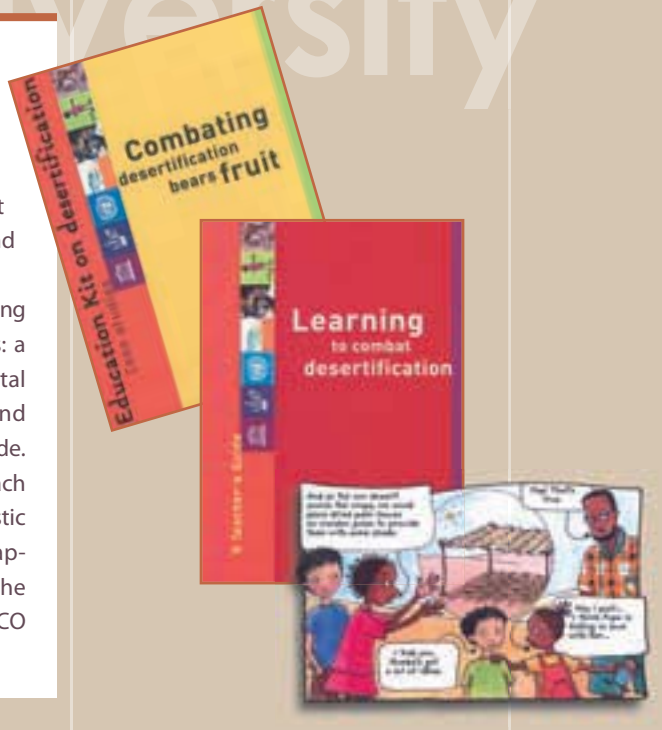
- Stimulating and coordinating networks composed of new information technologies and traditional communication mechanisms;
- Exchanging of knowledge and expertise among professionals, enhancing development and innovation on communication, education and public awareness;
- Developing capacity of the governments to market biodiversity to other sectors, and mainstreaming biodiversity into the work of other sectors.

Box 29 Educating about drylands

In 2001, UNESCO's MAB Programme launched a desertification kit for schools in tandem with the UN Convention to Combat Desertification (UNCCD). The kit targets teachers and their 10-12 year-old pupils. It comprises a teacher's guide, a compilation of case studies, a classroom poster showing desertification in the world and a comic book. Part I of the teacher's guide explains the causes of desertification and consequences on climate and geography, biology and on the socioeconomic sphere.

Part II introduces the UNCCD and describes activities for combating desertification. The kit includes case studies of solutions employed in Algeria, Chile, China, Ecuador, Gambia, India, Italy, Kenya, Niger, Peru, Spain and Uzbekistan. The kit was distributed to schools in dryland countries around the world.

Currently in preparation, a"Teaching Resource Kit for Dryland Countries: a creative approach to environmental education" is aimed at primary and secondary school teachers worldwide. It is based on an innovative approach appealing to the creativity and artistic sensibilities of pupils aged 6-15 approximately. The kit ties in with the activities developed for the UNESCO spearheaded UNDESD (2005-2014).



- http://unesdoc.unesco.org/images/0012/001258/125816e.pdf

Box 30 Sandwatch, a global activity involving islands

Sandwatch started in the Caribbean in 1999 as an initiative of UNESCO's platform for Environment and Development in Coastal Regions and Small Islands and the UNESCO Associated Schools Network. Today, Sandwatch is a global activity involving islands as far apart as Cook Islands in the Pacific, Seychelles in the Indian Ocean, and the Bahamas in the Caribbean. It is an educational process, with a strong field monitoring component, through which school students and community members learn and work together to critically evaluate the problems and conflicts facing their beach environments and to develop sustainable approaches to address these issues. Sandwatch provides a new vision of education, one that seeks to empower people of all ages to assume responsibility for creating and enjoying a sustainable future.

Secondary pupils in the Dominican Republic learning to measure wave height.
Photo: © Maria Mercedes Brito-Feliz.

- http://portal.unesco.org/education/en/ev.php-URL_ID=33884&URL_DO=DO_TOPIC&URL_SECTION=201.html

Box 31 A tree at the centre: The Mapuche-Pewenche, people of the Araucaria

In the Andes of southern Chile, the Araucaria tree is an ecological keystone species that also plays a central role in the economic, social and spiritual lives of the indigenous inhabitants of the area, who call themselves 'Mapuche-Pewenche' - the people of the Araucaria tree. With the support of UNESCO-LINKS, and in consultation with the local communities, the indigenous Markan-Kura Association has collected knowledge relating to the Araucaria so as to enhance teaching material in schools in the Mapuche-Pewenche territory. As a result, two pedagogical textbooks have been developed, each one conceived for different primary education segments. The aim is not only to encourage the safeguarding of the Mapuche language through bilingual education, but also to move beyond a mere translation of western scientific concepts to presenting Mapuche understandings of their environment in a way that is consistent with their own world view.

A Mapuche-Pewenche woman addressing prayers to a Pewen tree (*Araucaria araucana*) as part of a Kon Pewen Gellipun ceremony
Photo : © Asociación Mapuche Pewenche Markan Kura de Ikalma.

secondary schools and teacher training institutions) that work in support of quality education in practice. Associated schools help to achieve education on sustainable development, including education on biodiversity, by creating innovative educational material and methods and developing exchanges of students and teachers worldwide (Box 32).

Educating, Training and Building Capacity on Biodiversity Conservation and Sustainable Management

Education, training and capacity building activities are key components of all UNESCO actions aiming at pursuing sustainable development through conservation and sustainable use of biodiversity.

Education on biodiversity is at the heart of the MAB Programme and its World Network on Biosphere reserves. During the UNDESD, biosphere reserves are being promoted as learning laboratories for sustainable development with particular emphasis given to policy prescriptions and practices that drive biodiversity trends and social and economic change. Education and capacity building continue to play the important role they have always enjoyed throughout the origin and evolution of the concept and practice of biosphere reserves; together they constitute the link that promotes an iterative and learning interaction between science, policy and practice.

The UNESCO Office in Cairo has recently launched an educational kit containing important information on biosphere reserves and biodiversity. The kit consists of two learning CDs, a brochure and a book entitled Adventures of Bakar and Takhtana (famous children Characters in Egypt) in Wadi Allaqi Biosphere Reserve.

The UNESCO Office in Montevideo in collaboration with the University for International Cooperation, IUCN and the Foundation for the Conservation of Chiquitano Forest, have recently organized training courses on ecosystem approach taking as examples biosphere reserves and other landscape projects in

Box 32 The Great Volga River Route project

Biodiversity conservation in UNESCO sites is at the heart of one of the flagship biodiversity education projects of the UNESCO Associated Schools Network - the Great Volga River Route project launched in 2004. This cross-cutting inter-sectoral project of UNESCO aims at linking young people engaged in the preservation and promotion of World Heritage and biosphere reserve sites and sustainable development issues. It links 16[7] countries located along the Volga River and on the banks of the Baltic, Black and Caspian Seas. The project intends to explore and develop the effective use of information and communication technologies to improve quality education and serves as a concrete contribution to the UNDESD.

Photo: © Bernard Combes.

● **http://portal.unesco.org/education/en/ev.php-URL_ID=37313&URL_DO=DO_TOPIC&URL_SECTION=201.html**

* Azerbaijan, Bulgaria, Estonia, Finland, Georgia, Germany, Latvia, Lithuania, Iran, Kazakhstan, Poland, Romania, Russian Federation, Sweden, Turkey and Ukraine.

Latin America and the Caribbean so as to take into account the Latin-American perspectives to achieve the goals of the CBD.

The World Heritage Centre builds protected area management capacity to conserve outstanding biodiversity values worldwide. Since 1994, the World Heritage Education Programme has given young people a chance to voice their concerns and to become involved in the protection of the world's natural and cultural heritage. Pedagogical approaches are developed, and international youth forums on world natural heritage, training seminars and courses on concrete approaches to conservation are organized as a part of the project (Box 33).

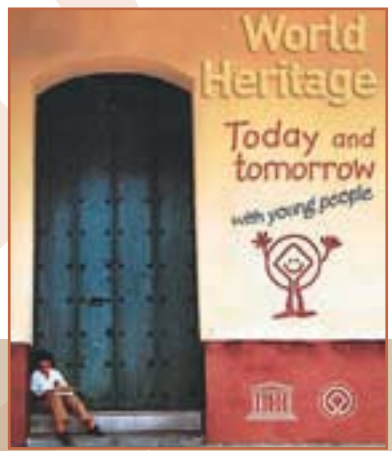
Since 2006 the UNESCO-VOCATIONS PATRIMOINE Fellowships for World Heritage Site Managers Programme has provided fellowships to reinforce the capacity of professionals working in the management, conservation and development of a World Heritage property. This programme is an important tool in UNESCO's efforts to conserve and promote the outstanding universal value that justifies a property's inscription on the World Heritage List.

UNESCO has considerable experience in advancing research, training and programme development in higher education by building university networks and encouraging inter-university cooperation through transfer of knowledge across borders. Since 1992, 609 UNESCO Chairs and 67 UNITWIN Networks have been developed involving over 730 institutions in 125 countries. Environment and biodiversity are the focus in several collaborative networks and chairs, such as in the Cheikh Anta Diop regional UNESCO chair in Dakar.

Box 33 **Examples of pedagogical approaches of the World Heritage Education Programme**

"World Heritage in Young Hands" Resource Kit for Teachers is used as a tool to encourage young people to develop strong conservation ethics and responsibility for the environment and to approach life in a sustainable way to protect species and ecosystem diversity. The kit, published in 30 languages, introduces some of the major issues in environmental conservation and their significance to World Heritage conservation as well as the interaction between people and the environment.

"Patrimonito in the Sub-Antarctic Islands" is an episode within a series of animated adventures for young people on World Heritage conservation (Patrimonito's World Heritage Adventures). This cartoon series was launched in 2002, when UNESCO organized a storyboard competition among secondary-school students to raise their awareness of the importance of World Heritage and their role in preserving it. In each episode Patrimonito introduces a World Heritage site, the threats it is facing and proposes solutions to preserve it. In April 2006, the episode on the Sub-Antarctic Islands showing how the site is threatened by alien species, was selected for the 20th International Nature and Environmental Film Festival of Grenoble (France) and was included in the roster of school presentations.



● http://whc.unesco.org/education/

· · · EDUCATION, CAPACITY BUILDING, and COMMUNICATION · · ·

In the field of heritage, UNESCO founded in 1995 an international network named "Forum UNESCO - University and Heritage" (FUUH) to support its action in favour of cultural and natural heritage protection, enhancement and conservation. FUUH links heritage conservation professionals to academics and students and creates synergies between universities and the media, locally elected representatives, tourist guides and teachers to ensure the protection of heritage. Structured in thematic sub-networks, consisting of international interdisciplinary research teams, the network counts some 10,000 members from over 400 universities in some 115 countries.

UNESCO encourages young scientists to conduct interdisciplinary research on ecosystems, natural resources, biodiversity and sustainability under the MAB Young Scientists Award Scheme that annually awards ten young scientists throughout the world.

In partnerships with various donors, UNESCO also builds institutional capacity on natural resources management, such as the regional postgraduate school on integrated management of tropical forests and territories (ERAIFT) (Box 34).

UNESCO also works on strengthening capacities at local levels through the use of space technologies to monitor UNESCO's natural heritage sites and biosphere reserves and to make use of space science and technology for public outreach on biodiversity issues.

Recognizing the importance of local knowledge for sustainable and participatory biodiversity management, UNESCO promotes the transmission of local ecological knowledge by generating dialogue across generations, and highlighting the connections between local knowledge and science. A nota-

Box 34 **Training African forest managers via ERAIFT**

UNESCO launched a postgraduate training in tropical forest management in 1999 at the University of Kinshasa in the Democratic Republic of the Congo. Named ERAIFT (École régionale post-universitaire d'aménagement et de gestion intégrés des forêts et territories tropicaux), the school is training a new generation of African specialists and decision-makers to apply the ecosystem approach *in situ* to forest management in Africa. Financial partners include the governments of Belgium and the Democratic Republic of the Congo and the European Union.

In 2007, after the graduation of 65 Masters students, ERAIFT has graduated the first set of PhD students attaining its highest level of training of African specialists.

The fourth promotion of the Masters programme was launched at the same time as the PhD graduation with 24 new students intake from several African countries: Thanks to the financial support from the European Union/Kinshasa, ERAIFT has now two additional buildings, completely refurbished. These buildings will now permit ERAIFT to lodge 25 additional students increasing its capacity to 50 accommodations. At the same time, the ERAIFT new GIS laboratory is currently being equipped with new computers and other ITC equipment.

It is envisaged to replicate the success of ERAIFT approach in Africa in other regions of the world.

● **www.eraift.org**

Third promotion of Masters students (2005). Photo: © ERAIFT

ble example is the UNESCO-LINKS project on village-level documentation and transmission of local environmental knowledge in Solomon Islands. One of the results of the project is the publication of Reef and Rainforest: An Environmental Encyclopedia of Marovo Lagoon in 2005. This encyclopedia, written in both the Marovo and English languages, is based entirely upon local knowledge of the environment and is envisaged as a starting point for a process whereby school students begin to engage with local indigenous knowledge.

At the time when increasing controversy and public concern arise around the issues of biosafety and in particular that of genetically modified organisms (GMOs), UNESCO's Division of Basic Sciences, in collaboration with the International Centre for Genetic Engineering and Biotechnology, is currently producing a pedagogical teaching tool on GMOs. The kit will provide teachers with the tools and information they need to teach secondary school pupils about GMOs. This topic has been chosen for its public interest but will hopefully serve as a tool to stimulate critical thinking of the society on other scientific advances it increasingly has to deal with.

Enhancing Communication, Networking and Outreach on Biodiversity

Sharing and exchanging information, knowledge, practices and approaches through networking people and institutions is a key objective for UNESCO. Thus UNESCO's action on biodiversity has a strong communication and networking component.

For instance, some of the UNESCO supported initiatives include the World Network of Biosphere Reserves, and its thematic and regional networks (AfriMAB, EuroMAB, ArabMAB, South and East Asian Biosphere Reserves Network, IberoMAB, PacMAB, and the Ibero-American Programme for the Development of Science and Technology).

UNITWIN Networks, Microbial Resources Centres, the Coastal Regions and Small Islands Platform, the LINKS Programme are other examples of networking initiatives of UNESCO. Via these platforms, practices for biodiversity research, conservation, and sustainable use are exchanged, and lessons learned are widely disseminated.

With regard to communication, UNESCO is keen on taking advantage of new information and communication technologies (ICTs). ICTs provide improved means for monitoring habitat change and species distribution as well as for handling and analysing large data sets and accessing biodiversity information.

UNESCO increasingly supports internet-based discussion forums, and the establishment of community multimedia centres which combine community broadcasting with Internet and related technologies in promoting community empowerment for biodiversity management. ◆

BIODIVERSITY
International Conventions

Recognizing the importance of biodiversity for environmental and human well-being, UNESCO contributes to major international conventions and agreements that aim at sustaining the variety of life on Earth and reducing the current rate of its loss:

- The World Heritage Convention (WHC);
- Convention on Biological Diversity (CBD);
- The Ramsar Convention on Wetlands (Ramsar);
- The Convention on Migratory Species (CMS); and
- The Convention on International Trade in Endangered Species (CITES).

UNESCO provides technical support to countries to help them to implement the provisions of these agreements.

The Convention concerning the Protection of the World Cultural and Natural Heritage is one of the major global biodiversity conventions aiming at protecting the heritage of outstanding universal value.

UNESCO's World Heritage Centre encourages countries to sign the World Heritage Convention, and to nominate sites for inclusion on the World Heritage List. It also helps countries to carry out their conservation commitments, and galvanizes new partnerships in support of heritage conservation activities, from site-specific interventions to global programmes.

The Centre cooperates closely with other biodiversity-related Conventions, individually and also through the mechanism of the Biodiversity Liaison Group comprised of the Heads of the Secretariats of the major multilateral environmental agreements (CBD, Ramsar, CMS, CITES, and WHC).

UNESCO is a key partner of the CBD and has assisted the CBD in the development and implementation of its decisions in relation to several of its themes and cross cutting issues. Since the inception of the CBD in 1992, UNESCO has been particularly attentive with regard to the development of international biodiversity policies. UNESCO has contributed directly to informing recommendations by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and decisions of the Conference of the Parties (COP) to the CBD.

More specifically, UNESCO has been supporting the work of the SBSTTA on a systematic basis and has contributed substantively and substantially to working documents of SBSTTA on, *inter alia*, biodiversity and tourism, biodiversity communication, education and public awareness, marine and coastal biodiversity, inland and inland water biodiversity, the Ecosystem Approach, protected areas, etc. In doing so, UNESCO has been able to make available its knowledge and experience, including field-based knowledge, to inform the CBD process.

UNESCO cooperates in a similar manner with the Ramsar Convention, the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD). It has also contributed to the production of reports that have fed directly into decisions related to oceans and the law of the sea by the United Nations General Assembly.

UNESCO is committed to raising the political and societal profile of biodiversity through publications, briefings with its Member States' permanent delegations and the organization of major events such as the France-UNESCO International Conference on Biodiversity: Science and Governance that took place in UNESCO's Headquarters in Paris in January 2005 (Box 35).

Box 35 **International Conference on Biodiversity: Science and Governance**

The Conference was held at UNESCO Headquarters in Paris, in 2005, was organized by the French Ministry for Research and co-sponsored by UNESCO.

It was part of the ongoing global effort to curb the loss of biodiversity by 2010 and ensure the long-term conservation and sustainable use of biological diversity, as well as the fair and equitable sharing of the benefits that genetic resources can yield. The Conference aimed at contributing to and strengthening the ongoing global processes steered by the CBD, other relevant international conventions, international organizations and programmes. It also aimed at sensitizing public opinion to scientific and social issues connected to biodiversity.

Based on the presentations and discussions during the Conference, leading scientists, policy makers and representatives of civil society elaborated a joint statement recalling the commitment of governments to the global target of significantly reducing the rate of biodiversity loss by 2010 as a fundamental condition for sustainable development urging:

- Governments to take all necessary actions, including capacity building, needed to realize the 2010 Biodiversity Target, consistent with their sustainable development goals;
- Civil society, including local and indigenous communities and the private sector, to take actions consistent with the 2010 Biodiversity Target;
- The scientific community to develop greater national and international coordination;
- The necessary public and private resources to be mobilized for the interdisciplinary scientific research and monitoring;
- Improved communications and partnerships among the scientific community, decision makers and civil society, including local and indigenous communities;
- Parties and Secretariats to the multilateral environmental agreements to built greater cooperation and synergy.

● http://www.recherche.gouv.fr/biodiv2005paris/en/

Annex

Agricultural Ecosystems	☐ International Assessment of Agricultural Science and Technology for Development: http://www.agassessment.org/ ☐ Man and the Biosphere Programme (MAB) Programme: http://www.unesco.org/mab/mabProg.shtml ☐ Local and Indigenous Knowledge Systems: http://portal.unesco.org/sc_nat/ev.php?URL_ID=1945&URL_DO=DO_TOPIC&URL_SECTION=201
Dry and Sub-humid Lands Ecosystems	☐ MAB drylands programme: http://www.unesco.org/mab/ecosyst/drylands.shtml
Forest Ecosystems	☐ MAB Tropical forests programme: research, conservation, and training for sustainable resources management: http://www.unesco.org/mab/ecosyst/trop_forests.shtml ☐ Forests: World Heritage thematic programme: http://whc.unesco.org/en/activities/&pattern=&search_theme=6 ☐ The Great Apes Survival Project: http://www.unesco.org/mab/grasp/home.shtml ☐ ERAIFT: www. eraift.org
Freshwater Ecosystems	☐ Ecohydrology: http://www.unesco.org/water/ihp/ihp_five_results.shtml#eco ☐ DIVERSITAS Freshwater BIODIVERSITY: http://www.diversitas-international.org/cross_freshwater.html ☐ International Hydrological Programme: http://typo38.unesco.org/index.php?id=240
Island Ecosystems	☐ Island and coastal areas: sustainable use of natural resources and human development: http://www.unesco.org/mab/ecosyst/islands.shtml ☐ Sustainable Development in Coastal Regions and Small Islands (CSI): http://www.unesco.org/csi/
Marine and Coastal Ecosystems	☐ Intergovernmental Oceanographic Commission (IOC): http://ioc.unesco.org/iocweb/index.php ☐ Marine Environmental Protection: http://ioc.unesco.org/iocweb/environmentalProtection.php ☐ Partnership on coastal and marine protected areas: http://ioc3.unesco.org/mpa/index.php ☐ Global Ocean Ecosystem Dynamicsvhttp://www.globec.org/ ☐ World Heritage Marine Programme: http://whc.unesco.org/en/activities/&pattern=&search_theme=7 ☐ Global Coral Reef Monitoring Network: http://www.gcrmn.org/ ☐ CSI: http://www.unesco.org/csi
Mountain Ecosystems	☐ Sustainable mountain resources management: http://www.unesco.org/mab/ecosyst/mountains.shtml
Urban Ecosystems	☐ UNESCO's Man and the Biosphere Urban Group: http://www.unesco.org/mab/ecosyst/urban.shtml ☐ Sustainable Urbanization: http://portal.unesco.org/education/en/ev.php-URL_ID=32524&URL_DO=DO_TOPIC&URL_SECTION=201.html ☐ The Global Alliance's Creative Cities Network: http://portal.unesco.org/culture/en/ev.php-URL_ID=24544&URL_DO=DO_TOPIC&URL_SECTION=201.html ☐ World Heritage Cities Programme: http://whc.unesco.org/en/activities/&pattern=&search_theme=11
Wetlands	☐ UNESCO and Ramsar joint efforts to preserve important sites: http://www.unesco.org/mab/ecosyst/wetlands.shtml

More on Biodiversity in UNESCO at http://www.unesco.org/mab/biodiv/unesco/home.shtml

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