



Biodiversity, the variety of life on Earth, is disappearing at an increasing rate.

The international community has committed itself to significantly reducing this rate of loss, as it strives to achieve the Millennium Development Goals.

Science and governance for conserving and sustainably using biodiversity are key elements to decrease the rate of loss of biodiversity.

UNESCO's activities promoting international cooperation in science and governance are therefore essential to help countries to meet this global objective.

UNESCO was established in 1945, with the overall purpose of contributing to "peace and security by promoting collaboration among nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world (...)"

Since its very early days, UNESCO has had projects specifically focused on the diversity of nature and the resources provided by nature. These activities relate to scientific research and ecosystem management, normative instruments, interactive networks for sharing information, education and communication, and cultural and ethical concerns.

UNESCO and BIOdiversITY

1945 Founding of UNESCO, with 'S' inserted into 'UNECSO'

1946 Biologist Julian Huxley appointed as UNESCO's first Director-General (1946-48)

1948 With French government and Swiss League of Nature, **Fontainebleau Conference** leading to setting-up of International Union for the Protection of Nature (IUPN, now IUCN, World Conservation Union)

1949 Technical Conference at Lake Success (USA) on the Protection of Nature (with IUPN)

RESEARCH

Investigating biodiversity

Through scientific cooperation programmes, UNESCO contributes to a better understanding of biodiversity and its composition, structure and functions – at different scales of time (including geological) and space (from microbes to biosphere), in marine, freshwater and terrestrial environments.

At the genetic level, Microbial Resources Centres promote germplasm conservation and application.

Research at species and population levels

ranges from Silurian radiation to phytoplankton dynamics, from forest-tree demographies to the abundance and distribution of great apes.

At the ecosystem level, research includes studies on structure and functioning of different ecosystem types, including human use systems; work to restore degraded ecosystems such as mangroves; reflection on 'emerging ecosystems'; IOC work to improve long-term sustainability of resources and environments of the world's Large Marine Ecosystems (LMEs) and linked watersheds; and the IGCP project on the evolution of ecosystems and climate in the Devonian era.



MEASURING

Observing and monitoring change

UNESCO is supporting global and regional observation programmes that monitor biodiversity changes.

Observations focus on processes and parameters that affect biodiversity, such as land use changes and water quality, and are based on standardized or inter-calibrated methodologies whenever appropriate.

Capacity-building activities enable natural and social scientists and technicians to make observations in the field and use data from remote sensing.

For guiding policy-makers, the information generated through repeated observations is integrated in biodiversity inventories, research results and scientific assessments of the status of ecosystem services at different scales.

The development of standards and the building of systems for managing and sharing biodiversity information are also supported.

KNOWLEDGE

Empowering local and indigenous knowledge holders

Knowledge and know-how possessed by local and indigenous communities is the living memory of the timeless interplay between cultural and biological diversity.

Local and Indigenous Knowledge Systems (LINKS) is a UNESCO project aimed at empowering local communities in resource governance processes, by demonstrating that their in-depth knowledge, practical know-how and unique worldviews make them indispensable partners for scientists, resource managers and policy-makers.

Enhancing the dynamism of local and indigenous knowledge within communities is approached by encouraging its transmission both through schooling and through strengthening ties between elders and youth.

BIOETHICS

Ethics and biodiversity

Societal values, norms and traditions shape our relationships with the living world.

Ethics can help us to better understand and re-orient these relationships.

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.

Ethical questions related to biodiversity conservation, sustainable use and benefit sharing are among the issues to be addressed in the coming years.

- 1956 Kandy Symposium on 'Study of tropical vegetation', for launch of Humid Tropics Research Programme
- 1959 Founding of Charles Darwin Foundation for the Galápagos Islands
- 1959 Launch of Indian Ocean Expedition (1959-65)
- 1960 Setting-up of Intergovernmental Oceanographic Commission (IOC)
- 1963 Review of natural resources of Africa
- 1964 Establishment of Organization for Flora Neotropica
- 1964 Launch of ICSU's International Biological Programme (IBP) (1964-74), with first General Assembly at UNESCO (Paris)
- 1965 First issue of quarterly magazine Nature & Resources (1965-99)
- 1968 Intergovernmental Conference on the Conservation and Rational Use of the Resources of the Biosphere at UNESCO (Paris)
- 1971 International Coordinating Council for the Programme on Man and the Biosphere (MAB) – First session
- 1971 Ramsar Convention on Wetlands (UNESCO is depositary institution)
- 1972 World Heritage Convention adopted by UNESCO General Conference

From knowing

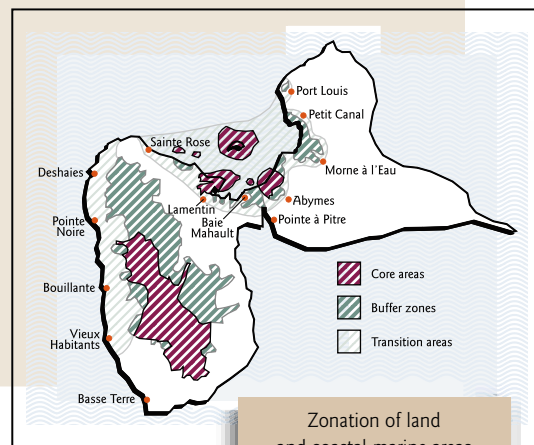
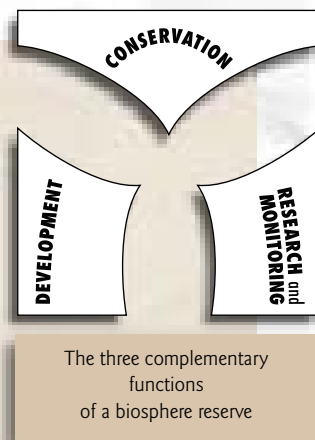
BIOSPHERE RESERVES

Biosphere reserves are special places where multiple stakeholders come together to build mutually supportive linkages between biodiversity conservation and socio-economic development using research, monitoring, capacity building, as well as participatory planning and management techniques and tools.

As laboratories for experimenting and demonstrating sustainable development, biosphere reserves are being promoted in particular during the UN Decade of Education for Sustainable Development.

Science and governance practices promoting sustainable use of biodiversity at various spatial scales are studied and relevant data, information and knowledge collated, documented and disseminated.

The World Network of Biosphere Reserves, established under UNESCO's Man and Biosphere Programme (MAB) and consisting of 459 sites in 97 countries aims at ensuring a systematic global representation of biodiversity, and at providing an operational structure for exchanges of experience, ideas and people.



Zonation of land and coastal-marine areas in Guadeloupe Archipelago Biosphere Reserve, France.

EDUCATION

UNESCO was designated by UN General Assembly Resolution 57/254 to lead the Decade of Education for Sustainable Development (2005-2014). In addressing biodiversity, the focus is on the interlinking issues of biodiversity and livelihoods, such as agriculture, livestock raising, forestry and fisheries.

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 role and responsibility in this process and to accelerate human resource development, education and training to prevent habitat loss and degradation, species loss, and pollution.

VALORIZING

Substantiating and enhancing values

Effective biodiversity conservation, sustainable use of nature resources and benefit sharing require information about the social and economic values derived from biodiversity and policies that can help to capture them.

Millennium Ecosystem Assessment

activities are supported, such as the assessment of the different values of the São Paulo City Green Belt Biosphere Reserve (Brazil).

Research on the development of quality economies and eco-jobs

is promoted in sites identified under UNESCO programmes, focusing on the valorization of biodiversity goods and services: for example, ecotourism, policies for market creation, access and appropriation of resources, labelling and certification of local products.

- 1973** Expert panel on "Conservation of Natural Areas and the Genetic Material They Contain" (MAB Project 8) (IUCN-Morges)
- 1974** MAB task force on criteria and guidelines for the choice and establishment of biosphere reserves
- 1975** Start of UNESCO-UNEP **International Environmental Education Programme (IIEP)** (1975-95)
- 1975** Setting-up of **World Network of Microbiological Resources Centres (MIRCENS)**
- 1976** Designation of first biosphere reserves (37 sites)
- 1978** UNESCO/UNEP/FAO state-of-knowledge report on tropical forest ecosystems
- 1980** World Conservation Strategy launched by IUCN, with UNEP, WWF, FAO, UNESCO
- 1983** International Biosphere Reserve Congress (Minsk)
- 1983** UNESCO Coastal Marine Programme Seminar (Jakarta) on 'The Traditional Knowledge and Management of Coastal Systems in Asia and the Pacific'
- 1983** UNESCO/AETFAT/UNSO Vegetation Map of Africa and accompanying descriptive memoir

to-doing

WORLD HERITAGE CONVENTION and the World Heritage List

The Convention concerning the Protection of the World Cultural and Natural Heritage is one of the five global biodiversity conventions, along with the Convention on Biological Diversity (CBD), Ramsar Wetlands, Migratory Species and the Convention on International Trade in Endangered species (CITES).

'**Outstanding universal value**' is the principal criterion for identification and approval of properties to be inscribed on the World Heritage List.

Increasingly innovative ways are being used in recent years by governments, multilateral agencies, NGOs, the private sector and individuals to promote *in-situ* conservation of high value biodiversity areas, both terrestrial and marine.

UNESCO's World Heritage Centre 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.

CAPACITY-BUILDING

UNESCO actions on biodiversity are infused with capacity-building activities, with priority to the development of specialist skills in research, policy, outreach and communication. Building institutional capacity, such as the post-graduate school on tropical forest lands in Kinshasa, is supported by partnerships with various donors.

UNITWIN Networks and the UNESCO Chairs Programme are located in more than five hundred institutions in one hundred countries. Environment and biodiversity are the focus of training and research activities in several collaborating networks and chairs, as in the Cheikh Anta Diop Regional UNESCO Chair in Dakar.

The World Heritage Convention and Centre build protected area management capacity to conserve outstanding biodiversity values throughout the world.

Research grants to young scientists are awarded each year under the MAB Programme as well as under the Global Biodiversity Information Facility (GBIF) partnership.

NETWORKING INITIATIVES

Individual and institutional linkages

Governance of biodiversity requires competent individuals and institutions that can share and exchange information, knowledge, practices and approaches.

Scientists, local communities, policy-makers, NGOs and the private sector all have a crucial role to play in the governance of biodiversity, at local, national and regional scales. Networking people and institutions, through research and training activities and programmes, is a key objective for UNESCO.

UNESCO-supported initiatives include the World Network of Biosphere Reserves and its thematic and regional networks (e.g. EuroMAB, AfriMAB, ASPACO), Microbial Resources Centres (MIRCENS), the CSI Platform and the LINKS Project.



- 1988** UNESCO/IUCN workshop (San Francisco) on applying the biosphere reserve concept to coastal marine areas
- 1991** Biosphere Reserve Integrated Monitoring (BRIM) proposed at EuroMAB meeting in Strasbourg
- 1991** IUBS, SCOPE and UNESCO original institutional partners in **Diversitas**, set up to catalyse and catalogue knowledge about biodiversity
- 1992** Convention on Biological Diversity (CBD) signed by 150 government leaders at Rio Earth Summit
- 1992** First meeting of Biological Diversity subprogramme of Inter-American Programme for Science and Technology for Development (CYTED)
- 1992** Adoption of 'cultural landscapes' categories under the World Heritage Convention
- 1992** Launch by WWF, UNESCO and Royal Botanic Gardens Kew of People and Plants, aimed at promoting ethnobotany and the sustainable use of plant resources
- 1993** Creation of UNESCO **Bioethics Programme**
- 1993** 'Biodiversity dynamics and protection in Dinghuson Biosphere Reserve, China' - one of annual awards in MAB Young Scientists

PARTNERSHIPS and FINANCING

Mobilizing resources

Finance and partnerships are increasingly among the most critical components for improved biodiversity governance worldwide.

Brokering public and private sector

support for biodiversity activities, in partnership with Member States, is among UNESCO's functions. Examples include support from the United Nations Foundation and the Global Environment Facility in favour of sites identified under UNESCO programmes.

Support to microfinance schemes and the establishment of trust funds in such sites are among the approaches of the Conservation Finance Alliance, of which UNESCO is a member. The Great Apes Survival Project (GRASP) of UNEP and UNESCO is an example of how public-private partnerships can be built for biodiversity conservation and use.

POLICIES and STRATEGIES

Cultural diversity and biological diversity

Understanding the diverse linkages between cultural diversity and biodiversity is essential to build policies for the conservation and valorization of both biological and cultural diversity.

'Cultural Diversity and Biodiversity for Sustainable Development' was the topic of a High-level Round Table which raised the awareness on these linkages among decision makers, organized by UNESCO and UNEP at the World Summit on Sustainable Development (WSSD) at Johannesburg. UNEP and UNESCO are preparing an overview of key issues at stake.

The UNESCO Universal Declaration on Cultural Diversity (adopted in 2001) reflects an international consensus regarding cultural diversity and its links with sustainable development. UNESCO continues to work towards mainstreaming cultural diversity into policy agendas by promoting intercultural dialogue.

MULTILATERAL ENVIRONMENTAL AGREEMENTS

Implementing international conventions and agreements

Recognizing the importance of biodiversity for human societies, the countries of the world have agreed in several international conventions and agreements to conserve and manage aspects of biodiversity.

These agreements include the Convention on Biological Diversity (CBD), the World Heritage Convention, the Ramsar Convention on Wetlands, the Convention on Migratory Species. UNESCO provides technical support to countries to help in implementing the provisions of these agreements.

Countries are encouraged to apply the CBD's Ecosystem Approach in Biosphere Reserves and World Heritage Sites. These sites are also used for testing the CBD's guidelines on sustainable tourism. UNESCO contributes technically to emerging issues related to the conservation of marine biological diversity in the high seas.

COMMUNICATION

Taking advantage of new technologies and opportunities

Today's processes of globalization are, in part, driven by new information and communication technologies (ICTs), which have multiple impacts on biodiversity.

ICTs provide improved means for monitoring habitat changes and species distributions, as well as for handling and analysing large data sets and accessing biodiversity information (e.g. products of the UNESCO-affiliated Expert Centre for Taxonomic Identification (ETI) at the University of Amsterdam).

UNESCO Internet-based discussion forums enable individuals to exchange experience and information on biodiversity, in such domains as wise coastal practices.

Community Multimedia Centres (CMCs) combine community broadcasting with Internet and related technologies in promoting community empowerment for biodiversity management.

DIALOGUE

Permanent dialogue for conflict prevention and management

UNESCO is capitalizing on experiences, cultural approaches, practices and methodologies to foster dialogue and concertation under different cultural and socio-economic contexts.

Managing biodiversity in multi-use spaces in a sustainable development perspective is being addressed in biosphere reserves. Through the MAB and IHP initiatives, research, training and capacity-building focus on prevention and management of conflicts linked to biological resources.

Analyses have shown that success does not lie only in the immediate resolution of a given conflict, but more in the establishment of permanent platforms for communication and concertation among stakeholders.

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Division of Ecological and Earth Sciences and the **Programme on Man and the Biosphere (MAB)**, including the **World Network of Biosphere Reserves** (presently with 459 sites in 97 countries).

Action through:

- ◆ Promoting international collaboration in research and monitoring in ecology;
- ◆ Testing and demonstration sites on sustainable development;
- ◆ National, regional and thematic networking;
- ◆ Human and institutional capacity-building on management of natural resources.

<http://www.unesco.org/mab>

Convention concerning the Protection of the World Cultural and Natural Heritage, with the World Heritage List, comprising 788 sites including 154 natural and 23 mixed (natural and cultural).

Main activities:

- ◆ Identification, conservation and monitoring of cultural and natural sites of outstanding universal value;
- ◆ Capacity-building for long-term site integrity and conservation;
- ◆ Linking cultural and biological diversity, including sacred sites and cultural landscapes;
- ◆ Leveraging international assistance and cooperation.

<http://whc.unesco.org>

Intergovernmental Oceanographic Commission (IOC). Includes several initiatives relating to coastal and marine biodiversity.

Activities include:

- ◆ Collaborative research on coral bleaching, harmful marine algae, benthic and fisheries indicators;
- ◆ Global Coral Reef Monitoring Network (UNEP, World Bank, IUCN, IOC) and its biennial *Status of Coral Reefs of the World*;
- ◆ Co-patronage of the Global Forum on Oceans, Coasts and Islands.

<http://ioc.unesco.org>

International Hydrological Programme (IHP). 'Freshwater resources and associated ecosystems' is the overall priority theme within UNESCO's Natural Sciences Sector.

Key focus:

- ◆ Ecohydrology approach;
- ◆ Development of coupled water, land and biodiversity management strategies;
- ◆ Prevention and resolution of water-related conflicts.

<http://www.unesco.org/water>

International Geosciences Programme (IGCP). Joint initiative of UNESCO and ICSU's International Union of Geological Sciences (IUGS). Includes studies of changes in biological diversity over geological time.

Recent and ongoing projects include:

- ◆ Development of an African pollen database;
- ◆ Variscan terrestrial biotas and palaeoenvironments;
- ◆ Triassic/Jurassic boundary events;
- ◆ Ordovician palaeogeography and palaeoclimate.

<http://www.unesco.org/science/earth/igcp/index-igcp.html>



Photo: © Hubert de Foresta. Guyane.



Photo: © Hubert de Foresta. *Caryocar glabrum*. Guyane.

- 1999** UNESCO-ICSU Workshop on 'Science and Other Systems at the World Conference on Science on Science' (Budapest)
- 1999** UNESCO-SOLAGRAL briefing kit on genetically modified organisms (GMOs)
- 2000** Launch of UNEP-UNESCO GRASP initiative, aimed at mobilizing support for conservation of great apes
- 2001** 'Biodiversity and Society' Conference at Columbia University, New York
- 2001** Universal Declaration on Cultural Diversity
- 2001** Coral bleaching, harmful algal blooms and benthic indicators among topics in IOC's restructured Ocean Sciences Programme
- 2002** Launch of cross-cutting project on Local and Indigenous Knowledge Systems (LINKS)
- 2002** High-level UNESCO-UNEP Roundtable on 'Cultural diversity and biodiversity for sustainable development', during WSSD in Johannesburg
- 2002** UNESCO-MAB/ICSU-SCOPE workshop on 'Emerging ecosystems' (Grenada)
- 2003** UN Foundation (UNF) project on management effectiveness of World

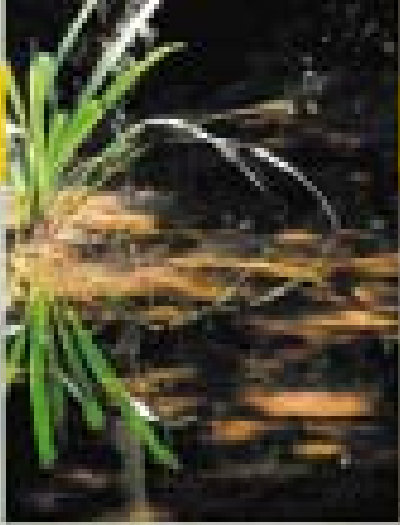


Photo: © Hubert de Foresta. Guyane.

Coastal Regions and Small Islands (CSI) Platform. Set-up in 1995-96 to catalyse joint actions among five programme sectors in UNESCO headquarters and field offices in the various regions of the world.

Three main activities:

- ◆ Field projects (e.g. village-based marine resource management in Vanuatu);
- ◆ UNESCO chairs and university twinning;
- ◆ Multilingual Internet-based forums, such as Wise Coastal Practices (WiCoP), with 19,000 persons connected.

<http://www.unesco.org/csi>

Microbial Resources Centres (MIRCENS). One of the networks of the Division of Basic and Engineering Sciences, with 34 MIRCENS established world-wide since 1975 in partnership with UNEP, UNDP and other partners.

Promoting microbiology and its biotechnological applications:

- ◆ Conservation of microbial germplasm;
- ◆ Bioremediation and bioconversion processes;
- ◆ Microbial biotechnologies for counteracting pollution.

<http://www.unesco.org/science/index.shtml>

Global Earth Observation System of Systems (GEOSS). Intergovernmental initiative to put into place comprehensive, coordinated and sustained observation of the Earth by 2015.

Builds on observation systems that are planned or in place:

- ◆ An example is IGOS – the 14-member partnership that includes global observing systems for atmosphere and weather, climate, terrestrial ecosystems and oceans, with UNESCO as chair in 2002-2003;
- ◆ Understanding, monitoring and conserving biodiversity is one of the societal benefit areas identified in the draft implementation plan of GEOSS.

<http://earthobservations.org>

Local and Indigenous Knowledge Systems (LINKS) . A cross-cutting UNESCO project involving all five programme sectors.

Key activities:

- ◆ Reinforcing joint action among local knowledge holders, biodiversity managers and decision-makers;
- ◆ Enhancing the presence of indigenous language and knowledge in the classroom;
- ◆ Elaborating pedagogical methods and tools rooted in indigenous worldviews.

<http://www.unesco.org/links>

UN Decade of Education for Sustainable Development (2005-14). As lead agency, UNESCO will continue to promote education and public awareness on biodiversity.

Builds on:

- ◆ UNESCO-UNEP International Environmental Education Programme (1975-95);
- ◆ UNESCO experience as interagency task manager for Chapter 36 of Agenda 21 on Education, Public Awareness and Training for Sustainable Development;
- ◆ CBD-UNESCO Global Initiative on Biodiversity Communication, Education and Public Awareness.

<http://www.unesco.org/education/desd>

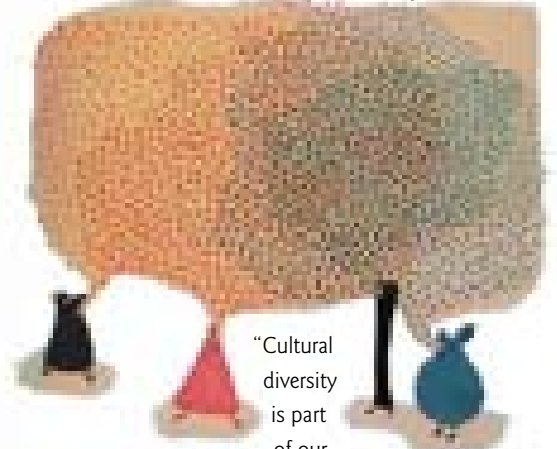
Ethics. Includes programmes on Bioethics and on Ethics of Science and Technology.

Recent and ongoing activities:

- ◆ Universal Declaration on the Human Genome and on Human Rights (1997);
- ◆ Study on advisability of elaborating an international declaration on environmental ethics.

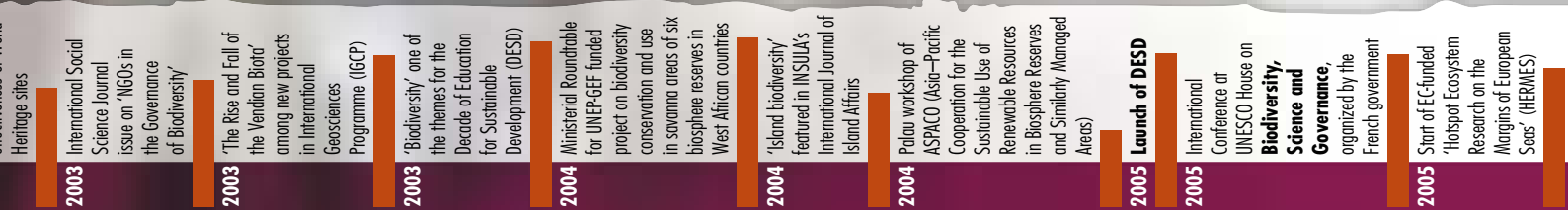
<http://www.unesco.org/ethics>

All different, all unique



“Cultural diversity is part of our common history, and is shared by all of us today.

[...] Just as nature needs a variety of animals and plants to sustain itself, humanity requires all forms of culture to maintain its vitality”. From a 2004 booklet on Young People and the UNESCO Universal Declaration on Cultural Diversity (twelve articles). The booklet was produced as a joint initiative of UNESCO and Oxfam International.



To address the global challenge of biodiversity loss...

UNESCO contributes to the scientific understanding of biodiversity, expanding the fundamental knowledge base on genes to landscapes, applying new and traditional knowledge, building bridges between the natural and the social sciences, bringing science into policy making.

UNESCO mobilizes the scientific community across disciplines, uses biosphere reserves as open air laboratories and demonstration sites, stimulates the testing out of innovative approaches to reconcile ecological and socio-economic interests, highlights the value of ecosystem services, promotes the adoption of more environmentally appropriate technologies, livelihoods and lifestyles.

UNESCO encourages communication and coordination, constructing new partnerships and synergies among scientists, civil society, industry and governments. It creates and coordinates networks, supports training centres of excellence, and sets standards and ethical frameworks for society.

Biosphere Reserves

World Heritage sites



Such international cooperation is paramount for a sustainable future

