United Nations Educational, Scientific and Cultural Organization · Man and the Biosphere Programme

United Nations Educational, Scientific and Cultural Organization · Austrian National Committee of the Man and the Biosphere Programme

United Nations Educational, Scientific and Cultural Organization · International Center for the Mediterranean Biosphere Reserves under the auspices of UNESCO

GOBIERNO DE ESPAÑA · MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE · ORGANISMO AUTÓNOMO PARQUES NACIONALES

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LAUNCHED IN 1971, UNESCO's Man and the Biosphere Programme (MAB) is an Intergovernmental Scientific Programme that aims to establish a scientific basis for the improvement of relationships between people and their environments.

MAB's work engages fully with the international development agenda – specially with the Sustainable Development Goals and the Post 2015 Development Agenda – and addresses challenges linked to scientific, environmental, societal and development issues in diverse ecosystems; from mountain regions to marine, coastal and island areas; from tropical forests to drylands and urban areas.

This publication summarizes the activities undertaken by the MAB Programme and its World Network of Biosphere Reserves in 2014 and 2015.

MAN AND THE BIOSPHERE PROGRAMME BIANNUAL ACTIVITY REPORT 2014 – 2015

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4 World Congress of Biosphere Reserves · Lima, Peru · 14-17

United Nations Educational, Scientific and Cultural Organization · Man and the Biosphere Programme

FOREWORD BY THE DIRECTOR OF THE DIVISION OF ECOLOGICAL AND EARTH SCIENCES, SECRETARY OF THE MAN AND THE BIOSPHERE (MAB) PROGRAMME

SINCE 1971, THE MAN AND THE BIOSPHERE (MAB) PROGRAMME has worked to improve the relationship between people and the environment. By combining the natural and social sciences with economics, education and capacity-building, the MAB programme has promoted the sustainable use and conservation of biological diversity.

In 2014 – 2015, the MAB Programme underwent a number of important developments at international, national and regional levels. Following a broad and transparent consultation process and the collective contributions of many Member States, the MAB Strategy 2015 – 2025 was adopted by the 38th session of the General Conference of UNESCO. This document will guide the MAB programme for the next 10 years. During the present biennium, the World Network of Biosphere Reserves (WNBR) has added 33 new biosphere reserves, including three transboundary sites, with Albania, the Former Yugoslav Republic of Macedonia and Myanmar joining the WNBR for the first time. Adoption of an Exit Strategy to improve the quality and credibility of the WNBR has led to a record rise in Periodic Review reports received from Member States, together with an increase in extension proposals to strengthen the role played by biosphere reserves in promoting sustainable development.

The WNBR now encompasses 651 sites covering over 1,020 million ha of terrestrial, coastal and marine areas, representing all major ecosystem types and diverse development contexts, which are home to approximately 172 million people (ranging from rural local communities and indigenous peoples to urban dwellers). MAB and its WNBR are thus well placed to support the implementation of the 2030 Agenda for Sustainable Development, in particular Sustainable Development Goal (SDG) 15 related to life on land, as well a SDG 13 on climate, SDG 6 on water, SDG 14 on sea and oceans, SDG 11 on cities, SDG 2 on food and SDG 1 on poverty alleviation, to different extents.

Cooperation in research, training, exchange and capacity-building projects, both through UNESCO regular programme and extra-budgetary resources, as well as partnership projects has remained strong and dynamic. MAB's thematic and regional networks in Africa, the Arab States, Asia and the Pacific, Europe, and Latin America and the Caribbean are likewise highly active. UNESCO also accepted the Regional School on Integrated Management of Tropical Forests and Territories (ERAIFT) in the Democratic Republic of the Congo as the first Category II Centre of MAB in Africa on tropical forest and land management.

This publication is intended to present an overall picture of MAB activities during 2014–2015 and the significant roles and values of the WNBR, highlighting in particular newly designated sites. It is our hope that this report will enable people to obtain a clearer idea of the actions and added value of UNESCO's MAB and its WNBR within the global agenda for sustainable development.

Han Qunli

FOREWORD BY THE AUSTRIAN NATIONAL COMMITTEES FOR MAB, GLOBAL CHANGE AND GEO/HYDRO SCIENCES

CLIMATE CHANGE, loss of biological and cultural diversity, and sustainable development are recognized as the most serious and globally significant challenges to societies and ecosystems around the world today.

The MAB Programme and its World Network of Biosphere Reserves (WNBR) play a key role in studying, monitoring and understanding the underlying processes, and addressing the crucial challenges. Since biosphere reserves include transition zones where people live and make a living, it is here that the impacts of global environmental change on local economies and people's livelihoods can best be assessed. In addition, many biosphere reserves are also designated under the Ramsar Convention as World Heritage Sites or Global Geoparks. Such multiple designations provide opportunities for synergies and cooperation with other UNESCO programmes, such as the International Geoscience Programme (IGCP) and the International Hydrological Programme (IHP), making UNESCO's research programmes efficient instruments in the search for solutions to these global problems.

For four decades, biosphere reserves, as model regions for sustainable development, have set global standards in integrating conservation, research, development, learning, practical knowledge and community benefits. However, this was only made possible through ongoing adaptation and development of the MAB Programme and its biosphere reserve concept in response to the challenges of our world. The Seville Strategy and the Statutory Framework (1995), and the Madrid Action Plan (2008) were important steps in modernizing the biosphere concept. With the new MAB Strategy 2015 – 2025, followed by the Lima Action Plan 2016 – 2025, the World Network of Biosphere Reserves will enter a new era of high-quality initiatives to combat the challenges facing our world.

The Austrian Academy of Sciences' international research programmes and its National Committees are dedicated to finding solutions to the global problems of the twenty-first century, to promoting first-class research into global environmental change (e.g. climate, biodiversity, food and water security, disaster reduction), and to transferring scientific findings into practice.

The Republic of Austria, as one of the first nations to become involved in the MAB programme, has supported this UNESCO flagship programme for more than 40 years and is committed to continuing its support.

Arne Arnberger
Chair of the Austrian MAB National Committee
Günter Köck
Austrian delegate to the MAB-ICC
Werner Piller
Chair of the Austrian National Committee for Geo/Hydro-Sciences
Roland Psenner
Chair of the Austrian Global Change National Committee

FOREWORD BY THE DIRECTOR OF THE SPANISH NATIONAL PARKS AUTONOMOUS AGENCY, VICE-CHAIRMAN OF THE SPANISH MAB NATIONAL COMMITTEE

GIVEN CURRENT ENVIRONMENTAL PROBLEMS, it is essential that countries come to terms with the need to maintain and sustain the provision of environmental services, by reconciling long-term resource conservation, economic development and the protection of natural resources at a large scale, taking into account the social context of each region. These ideas have been integrated by the UN into a single concept, 'sustainable development', which was established in 1987 and officially adopted at the Rio Conference in 1992, as a new paradigm for society that gives equal weight to the environment and development.

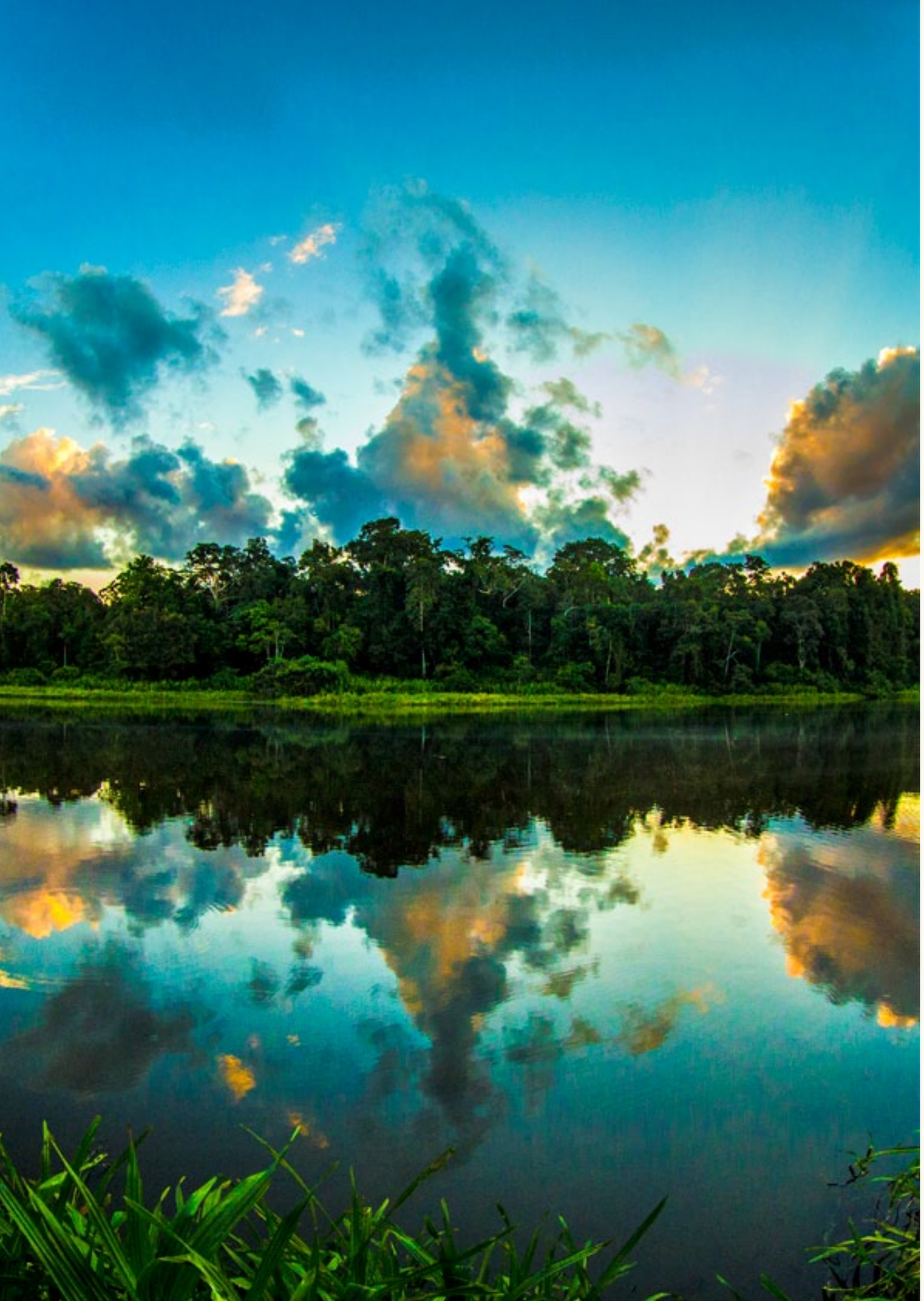
Subsequent international forums have refined the concept of sustainable development and elaborated the role that biosphere reserves can play through participatory planning. This was made clear in the Convention on Biological Diversity, which stipulated the 20 Aichi targets, and the Millennium Ecosystem Assessment. More recently, the UN General Assembly adopted in 2015 the Agenda for Sustainable Development 2030.

The World Network of Biosphere Reserves (WNBR) of the MAB programme represents a unique opportunity to implement these development models. During 2014—2015, the MAB Secretariat and the countries, biosphere reserves and other actors involved in the programme engaged an intense activity, as reflected in this report.

Spain has established 47 biosphere reserves, which account for 10.5% of its territory. Three of these are transboundary sites shared with neighbouring countries, two with Portugal and one with Morocco. These sites have devoted significant effort to the development of the MAB Programme and the WNBR, thereby supporting the actions of UNESCO. Other regional or thematic networks are also subject to extensive support, for example, the IberoMAB Network, the Network REDBIOS and the Network on Islands and Coastal Areas, to name but a few. In 2015, the Network of Mediterranean Biosphere Reserves was established in Spain and has its headquarters in the first Category II Centre linked to the UNESCO MAB Programme, the International Centre for Mediterranean Biosphere Reserves — a model for public-private partnerships.

We believe that the principles underlying the MAB Programme and biosphere reserves make them ideal tools to improve land use planning, combining the proper management of natural resources and biodiversity to achieve sustainable development of the territory, with the involvement of the people who live and carry out economic activities in these areas. Therefore, we will continue to work and provide full support to UNESCO to contribute to the success of the programme worldwide.

Basilio Rada Martínez



THE ABERTIS FOUNDATION headquarters, Castellet castle, has been designated as UNESCO International Centre for the Mediterranean Biosphere Reserves, the only of its type under the Man and Biosphere Programme, as it is the first public-private collaboration with a leading motorway management company.

Salvador Alemany
Chairman of Abertis and Abertis Foundation

THE ENVIRONMENT is one of the pillars of Corporate Social Responsibility at Abertis. In fact, minimizing environmental impact is the first line of the Abertis' Strategic Plan for Corporate Social Responsibility. Since it was established, the Abertis Foundation has been sensitive to environmental issues and has fostered research on the impact of large infrastructure on the land, with particular emphasis on the environment and the people'

Sergi Loughney
Director of the Abertis Foundation

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IMPROVING THE RELATIONSHIP BETWEEN PEOPLE AND THEIR ENVIRONMENTS. Launched in 1971, UNESCO's Man and the Biosphere Programme (MAB) is an intergovernmental scientific programme that aims to establish a scientific basis for the improvement of relationships between people and their environments. MAB combines the natural and social sciences to improve human livelihoods and to safeguard natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable. It also promotes greater involvement of science and scientists in policy development concerning the wise use of biological diversity.

MAB's work engages fully with the international development agenda — in particular with the United Nations Sustainable Development Goals and the 2030 Agenda for Sustainable Development, and specifically with Goal 15 to 'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss' — and addresses challenges linked to scientific, environmental, social and development issues in diverse ecosystems.

MAB provides a unique platform for cooperation on research and development, capacity-building and networking to share information, knowledge and experience on three interlinked issues: biodiversity loss, climate change and sustainable development.

2016 will be an important year for MAB. The Programme will host its 4th World Congress on Biosphere Reserves (March 2016 in Lima) and launch a new Action Plan that will guide the Programme and its World Network of Biosphere Reserves during 2016—2025.

How does the Man and the Biosphere programme work? UNESCO's intergovernmental structure provides MAB with a framework to help national governments support the planning and implementation of research and training programmes with technical assistance and scientific advice.

Participating countries establish MAB National Committees that ensure maximum national participation in the international programme, defining and implementing each country's activities. MAB currently operates through 158 National Committees established among the 195 Members States and nine Associate Members States of UNESCO.

The agenda of the MAB Programme is defined by its main governing body, the International Coordinating Council. The MAB Council consists of 34 Member States elected by UNESCO's General Conference. The Council elects a chair and five vice-chairpersons from each of UNESCO's geopolitical regions, one of which functions as a rapporteur. These constitute the MAB Bureau.

The MAB Secretariat is based at UNESCO's Division of Ecological and Earth Sciences, and works closely with the different field offices around the world to coordinate the work of the MAB programme at national and regional levels.

Its staff members draw on expertise in many and varied disciplines.

MAB is funded through the regular budget of UNESCO and mobilizes funds in-trust granted by Member States, bilateral and multilateral sources, and extra-budgetary funds provided by countries, the private sector and private institutions. MAB-related activities are nationally financed. The Programme can grant seed funding to assist countries in developing projects and/or to secure appropriate partnership contributions.

Vision and Mission of MAB. Our vision is a world where people are conscious of their common future and interaction with our planet, and act collectively and responsibly to build thriving societies in harmony within the biosphere. The MAB Programme and its World Network of Biosphere Reserves (WNBR) serve this vision within and outside biosphere reserves.

Our mission for the period 2015—2025 is to:

- Develop and strengthen models of sustainable development in the WNBR;
- Communicate the experiences and lessons learned, facilitating the global diffusion and application of these models;
- Support evaluation and high-quality management, strategies and policies for sustainable development and planning, as well as accountable and resilient institutions;
- Help Member States and stakeholders to urgently meet the Sustainable Development Goals through experiences from the WNBR, particularly through exploring and testing policies, technologies and innovations for the sustainable management of biodiversity and natural resources, and mitigation and adaptation to climate change.

MAB Strategy and Action Plan. To ensure a strong MAB Programme and WNBR response to contemporary development challenges and opportunities in the coming years, notably the realization of the Sustainable Development Goals and the implementation of UNFCCC COP21 decisions, the MAB ICC has adopted a new MAB Strategy (2015—2025) and is preparing an associated Action Plan (2016—2025). These will engage with a broad range of stakeholders and partners focusing on MAB's Strategic Objectives, which are to:

1. Conserve biodiversity, restore and enhance ecosystem services, and foster the sustainable use of natural resources;
2. Contribute to building sustainable, healthy and equitable societies, economies and thriving human settlements in harmony within the biosphere;
3. Facilitate biodiversity and sustainability science, education for sustainable development and capacity building;
4. Support mitigation and adaptation to climate change and other aspects of global environmental change.

The new Action Plan for Biosphere Reserves will be adopted during the 28th MAB ICC that will take place in conjunction with the 4th World Congress on Biosphere Reserves (WCBR), held on 14—19 March 2016 in Lima. The Congress will address key issues related to the 2030 Agenda for Sustainable Development.

The World Network of Biosphere Reserves: sites of excellence. The World Network of Biosphere Reserves (WNBR) of the MAB Programme consists of a dynamic and interactive network of sites of excellence. It works to foster the harmonious integration of people and nature for sustainable development through participatory dialogue, knowledge sharing, poverty reduction, human well-being improvements and respect for cultural values, and by improving society's ability to cope with climate change. It promotes North-South and South-South collaboration and represents a unique tool for international cooperation through the exchange of experiences and know-how, capacity-building and the promotion of best practices.

The WNBR is a network of natural environments dedicated to interdisciplinary research, capacity-building, and management and experimentation with innovative combinations of economic, environmental and energy alternatives for sustainable development.

What are biosphere reserves? Biosphere reserves are 'learning places for sustainable development'. They are sites for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity.

They cover terrestrial, marine and coastal ecosystems, and each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use.

Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Their status is internationally recognized. They have three interrelated zones that aim to fulfil three complementary and mutually reinforcing functions:

- The core area(s) comprises a strictly protected ecosystem that contributes to the conservation of landscapes, ecosystems, species and genetic variation.
- The buffer zone surrounds or adjoins the core areas, and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.
- The transition area is the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable.

Huascarán Biosphere Reserve, Peru © SERNANP

A VARIETY OF REGIONAL, SUB-REGIONAL AND THEMATIC NETWORKS provide support to the World Network of Biosphere Reserves. During 2014—2015 the different networks undertook the following activities:

The ArabMAB Network was officially launched in 1997 and represents 18 Arab countries. A Regional Environmental Expert and Biosphere Reserve Manager's Consultation Meeting on Biosphere Reserve Challenges in the Arab Region was held in Agadir, Morocco from 4—6 May 2015. The consultation meeting brought together experts in environmental issues and biosphere reserve managers to discuss and identify environmental challenges facing biosphere reserves in the Arab Region.

ArabMab Meeting in Agadir, Morocco, May 2015.
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Experts discussed the development of best practices and identified solutions for tackling various environmental issues, including water, climate change, ecosystem services and the green economy, for the effective management of biosphere reserves.

On 1—3 December, a Regional Workshop on Effective Management of Biosphere Reserves in the Arab Region was organized in the city of Alger, Algeria. The main objective of the workshop was to enhance the capacities of biosphere reserve managers. More than 30 participants from eight Arab countries attended the workshop. The participants exchanged lessons learnt, introduced case studies and discussed best practices for the effective management of biosphere reserve in the region.

The African Biosphere Reserves Network (AfriMAB) was created in 1996 and comprises 33 African countries.

The 4th Session of the General Assembly of AfriMAB was hosted by the Ghana MAB National Committee in Accra on 24—27 November 2015 under the theme 'AfriMAB: Aligning the MAB Strategy (2015—2025) to the Sustainable Development Goals, SDGs (2015—2030)'. Participants from 21 Member States attended the assembly including representatives of Benin, Burkina Faso, Cameroon, Central Africa Republic, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, the Republic of Sao Tome and Principe, Rwanda, South Africa, Tanzania, Togo and Zimbabwe. Representatives of UNESCO, the German Federal Agency for Nature Conservation (BfN) and the Korea International Cooperation Agency (KOICA) also attended.

4th General Assembly of the African Network of Biosphere Reserves in Ghana.
© UNESCO/Sheila Ashong

The Hon. Nii Osah Mills, Minister for Land and Natural Resources, the Hon. Prof. Naana Jane Opoku-Agyemang, the Minister of Education and Chairman of the Ghana National Commission, and the Hon. Mahama Ayariga, Minister for Environment, Science and Technology graced the occasion with their presence, demonstrating inter-ministerial collaboration and cooperation in support of the MAB Programme and activities. Prof. Alfred Oteng-Yeboah, Chair of the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) and former member of the International Advisory Committee on Biosphere Reserves, chaired the opening ceremony.

In line with the main theme of the General Assembly, the participants discussed the MAB Strategy and the Lima Action Plan and held preliminary discussions on priority areas for AfriMAB. These discussions will be pursued during the forthcoming 4th Congress of World Network of Biosphere Reserves.

The East Asian Biosphere Reserve Network was launched in 1994 and consists of China, the Democratic People's Republic of Korea, Japan, Kazakhstan, Mongolia, the Republic of Korea and the Russian Federation.

14th meeting of the East Asian Biosphere Reserve Network (EABRN) in Shiga Highland Biosphere Reserve, Japan.
© Hans Thulstrup

The 14th meeting of the East Asian Biosphere Reserve Network (EABRN) took place on 6—9 October 2015 at the Shiga Highland Biosphere Reserve in Japan. The meeting was organized by the Japanese National Commission for UNESCO, the Japanese National Committee for the MAB programme, the EABRN Secretariat of the UNESCO Office in Beijing and the Shiga Highland Biosphere Reserve. The meeting took place under the theme 'Activities in the transition area and the role of local communities in managing biosphere reserves', and included a field evaluation of the host biosphere reserve, as well as joint sessions with the Japanese Biosphere Reserves Network (JBRN). Key outcomes of the meeting included the revision and updating of the EABRN Statutes, the identification of priorities for network activities over the coming decade, and the confirmation of EABRN's presence at the 4th Biosphere Congress in Lima.

The 6th EABRN training course, organized jointly by the EABRN Secretariat at UNESCO Beijing Office, the International Centre on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO (HIST), the Wudalianchi Administration Committee and the Chinese National Committee for MAB, and made possible through the support of the Republic of Korea National Commission for UNESCO and HIST, took place on 20–30 May 2015 at the Wudalianchi Biosphere Reserve in Heilongjiang Province, China.

With the aiming of sharing and reinforcing biosphere reserve management experience and capacity, the course covered a range of issues including zonation, biodiversity conservation, socio-economic development, and exchange of information on the major functions of biosphere reserves in member countries.

Special attention was given to developing the capacity of biosphere reserve managers through the application of modern technologies and spatial tools.

EuroMAB was created in 1987 and consists of 53 countries that form a network of biosphere reserves in Europe and North America.

The 2015 EuroMAB meeting took place in Haapsalu, Estonia on 19–23 May 2015. During the five-day meeting, countries discussed key issues around the new MAB Strategy (2015–2025) and examined the implementation of the MAB Exit Strategy and the preliminary results from the communication and branding of the EuroMAB project. The contribution of EuroMAB to the preparation of the World Congress of Biosphere Reserves also constituted a main topic of discussion during this event.

2015 EuroMAB meeting in Haapsalu, Estonia.
© Toomas Kokovkin

A number of workshops and projects proposals during the meeting highlighted the feasibility of combining local traditions and practices with business. They shared insights and lessons from social enterprises and encouraged cooperation between community-based knowledge and scientific knowledge and research, with a view to discussing ideas and insights such as 'green care'.

The Ibero-American MAB Network (IberoMAB) was created in 1992. It comprises 22 countries from Latin American and the Caribbean, Spain and Portugal.

The 16th IberoMAB meeting took place in Castellet I la Gornal, Barcelona, Spain on 21–23 October 2015. The meeting was organized by the MAB Programme, the Category II Centre for Mediterranean Biosphere Reserves under the auspices of UNESCO, and the Autonomous Organism for National Parks of the Spanish Ministry of Agriculture, Food and Environment.

Representatives of IberoMAB countries presented the state of biosphere reserves in their different countries, including successful experiences, and discussed the new MAB Strategy and the future of IberoMAB. The meeting also focused on the contributions of IberoMAB to the 4th World Congress of Biosphere Reserves as well as the Lima Action Plan.

16th IberoMAB meeting in Castellet I la Gornal, Barcelona, Spain.
© Abertis Foundation

The Pacific Man and the Biosphere Network (PacMAB) was created in 2006 and comprises the Federated States of Micronesia, Kiribati, Palau, Papua New Guinea, Samoa and Tonga.

For the fourth time, representatives, managers and researchers of the Pacific Biosphere Reserve Network (PacMAB) met on 23–25 April 2014 in Nadi, Fiji, to discuss the role of biosphere reserves in sustainable development in the Pacific.

The objective of the meeting was to assess the progress, accomplishment and key challenges of the Madrid Action Plan (MAP) for Pacific biosphere reserves, and to identify post-MAP follow-up actions. During the meeting, participants also worked to identify new ways to engage with current biosphere reserves while working to increase the number of reserves in the Pacific.

4th PacMAB Meeting in Nadi, Fiji.
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The South and Central Asia MAB Network (SACAM) was created in 2002 and comprises Afghanistan, Bangladesh, Bhutan, India, Iran, Kazakhstan, Maldives, Nepal, Pakistan and Sri Lanka. The 6th SACAM meeting was hosted by the Ministry of Science and Technology of Pakistan, the Pakistan Science Foundation and the Museum of Natural History of Pakistan in Islamabad, Pakistan on 3—5 December 2014.

The meeting focused on the 'Impact of Climate Change on Natural Ecosystems'. About 15 countries of the region participated in the meeting, and about 40 climate change experts from Pakistan presented their findings.

The network organized its 7th SACAM Meeting in Dhaka, Bangladesh on 14—15 December 2015. The meeting focused mainly on sharing the experiences of biosphere reserves and Natural Heritage sites from across the South and Central Asian sub-region, SACAM participation in the 4th World Congress of Biosphere Reserves, and strengthening the MAB Programme in Bangladesh.

7th SACAM Meeting in Dhaka, Bangladesh.
© UNESCO Islamabad Office

The Southeast Asian Biosphere Reserve Network (SeaBRnet) was created in 1998 and comprises Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Viet Nam and Timor Leste.

The 8th SeaBRnet meeting was organized jointly with the 2nd Asia-Pacific Biosphere Reserves Network (APBRN) Strategic Meeting in Cambodia, Siem Reap on 15—19 December 2014. The 8th SeaBRnet meeting focused its attention on 'Biosphere Reserves as Places for Sustainable Development through Ecotourism and Eco-labelling' while the 2nd APBRN meeting discussed 'Biosphere Reserves as Models for Alleviating Poverty through Ecosystems Services'.

Representatives from the MAB National Committees and biosphere reserve networks in the Southeast Asia and the Asia-Pacific regions presented the different experiences of their biosphere reserves. The meetings were followed by a two-day training workshop on biosphere reserves and protected areas management for managers and experts from the Asia and the Pacific region, and included a field trip to Tonle Sap Biosphere Reserve.

The 9th SeaBRnet meeting was held on 28—30 October 2015 in Malang, Indonesia, and addressed issues linked with the visibility, branding and communication strategies of the World Network of Biosphere Reserves, and especially biosphere reserves

9th SeaBRnet meeting in Malang, Indonesia.
©UNESCO Jakarta Office

in Southeast Asia. The meeting was organized around keynote addresses, assessment of country reports from SeaBRnet members with a special session on Indonesia, case studies and strategic discussions, and concluded with a field trip to Bromo Tengger Semeru-Arjuno Biosphere Reserve.

The East Atlantic Biosphere Reserve Network (REDBIOS) was created in 1994 and comprises the Canary Islands (Spain), Cape Verde, Guinea Bissau, Madeira and Azores (Portugal), Mauritania, Morocco, Sao Tomé and Principe, and Senegal.

The 12th Meeting of the REDBIOS Network took place on 22—26 September 2014 in the Azores, under the auspices of UNESCO and the Government of the Azores.

Knowledge transfer, exchange of experiences and new opportunities for cooperation between REDBIOS biosphere reserves were core parts of the agenda. Special attention was also paid by Macaronesian biosphere reserves to the potential contribution of European cooperation programmes such as the Transnational Cooperation Programme Madeira-Acores-Canary Islands (PCT-MAC) in support of the REDBIOS network and its specific projects.

12th Meeting of the REDBIOS Network in the Azores.
© Antonio Abreu

The REDBIOS Network also proposed a series of collaborative partnerships to promote activities and strategies for knowledge transfer at local, regional, national and European levels, including international cooperation.

At the meeting, the REDBIOS Network paid tribute to Mr Juan Antonio Menendez-Pidal in recognition of his long dedication to the network, his significant contribution to the creation and promotion of REDBIOS reserves and associated regions, and to strengthening the bonds of friendship and cooperation between communities and peoples of the REDBIOS Network.

The World Network of Island and Coastal Biosphere Reserves was established in 2012 and comprises 22 countries.

The 4th Meeting of the Global Network of Island and Coastal Biosphere Reserves took place in the Palawan Biosphere Reserve in the Philippines on 16—21 June 2014 and was attended by representatives of more than 20 biosphere reserves from the five continents. The meeting was organized by the MAB Programme, the Palawan Centre for Sustainable Development, Jeju Island Biosphere Reserve and Menorca Biosphere Reserve. Its aim was to discuss the main challenges and threats and issues facing these sites, in particular water, energy and food self-sufficiency, climate change, natural disasters and waste management, and to share experiences and potential solutions.

4th Meeting of the Global Network of Island and Coastal Biosphere Reserves in the Philippines.
© UNESCO/Miguel Clüsener Godt

The 5th Meeting World Network of Island and Coastal Biosphere Reserves was held in Attard, Malta, on 24—26 March 2015 and was attended by representatives of 18 biosphere reserves from 13 countries. Participants came from Australia, Canada, Chile, Estonia, France, Germany, Japan, Philippines, Portugal, the Republic of Korea, Sao Tome & Principe, Spain, Tunisia, and the MAB National Committees of the Republic of Korea and Spain, the UNESCO National Commissions of Iceland, Malta and the Republic of Korea, and the UNESCO/MAB Secretariat.

The main subject of the meeting was 'The Impact of Climate Change and Sustainable Development on Island and Coastal Biosphere Reserves'. The participants introduced their biosphere reserves, examined future action plans and took a number of decisions.

As the number of biosphere reserve members has increased and the management criteria are vague, the Network decided that it is necessary to establish regulations for systematically ensuring and managing network activities on a continuous basis.

THE MAB PROGRAMME CONTRIBUTES TO GLOBAL EFFORTS for education and capacity-building through workshops, training courses, educational programmes and partnerships with professional and educational institutions.

First UNESCO Centre for Mediterranean Biosphere Reserves. On Saturday, 5 April 2014, the Director-General of UNESCO, Ms Irina Bokova, together with H.E. Mr Juan Manuel de Barandica y Luxán, Ambassador, Permanent Delegate of the Kingdom of Spain to UNESCO, signed an agreement establishing the UNESCO Centre on Mediterranean Biosphere Reserves in Castellet i Gornal, Barcelona, Spain.

Inauguration of the first UNESCO Centre for Mediterranean Biosphere Reserves, Castellet i Gornal, Barcelona, Spain.
© Miguel Clüsener-Godt

'This first Centre of the MAB Programme under UNESCO auspices will serve as a model for scientific cooperation between the two shores of the Mediterranean and provide an excellent platform of information exchange and sharing on all issues related to biosphere reserves and their sustainable development', declared Ms Irina Bokova.

The tripartite agreement was signed in the presence of H.E. Mr Jorge Fernández Díaz, Minister of the Interior of the Government of Spain, Mr Federico Ramos, Secretary of State for the Environment, Mr Sergi Loughney, Director of the Abertis Foundation, and numerous personalities from the Spanish Government and representatives from the local authorities, as well as the media.

At the opening ceremony, Mr Fernandez Diaz, Minister of the Interior of Spain, highlighted the role of Spanish Biosphere Reserves, which represent 7.2% of the total biosphere reserves of the world and emphasized that these sites represent sites of excellence for the protection of the world's biodiversity and the study of global climate change.

'Today marks the renewed commitment of the Government of Spain in UNESCO's leadership role to advance sustainable development worldwide.'

The Centre, which falls under UNESCO's Man and the Biosphere (MAB) Programme, and which collaborates closely with the Ministry of Agriculture, Food and Environment and its Autonomous Organism for National Parks (OAPN), is the first of its kind, combining public engagement and private financial support under UNESCO's auspices.

It also provides a unique setting of two coastlines united by culture and nature. Located in the medieval castle of Castellet, restored by the Abertis Foundation, the Centre documents scientific research and knowledge on all biosphere reserves in the Mediterranean basin.

Director General of UNESCO signs the agreement establishing the UNESCO Centre on Mediterranean Biosphere Reserves in Castellet i Gornal, Barcelona, Spain.
© Miguel Clüsener-Godt

The Centre will act as a platform for training and transferring advanced knowledge on environmental and societal issues between developed and developing countries in the Mediterranean basin, and will facilitate joint programmes between biospheres reserves.

The primary objectives of the Centre will be to collect, structure, synthesize and disseminate experiences acquired in all biosphere reserves in the Mediterranean area, starting with biosphere reserves in Spain, in order to contribute to advancing scientific knowledge within the World Network of Biosphere Reserves. The Centre will also act as a laboratory to devise tools for improving the dissemination of scientific data, information and training activities within the Network.

Regional School on Integrated Management of Tropical Forests and Territories (ERAIFT), a new UNESCO Category II Centre for Africa. Tropical forest management has to be able to balance forest-based subsistence activities (e.g. farming, hunting, fishing and gathering of firewood) with encroaching urbanization, demographic growth and the growing involvement of tropical forest resources in the global economy.

UNESCO launched postgraduate training in tropical forest management in 1999 at the University of Kinshasa in the Democratic Republic of Congo. Named ERAIFT (École régionale post-universitaire d'aménagement et de gestion intégrés des forêts tropicales), the school trains some 30 specialists from francophone and lusophones countries in Africa each year and offers courses at Masters (DESS) and PhD (doctorate) levels. The ERAIFT DESS diploma is recognized by the CAMES (Conseil africain et malgache pour l'enseignement supérieur).

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. The curriculum includes, notably, integrated management of tropical forests, collaboration with local communities, improving conditions for local populations and sustainable development.

ERAIFT Students.
© ERAIFT

The 38th session of the General Conference (November 2015) approved the establishment of ERAIFT as a Category II Centre under the auspices of UNESCO. This is the second MAB Category II Centre and the first in Africa.

Through capacity-building, knowledge sharing and research, this new Category II Centre will provide a valuable and unique contribution to the implementation of UNESCO's strategic programme objectives for the benefit of African Member States.

Summer school on Education for Sustainable Development in Biosphere Reserves. This 14-day summer school on Education for Sustainable Development (ESD) in Protected Areas and Biosphere Reserves was organized within the framework of a long-lasting collaboration with the UNESCO Chair and Network on sustainable development management and education in the Mediterranean, the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) and with the support of the Erasmus Programme (European Region Action Scheme for the Mobility of University Students) from the European Union. It was held on 6–19 July 2014 in Amfissa, Greece and involved 39 trainees from all over Europe.

Summer school on Education for Sustainable Development, in Amfissa, Greece.
© UNESCO Venice Office

The courses were based, to a large extent, on the UNESCO publication *Education for Sustainable Development in Biospheres Reserves and other Designated Areas: A Resource Book for Educators in South-Eastern Europe and the Mediterranean*, which was developed in 2013 as a training material for ESD experts and trainers. The summer school

was based upon the main ESD principles and methods including critical thinking, participatory processes, interdisciplinary and systemic approaches, and skill development and enhancement. The school ultimately promoted designated areas, and especially biosphere reserves, as 'learning laboratories', ideal for applying education to sustainable development. A declaration prepared by the trainees was delivered at the final conference of the UN Decade of Education for Sustainable Development in Nagoya, Japan (November 2014) and at the 7th World Water Forum in Korea (April 2015).

Training Courses for Island and Coastal Biosphere Reserves Managers. Since 2013, the World Network of Island and Coastal Biosphere Reserves (WNICBR) has provided annual training courses for managers of island and coastal biosphere reserves.

Island and coastal areas biosphere reserves around the world have different natural, cultural, socio-economic and political characteristics, but also experience similar problems that can be addressed in a common way.

Training Courses for Island and Coastal Biosphere Reserves Managers in Jeju Island.
© Sung-Jun Pang

UNESCO's Man and the Biosphere Programme, the Jeju Island Biosphere Reserve and the Menorca Biosphere Reserve organized a Training Course for Island and Coastal Biosphere Reserve Managers on 13–17 October 2014 and 19–22 October 2015 at the Jeju World Natural Heritage Centre, Jeju Island, Republic of Korea.

The purpose of these training courses was to provide biosphere reserve managers with an opportunity to share experiences and build capacities for climate change adaption and achieving sustainable development. In order to achieve the objectives of the training courses the following topics were addressed: climate change impacts on island and coastal regions and good practices; renewable energy, ecotourism and eco-education programmes; regional marketing for biosphere reserves; and management policy and land-use planning.

Master Class Reflections: UNESCO Biosphere Reserves as Learning Laboratories for Sustainability. In February 2015, a new UNESCO master class was delivered for the Asia-Pacific region. Entitled 'UNESCO Biosphere Reserves as Learning Laboratories for Sustainability', the programme involved immersive master classes occurring in Australian Biosphere Reserves (Great Sandy Biosphere Reserve in Queensland and Mornington Peninsula and Western Port Biosphere Reserve in Victoria) accompanied by lectures streamed live online.

The network of UNESCO biosphere reserves across the Asia-Pacific region offers a unique opportunity for synthesizing experiences and sharing knowledge in response to the ramifications of climate change. This UNESCO master class showcased the local and global value of biosphere reserves as learning laboratories for sustainability. It highlighted a series of projects and innovative ideas uniting the conservation of biological and cultural diversity. The initial modules focused on local issues exploring community engagement, partnerships and projects, while the concluding modules focused on global issues across the Asia-Pacific and introduced opportunities for knowledge sharing, virtual collaborations and the future possibilities of creative technology in response to climate change.

This master class identified a clear need to develop accessible tools that enable biosphere reserves to share their experiences. The Asia-Pacific region could act as a catalyst in inspiring international biosphere reserves to take climate action and one of the most critical tools will be the ability to creatively and collaboratively share advice, ideas and actions from other communities who have had similar experiences. Through this master class, the value and future possibilities of UNESCO biosphere reserves were explored to showcase how these sites could have a significant impact on shaping local, national and international climate adaptation responses by engaging communities in interdisciplinary projects.

Participation focused mainly on Australia, Cambodia, Indonesia, Malaysia and Viet Nam, but the live streams also engaged participants from Mexico to New York and New Zealand to Spain. The master class was not about traditional education, but instead explored new dynamic models that combine global engagement with immersive experiences and leverage new technologies that are rapidly becoming accessible.

Underpinning this project is the opportunity to harness the possibilities of mobile technology and community engagement to strengthen the network of UNESCO biosphere reserves. The blended learning experience of the master class was developed through a process of research and experimentation to create the most effective tool kit to facilitate accessible education programmes. The master class proved that embracing the possibilities of this emerging technology will improve cooperation and awareness of the Asia-Pacific Biosphere Reserve Network.

Training course for biosphere reserve managers and local communities on sustainable development opportunities for local communities. The National Service of Protected Natural Areas (SERNANP), UNESCO's Man and the Biosphere Programme and the German International Cooperation (GIZ), with the support of the Spanish Autonomous Authority for National Parks (OAPN), jointly organized the training course 'Biosphere reserves, an opportunity to promote differentiated products and services', held in Lima on 11–13 March 2015. The workshop was attended by representatives from regional governments, mayors and producer associations of the four Peruvian biosphere reserves, as well as representatives of Colombian and Spanish biosphere reserves.

Oxapampa-Ashaninka-Yanesha Biosphere Reserve presenting their local products.
© SERNANP

The course also invited two honorary guests to share experiences from their own biosphere reserves: Mr Antonio San Blas from the La Palma Biosphere Reserve (Spain) and Ms June Marie Mow Robinson from the Seaflower Biosphere Reserve (Colombia). Both invitees used educational and interactive approaches to explain the steps both biosphere reserves had followed and the different challenges they had encountered. They discussed the socio-economic benefits achieved through the promotion of products and services from their biosphere reserves and their contribution to sustainable development.

The four Peruvian biosphere reserves worked in groups to identify their strengths and weaknesses and potential services and products, as well as the different steps in the development of a biosphere reserve brand.

Enriching knowledge through exchanges between Haitian and Chilean biosphere reserves. In July 2015, representatives of the Haitian MAB National Committee met with the National Forestry Corporation (CONAF-Chile) in Chile, to learn about the management of Chilean biosphere reserves. This exchange was made possible by the contribution of the Spanish Agency for International Cooperation and Development (AECID) to the MAB Programme in Haiti.

During their visit they explored the management models of La Campana-Peñuelas Biosphere Reserve, and discussed cooperation protocols, shared experiences and examined the possibility of strengthening capabilities between the two nations. The visit gave rise to new opportunities to exchange practices and seek benefits for both countries within the framework of South-South Cooperation.

Chile, through its National Forestry Corporation, has extensive experience in forest policy management in cooperation with other biosphere reserves. A similar collaboration took place between the Campana-Peñuelas Biosphere Reserve (Chile) and the Fontainebleau-Gâtinais Biosphere Reserve (France). Meanwhile, Haiti is promoting the creation of a botanical garden that will be integrated into the La Selle Biosphere Reserve, and is also active in environmental education through the UNESCO Associated Schools Project (ASP) Network.

Knowledge exchange between Haitian and Chilean biosphere reserves.
© Mario Gálvez

Green Academies in UNESCO Biosphere Reserves. Kindergartens, schools, colleges and universities are being equipped with rainwater collection and storage devices, gardening space for food-production, wastewater recycling, application of clean energy, and the establishment of science education clubs for girls and boys. These 'green academies' engage in capacity-building on environmental aspects including climate, biodiversity, water, food and waste. They also actively engage on aspects of peace development, root causes of migration, conflict management and the ideals of UNESCO.

Initially, UNESCO will focus on buildings inside UNESCO biosphere reserves, Geoparks and World Heritage Sites, as well as refugee camps and capital cities. The first UNESCO Green Academy inside the Lake Tana Biosphere Reserve in Ethiopia was visited on 3 December, to assess the progress made. It is due to be launched in March 2016. UNESCO is working on five additional sites in Ethiopia (including one refugee camp), and has developed the first steps for UNESCO Green Academies in Sierra Leone and Tanzania. This project was financially supported by Manfred-Hermsen-Stiftung.

Green Academies in UNESCO Biosphere Reserves.
© UNESCO/Benno Boer

'Introduction to biosphere reserves', a virtual course for Latin-American and Caribbean biosphere reserve. The course 'Introduction to biosphere reserves', was organized by the UNESCO Montevideo Office in collaboration with the UNESCO Chair on biosphere reserves at the University for International Cooperation (UCI) in Costa Rica from 27 October to 24 November 2015 in order to facilitate the understanding of biosphere reserves and their importance in the planning and management of local and regional development. The course was targeted at managers and local actors of biosphere reserves, professionals from public institutions, NGOs, universities and research centres involved in the management of the territories, as well as researchers and students. The course was held in virtual mode on the UCI platform.

Participatory learning process was promoted, enabling students to make their own analysis and build knowledge through the exchange of ideas and experiences. Key topics of the course included the statutory documents of the MAB programme including the new 2015-2025 Strategy, reviewing functions and objectives of biosphere reserves and cases studies of biosphere reserves from the region. The course was reached a broad public, as over 1500 people from the region signed up, and over 200 people completed the full 30 hours of the course.

UNESCO Biosphere Excursion: Making use of UNESCO Biosphere Reserves as platforms for environmental education and cultural exchange. November 2015 marked the first round of the UNESCO Biosphere Excursion. A total of 16 young participants from Ethiopia and the United Arab Emirates were selected to join this excursion to UNESCO Biosphere Reserves in the two countries. After visiting the Kafa Biosphere Reserve and the Lake Tana Biosphere Reserve in Ethiopia in November 2015, the same group will meet again in April 2016 in the United Arab Emirates.

Biosphere Excursion in Ethiopia.
© Maria Hänsel/ UNESCO

The goal of the UNESCO Biosphere Excursion Programme is to offer an in-depth understanding of the challenges and solutions of environmental management through first-hand experience. In Ethiopia, participants had the chance to visit project sites with environmental NGOs and government representatives, and discuss possible solutions to deforestation and promoting tourism.

Small research assignments in groups covering topics such as wetland management and tourism development enabled close interaction with the concerned local communities in each biosphere reserve. Additionally, training sessions with local and national experts were held to ensure a more detailed understanding of efforts towards environmental protection and options for livelihood improvement in Ethiopia. The diverse cultural and professional backgrounds of participants made the first part of this event a special experience for everyone involved. During the 16 days of travel through Ethiopia the participants worked together closely on joint efforts and shared unforgettable experiences.

This educational and cultural exchange was made possible by the generous funding of the Global Citizen Foundation and other in-kind support from the Emirates, the Horn of Africa Regional Environmental Centre and Network and the Hope College of Business, Science and Technology, as well as the Embassy of the United Arab Emirates in Ethiopia.

"Community-based forest management in Kafa zone, as practised by the Manja ethnic group, has shown us exactly why engaging local communities is the best way for both livelihood improvement and environmental sustainability." Tesfau Bekele, participant from Ethiopia

"Planting coffee needs the shade of the forest, which makes it a good environmental practice that decreases deforestation. Farmers gave us a good explanation during the visit and the tour in the planted areas." Zulfa Rasheed, participant from the UAE

Training courses for Arab countries on effective implementation of the MAB Programme and nomination of biosphere reserves. In 2015, the UNESCO Doha Office organized two training workshop related to the Man and the Biosphere (MAB) Programme and its biosphere reserves.

Training courses for Arab countries in Qatar.
© UNESCO Doha Office

The first training workshop was held in Doha, Qatar on 29—31 March 2015 and was co-organized with the General Directorate of Natural Reserves of the Ministry of Environment of Qatar. This training course was organized to support local authorities in promoting sustainable development and conservation of natural heritage sites in Qatar, and was an opportunity to inform participants about nomination procedures for biosphere reserves and natural sites.

The training course was conducted by experts from the Royal Society for Conservation of Nature, based in Jordan, the Arab Regional Centre for World Heritage, based in Bahrain, and the International Union for Conservation of Nature.

The second training workshop took place on 13–15 December 2015 and was organized by the UNESCO Office in Doha in cooperation with the Oman National Commission for Education, Culture and Science in Muscat. The workshop aimed to explain the designation process for biosphere reserves, how to complete the biosphere reserve application forms, and the zonation of biosphere reserves.

The workshop was organized to promote the MAB Programme and the biosphere reserve concept in Oman and in the whole Arab region, provide practical experience in biosphere reserves and share lessons learned from other biosphere reserves.

University Twinning and Networking Programme/UNESCO Chairs. There are currently 47 UNITWIN/UNESCO Chairs related to biosphere reserves and sustainable development.

During 2014–2015 two new chairs were created: the UNESCO Chair on New paradigms and instruments for bio-cultural landscape management at the Higher Institute on Territorial Systems for Innovation (Italy) and the UNESCO Chair on Sustainable Heritage and Environmental Management-Nature and Culture at the University of Bergen (Norway).

MAB Young Scientists Award: helping young people help the planet. Since 1989, MAB has presented annual awards of up to US$ 5,000 to young researchers in support of their research on ecosystems, natural resources and biodiversity. Through the MAB Young Scientists Awards, the MAB programme has invested in a new generation of scientists worldwide, whose work is vital to addressing ecological and sustainability issues.

Nizar Hani, one of six young scientists to receive the MAB Young Scientists Awards in 2014.
© UNESCO

The young scientist and projects recognized in 2014 were:
- Mona Poorzady (Islamic Republic of Iran): Using renewable energies in the Arasbaran Biosphere Reserve to replace forest resources as fuel wood.
- Nizar Hani (Lebanon): Sustainable Territorial Management and Action Plan: Shouf Biosphere Reserve.
- Julieta Rosell Garcia (Mexico): A comparison of plant communities in wet and dry environments to understand how bark contributes to plant survival under climate change.
- Thomas E. Dela Cruz (Philippines): Biodiversity, taxonomy, ecological patterns and conservation of myxomycetes and macrofungi in Peurto Galera Biosphere Reserve and Sablayan Watershed Forest Reserve, Mindoro, Philippines.
- Juraj Svajda (Slovakia): Monitoring of visitors (impacts and perceptions) in the Slovak part of the Tatra Biosphere Reserve.
- Michelle Jooste (South Africa): The invasive tunicates *Ciona intestinalis* and *Botryllus Schlosseri*: Habitat utilization and impacts.

And in 2015, the following young researchers and projects received awards:
- Victoria Gonzalez Carman (Argentina): Understanding the human dimensions of bycatch of large marine vertebrates in a small-scale fishery of Argentina.
- Richmond Ametefe (Ghana): Impacts of socio-economic activities of communities on water resource management in the Songor Biosphere Reserve.
- Angela Mwatujobe (United Republic of Tanzania): Contribution of local communities to the conservation of biosphere reserves.
- Sameh Chaabani (Tunisia): Pine Forest under alert in the MAB Chaambi National Park in Tunisia: Tree-level impact assessment of long-term climate change and recent social unrest.
- Vitaliy Turych (Ukraine): Forest ecosystems of the Ukrainian part of the West Polesie Transboundary Biosphere Reserve and global climate change.
- The Nguyen Duc (Viet Nam): Outbreak of coral-eating snails (*Drupella sp*) in the Cat Ba Biosphere Reserve – habitat utilization and prey selection.

The Michel Batisse Award is awarded in memory of Dr Michel Batisse for excellence in the management of biosphere reserves in line with the recommendations of the Seville Strategy.

Winners of the Michel Batisse Award.
© UNESCO/ Alberto Hernández

In 2014, the US$ 6,000 Award was attributed to Ana Luisa R. Figueroa (Mexico), Director of Islands of the Gulf of California Flora and Fauna Protection, for her case study on 'A group of fishermen and fishing families who became guardians of the San Pedro Martir

Island, part of the Islas del Golfo de California Biosphere Reserve'. In 2015, the award was attributed to Bandi Namkhai, Director of the Khustain Nuruu Biosphere Reserve in Mongolia, for his study of Khustain Nuruu.

The UNESCO Sultan Qaboos Prize for Environmental Preservation recognizes outstanding contributions in the management or preservation of the environment, consistent with the policies, aims and objectives of UNESCO, and in relation to the Organization's programmes in this field (i.e. environmental and natural resources research, environmental education and training, creation of environmental awareness through the preparation of environmental information materials, and activities aimed at establishing and managing protected areas such as biosphere reserves and Natural World Heritage Sites).

The laureates of the 2015 UNESCO Sultan Qaboos Prize for Environmental Preservation were Fabio A. Kalesnik, Horacio Sirolli and Luciano Iribarren of the Wetlands Ecology Research Group of the University of Buenos Aires, Argentina.

The laureates were recommended by an international jury for their research on a wide range of ecological aspects of wetland ecosystems on different spatial and temporal scales in the Delta del Paraná, and for their critically valuable socio-environmental studies and environmental education and training initiatives. The research and advocacy work of Mr Kalesnik, Mr Sirolli and Mr Iribarren have contributed to the establishment and management of the Delta del Paraná Biosphere Reserve of the UNESCO Man and the Biosphere Programme.

Established in the year 2000, the Delta del Paraná Biosphere Reserve is a coastal freshwater delta of the Parana River north of Buenos Aires. It is rich in biodiversity and home to species that find their southernmost limit of distribution in the reserve.

2014–2015 marks the silver jubilee of the UNESCO Sultan Qaboos Prize for Environmental Preservation, which was established 25 years ago through a generous donation by Sultan Qaboos Bin Said Al Said of Oman. The laureates shared the US$ 70,000 prize, which is allocated every two years, and received a diploma and medal at a special ceremony held at the World Science Forum in Budapest, Hungary, on 4 November 2015.

Sultan Qabooz Prize 2015.
© UNESCO/ Sarah Colautti

MEETING GLOBAL CHALLENGES and creating sustainable and long-term impacts is only possible through the collaborative work of a broad partnership.

During 2014–2015, MAB continued to work with other UN agencies, international and national partners, different governments, NGOs, academia and the private sector, and promoted North-South and South-South cooperation. The following section presents some examples of such partnerships:

Great Apes Survival Partnership (GRASP). Through the Great Apes Survival Partnership (GRASP) UNESCO's Man and the Biosphere Programme ensure the long-term survival of gorillas *(Gorilla beringei, G. gorilla)*, chimpanzees *(Pan troglodytes)*, bonobos *(Pan paniscus)* and orangutans *(Pongo abelii, P. pygmaeus)* across their ranges in Equatorial Africa and Southeast Asia.

Orangutans.
© UN-GRASP

Coordinated by UNESCO and the UN Environment Programme (UNEP), GRASP is a unique alliance of nearly 100 national governments, conservation organizations, research institutions, United Nations (UN) agencies, and private companies.

Great Apes are found in 21 biosphere reserves, including Mountain gorillas in the Volcans Biosphere Reserve in Rwanda, chimpanzees in the Haut Niger Biosphere Reserve in Guinea, and Sumatran orangutans in the Gunung Leuser Biosphere Reserve in Indonesia. These sites are 'living laboratories' that enable better understanding of great apes. Studies are underway in different biosphere reserves.

One of the most important populations of wild chimpanzees lives in the Taï Biosphere Reserve in Côte d'Ivoire, where zoologists have been studying their behaviour since 1979. Much of what we know today about orangutan tool-making is the result of studies in the Tanjung Puting Biosphere Reserve in Indonesia. These studies are combined with a variety of projects to reconcile conservation with the needs of local communities.

UNESCO—CHIC Group (China) Biosphere Integrated Rural Urbanization Programme (BIRUP). The BIRUP programme seeks to integrate rural land consolidation with new agricultural projects, training of farmers, expansion of urbanized rural villages, crop production, food processing, training, education and a new sustainable, high-tech education and science-based entrepreneurial city, which emphasizes agricultural, agribusiness and rural sciences.

MAB-BIRUP Workshop 2015.
© UNESCO/ Hans Thulstrup

The BIRUP programme constitutes a first step in building a new and more harmonious relationship between peoples living in urban areas and the surrounding rural zones on which they are dependent for ecosystem goods and services (e.g. clean water, food, renewable energy and recreational opportunities). Actions piloted in Ba'nan, Chongqing, are likely to be replicable elsewhere in Asia and other continents. The programme also facilitates exchange and learning among urban areas, BIRUP pilot sites and UNESCO biosphere reserves.

Within the framework of this project, experts, managers and entrepreneurs from biosphere reserves and other UNESCO sites met on 14—16 December 2015 in Shanghai, China, to discuss biodiversity conservation, green economies and sustainable development. The three-day workshop, entitled 'MAB-BIRUP Workshop: Promoting Green Economies in Biosphere Reserves through Certification, Labelling and Branding Schemes', was organized by the MAB Programme, CHIC Group and the UNESCO Beijing Office.

Gathering 39 participants from 14 countries across Asia, Africa, Europe and Latin America, the MAB-BIRUP Workshop served as a platform for biosphere reserve experts and site managers, as well as public and private partner organizations including certification bodies and NGOs.

Participants shared information, knowledge and experiences over three half-day sessions of presentations and discussion. During a concluding discussion held on 15 December, the participants agreed on a series of statements and recommendations relating to the topic of the workshop.

Biosphere Connections is a unique global corporate social responsibility initiative of the airline coalition Star Alliance network, which has been underway since 2007. It is dedicated to supporting sustainability by flying environmental field workers, scientists and educators across the global UNESCO Man and the Biosphere network to help further their knowledge, skills and understanding of major environmental issues and initiatives, and to help conserve some of the world's most unique habitats.

Danone Waters Germany provides generous financial support to projects that aim to improve or safeguard water quality (lakes, rivers, subterranean waters) in the 15 biosphere reserves in Germany. The partnership seeks to increase the visibility of biosphere reserves and their activities, especially in cooperation with the new brand 'Volvic Landfrucht'.

Contributing to EXPO Milano 2015 'Feeding the Planet, Energy for Life'. The theme chosen for EXPO Milano 2015, 'Feeding the Planet, Energy for Life', provided an excellent opportunity for UNESCO and its Man and the Biosphere programme to share through a variety of events and activities its knowledge and experiences of the relationship between people, culture, nature and the production/consumption of food with a global audience, and to explore the vital role of cultural and natural diversity as drivers for sustainable development.

Exhibition 'Behind Food Sustainability'.
© UNESCO Venice office

The exhibition 'Behind Food Sustainability', which was inaugurated in Venice on 5 May 2015 and remained on show until 31 October was replicated at the Sila, Circeo, Appenino Tosco-Emiliano and Po Delta biosphere reserves, two World Heritage Sites (the Dolomites and Botanical Garden of Padua), as well as at the 3rd World Forum on Local Economic Development in Turin and the Science Festival in Genoa, where it was viewed by thousands of visitors. The exhibition brought together experiences from UNESCO networks including World Heritage sites, Biosphere Reserves and elements of Intangible Cultural Heritage to provide examples of food sustainability that yield valuable lessons for the future. The exhibition included five main thematic areas, each focusing on a particular sustainability challenge: Managing Water, Looking after the Land, Balancing the Food Economy, Protecting diversity and Fostering Participation. It also featured an 8-minute video on these thematic areas and a map table with interactive tablets that allowed visitors to learn about more UNESCO sites from around the world.

The Starlight Initiative is an international project in defence of the values associated with the night sky and the general right to observe the stars. It is open to the participation of all scientific, cultural, environmental and civic organizations and associations, as well as public institutions and other public and private bodies willing to effectively cooperate in the conservation of clear skies and the dissemination of knowledge related to their observation. The final aim of the initiative is to strengthen the importance of clear skies for humankind, emphasizing and introducing the value of this endangered heritage for science, education, culture, technological development, nature conservation and tourism, as well as underlining its importance for quality of life.

Composite map of the world assembled from data acquired by the Suomi NPP satellite in April and October 2012.

NEW BIOSPHERE RESERVES IN 2014

BIOSPHERE RESERVES are areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions to reconcile the conservation of biodiversity with its sustainable use. They serve as places to test different approaches to integrated management of terrestrial, freshwater, coastal and marine resources and biodiversity. Biosphere reserves are thus sites for experimenting with and learning about sustainable development.

Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located.

In 2014, 13 new sites were added to the World Network of Biosphere Reserves by the International Coordinating Council (ICC) of the UNESCO Man and the Biosphere Programme, at its 26th session, which took place in Jönkoping and the East Vättern Landscape biosphere reserve in Sweden on 10—13 June. Two countries joined the World Network of Biosphere Reserves: Albania and The Former Yugoslav Republic of Macedonia.

Meanwhile, Austria and the United Kingdom decided to withdraw sites from the Network. The withdrawn sites are Gossenköllesee and Gurgler Kamm in Austria (designated in 1977), and North Norfolk in the United Kingdom (designated in 1976).

A year later, in its 26th session in Paris on 9—13 July 2015, the ICC added 20 new sites including two transboundary sites to the World Network of Biosphere Reserves (WNBR).

The network now consists of 651 biosphere reserves including 15 transboundary sites in 120 countries.

The biosphere reserves added in 2014 were as follows:

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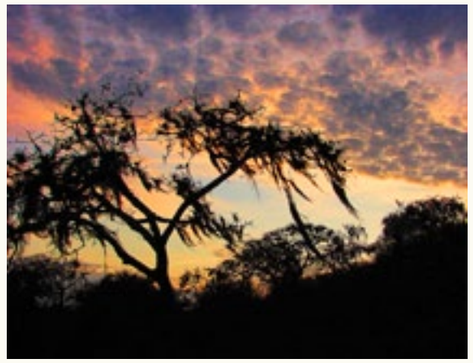
ARGENTINA

The Valdés Biosphere Reserve encompasses the Patagonian Steppe, Hill Plains and Plateaus, and the Argentine Sea eco-regions, as well as the Peninsula Valdés Natural Protected Area World Heritage site and the San Jose and Playa Fracaso Ramsar sites. The biosphere reserve is home to significant biodiversity including highly fragile terrestrial and marine ecosystems, whose conservation is crucial to vulnerable species, including, for example, the southern right whale *(Eubalaena australis)* that reproduces in Golfo Nuevo and San José. The 214,196 inhabitants in the region are engaged mainly in livestock farming, tourism, fisheries and industry (aluminium, porphyry). Other economic activities include port activity and wind power generation.

© Uri Tours/Wikimedia Commons

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

The Mount Chilbo Biosphere Reserve covers 340 hectares in the north-east of the country and represents a major storehouse of biodiversity. It hosts 16 plant species endemic to the Democratic People's Republic of Korea, 30 endangered plant and animal species, 132 species of medicinal herbs, and several species of wild vegetables and fruits. Agriculture, fishery and tourism are the main economic activities practised in the reserve. The site offers many tourist attractions and has developed facilities to welcome a large number of visitors each year.



© Renzo Paladine

ECUADOR

The Bosque Seco Biosphere Reserve in the south-west of Ecuador extends over 500,000 hectares, including scrub and the most extensive and best-preserved dry forest in the country. It is also home to one of the highest concentrations of endemic birds in South America and a significant population of flagship endemic species such as the American crocodile *(Crocodylus acutus)* and the mantled howler monkey *(Alouatta palliata)*. The main economic activities at the site, which is inhabited by more than 100,000 people, are livestock and agriculture (coffee, fruit and corn).

© UNESCO/PnrQ

FRANCE ITALY

Mont-Viso/Area della Biosfera del Monviso transboundary biosphere reserve was designated as national biosphere reserve in 2013. It's French and Italian parts are subject to both Alpine and Mediterranean influences. They now form a transboundary biosphere reserve straddling France and Italy. Particular characteristics of the region include the presence of several high altitude lakes, landscapes shaped by pastoralism, and great ecological and biological diversity. The site includes forests, rock formations and water environments. Tourism is the main driver of the region's economy, along with agriculture, forestry and crafts.

© Sila Biosphere Reserve

The Sila Biosphere Reserve extends over an area of 357,294 hectares. The biosphere reserve is host to approximately 1,000 vascular plant species and over 210 vertebrate species. The site's plant diversity has earned it global recognition. The 230,000 permanent residents live mostly from agriculture, although eco-tourism has been playing an increasing role in the local economy in recent years, attracting over 500,000 visitors a year.

ITALY

© Minami-Alps

The Minami-Alps Biosphere Reserve extends over an area of 302,474 hectares and consists of a mountainous region flanked on two sides by the south-flowing Fuji and Tenryu rivers. It includes the Koma, Akaishi and Ina mountains. The flora of the Minami Alps is characterized by plant species that migrated south along the Japanese archipelago during the Ice Age, when it was still joined by land to the continent. Plant species recorded at over 800 metres above sea level in the site include 248 varieties of moss and 98 species of lichen. The areas around the foothills of the Minami Alps have long remained isolated from one another, but one of the aims of the biosphere reserve is to strengthen interactions between these regions and to foster sustainable development.

JAPAN

© Wajiro Suzuki

The Tadami Biosphere Reserve covers an area of 78,000 hectares and is located at the eastern edge of the Echigo mountains, the western edge of the Fukushima Prefecture and the southern part of the Tohoku region in Honshu. It consists of low relief, middle relief and high mountains (over 600 metres) as well as a gravel plateau and the floodplains of the Tadami and Ina river basins. Some 32 species of mammal have been recorded, as well as 145 bird species and 10 species of reptile. In 2007, the town of Tadami announced an initiative entitled 'The Capital of Mother Nature' aimed at reminding local residents of the value of their natural environment.

JAPAN

© Victoria Kovshar

The Ak-Zhayik Biosphere Reserve covers an area of 396,346 hectares and is located in the Atyrau oblast, where it mainly occupies wetlands of the Ural River delta and adjacent territories along the coast of the Caspian Sea. These lie along one of the largest migration routes, stretching from Eurasia to Eastern Africa. It is a concentration site for more than 240 species of migrating birds, including 110 species of waterbirds, while the region acts as a nesting ground for about 70 waterbird species. The site also hosts a rare bird, the Dalmatian pelican *(Pelicanus crispus)* with more than 600 nesting pairs in the colony (12% of the global population). The 17,000 permanent residents rely mainly on fishing, cattle breeding and hunting.

KAZAKHSTAN

© Yu Zinchenko

The Katon-Karagay Biosphere Reserve in eastern Kazakhstan extends over an area of 1,631,940 hectares. The northern section includes part of the Katunskiy Ridge, with altitudes ranging from 2,000 to 4,500 metres, while the southern section stretches from 850 to 3,487 metres (Southern Altai Ridge). The abundant meadow grasses and flowers on this site include over a thousand vascular plants — both ferns and seed plants — as well as mosses, lichens and fungi. The local population mainly rears cattle, sheep, deer and Siberian stags. They also cultivate cereal crops (barley and oats) as fodder for the cattle during the winter months.

KAZAKHSTAN

© CEphoto, Uwe Aranas

The Crocker Range Biosphere Reserve covers an area of over 350,584 hectares and is located south of Mount Kinabalu — a World Heritage site — in the State of Sabah, at the northern end of the island of Borneo. About 100 mammal species, 259 bird species, 47 reptiles, 63 amphibians and 42 freshwater fish species have been recorded. The park also hosts some endangered species such as the orang-utan, the sun bear and clouded leopard. The community and local authorities were extensively involved in the nomination of this biosphere reserve.

MALAYSIA

© UNESCO/ Philippe Pypaert

The Ohrid-Prespa Transboundary Reserve's landscape is a balanced combination of water bodies and surrounding mountains bordered by flat areas on its external boundaries. With an area of 446,244 hectares and a population of about 455,000, it includes part of Lake Ohrid and its surroundings in the former Yugoslav Republic of Macedonia, which are inscribed on the World Heritage List, as well as part of Lake Orhid in Albania.

REPUBLIC OF ALBANIA
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

© UNESCO/Rich Howorth

The Brighton and Lewes Downs Biosphere Reserve, situated on the south-eastern coast of England, is the first full-fledged UK nomination since 1977 (i.e. not counting extensions) and covers an area of 38,921 hectares. It includes the town of Brighton and part of the South Downs National Park and is home to 371,500 permanent residents. The region's main terrestrial landscape is chalkdown, with a coast dominated by impressive chalk cliffs in the east and an urbanized plain in the west. The site supports more than 200 species on international conservation lists and over a thousand locally rare species. Because of the diversity of the region's rare wildlife habitats, its rich heritage and proximity to London, tourism is particularly well developed, with up to 12 million visitors a year. Other economic activities include agriculture and commercial sea fishing.

UNITED KINGDOM

© José María Almada Sad

The Bioma Pampa-Quebradas del Norte Biosphere Reserve covers an area of 110,882 hectares. It comprises a mosaic of different ecosystems, including primary forest with subtropical jungle. The pampa ecosystem includes temperate grasslands and is an important nesting area for many bird species. At present, however, only 0.7% of the grasslands are protected and the ecosystem faces significant threats to its conservation. Rare species of amphibians and reptiles in the area include the Uruguayan frog *(Hyla uruguaya)*, the Toad of Devincenzi *(Melanophryniscus devincenzii)* and the South American rattlesnake *(Crotalus durissus terrificus)*. The site is inhabited by a small number of smallholder farming families. Indeed, development of the biosphere reserve is linked to promotion of the traditions of gauchos, the herders of the pampa.

URUGUAY

EXTENSIONS OF EXISTING BIOSPHERE RESERVES

With this extension of the **Laguna Oca del Río Paraguay Biosphere Reserve**, the biosphere reserve will increase in size from 12,000 to 61,763 hectares. The new area will integrate the city of Formosa, the Laguna de Herradura and the Riacho Salado, up to Mision Laishi, through a biodiversity and cultural corridor named 'The Way of Water', which will pass through the Paraguay River and its tributaries.

ARGENTINA

The **Rhön Biosphere Reserve** is part of the German central upland range and includes a mountainous region formed as a result of volcanic activity in the Tertiary era. With the extension of 58,113 hectares, the biosphere reserve will comprise a total surface of 243,323 hectares. In 2010, the biosphere reserve had over 135,000 permanent residents, the majority living in rural settlements. As a result of the extension, the population now amounts to over 225,000.

GERMANY

Located in central Honshu island, the **Shiga Highland Biosphere Reserve**, 20 km north-east of Nagano, the biosphere reserve was designated in 1980. It now forms part of the Joshinetsu Kogen National Park. With this extension covering over 17,000 hectares, the site will encompass an area of more than 30,000 hectares, with over 21,000 permanent residents.

JAPAN

Designated in 1978, the **Montseny Biosphere Reserve** is located in the Catalan pre-coastal sierra, and presents a mosaic of Mediterranean and central European landscapes with a highly abundant biodiversity. Increasing from 30,000 to over 50,000 hectares, the reserve now numbers 51,310 residents compared to 1,250 before the extension.

SPAIN

Designated in 1980, the **Mancha Húmeda Biosphere reserve** encompasses a gently rolling plain located at altitudes between 600 metres and 700 metres, full of Tertiary deposits and scattered with a great number of wetlands arising from the seasonal flooding of rivers and from numerous upwellings of the Manchego aquifer in the depressions. The extension enlarges the reserve from 25,000 to 418,000 hectares.

SPAIN

NEW BIOSPHERE RESERVES IN 2015

© *Hamza-sia - Wikimedia Commons*

The Belezma Biosphere Reserve comprises a mosaic of habitats including forests, thickets, lawns, cliffs and rivers. It includes over 5,315 hectares of centuries' old Atlas cedars, representing almost one-third of the cedar forests of Algeria. Endemic to North Africa, Algeria and Morocco, the cedar is a protected species in Algeria, and is recognized as a flagship tree species of the Aurès region. The reserve also boasts historic and archaeological sites, caves and tombs. It is home to 3,500 inhabitants who work in livestock and grain farms as well as commercial and artisanal activities.

ALGERIA

© *PGBorboroglu*

The Patagonia Azul Biosphere Reserve is located in the south of the country on the coast of Chubut province, and covers an area of 3,102,005 hectares. The site encompasses a coastal area with the greatest biodiversity found on the Argentinean coastline. It also includes important breeding, feeding and migration sites of different species of birds and mammals. It hosts the largest colony of Magellanic penguins in the world, accounting for almost 40% of the global population. The site has a very low human population density, the only town being Camarone. Close to 5% of the town's permanent population belong to indigenous ethnic groups, including the Mapuche and Tehuelche. Ranches or rural establishments dedicated to sheep rearing account for the main human activity on the territory, followed by the production of wool, fishing, tourism and seaweed extraction.

ARGENTINA

© *Hanma Biosphere Reserve*

Hanma Biosphere Reserve is located in Inner Mongolia and represents an important part of the Taiga distributed across China. It protects the diversity of both forest and wetland ecosystems, extending over a total area of 148,948 hectares. The natural vegetation is intact, owing to very limited interaction with humankind. The cold temperate coniferous forest is the best-preserved forest type in China and is of high scientific value. Forest products from this site, such as bilberry and other wild fruit, contribute to the socio-economic development of communities in the area. Ecological tourism is an activity that could be exploited further.

PEOPLE'S REPUBLIC OF CHINA

© *Bernhard Walter*

The Lake Tana Biosphere Reserve is situated in the north-western part of Ethiopia and includes Lake Tana, the largest lake in Ethiopia. The site encompasses a total area of 695,885 hectares and is a hotspot of biodiversity. Internationally known as an important Bird Area, it is also of global importance in terms of agricultural genetic diversity. The main economic activities are agriculture, fishing, national and international tourism, and sand mining. The area has a unique cultural, historical, geological and aesthetic value with numerous monasteries and churches dating back to the thirteenth century. Church forests around Lake Tana host an outstanding diversity of tree and shrub species and medicinal plants, and play an important role in the conservation of biodiversity. The biosphere reserve will seek to rekindle traditional communities' appreciation of their cultures, knowledge and skills, which reflect a sustainable lifestyle in harmony with the environment.

ETHIOPIA

© *Gorges du Gardon Biosphere Reserve*

Gorges du Gardon Biosphere Reserve is located in the Gard département in southern France and covers a total area of 45,501 hectares. It includes the cities of Uzès and Nîmes, as well as the Pont du Gard, a World Heritage Site since 1985. The site is a typical Mediterranean landscape with scrubland, green oaks, the Gardon River and cliffs, and contains threatened and protected species such as Egyptian vultures, Bonelli's eagle and the Woodcock orchid. This area is known for its rich cultural, architectural and historical heritage. The main human activities are agriculture, tourism (450,000 visitors per year) and services. The main agricultural activities include wine production and olive oil, as well as *Tuber melanosporum* (truffles), herbal plants and aromatics.

FRANCE

© Nick Athanas

The Cacique Lempira, Señor de las Montañas Biosphere Reserve is located in the western part of the country and covers a total area of 168,634 hectares. It forms part of the ecological region of pine and oak forests as well as humid tropical forests and hosts a large number of endangered and endemic species. The high rate of endemism among the wildlife has led Conservation International to designate the eco-region an Endemic Bird Area (EBA). The total population of the biosphere reserve amounts to over 150,000 inhabitants. The predominant economic activity is traditional agriculture (87%), mainly mais and beans, with a steady increase in coffee production. Tourism is promoted in the city of Lempira, which receives local and international visitors in growing numbers.

HONDURAS

© Bromo Tengger Semeru-Arjuno Biosphere Reserve

The Bromo Tengger Semeru-Arjuno Biosphere Reserve is located in East Java province and covers a total area of 413,374 hectares. The biosphere reserve consists of the Bromo Tengger Semeru National Park (BTSNP) and the forest protected area of Raden Soerjo. There are 1,025 species of flora, including 226 orchid species along with 260 other medicinal and ornamental plant species. Several of the site's mammal species are included on the Red List of Threatened Species of the International Union for Conservation of Nature (IUCN). The area is a model of good practice in terms of sustainable development at the regional, national and international levels. The development of agriculture is envisaged in certain areas. Livestock farming of cattle, goats, sheep, horses, rabbits and chicken also contribute to the local economy. There is an active programme of research in the area on biodiversity management and carbon reduction.

INDONESIA

© Taka Bonerate-Kepulauan Selayar Biosphere Reserve

The Taka Bonerate-Kepulauan Selayar Biosphere Reserve is located at the south of Sulawesi (Celebes) and belongs to South Sulawesi Province. It covers an area of about 4,410,736 hectares. Mangrove forests serve as a barrier against the fierce ocean waves and hence as a shelter and spawning ground for various types of fish, as well as a habitat for many species of fauna such as birds. The national authorities aim to make this site the leading area in coral reef conservation and a major tourist destination in Sulawesi. The area is intended to serve as a learning laboratory for researchers, students, local government representatives, NGOs and private sector organizations.

INDONESIA

© Behin Nazemroaya

The Tang-e-Sayad and Sabzkuh Biosphere Reserve is a combination of the reserves of two regions, Tang-e-Sayad and Sabzkuh, totalling 532,878 hectares. Land subsidence, geological activity and the melting ice caps have formed several wetlands, home to rare fauna such as the wild cat and tiger snake. The Karun River, the biggest in Iran, supports 22 fish species, including pike and Mesopotamian catfish. During the cold season, the bushlands in the area are home to migratory birds such as the white stork and greater flamingo. The presence of several rivers and springs in the site has led to an increase in the development of agriculture and animal husbandry. Local handicrafts and folk festivals also offer the potential to develop tourism. These activities would be managed by the local communities.

ISLAMIC REPUBLIC OF IRAN

© Ledro Alps and Judicaria Biosphere Reserve

The Ledro Alps and Judicaria Biosphere Reserve is located in the Trento region in northern Italy, between the Dolomite World Heritage site and Lake Garda, with a surface area of 47,427 hectares. The site is representative of the southern slopes of the central-eastern Alps, comprising different non-polluted habitats (Alpine meadows, forest, grasslands, moorlands) as well as traditional crops. Its strategic location contributes to its rich biodiversity and the creation of a corridor running north–south across the Alps, ensuring territorial continuity between protected areas from the Po valley to the northern Alps. It is also highly valued by tourists who provide an important source of income to the local population. Agriculture is the main economic activity in the reserve, chiefly viticulture, olive, fruit and vegetable, as well as animal husbandry.

ITALY

© *Gastone Dissette*

The Po Delta Biosphere Reserve in northern Italy covers an area of 139,398 hectares and is home to 120,000 people living in 16 municipalities. The area is a plain produced by the Po River's action and recent human activity. It is the only delta in Italy. The site includes the confluence of river branches, coastal dune systems and sand formations, lagoons, fishing ponds, marshes, fossil dunes, canals and coastal pine forests, vast brackish wetlands and cultivated lands dominated by rice farming. These landscapes provide an exceptional biodiversity due to their range of habitats. Tourism is one of the main economic activities of local communities, along with agriculture and fish farming. Sustainable tourism could be promoted. Environmental and cultural education aimed at the general public is an important activity of the biosphere reserve.

ITALY

© *Giuseppe Carfagna*

The Appennino Tosco-Emiliano Biosphere Reserve is located in the Tuscany and Emilia Romagna regions in northern-central Italy. It covers the Tuscan-Emilian Apennine ridge from Passo della Cisa to Passo delle Forbici. This stretch of ridge marks the geographical and climatic boundary between continental Europe and Mediterranean Europe. It includes 38 municipalities. The total surface of the site covers 223,229 hectares. The reserve contains 70% of all the species present in Italy, including species of birds, amphibians, reptiles, mammals, fish, the wolf and the Golden Eagle, but also great plant biodiversity, with at least 260 aquatic and terrestrial species. The main economic activity is agriculture of various kinds depending on the landscape. A tourism economy has recently been developed to improve the link between tourism and agriculture, with, for example, 'zero kilometre menu' restaurants using local products.

ITALY

© *Evgeniy Belousov*

The Aksu-Zhabagly Biosphere Reserve is located south of Karatau in the western Tien Shan. The total area of the site covers 357,734 hectares. It hosts 48% of the total diversity of birds in the region and 72.5% of vertebrates. Land in the reserve is mostly used for agriculture with a variety of crops, with cereal cultures (wheat and barley) grown on rainfed areas and forage cultures (corn, clover, alfalfa) grown on irrigated arable lands. Local people usually breed cattle, sheep (South-Kazakh Merino), goats, horses (trotters and Donskaya breed) and poultry (chicken and turkey). Aksu Zhabagly is one of the famous tourist spots for birdwatchers from all over the world and there is significant potential for eco-tourism. Research activities on the ecology of the fauna are carried out within the biosphere reserve.

KAZAKHSTAN

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The Inlay Lake Biosphere Reserve is situated in Taunggyi District, Southern Shan State, and covers a total area of 489,721 hectares. The wetland ecosystem of this freshwater lake is home to 267 species of birds, out of which 82 are wetland birds, and 43 species of freshwater fish, otters and turtles. Diverse flora and fauna species have been recorded and the lake is reported to be the nesting place for the globally endangered Sarus crane *(Grus antigone)*. In addition to its ecological importance, Inlay Lake is also unique for the way in which the local inhabitants have adapted their lifestyle to their environment. Farmers from one of the dominant ethnic groups in the region, the Inthas, practise floating island agriculture, known locally as 'Yechan'. Inlay Lake and its watershed provide several ecosystem services on which local people depend, including clean air, clean water, a cooler climate, fish stocks and other resources.

MYANMAR

© Jan Vlok

The Gouritz Cluster Biosphere Reserve in the southern part of South Africa covers an area of 3,187,892 hectares. The reserve is divided into four connected sectors ranging from sea level to 2,240 m. It is the only place in the world where three recognized biodiversity hotspots (Fynbos, Succulent Karoo and Maputoland-Tongoland-Albany) converge. There are a great many endemic plant species. The site lies on the migratory route of large mammals such as the leopard and serves as a nursery for marine species. The area is critical for water resources. With over 200,000 inhabitants, the area is facing socio-economic challenges including high unemployment, widespread poverty, sprawling informal settlements with inadequate services, and rising HIV and crime rates. One promising solution envisaged to reduce youth unemployment consists of establishing local business models in the biosphere reserve and developing jobs linked to the biodiversity economy.

SOUTH AFRICA

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The Magaliesberg Biosphere Reserve between the cities of Pretoria and Johannesburg covers an area of 357,870 hectares. The site lies at the interface of two great African biomes — the Central Grassland Plateaux and the sub-Saharan savannah. Its rich biodiversity includes 443 bird species constituting 46.6% of the total bird species in the Southern African sub-region. In addition, the area is exceptionally beautiful, with unique natural features, rich cultural heritage and enormous archaeological interest in the 'Cradle of Humankind', which forms part of a 4 million year-old World Heritage Site. More than 260,000 people live in this region, adjacent to a major urban infrastructure impacting an economy that is dominated by agriculture, mining, urban development and tourism. The biosphere management plan aims to stimulate conservation and promote, among other things, tourism, farming and sustainable practices (such as solar power and water saving).

SOUTH AFRICA

© Macizo de Anaga Biosphere Reserve

The Macizo de Anaga Biosphere Reserve in the north-east of the island of Tenerife in the Canary Islands covers 48,727.61 hectares. Macizo de Anaga hosts significant diversity of fauna including reptiles, birds and fish, and in particular large numbers of invertebrates, with 1,900 recorded species. From a geological point of view the massif is one of the oldest areas on the island with rocks dating back 7–9 million years. Over this long period, the area has experienced several cycles of volcanic activity, the result of which is a rich geological and geomorphological mosaic. Over 22,000 people live permanently in the biosphere reserve. Historically, agriculture, livestock farming (especially goat breeding), forestry and fishing have been the main economic activities.

SPAIN

© Meseta Iberica Biosphere Reserve

The Meseta Iberica Biosphere Reserve encompasses the provinces of Salamanca and Zamora in Spain and Terra Quente and Fria in Portugal. It covers an area of 1,132,606 hectares. Altitudes in the area vary from 100 to 2,000 m above sea level. The area contains many flagship species, some of which have been the subject of conservation projects, such as the black stork *(Ciconia nigra)*, Egyptian vulture *(Neophron pernocpterus)*, Bonelli's eagle *(Aquila fasciata)*, Eurasian eagle-owl *(Bubo bubo)*, European otter *(Lutra lutra)* and Iberian wolf *(Canis lupus signatus)*. Over 300,000 people live in this site, which also features built heritage dating back to Roman times and the Middle Ages.

SPAIN
PORTUGAL

© Luyen Nguyen

Langbiang Biosphere Reserve in Lam Dong Province, covers a total area of 275,439 hectares. Biodiversity in this region is very high and includes many threatened species. The core area will create a biodiversity corridor, maintaining the integrity of 14 tropical ecosystems. It also acts as a habitat for many wildlife species. Agriculture, forestry and fishery are the main sources of employment for local communities, and flowers, coffee and tea are the most important cultivated crops in terms of revenue. A number of investment projects are planned in some areas with a view to improving overall management and protection.

VIET NAM

MAP OF THE WORLD NETWORK OF BIOSPHERE RESERVES

ALB — Albania
Ohrid-Prespa, *2014*; *Former Yugoslav Republic of Macedonia*

ARE — United Arab Emirates
Marawah, 2007

ARG — Argentina
San Guillermo, 1980
Laguna Blanca, 1982
Costero del Sur, 1984
Nacuñán, 1986
Laguna de Pozuelos, 1990
Yabotí, 1995
Mar Chiquita, 1996
Delta de Paraná, 2000
Laguna Oca del Río Paraguay, 2001
Riacho Teuquito, 2001
Las Yungas, 2002
Andino Norpatagónica, 2007
Pereyra Iraola, 2007
Valdés, 2014
Patagonia Azul, 2015

AUS — Australia
Croajingolong, 1977
Kosciuszko, 1977
Prince Regent River, 1977
Riverland, 1977
Uluru, Ayers Rock-Mount Olga, 1977
Unnamed, 1977
Yathong, 1977
Fitzgerald River, 1978
Hattah-Kulkyne & Murray-Kulkyne, 1981
Wilson's Promontory, 1981
Mornington Peninsula and Western Port, 2002
Barkindji, 2005
Noosa, 2007
Great Sandy, 2009

AUT — Austria
Lobau, 1977
Neusiedler See, 1977
Großes Walsertal, 2000
Wienerwald, 2005
Salzburger Lungau und Kärntner Nockberge, 2012

BEN — Benin
Pendjari, 1986
W Region, 2002; *Burkina Faso, Niger*

BFA — Burkina Faso
Mare aux hippopotames, 1986
W Region, 2002; *Benin, Niger*

BGR — Bulgaria
Alibotouch, 1977
Bistrichko Branichté, 1977
Boitine, 1977
Djendema, 1977
Doupkata, 1977
Doupki-Djindjiritza, 1977
Kamtchia, 1977
Koupena, 1977
Mantaritza, 1977
Ouzounboudjak, 1977
Parangalitza, 1977
Srébarna, 1977
Steneto, 1977
Tchervenata Sténa, 1977
Tchoupréné, 1977
Tsaritchina, 1977

BLR — Belarus
Berezinskiy, 1978
Belovezhskaya Puschcha, 1993
West Polesie, 2004; *Poland, Ukraine, 2012*

BOL — Bolivia
Pilón - Lajas, 1977
Ulla Ulla, 1977
Beni, 1986

BRA — Brazil
Mata Atlântica & São Paulo City Green Belt, 1993
Cerrado, 1994
Pantanal, 2000
Caatinga, 2001
Central Amazon, 2001
Espinhaço Range, 2005

CFA — Central African Republic
Basse-Lobaye, 1977
Bamingui-Bangoran, 1979

CAN — Canada
Mont Saint Hilaire, 1978
Waterton, 1979
Long Point, 1986
Riding Mountain, 1986
Charlevoix, 1988
Niagara Escarpment, 1990
Clayoquot Sound, 2000
Lac Saint-Pierre, 2000
Mount Arrowsmith, 2000
Redberry Lake, 2000
South West Nova, 2001
Thousand Islands - Frontenac Arch, 2002
Georgian Bay Littoral, 2004
Fundy, 2007
Manicouagan Uapishka, 2007
Bras d'Or Lake, 2011

CHE — Switzerland
Val Müstair - Parc Naziunal, 1979
Entlebuch, 2001

CHL — Chile
Fray Jorge, 1977
Juan Fernández, 1977
Torres del Paine, 1978
Laguna San Rafael, 1979
Lauca, 1981
Araucarias, 1983
La Campana-Peñuelas, 1984
Cabo de Hornos, 2005
Bosques Templados Lluviosos de Los Andes Australes, 2007
Corredor Biológico Nevados de Chillán - Laguna de Laja, 2011

CHN — China
Changbaishan, 1979
Dinghushan, 1979
Wolong, 1979
Fanjingshan, 1986
Wuyishan, 1987
Xilin Gol, 1987
Bogeda, 1990
Shennongjia, 1990
Yancheng, 1992
Xishuangbanna, 1993
Maolan, 1996
Tianmushan, 1996
Fenglin, 1997
Jiuzhaigou Valley, 1997
Nanji Islands, 1998
Baishuijiang, 2000
Gaoligong Mountain, 2000
Huanglong, 2000
Shankou Mangrove, 2000
Baotianman, 2001
Saihan Wula, 2001
Dalai Lake, 2002
Wudalianchi, 2003
Yading, 2003
Foping, 2004
Qomolangma, 2004
Chebaling, 2007
Xingkai Lake, 2007
Mao'er Mountain, 2011
Jinggangshan, 2012
Niubeiliang, 2012
Snake Island - Laotie Mountain, 2013
Hanma, 2015

CIV — Republic of Côte d'Ivoire
Taï, 1977
Comoé, 1983

CMR — Cameroon
Waza, 1979
Benoué, 1981
Dja, 1981

COD — Democratic Republic of the Congo
Luki, 1976
Yangambi, 1976
Lufira, 1982

COG — Congo
Odzala, 1977
Dimonika, 1988

COL — Colombia
Cinturon Andino, 1979
El Tuparro, 1979
Sierra Nevada de Santa Marta, 1979
Ciénaga Grande de Santa Marta, 2000
Seaflower, 2000

CRI — Costa Rica
La Amistad, 1982
Cordillera Volcánica Central, 1988
Agua y Paz, 2007

CUB — Cuba
Sierra del Rosario, 1984
Baconao, 1987
Cuchillas de Toa, 1987
Península de Guanahacabibes, 1987
Buenavista, 2000
Ciénaga de Zapata, 2000

CZE — Czech Republic
Krivoklátsko, 1977
Trebon Basin, 1977
Lower Morava, 1986
Sumava, 1990
Krkonose/Karkonosze, 1992; *Poland*
Bílé Karpaty, 1996

DEU — Germany
Flusslandschaft Elbe, 1979
Vessertal-Thüringer Wald, 1979
Berchtesgadener Land, 1990
Schleswig-Holstenisches Wattenmeer, Halligen, 1990
Schorfheide-Chorin, 1990
Rhön, 1991
Spreewald, 1991
Südost-Rügen, 1991
Hamburgisches Wattenmeer, 1992
Niedersächsisches Wattenmeer, 1992
Vosges du Nord/Pfälzerwald, 1992; *France, 1998*
Oberlausitzer Heide- und Teichlandschaft, 1996
Schaalsee, 2000
Bliesgau, 2009
Schwäbische Alb, 2009

DNK — Denmark
North-East Greenland, 1977

DOM — Dominican Republic
Jaragua-Bahoruco-Enriquillo, 2002

DZA — Algeria
Tassili N'Ajjer, 1986
El Kala, 1990
Djurdjura, 1997
Chrea, 2002
Gouraya, 2004
Taza, 2004
Belezma, 2015

ECU — Ecuador
Archipiélago de Colón, Galápagos, 1984
Yasuní, 1989
Sumaco, 2000
Podocarpus - El Cóndor, 2007
Macizo del Cajas, 2013
Bosque Seco, 2014

EGY — Egypt
Omayed, 1981
Wadi Allaqi, 1993

ESP — Spain
Grazalema, 1977
Ordesa-Viñamala, 1977
Montseny, 1978
Doñana, 1980
La Mancha Húmeda, 1980
La Palma, 1983
Las Sierras de Cazorla y Segura, 1983
Marismas del Odiel, 1983
Urdaibai, 1984
Sierra Nevada, 1986
Cuenca Alta del Río Manzanares, 1992
Lanzarote, 1993
Menorca, 1993
Sierra de las Nieves y su Entorno, 1995
Cabo de Gata-Nijar, 1997
Isla de Hierro, 2000
Bardenas Reales, 2000
Muniellos, Gran Cantábrica, 2000
Somiedo, 2000
Redes, 2001
Las Dehesas de Sierra Morena, 2002
Terras do Miño, 2002
Valle de Laciana, Gran Cantábrica, 2003
Monfragüe, 2003
Picos de Europa, Gran Cantábrica, 2003

Valle de Jubera, Leza, Cidacos y Alhama, 2003
Babia, Gran Cantábrica, 2004
Alto de Bernesga, Gran Cantábrica, 2005
Área de Allariz, 2005
Gran Canaria, 2005
Los Argüellos, Gran Cantábrica, 2005
Los Valles de Omaña y Luna, 2005
Sierra del Rincón, 2005
Las Sierras de Béjar y Francia, 2006
Los Ancares Leoneses, Gran Cantábrica, 2006
Los Ancares Lucenses y Montes de Cervantes, Navia y Becerrea, Gran Cantábrica, 2006
Reserva de la Biosfera intercontinental del Mediterraneo, 2006; *Morocco*
Rio Eo, Oscos y Terras de Buron, 2007
Fuerteventura, 2009
Gerês, 2009; *Portugal*
La Gomera, 2012
Las Ubinas - La Mesa, 2012
Marinas Corunesas e Terras do Mandeo, 2013
Terres de l'Ebre, 2013
Real Sitio de San Ildefonso – El Espinar, 2013
Macizo de Anaga, 2015
Meseta Ibérica, 2015; *Portugal*

EST — Estonia
West-Estonian Archipelago, 1990

ETH — Ethiopia
Kafa, 2010
Yayu, 2010
Sheka, 2012
Lake Tana, 2015

FIN — Finland
North Karelian, 1992
Achipelago Sea Area, 1994

FRA — France
Camargue, Rhône-Delta, 1977
Commune de Fakarava, 1977
Vallée du Fango, 1977
Cévennes, 1984
Iles et Mer d'Iroise, 1988
Vosges du Nord / Pfälzerwald, 1988; *Germany, 1998*
Mont Ventoux, 1990
Archipel de la Guadeloupe, 1992
Luberon-Lure, 1997
Fontainebleau et du Gâtinais, 1998
Bassin de la Dordogne, 2012
Marais Audomarois, 2013
Mont-Viso, 2013; *Italy*
Gorges du Gardon, 2015

FSM — Federated States of Micronesia
Utwe, 2005
And Atoll, 2007

GAB — Gabon
Ipassa-Makokou, 1983

GBR — United Kingdom
Beinn Eighe, 1976
Braunton Burrows - North Devon, 1976
Biosffer Dyfi, 1976
North Norfolk Coast, 1976
Galloway and Southern Ayrshire, 2012
Brighton and Lewes Downs, 2014

GHA — Ghana
Bia, 1983
Songor, 2011

GIN — Guinea
Massif du Ziama, 1980
Monts Nimba, 1980
Badiar, 2002
Haut Niger, 2002

GNB — Guinea-Bissau
Boloma Bijagós, 1996

GRC — Greece
Gorge of Samaria, 1981
Mount Olympus, 1981

GTM — Guatemala
Maya, 1990
Sierra de Las Minas, 1992
Trifinio Fraternidad, 2011; *El Salvador, Honduras*

HND — Honduras
Río Plátano, 1980
Trifinio Fraternidad, 2011; *El Salvador, Guatemala*
Cacique Lempira, Señor de las Montañas, 2015

HRV — Croatia
Velebit Mountain, 1977
Mura Drava Danube, 2012; *Hungary*

HTI — Republic of Haiti
La Selle, 2012

HUN — Hungary
Aggtelek, 1979
Hortobágy, 1979
Kiskunság, 1979
Lake Fertö, 1979
Pilis, 1980
Mura Drava Danube, 2012; *Croatia*

IDN — Indonesia
Cibodas, 1977
Komodo, 1977
Lore Lindu, 1977
Tanjung Puting, 1977
Gunung Leuser, 1981
Siberut, 1981
Giam Siak Kecil - Bukit Batu, 2009
Wakatobi, 2012
Bromo Tengger Semeru-Arjuno, 2015
Taka Bonerate-Kepulauan Selayar, 2015

IND — India
Nilgiri, 2000
Gulf of Mannar, 2001
Sunderban, 2001
Nanda Devi, 2004
Nokrek, 2009
Pachmarhi, 2009
Similipal, 2009
Achanakmar-Amarkantak, 2012
Great Nicobar, 2013

IRL — Ireland
Dublin Bay, 1981; former North Bull Island, renamed in 2015
Killarney, 1982

IRN — Islamic Republic of Iran
Arasbaran, 1976
Arjan, 1976
Geno, 1976
Golestan, 1976
Hara, 1976
Kavir, 1976
Lake Oromeeh, 1976
Miankaleh, 1976
Touran, 1976
Dena, 2010
Tang-e-Sayad and Sabzkuh, 2015

ISR — Israel
Mount Carmel, 1996
Ramat Menashe, 2011

ITA — Italy
Circeo, 1977
Collemeluccio-Montedimezzo, 1977
Miramare, 1979
Cilento and Valle di Diano, 1997
Somma-Vesuvio and Miglio d'Oro, 1997
Valle del Ticino, 2002
Tuscan Islands, 2003
Selva Pisana, 2004
Area della Biosfera del Monviso, 2013; *France*
Sila, 2014
Ledro Alps and Judicaria, 2015
Po Delta, 2015
Appennino Tosco-Emiliano, 2015

JOR — Jordan
Dana, 1998
Mujib, 2011

JPN — Japan
Mount Hakusan, 1980
Mount Odaigahara & Mount Omine, 1980
Shiga Highland, 1980
Yakushima Isalnd, 1980
Aya, 2012
Minami Alps, 2014
Tadami, 2014

KAZ — Kazakhstan
Korgalzhyn, 2012
Alakol, 2013
Ziarat Juniper Forest, 2013
Ak-Zhayik, 2014
Katon-Karagay, 2014
Aksu-Zhabagly, 2015

KEN — Kenya
Mount Kenya, 1978
Mount Kulal, 1978
Malindi-Watamu, 1979
Kiunga, 1980
Amboseli, 1991
Mount Elgon, 2003

KGZ — Kyrgyzstan
Sary-Chelek, 1978
Issyk Kul, 2001

KHM — Cambodia
Tonle Sap, 1997

KNA — Saint Kitts and Nevis
St. Mary's, 2011

KOR — Republic of Korea
Mount Sorak, 1982
Jeju Island, 2002
Shinan Dadohae, 2009
Gwangneung Forest, 2010
Gochang, 2013

LBN — Lebanon
Shouf, 2005
Jabal Al Rihane, 2007
Jabal Moussa, 2009

LKA — Sri Lanka
Hurulu, 1977
Sinharaja, 1978
Kanneliya-Dediyagala-Nakiyadeniya, 2004
Bundala, 2005

LTU — Lithuania
Zuvintas, 2011

LVA — Latvia
North Vidzeme, 1997

MAR — Morocco
Arganeraie, 1998
Oasis du sud marocain, 2000
Réserve de Biosphère intercontinentale de la Méditerranée, 2006; *Spain*

MDG — Madagascar
Mananara Nord, 1990
Sahamalaza-Iles Radama, 2001
Littoral de Toliara, 2003

MDV — Republic of Maldives
Baa Atoll, 2011

MEX — Mexico
Mapimí, 1977
La Michilía, 1977
Montes Azules, 1979
El Cielo, 1986
Sian Ka'an, 1986
Sierra de Manantlán, 1988
Région de Calakmul, 1993
Alto Golfo de California, 1993
El Triunfo, 1993
El Vizcaíno, 1993
Islas de Golfo de California, 1995
Sierra Gorda, 2001
Banco Chinchorro, 2003
Ría Celestún, 2003
Sierra La Laguna, 2003
Ría Lagartos, 2004
Barranca de Metztlán, 2006
Chamela-Cuixmala, 2006
Cuatro Ciénagas, 2006
Cumbres de Monterrey, 2006
Huatulco, 2006
La Encrucijada, 2006
Laguna Madre y Delta de Río Bravo, 2006
La Primavera, 2006
La Sepultura, 2006
Los Tuxtlas, 2006
Maderas del Carmen, Coahuila, 2006
Mariposa Monarca, 2006
Pantanos de Centla, 2006

Arrecife Alacranes, 2006
Sistema Arrecifal Veracruzano, 2006
Selva El Ocote, 2006
Sierra de Huautla, 2006
Volcan Tacaná, 2006
Sierra de Alamos - Rio Cuchujaqui, 2007
Islas Marietas, 2008
Lagunas de Montebello, 2009
Islas Marías, 2010
Los Volcanes, 2010
Nahá-Metzabok, 2011
Tehuacán-Cuicatlán, 2012

MKD — Former Yugoslav Republic of Macedonia
Ohrid - Prespa, 2014; *Albania*

MLI — Mali
Boucle du Baoulé, 1982

MMR — Myanmar
Inlay Lake, 2015

MNE — Montenegro
Tara River Basin, 1976

MNG — Mongolia
Great Gobi, 1990
Boghd Khan Uul, 1996
Uvs Nuur Basin, 1997
Hustai Nuruu, 2002
Dornod Mongol, 2005
Mongol Daguur, 2007

MRT — Mauritania
Delta du Fleuve Sénégal, 2005; *Senegal*

MUS — Mauritius
Macchabee / Bel Ombre, 1977

MWI — Malawi
Mount Mulanje, 2000
Lake Chilwa Wetland, 2006

MYS — Malaysia
Tasik Chini, 2009
Crocker Range, 2014

NER — Niger
W Region, 1996; *Benin, Burkina Faso, 2002*
Aïr et Ténéré, 1997

NGA — Nigeria
Omo, 1977

NIC — Nicaragua
Bosawas, 1997
Río San Juan, 2003
Ometepe Island, 2010

NLD — Netherlands
Wadden Sea Area, 1986

PAK — Pakistan
Lal Suhanra, 1977

PAN — Panama
Darién, 1983
La Amistad, 2000

PER — Peru
Huascarán, 1977
Manu, 1977
Noroeste, 1977
Oxapampa-Ashaninka-Yanesha, 2010

PHL — Philippines
Palawan, 1977
Puerto Galera, 1977

PLW — Palau
Ngaremeduu, 2005

POL — Poland
Babia Gora, 1976
Bialowieza, 1976
Lukajno Lake, 1976
Slowinski, 1976
Krkonose / Karkonosze, 1992; *Czech Republic*
Tatra, 1992; *Slovakia*
East Carpathians, 1998; *Slovakia, Ukraine*
Puszcza Kampinoska, 2000
West Polesie, 2002; *Ukraine, Belarus, 2012*
Tuchola Forest, 2010

PRK — Democratic People's Republic of Korea
Mount Paekdu, 1989
Mount Kuwol, 2004
Mount Myohyang, 2009
Mount Chilbo, 2014

PRT — Portugal
Paúl do Boquilobo, 1981
Corvo Island, 2007
Graciosa Island, 2007
Flores Island, 2009
Xurés, 2009; *Spain*
Berlengas, 2011
Santana Madeira, 2011
Meseta Ibérica, 2015; *Spain*

PRY — Paraguay
Bosque Mbaracayú, 2000
El Chaco, 2005

QAT — Qatar
Al-Reem, 2007

ROU — Romania
Pietrosul Mare, 1979
Retezat, 1979
Danube Delta, 1992; *Ukraine, 1998*

RUS — Russian Federation
Kavkazskiy, 1978
Okskiy, 1978
Prioksko-Terrasnyi, 1978
Sikhote-Alin, 1978
Tsentral'nochernozem, 1978
Astrakhanskiy, 1984
Kronotskiy, 1984
Laplandskiy, 1984
Pechoro-Ilychskiy, 1984
Sayano-Shushenskiy, 1984
Sokhondinskiy, 1984
Voronezhskiy, 1984
Tsentralnolesnoy, 1985
Baikalskyi, 1986
Barguzinskyi, 1986
Tsentralnosibirskiy, 1986
Chernyje Zemli, 1993
Taimyrsky, 1995
Daursky, 1997
Teberda, 1997
Ubsunorskaya Kotlovina, 1997
Katunskiy, 2000
Nerusso-Desnianskoe-Polesie, 2001
Visimskiy, 2001
Vodlozersky, 2001
Darvinskiy, 2002
Commander Islands, 2002
Nijegorodskoe Zavolje, 2002
Smolensk Lakeland, 2002
Ugra, 2002
Far East Marine, 2003
Kedrovaya Pad, 2004
Kenozersky, 2004
Valdaiskiy, 2004
Khankaiskiy, 2005
Middle Volga Integrated Biosphere, 2006
Great Volzhsko-Kamsky, 2007
Rostovsky, 2008
Altaisky, 2009
Wolga-Akhtuba Floodplain, 2011
Bashkirskiy Ural, 2012

RWA — Rwanda
Volcans, 1983

SDN — Sudan
Dinder, 1979
Radom, 1979

SEN — Senegal
Samba Dia, 1979
Delta du Saloum, 1980
Niokolo-Koba, 1981
Delta du Fleuve Sénégal, 2005; *Mauritania*
Ferlo, 2012

SLV — El Salvador
Apaneca - Llamatepec, 2007
Xiriualtique - Jiquitizco, 2007
Trifinio Fraternidad, 2011; *Guatemala, Honduras*

SRB — Serbia
Golija-Studenica, 2001

STP — São Tomé and Príncipe
The Island of Príncipe, 2012

SVK — Slovakia
Slovenskiý Kras, 1977
Polana, 1990
Tatra, 1992, TBD Polonia
East Carpthians, 1998; *Poland, Ukraine*

SVN — Slovenia
Julian Alps, 2003
The Karst, 2004
Kozjansko and Obsotelje, 2010

SWE — Sweden
Kristianstad Vattenrike, 2005
Lake Vänern Archipelago, 2010
Blekinge Archipelago, 2011
Nedre Dalälven River Landscape, 2011
East Vättern Scarp Landscape, 2012

SYR — Syria
Lajat, 2009

TGO — Togo
Complexe Oti-Keran / Oti-Mandouri, 2011

THA — Thailand
Sakaerat, 1976
Hauy Tak Teak, 1977
Mae Sa-Kog Ma, 1977
Ranong, 1997

TKM — Turkmenistan
Repetek, 1978

TUN — Tunisia
Djebel Bou-Hedma, 1977
Djebel Chambi, 1977
Ichkeul, 1977
Iles Zembra et Zembretta, 1977

TUR — Turkey
Camili, 2005

TZA — Tanzania
Lake Manyara, 1981
Serengeti-Ngorongoro, 1981
East Usambara, 2000

UGA — Uganda
Queen Elizabeth, 1979
Mount Elgon, 2005

UKR — Ukraine
Chernomorskiy, 1985
Askaniya-Nova, 1985
Carpathian, 1992
Danube Delta, 1998; *Romania*
East Carpathians, 1998; *Poland, Slovakia*
West Polesie, 2002; *Poland, Belarus, 2012*
Desnianskyi, 2009
Roztochya, 2011

URY — Uruguay
Bañados del Este, 1976
Bioma Pampa-Quebradas del Norte, 2014

USA — United States
Aleutian Islands, 1976
Beaver Creek, 1976
Big Bend, 1976
Cascade Head, 1976
Central Plains, 1976
Channel Islands, 1976
Coram, 1976
Denali, 1976
Desert, 1976
Everglades, 1976
Fraser, 1976
Glacier, 1976
H.J. Andrews, 1976
Hubbard Brook, 1976
Jornada, 1976
Luquillo, 1976
Noatak, 1976
Olympic, 1976
Organ Pipe Cactus, 1976
Rocky Mountain, 1976
San Dimas, 1976
San Joaquin, 1976

Sequoia-Kings Canyon, 1976
Stanislaus-Tuolumne, 1976
Three Sisters, 1976
Virgin Islands, 1976
Yellowstone, 1976
Konza Prairie, 1978
University of Michigan Biological Station, 1979
Niwot Ridge, 1979
Virginia Coast, 1979
Hawaiian Islands, 1980
Isle Royale, 1980
Big Thicket, 1981
Guanica, 1981
California Coast Ranges, 1983
Central Gulf Coast Plain, 1983
South Atlantic Coastal Plain, 1983
Mojave and Colorado Deserts, 1984
Carolinian-South Atlantic, 1986
Glacier Bay-Admiralty Islands, 1986
Golden Gate, 1986
New Jersey Pinelands, 1988
Southern Appalachian, 1988
Champlain-Adirondak, 1989
Mammoth Cave Area, 1990
Land Between the Lakes Area, 1991

UZB — Uzbekistan
Mount Chatkal, 1978

VEN — Venezuela
Alto Orinoco-Casiquiare, 1993
Delta Orinoco, 2009

VNM — Viet Nam
Can Gio Mangrove, 2000
Cat Tien, 2001
Cat Ba, 2004
Red River Delta, 2004
Kien Giang, 2006
Western Nghe An, 2007
Cu Lao Cham - Hoi An, 2009
Mui Ca Mau, 2009
Langbiang, 2015

YEM — Yemen
Socotra Archipelago, 2003
Bura'a, 2011

ZAF — South Africa
Kogelberg, 1998
Cape West Coast, 2000
Kruger To Canyons, 2001
Waterberg, 2001
Cape Winelands, 2007
Vhembe, 2009
Gourlitz Cluster, 2015
Magaliesberg, 2015

ZWE — Zimbabwe
Middle Zambezi, 2010

TRANSBOOUNDARY BIOSPHERE RESERVES

Poland, Slovakia
Tatra, 1992

Poland, Czech Republic
Krkonose / Karkonosze, 1992

Germany, France
Vosges du Nord / Pfälzerwald, 1998

Poland, Slovakia, Ukraine
East Carpathians, 1998

Romania, Ukraine
Danube Delta, 1998

Benin, Burkina Faso, Niger
W Region, 2002

Mauritania, Senegal
Delta du Fleuve Sénégal, 2005

Morocco, Spain
Réserve de Biosphère Intercontinentale de la Méditerranée, 2006

Portugal, Spain
Gerês / Xurés, 2009

El Salvador, Guatemala, Honduras
Trifinio Fraternidad, 2011

Poland, Ukraine, Belarus
West Polesie, 2012

Croatia, Hungary
Mura Drava Danube, 2012

France, Italy
Mont-Viso / Area della Biosfera Del Monviso, 2013

Albania, Former Yugoslav Republic of Macedonia
Ohrid-Prespa, 2014

Portugal, Spain
Meseta Ibérica, 2015

Green Economy in Biosphere Reserves project in Ghana, Nigeria and Tanzania. The Green Economy in Biosphere Reserves project (GEBR) is a three-year project being implemented in three sub-Saharan African countries: Ghana, Nigeria and Tanzania. The project is financed by the Korea International Cooperation Agency (KOICA) through a funds-in-trust agreement, and is being implemented by UNESCO within the framework of the Man and the Biosphere (MAB) Programme.

The main aims of this project are the conservation of biodiversity, poverty reduction and sustainable development through green economies.

The project strives to ensure the long-term conservation of biodiversity in three biosphere reserves in Africa, all internationally recognized for their values in terms of genetic resources and representative ecosystems. These biosphere reserves have similar ecosystem types with tropical humid forests in the Bia (Ghana) and Omo (Nigeria), and tropical submontane and evergreen forests in the East Usambara (Tanzania). With people living within or in close proximity to the three sites, GEBR seeks to integrate their developmental needs and conservation objectives in line with MAB principles.

Start-up equipment given to beneficiaries of the Green Economy in Biosphere Reserves Project in Ghana.
© UNESCO Accra Office

In Ghana, 230 beneficiaries were trained to undertake apiculture, snail farming, mushroom production and palm oil extraction. In order to ensure the sustainability of their businesses and add value to the products, training was provided on book-keeping, marketing, packaging and how to invest profits back into the business. On 13 August 2015, at a ceremony held in Debiso in the Juabeso and Bia District of Ghana, beneficiaries were presented with start-up equipment such as beehives, snail pens and mushroom sheds.

From July 2015 to October 2015, 552 farmers living in and around the East Usambara Biosphere Reserve in Tanzania were given further training in technical and vocational skills in beekeeping, tree planting, spice farming, mushroom farming, butterfly farming and fish farming. The training aimed at improving their technical capacity and formalizing their work through the formation of associations. The ultimate goal was to increase farmers' capabilities in these businesses to enable them to meet market demand both in terms of quality and quantity. The businesses are all supported by the climate and soils of the area.

No plastic. A small gesture in our hands. In February 2014, the Biosphere Reserve of the Island of Príncipe (São Tomé and Príncipe) and UNESCO jointly launched an awareness and mobilization campaign entitled 'No plastic. A small gesture in our hands'. The campaign aims to reduce plastic waste and promote access to drinking water in the biosphere reserve. It intends to involve the whole population in collecting plastic bottles. Fifty plastic bottles can be exchanged for a 'Principe Biosphere Bottle', a reusable stainless steel bottle made from safe, plastic-free materials. These bottles can be replenished at various treated water points installed across the island of Principe.

While meeting with representatives of the MAB programme and the Spanish Ministry of Agriculture, Food and Environment, the Regional President of the Government of Principe announced that the Island of Principe would become 'plastic-free' by 2020, and that this project would serve as a model for future activities.

The 'No plastic campaign' targets children as future advocates for a healthy environment. For this reason, the campaign is promoted in towns and schools throughout the autonomous region of the island of Principe.

No plastic. A small gesture in our hands.
© Antonio Abreu

After a year-long campaign, a total of 200,000 plastic bottles were removed, 13 safe water fountains were established, and 6,000 'Principe Biosphere Bottles' were distributed among the local population.

The campaign represents a partnership between the Regional Government of Principe through the Island of Príncipe Biosphere Reserve, UNESCO's Man and Biosphere (MAB) programme, the Spanish Ministry for Agriculture, Food and the Environment, and the HBD group.

Botanists of the twenty-first century: Roles, challenges and opportunities. The conference 'Botanists of the twenty-first century: Roles, challenges and opportunities', was organized by the MAB Programme and its partners, and took place at UNESCO Headquarters in Paris, France on 22 — 25 September 2014. The conference aimed to develop a forward-looking perspective for the botanical profession in the twenty-first century. It focused on tropical and temperate botanical issues, identifying skills to be maintained or developed

and current training needs. It also defined ways for professionals to interact with other disciplines and improve communication with the general public and policy-makers.

Conference 'Botanists of the twenty-first century: Roles, challenges and opportunities'.
© UNESCO/P. Chiang-Joo

The conference brought together 300 participants from 60 countries from various disciplines, including experts from education, science, academia, policy, NGOs, communities and business, as well as development partners from different regions of the world.

Strengthening of the Argan Biosphere Reserve in Morocco. Located in the southwest of Morocco, the Arganeraie Biosphere Reserve is a large intra-montane plain home to the Argan tree *(Argania spinosa)*, a species endemic to the reserve in need of conservation. These trees constitute a major economic resource for local inhabitants as the principal source of Argan oil, which has multiple uses in cooking, medicines and cosmetics. The trees are also used as fuelwood for cooking and heating.

For centuries, Argan oil has been a mainstay of the Berber people of the region. Since 1999, coinciding with the designation of the area as a biosphere reserve by UNESCO, the oil has met with increasing interest and appreciation in Europe and other high-value markets.

Most of the oil is harvested by women's 'Argan oil cooperatives'. Since 2014, the Man and the Biosphere (MAB) Programme and Procter & Gamble have been working together to provide support for research activities and women's cooperatives.

The aim is to enable rural families to increase consumption and investment and simultaneously preserve the health of the Argan forest. Increased returns on female labour might also improve the position of women in intra-household bargaining and simultaneously enable families to send their girls to secondary school.

To ensure the sustainable development of this biosphere reserve and help meet the energy needs of the local community, the MAB Programme and the Moroccan National Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE) organized a seminar, held in Marrakech, Morocco in March 2015 to discuss these issues.

The seminar brought together key national institutions and stakeholders, scientists, as well as international experts. It highlighted present management and socio-economic challenges facing the Argan Forest and the people who live there, as well as possible ways and means that renewable energy could constitute part of the solution. Building on these discussions, ADEREE together with the National Agency for the Development of Oasis Areas and the Argan Forest (l'Agence nationale pour le développement des zones oasiennes et de l'arganier, ANDZOA), the MAB National Committee of Morocco and the Arganeraie Biosphere Reserve, supported by the UNESCO Rabat Office and UNESCO Paris, are developing an renewable energy action plan for the Arganeraie Biosphere Reserve, within the overall framework of Morocco's renewable energy strategy.

Biosphere Reserves as a Tool for Coastal and Island Management in the South-East Pacific Region. Financed by the Flemish Government of Belgium and coordinated by the MAB Programme, the Biosphere Reserves as a Tool for Coastal and Island Management in the South-East Pacific Region (BRESEP) project aims to create and strengthen existing biosphere reserves in coastal areas and islands of the eastern South Pacific in Chile, Colombia, Ecuador, Panama and Peru. This three-year project also aims to promote biosphere reserves as tools for innovative projects to bring added value to local socio-economic activities, and to sensitize and build the capacity of stakeholders in the area.

The kick-off meeting for the BRESEP project took place in Castro, Chiloe Island in Chile on 10—12 December 2014 and was organized by the MAB programme and the National Forestry Corporation (CONAF-Chile).

Mr Nofal Abud, the Director of the Region of Los Lagos, the highest authority in the region and regional representative of the President of the Republic of Chile, closed the opening ceremony by affirming the Regional Government's interest in programmes such as BRESEP, 'which open doors and develop sustainable development for the province of Chiloé and the Region of Los Lagos'.

Kick-off meeting of the BRESEP Project, Chiloé Island, Chile.
© CONAF

Mr Miguel Clüsener-Godt, Senior Programme Specialist of the Man and the Biosphere (MAB) Programme presented the objectives, vision and goals of the BRESEP Project. He explained that biosphere reserves promote solutions to reconcile biodiversity conservation and sustainability, for example, through sustainable tourism, benefitting local communities.

The 2nd project meeting took place in Lima, Peru on 1—3 July 2015, and was organized by the MAB programme and the National Service of Natural Areas Protected by the State from Peru.

The five participating countries (Chile, Colombia, Ecuador, Panama and Peru) presented progress made since December 2014 and short and long-term initiatives and activities identified within the framework of this project.

The third meeting of the BRESEP project was held almost five months later on 24–26 November 2015 in Puerto Ayora, Galapagos Islands in Ecuador. Each country presented work currently underway.

Kick-off meeting of the BRESEP Project, Chiloé Island, Chile. © CONAF

Chile is currently working on an extension of the Juan Fernandez Biosphere Reserve to incorporate its marine area and will assess the possibility of creating a new biosphere reserve on the Island of Chiloé.

Peru has submitted an extension of the Noreste Biosphere Reserve to the Man and the Biosphere Programme that includes the mangroves of Tumbes.

Ecuador is currently working on the extension of the Archipielago de Colon Biosphere Reserve (Galapagos) to incorporate the marine area, and is developing the management plan for the Biosphere Reserve. The country is also working on the establishment of a new biosphere reserve in the Gulf of Guayaquil.

Panama is working on the extension of the Darien Biosphere Reserve to cover a marine and coastal area. The country will organize meetings with the community as well as educational projects in the area.

At the meeting, a field trip was co-organized with the Galapagos National Park to North Seymour Island, with explanations by the National Park on the different management actions related to tourism, environmental monitoring, inventory of native and endemic species, and rodent eradication to ensure that these ecosystems maintain their integrity.

The meeting also included a workshop on coastal and marine management for all participants, with a joint event held between the Flemish Government of the Kingdom of Belgium, BRESEP and the SPINCAM (Southeast Pacific data and Information Network in support of integrated Coastal Area Management) project of UNESCO's Intergovernmental Oceanographic Commission (IOC).

As BRESEP and SPINCAM projects are funded by the Government of Flanders in Belgium, and focus on the same five counties in Latin America, they have decided to coordinate their activities and indicators and share coastal spatial data acquired with the aim of supporting future development and management practices for a sustainable coast.

The joint workshop organized in Galapagos aimed to find synergies between the experts involved in both projects, promote exchange of experiences between projects using different approaches to managing coastal and marine environments, and identify tools for the identification of ecosystem services and threats to the marine environment to support the definition of priority areas for conservation in the context of integrated coastal zone management and marine spatial planning.

Transboundary Biosphere Reserves in Europe: Instruments, Methods and Governance. The MAB National Committees of France and Germany, the Transboundary Vosges du Nord/Pfälzerwald Biosphere Reserve, the UNESCO/MAB Secretariat and the UNESCO Regional Bureau for Science and Culture in Europe jointly organized an international meeting on 2–5 June 2015. The focus of this event held in Château De Liebfrauenberg, Goersdorf, Vosges du Nord (France), was the management of transboundary biosphere reserves in Europe.

Participants to the Meeting 'Transboundary Biosphere Reserves in Europe'. © RBT Vosges du Nord-Pfälzerwald

Over the last 20 years, UNESCO has designated 14 transboundary biosphere reserves (TBRs) in 23 countries in Europe, Africa and Latin America. Each of them includes two to three countries. As borders between states are political rather than ecological, ecosystems often occur across national boundaries, and may be subject to different, or even conflicting, management and land use practices. TBRs provide a tool for common management and allow the establishment of cooperation projects on the management of socio-ecological systems over borders. Other projects are currently under preparation.

Located along the French-German border, the Vosges du Nord/Pfälzerwald reserve shares a number of natural features including water, sandstone and forests. This TBR seeks to develop methods for the sustainable management of natural resources and to establish a new relationship between people and the environment, through research and education with the participation of local communities.

In 2004, an international conference followed by an expert workshop took place in the German part of the TBR Pfälzerwald/Vosges du Nord, in Fischback and Edesheim. Ten years later, there was a need to assess the situation and progress achieved under the TBR approach in Europe, examine the lessons learned, and extend the approach outside the UNESCO-MAB area.

The meeting in Goersdof focused on strengthening everyday management and governance in the TBR and involving local people in transboundary sustainable development project. It also sought to enhance institutional and funding mechanisms in the TBR, improve the visibility and recognition/acknowledgement of TBRs by authorities at regional, national and international levels, including the EU, and promoting TBRs as a tool for cooperation in Europe.

RENFORUS Initiative – Renewable Energy Futures for UNESCO Sites. Energy is at the heart of human, social, economic and sustainable development issues. Decisions taken on use of energy sources and related technologies have a major influence on opportunities for development, as well as on the wellbeing of human beings and ecosystems. Energy and environment issues cannot be dissociated from development concerns and are linked to other physical resources such as forest and agriculture, water, land, air and, in fact, the entire biosphere.

The objective of the RENFORUS initiative is to provide the international community with global climate change field observatory sites involving the sustainable use of environmentally sound renewable energy sources at UNESCO sites (biosphere reserves and World Heritage Sites). This initiative will address climate change mitigation, while also aiming to demonstrate the benefit of harnessing locally available renewable energy sources and their potential impact on the environmental and ecological preservation of UNESCO sites.

El Hierro Biosphere Reserve, Spain.
© Cipriano Marín

Within the framework of this initiative, the Man and the Biosphere Programme co-organized the Renisla 2014 Forum, which took place on the Island of El Hierro Biosphere Reserve (Spain) on 25–26 June 2014, under the slogan '100% renewable energy: a possible future'.

The meeting brought together global experts to exchange knowledge, technology and experiences from different sites that are moving towards energy self-sufficiency based on renewable energy.

The Renisla 2014 Forum focused on key issues including energy self-consumption and green building, sustainable electric mobility, renewable water strategies and cooperation opportunities with Africa.

MAB France rewards original sustainable development initiatives in biosphere reserves. The French MAB National Committee and the Man and the Biosphere Programme presented this year's winners of the French Biosphere Reserve Trophies in a ceremony that took place at UNESCO Headquarter in Paris on Monday 21 September 2015.

Laureates of the French Biosphere Reserve Trophies.
© UNESCO/Vincent van Ryssegem

The Biosphere Reserve Trophies rewards original initiatives carried out by local actors in the field of sustainable development in French biosphere reserves. They encourage commitment to the sustainable management of natural resources, biodiversity, sustainable development and combatting climate change, and are accompanied by financial support. The trophies promote the establishment of exchanges and partnerships between biosphere reserves and local actors to support their network organization.

The MAB France Trophies is a great opportunity to highlight positive and concrete action that are taking place in Biosphere Reserves.

The role of Biosphere Reserves in large river basins. A workshop entitled 'The role of Biosphere Reserves in large river basins in promoting sustainable development at local, regional and international scales – The cases of the Volga and Po river basins', held in Venice and the Po Delta Biosphere Reserve, on 21–25 September 2015, brought together representatives from 13 biosphere reserves located along the Volga river in the Russian Federation, with representatives from the biosphere reserves of Po Delta (Italy), Terres del Ebre (Spain) and the Danube Delta (Romania and Ukraine), in the presence of representatives of the Po River Authority.

The meeting focused on the integrated management of natural resources and ecosystem services in large river basins, and allowed participants to exchange views and experiences, and investigate opportunities for strengthening the role of biosphere reserves in all key aspects of sustainable development in large river basins. On this occasion, informative and awareness-raising material promoting the role of biosphere reserves in the Volga river basin was presented.

The main outcome of the meeting was a set of recommendations to strengthen regional cooperation and the improvement of science-policy interface in the management of large river basins.

Biosphere Reserves for Environmental and Economic Security in Asia-Pacific. The Biosphere Reserves for Environmental and Economic Security (BREES) is a long-term regional climate change and poverty alleviation programme that works with communities, micro-finance institutions, educational institutions, government and donor agencies to use biosphere reserves as learning centres for environmental and human adaptability to climate change effects, and to improve economic conditions for the rural poor in and near biosphere reserves.

BREES works with donors and micro-finance institutions to establish micro-financing and grant networks in communities surrounding the almost 150 biosphere reserves in the Asia-Pacific region. The programme invests heavily in community-based efforts to alleviate poverty, and establishes a critical mass of resources and people to effectively safeguard important carbon sinks, and develop innovative solutions to enhance the livelihoods of the rural poor.

With support from Japanese Funds-in-Trust and the UNESCO Office in Jakarta (Regional Sciences Bureau in Asia and the Pacific), the BREES programme has completed:

a) a collaborative study with MAB Viet Nam and Cat Ba Biosphere Reserve on the use of social capital as an underlying operating system with the four pillars of biosphere reserves;
b) a study on Best Practices and Management Experiences in Ecotourism: Generating Alternative Livelihoods within the Palawan Biosphere Reserve, Philippines; and
c) a series of interactive case studies on the Experiences of Biosphere Reserves as Learning Centres for Environmental and Human Adaptability to Climate Change, which are presented as audiovisual documentaries for online dissemination.

Climate Change Adaptation and Integrated Water Management. The Huascaran Biosphere Reserve is home to 35% of the tropical glaciers in Peru, which are located in its protected core zone, the Huascaran National Park. Water resources provided by the Huascaran National Park help to sustain local communities by providing water for domestic consumption, agriculture and ranching, and hydropower generation. However, glacier retreat has had an effect on mountain morphology and geometry, leading to an increase in hazardous risks such as landslides and flooding, dramatic ecosystem changes and long-term decrease in freshwater supplies. Taken together, the high stress on the demand of water resources due to demographic and economic dynamics threatens the livelihood of communities within the immediate vicinity, rendering them especially vulnerable to the effects of climate change.

In the Huascaran Biosphere Reserve, the UNESCO Office in Lima and the Spanish Government are implementing a project to help improve livelihoods and strengthen the adaptive capacities of selected rural communities located at the buffer zone of the Huascaran Biosphere Reserve. The project focuses on education and an integrated water resource management approach in a context of high vulnerability to the impacts of climate change. Working with local authorities, the San Antunez de Mayolo National University, the Regional Direction for Education in Ancash, the National Park Authority and different NGOs, the project has strengthened educational, communication and governance capacities to increase resilience to climate change.

International Seminar on Sustainable Development for Biosphere Reserves Managers in Ibero-America and the Caribbean. Around 40 Biosphere Reserves technicians and managers from Ibero-America (Latin America and the Caribbean, Portugal and Spain), together with representatives of the Spanish Autonomous Agency of National Parks (OAPN), UNESCO's Man and Biosphere (MAB) Programme, the United Nations Food and Agriculture Organization (FAO), the International Union for Conservation of Nature (IUCN) participated at an international seminar that took place in Santa Cruz de la Sierra, Bolivia, from 9 to 13 November 2015.

Organized by OAPN jointly with the Spanish Agency for International Cooperation for Development, the seminar aimed to exchange experiences between biosphere reserves and promote the work from the IberoMAB network.

The Exit Strategy, adopted in 2013 by the International Coordinating Council of the MAB Programme to improve the credibility and quality of the World Network of Biosphere Reserves, was a topic that raised many questions that were discussed at a round table on the first day of this event.

The successful experience of the Trifinio Fraternidad Biosphere Reserve shared by Guatemala, Honduras and El Salvador, was also presented at the seminar. Participants emphasized that political and social will were essential ingredients in the process of proposition of new biosphere reserves and for successful management.

Best Practices of Public-Private Partnerships in Latin America. The UNESCO Montevideo office organized from 14 – 16 December in Costa Rica a workshop with biosphere reserve managers and actors from Brazil, Chile, Costa Rica, Mexico and Paraguay as well as contributions from Spain to highlight best practices of public-private partnerships in the region. In addition to presenting successful cases of public-private partnerships for Latin America and the Caribbean, the participants began elaborating key elements of what make sustainable and successful public-private partnerships. Following the event, the UNESCO Montevideo office will be elaborating with the participants a publication of the subject and a how-to guide to promote public-private partnerships in Latin American and Caribbean biosphere reserves.

Participants to the Meeting on Best Practices of Public-Private Partnerships in Latin America.
© UNESCO Montevideo Office

BIOSPHERE RESERVES: A GLOBAL OBSERVATORY FOR CLIMATE CHANGE MITIGATION AND ADAPTATION

THE UNESCO MAN AND THE BIOSPHERE (MAB) PROGRAMME, together with its World Network on Biosphere Reserves (WNBR), functions as a Global Observatory for Climate Change Mitigation and Adaptation. It adds value to the fight against climate change by promoting integrated monitoring, multidisciplinary approaches and participatory activities supporting climate change management and field learning on climate change impacts and related solutions.

From 30 November to 11 December 2015, the 21st United Nations Climate Change Conference (COP21) took place in Paris, France. It concluded successfully with a unanimous multinational agreement to address the causes and impacts of climate change.

In the light of this major event, the Man and the Biosphere Programme organized several activities:

Les Assises du Vivant 2015 — Biodiversity and Climate Change in Interaction: Creating new life possibilities. The 2015 Assises conference took place at UNESCO Headquarters in Paris, France from 9 to 10 February 2015, and brought together scientists, civil society, responsible and engaged citizens, youth, entrepreneurs and artists, all of whom explore new constructive approaches to climate change and biodiversity linkage by sharing their views and experiences.

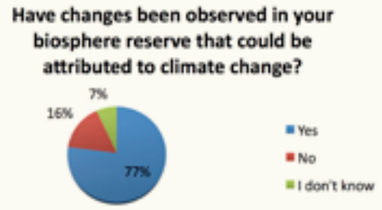
Mr Hubert Reeves, President of Humanité et biodiversité; Ms Ségolène Royal, Minister of Ecology, Sustainable Development and Energy; Ms Flavia Schlegel, Assistant Director-General for Natural Sciences Flavia Schlegel; and Emmanuel Delannoy, Director of the Institut Inspire at the opening of the Concerence 'Les Assises du Vivant 2015'.
© Bernard Suard

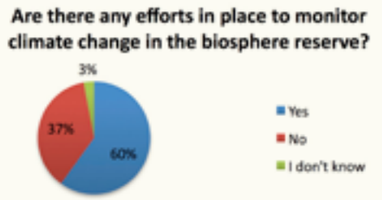
The event focused on three main themes — rethinking conservation: towards 'no regrets' strategies; developing ecological solidarity and environmental justice: 'teaming up' with the rest of the living world; and doing business differently: articulating performance and resilience.

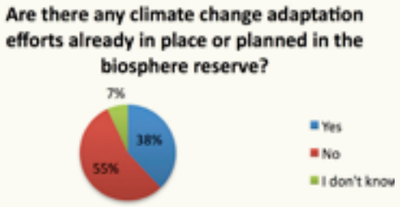
Each theme involved crosscutting perspectives from the available information and scientific findings, and actions and solutions implemented at local and international levels followed by an interactive discussion on the present and possible futures.

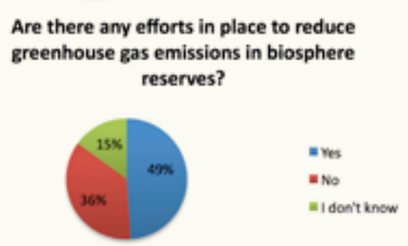
The French Environment Minister, Ségolène Royal, opened the conference alongside Hubert Reeves, President of Humanité et biodiversité, Flavia Schlegel, Assistant UNESCO Director-General for the Natural Sciences, and Emmanuel Delannoy, Director of the Institut Inspire.

MAB survey on biosphere reserves and climate change. In October 2015, the MAB Programme asked its biosphere reserve managers to complete a short survey on biosphere reserves and climate change. A large majority of participants (77%) confirmed that changes had been observed in their biosphere reserve that could be attributed to climate change.









Most of the biosphere reserves mention seasonal changes such as shorter winters and longer periods of drought. The Bassin de la Dordogne Biosphere Reserve in France presents the most striking change: over the last 40 years the temperature of the Dordogne river has risen by 2°C.

60% of the participating biosphere reserves confirmed that they are undertaking efforts to monitor climate change, but only 38% of reserves are taking or plan to undertake climate change adaptation efforts. 49% stated that they are making efforts to reduce greenhouse gas emissions in their biosphere reserve.

Mountains: early warning systems for climate change. The Director-General of UNESCO, Irina Bokova, inaugurated the exhibition 'Mountains: early warning systems for climate change' on 4 November 2015. In her speech, she stated "We know mountains are 'water towers' for many regions, and we know at least half of the world's population depends on water from mountain headwaters".

The exhibition was organized jointly by the MAB Programme and UNESCO's International Hydrological Programme, and was displayed on the exterior fences of UNESCO during the 38th Session of the General Conference (3—18 November 2015) and subsequently at the Cité universitaire de Paris (December 2015), to raise awareness of the impacts of climate change in mountains, which could affect water and food security.

The exhibition shows that reducing the knowledge gaps around mountain systems would contribute to a better understanding of global climate change and its likely impacts at the local scale, thus informing policies to implement the 2030 Agenda for Sustainable Development.

Opening of the exhibition 'Mountains: early warning systems for climate change'.
© UNESCO/Pilar Chiang-Joo

Mountains are among the most sensitive ecosystems. They experience the impacts of climate change faster than any other terrestrial habitat, providing a unique indicator of global warming. Ms Irina Bokova explained further: 'We see this in the Everest, the Nigardsbreen, the Kilimanjaro, the Andes, where most of the glaciers are experiencing a rapid decline in mass. This will have considerable consequences on the large, often vulnerable, populations of these regions and their livelihoods.'

Many partners made this exhibition possible through their generous contributions, notably the Government of Flanders in Belgium, the Permanent Delegation of the French Republic to UNESCO, the Japan Aerospace Exploration Agency (JAXA), the United States Geological Survey (USGS), the World Glacier Monitoring Service (WGMS), the United Nations Environment Programme (UNEP), the Government of Austria, the Federal Ministry of Agriculture, Forestry, Environment and Water Management, GRID-Arendal and Wild Touch.

Climate change impacts in Caribbean and central American Biosphere Reserves. The UNESCO Montevideo Office organized a workshop in Havana, Cuba, from 23 to 25 November 2015 on Climate change impacts in Caribbean and central American Biosphere Reserves.

The event brought together representatives of biosphere reserves from Colombia, Costa Rica, Cuba, Dominican Republic, Haiti, Honduras, Mexico and St Kitts and Nevis to discuss best practices for adaptation to climate change in biosphere reserves of the region, as well as climate change specialists from the region. The participants exchanged experiences and knowledge on the management of transboundary biosphere reserves, on how to build resilience in coastal ecosystems, deforestation and carbon storage in the context of climate change. Key outcomes of the event were agreements to cooperate at the regional level (Cuba would share its best practices with other islands from the region, notably relating to disaster risk reduction) to position biosphere reserves in relation to strategies for adapting to climate change through the new Sustainable Development Goals 'Climate Action', that biosphere reserves should be demonstration sites for climate adaptation, the need to link science and academia with the managers of biosphere reserves to support the management of these territories and promote better science in biosphere reserves and the necessity to empower local communities and promote exchanges between local actors themselves.

UNESCO Sites — A Climate Change Observatory. On 5 December 2015, the UNESCO Pavilion at the COP21 venue in Le Bourget hosted an event dedicated to the theme 'UNESCO Sites — A Climate Change Observatory'. The aim of the event was to explore how UNESCO designated World Heritage Sites, biosphere reserves and Global Geoparks can serve as global field observatories, where climate knowledge can be gathered and solutions found to mitigate the impacts of climate change on human societies and cultural diversity, biodiversity and ecosystem services, and the world's natural and cultural heritage.

Practitioners from UNESCO sites, researchers, experts and policy-makers participated in the event, sharing their experiences through interviews and roundtable discussions.

Side event 'UNESCO Sites — A Climate Change Observatory' at COP21.
© UNESCO/Peter Dogse

COMMUNICATION: SPREADING THE WORD ABOUT THE MAB PROGRAMME AND ITS WORLD NETWORK OF BIOSPHERE RESERVES

DEVELOPING A NEW COMMUNICATION PLAN FOR THE MAB PROGRAMME AND ITS WORLD NETWORK OF BIOSPHERE RESERVES. The MAB Secretariat in conjunction with the EuroMAB network, and with expertise from the communication company 'WITHIN people', has been working to develop a communication and branding project, so as to determine and further clarify common values and messages on biosphere reserves that can be used as communication tools at both local and international levels.

A workshop was held in UNESCO Paris on 31 October 2014 to define the objectives, scope and methodology of the project in cooperation with representatives from EuroMAB biosphere reserves.

MAB Publications.
© UNESCO/Alberto Hernández

This communication and branding project and its toolkit have been tested with volunteer pilot biosphere reserves representing different languages, challenges, ecosystems and target audiences.

In each of these sites, a specific workshop has been held with local stakeholders: the Bassin de la Dordogne Biosphere Reserve (France) in November 2014; the Urdaibai Biosphere Reserve (Spain) in January 2015; the North Bull Biosphere Reserve (Ireland) in January 2015; the Niagara Escarpment Biosphere Reserve (Canada) in February 2015; the proposed Noorhoordland biosphere reserve (Norway) in September 2015; the Danube Delta Transboundary Biosphere Reserve (Ukraine/Romania); and ongoing biosphere reserve proposals with the Republic of Moldova in November 2015 and Ramot Menashe Biosphere Reserve (Israel) in January 2016.

African Environmental Film Series. This environmental film series developed by UNESCO and supported by the United Nations Environment Programme (UNEP) offers a platform to reflect on emerging environmental issues, propose good practices and establish ways to move forward.

The Geohazards, Habitats and Ecotourism Potential of the Bale Mountains National Park in Ethiopia is the first film in the series, produced by young professional and amateur African film-makers and launched on 16 November 2015, coinciding with the 70th anniversary of UNESCO. The Bale Mountains National Park is a candidate to become a biosphere reserve.

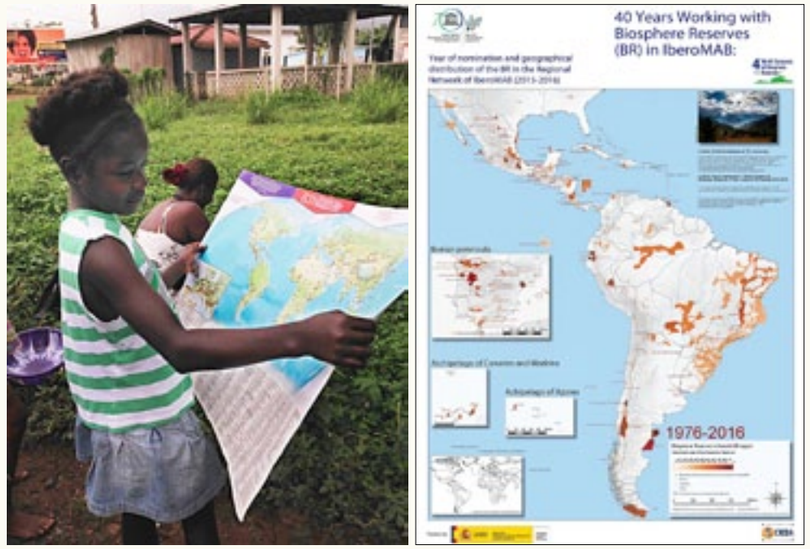
Two other films are currently in production: *The Bird-life of Lake Tana Biosphere Reserve* and *The Importance of the Church Forest of Lake Tana Biosphere Reserve for Biodiversity.*

Social media. The MAB Facebook page launched in February 2014 and currently has 2,410 likes (December 2015), mainly from Brazil, India, Italy, Mexico and Spain. The Twitter account @UNESCO_MAB was reopened in early 2015 and currently has around 500 followers (December 2015).

The MAB Facebook page and Twitter have improved communication among the World Network of Biosphere Reserves through the exchange of experiences and news.

The number of page visits and the level of interaction have improved weekly, along with growth in the number of likes and followers.

World Network of Biosphere Reserves maps. The World Map of the WNBR is produced every year in English, French, Spanish and German thanks to the German National Commission for UNESCO.



Girl reading the World Map of the WNBR.
© Principe Biosphere Reserve

In 2014, IberoMAB published for the first time a map showing all biosphere reserves in Portugal, Spain, Latin America and the Caribbean. The map is available in English, French, Spanish and Portuguese.

Communication material on biosphere reserves of the Volga River basin. In 2010, a map and supplementing brochure on biosphere reserves of the Volga Basin were developed, in addition to other informative and educational materials, within the framework of the partnership programme (UNESCO/Coca-Cola HBC Euroasia). Eleven biosphere reserves of the Volga River basin took active participation in the development of the

materials. The biosphere reserves provided comprehensive information about natural features and the activities of reserves within the WNBR of UNESCO. The biosphere reserves of the Volga River basin now number 13 and the UNESCO Office in Venice has endeavoured to update the map and the associated brochure, 'Biosphere Reserves of the Volga River basin'. Some of the biosphere reserves are located on the Volga riverside, one covers the entire area of the Volga delta, and the other biosphere reserves have a significant impact on the quality of Volga water and associated ecosystems. This provides unique opportunities for the development of scientific activities, the improvement of environmental awareness, eco-tourism development and other interventions, which should help to attain the main goals of the Living Volga programme, which in turn has become a useful tool for the implementation of the UNESCO MAB Programme in this area and establishing a bridging between the MAB and IHP Programmes.

MAB Brochure. A brochure of the MAB Programme has been regularly updated and printed yearly since 2014. The brochure is available in the six UN languages – Arabic, Chinese, English, French, Russian and Spanish – and explains the work and activities of the MAB programme and its World Network of Biosphere Reserves.

MAB brochure.
© UNESCO

Proceeding of the 5th Meeting of the World Network of Island and Coastal Biosphere Reserves: The Impact of Climate Change and Sustainable Development of Island and Coastal Biosphere Reserves
Menorca Biosphere Reserve Agency, Island Council of Menorca; the Autonomous Organization of National Parks, Department of Agriculture, Food and the Environment; and the UNESCO MAB Programme.

Mountains: early warning systems for climate change
Man and the Biosphere Programme and the International Hydrological Programme.

Proceeding of the 8th Southeast Asia Biosphere Reserves Network Meeting, the 2nd Asia-Pacific Biosphere Reserves Networks Strategic Meeting and the Asia-Pacific Workshop on Strengthening Capacity for Management of Biosphere Reserves and Protected Areas (Siem Reap, Cambodia, 2014)
UNESCO Offices in Jakarta, Phnom Penh and Beijing; Ministry of Environment, Kingdom of Cambodia; supported by Japan Funds-in-Trust and the Korean National Commission for UNESCO.

Management manual for UNESCO biosphere reserves in Africa: a practical guide for managers
Wafaa Amer, Sheila Ashong and Djafarou Tiomok.

Climate change impacts on mountain regions of the world
Man and the Biosphere Programme and the International Hydrological Programme.

Energías renovables para las reservas de la biosfera: líneas estratégicas sobre energías renovables en la Red Española de Reservas de la Biosfera; experiencias demostrativas y recomendaciones para el futuro
Cipriano Marín.

Proceeding of the 3rd Meeting of the World Network of Island and Coastal Biosphere Reserves (Hiiumaa, Estonia; 2013)
Menorca Biosphere Reserve Agency, Island Council of Menorca; the Autonomous Authority of National Parks, Department of Agriculture, Food and the Environment; and the UNESCO MAB Programme.

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