



United Nations
Educational, Scientific and
Cultural Organization



Man and
the Biosphere
Programme

BIOSPHERE RESERVES, REAL-LIFE OBSERVATORIES OF CLIMATE CHANGE

— Draft UNESCO MAB report based on a 2015 survey

Creating a world where people are conscious of their interaction and common future with our planet is vital. The MAB Biosphere Reserves show us this is possible.

Climate change affects millions of lives every year and has alarming consequences on both nature and society. In the light of these threats, the World Network of Biosphere Reserves, which strives to implement the Paris Agreement and UN Sustainable Development Goals, improves human livelihoods and protects natural and managed ecosystems by fostering sustainable development. By building resilient and sustainable societies, and encouraging local communities to take part in the fight against climate change, the MAB shows the way forward in one of our century's major challenges.

Ava Meggle

On September 25th 2015, the UN adopted a set of Sustainable Development Goals (SDG) to end poverty, protect the planet, and ensure prosperity for all, with each goal having specific targets to be achieved over the next 15 years. The spirit of SDG 13¹, which urges to take action to combat climate change and its impacts, was at the heart of COP21. Held from November 30 to December 12 2015, this event proved that the international community aspires to progress in the fight against climate change. After two weeks of negotiations, 195 heads of states agreed on a common objective to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels; to foster low greenhouse gas emissions development, as well as adaptation and resilience to climate change. These ambitious targets must be reached in order to significantly reduce the risks caused by climate change on society, culture and nature. The signing of the Paris Agreement² by 177 heads of state at the UN headquarters in April 2016 build on the strong political momentum from Paris and showed international recognition of the fight against climate change as one of our century's main challenges.

These objectives are at the centre of UNESCO's Man and Biosphere Programme (MAB). Launched in 1971, the MAB is an Intergovernmental Scientific Programme that strives to establish a scientific basis for the improvement of relationships between people and their environments, a mission recently redefined by the MAB strategy for 2015-2025³ and associated Lima Action Plan for 2016-2025³. It has established 669 nature conservation and sustainable development areas, called 'biosphere reserves', in which the MAB leads research, builds capacity, and reduces biodiversity loss. Whether these biosphere reserves comprise deserts, glaciers, tropical forests or mountains, this World Network of Biosphere Reserves allows the MAB to evaluate climate change impacts on a wide-range of natural habitats in 120 countries.

Through their research on climate change, the biosphere reserves are able to create mitigation, resilience and adaptation projects, aiming to make local communities actors of the fight against climate change, by promoting economic and sustainable development that are culturally and socially appropriate.

This report is based on a survey related to climate change in biosphere reserves. 80 answers were provided by 75 biosphere reserves across Asia (34), Europe (19), Africa (15), and North (4) and South America (3).

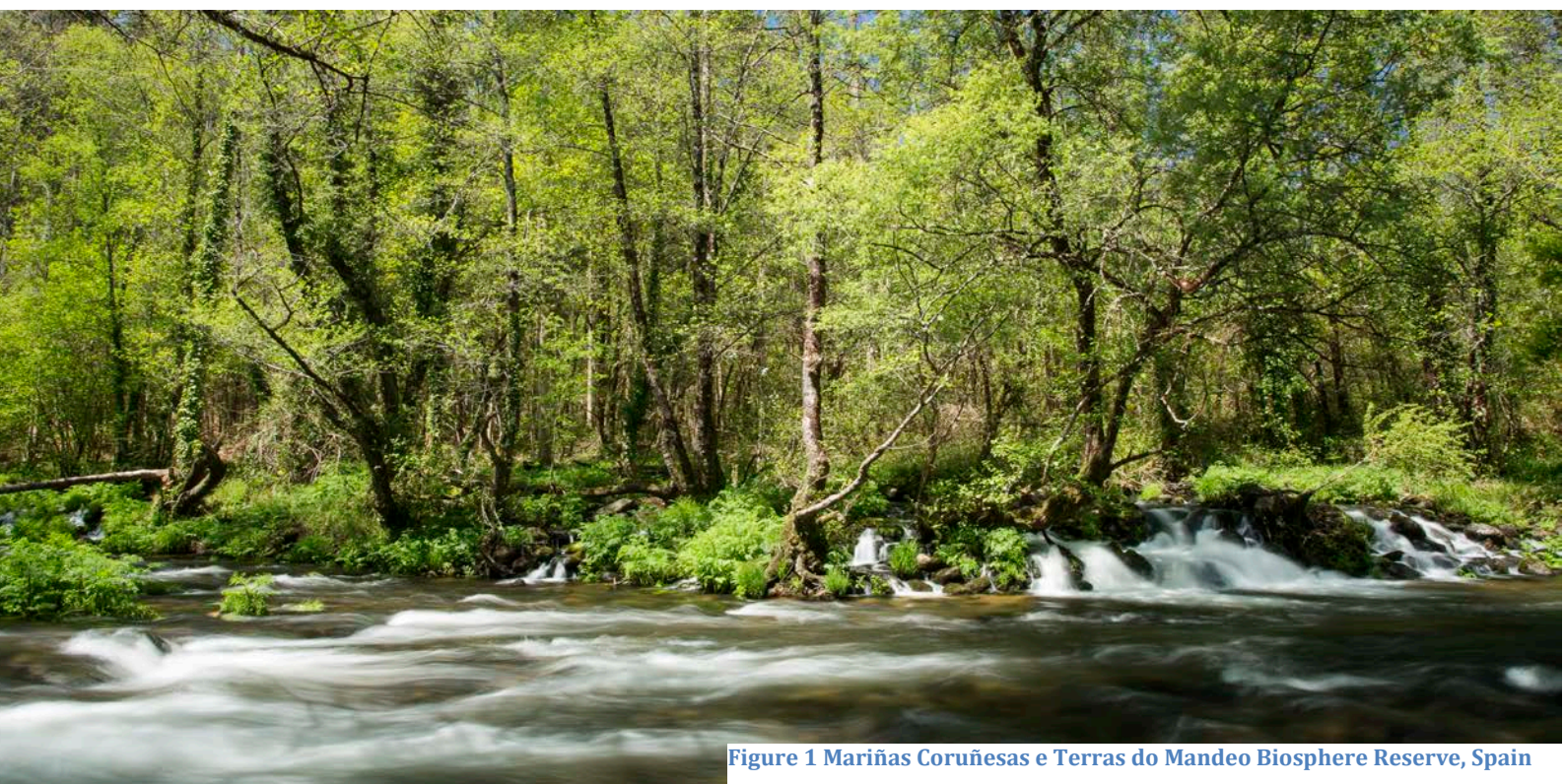


Figure 1 Mariñas Coruñasas e Terras do Mandeo Biosphere Reserve, Spain

1. RESEARCH ON CLIMATE CHANGE IMPACTS BIOSPHERE RESERVES, REAL-LIFE OBSERVATORIES OF CLIMATE

Most of MAB biosphere reserves assess general climate changes by measuring fluctuations of meteorological factors. This includes monitoring of temperature, rainfall and wind patterns, as well as snow and storms. Moreover, some reserves focus on specific animal or plant species to monitor climate change. For instance, the Vallée du Fango biosphere reserve, France, follows blue tits' (*Cyanistes caeruleus*) behaviors. For 27 years, local researchers have been counting the number of blue tits, observing the way they live and interact, and tracking phenology events. Migrating birds' behaviors are significant when it comes to study any transformations in wildlife, as a difference in migration dates is easy to spot.

Through these methods, the reserves' scientists, experts and researchers have been able to track several transformations. According to the survey, 79 % of them say they have noticed significant changes attributed to global warming (see charts below).

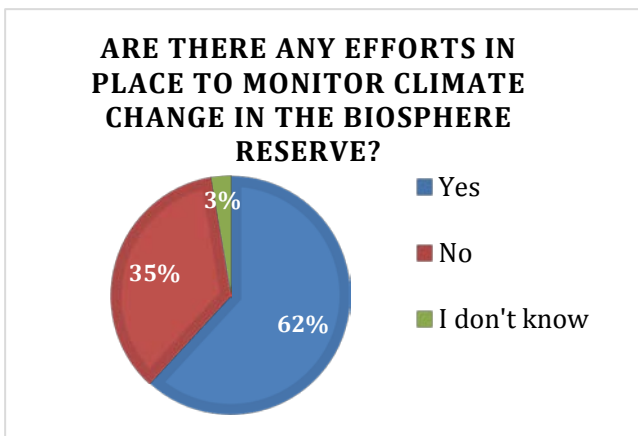


Figure 3: Efforts to monitor climate change in biosphere reserves

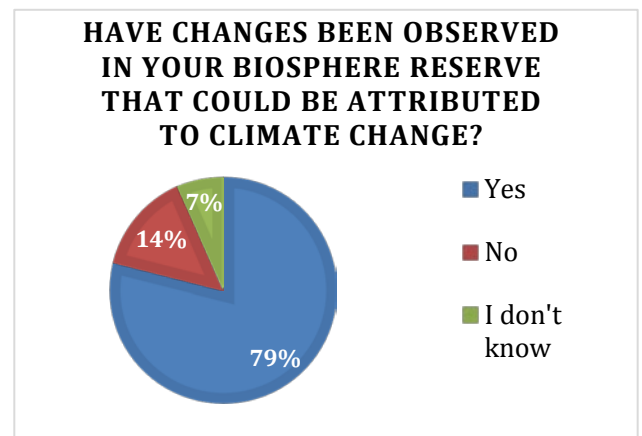


Figure 2: Observations of climate change impacts.

What are the main changes attributed to climate

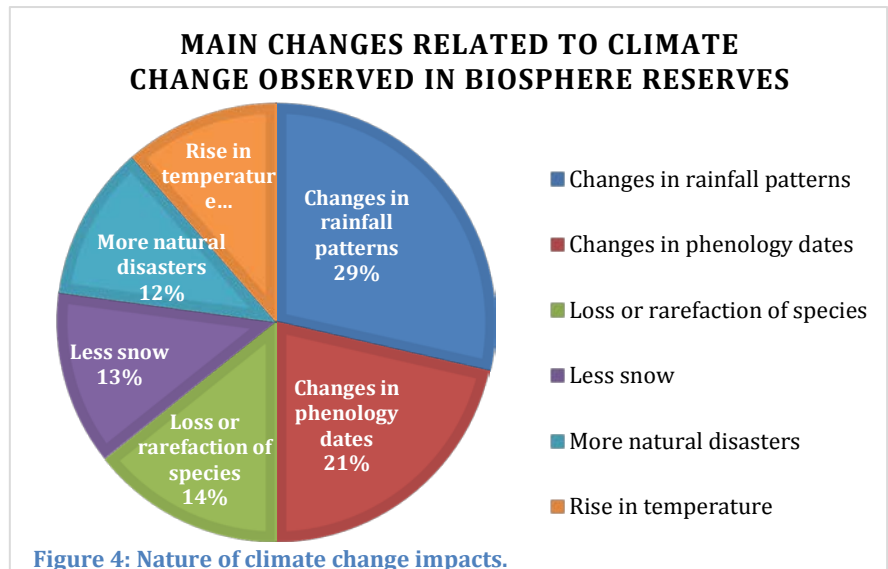


Figure 2 Buffaloes near Mount Kilimanjaro, in Amboseli Biosphere Reserve, Kenya

change?

Common trends of climate change consequences have been identified across all five continents. Drastic modifications in rainfall patterns and seasonal changes in animals and plants seem to be the most observed changes. Events such as wildlife migration, dates of appearance of flowers in spring, of reproduction, and egg-laying, have been modified by global warming.

Other trends that were common to some biosphere reserves are the disappearance or the increase of scarcity of a specific animal or plant species, as well as a rise in both atmosphere and water temperatures (seas, lakes and streams) and a rise of sea level. Furthermore, all mountains located in Asia, America, Europe or Africa have seen their snow coverage diminish.



Furthermore, climate change impacts wildlife, society and economy differently according to the zones' particular environmental characteristics. Climate change's consequences may vary across the regions, however the whole world is experiencing a surge in natural disasters and climate-related hazards, namely extreme rainfalls, river flooding's and storms. Droughts increased especially in Africa, where rivers dry up faster than decades ago. Moreover, some reserves such as the Oxapampa-Asháninka-Yánesha biosphere reserve in Perú, noticed a rise of tropical diseases.



Figure 5 Cacti in Barranca de Meztilan Biosphere Reserve, Mexico.

Are these changes worrying?

The survey asked scientists in their specific reserves to rate observed changes on a scale from “*positive*” to “*very worrying*”. According to this survey, nearly 60 % highly consider them as “*rather worrying*” or “*very worrying*”, 14 % see them as “*neutral*”, and only 1 % see them as “*positive*” (see chart below). These natural modifications represent indeed drastic consequences on both social and economic levels.

First, these changes have ecological consequences that vary according to the region’s environment. For instance, in Africa, the change in rainfall patterns is indicated by a significant reduction of rain, whereas rainfalls are surging in some parts of Europe and South East Asia. Both extremes have respectively led to higher risks of droughts and floods, whose frequency will inevitably rise over the next decades. Furthermore, seasonal changes in the fauna and flora will undeniably lead to imbalances of various ecosystems, which may ultimately induce to the disappearance of some essential animal and plant species.

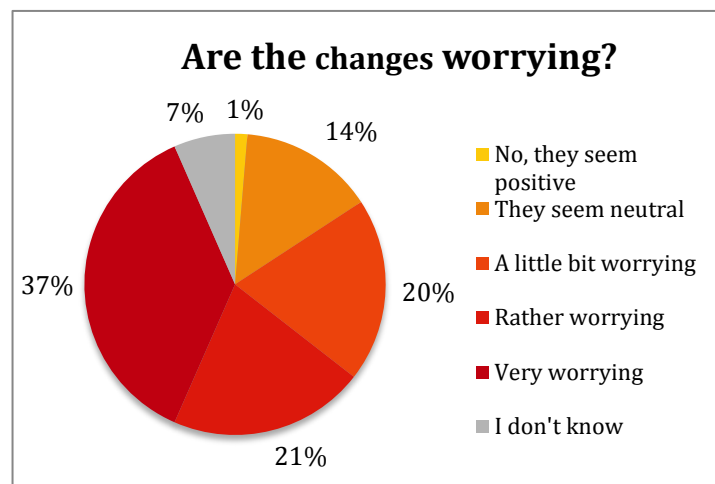


Figure 6. Rating of observed changes.

All of these ecological changes have an undeniable economic, social and cultural impact, particularly on vulnerable societies and poor populations. The former will indeed lead people to suffer from a growing number of risks, such as water scarcity, the spread of diseases and other insupportable physical living conditions. Many more will be affected by a serious degradation of agriculture and fishing industries, which form the core of many developing countries’ economy and feed many of the world’s poorest people. Thus, hundreds of millions of people will be forced to look for an environment in which they can survive, causing one of the most alarming mass migrations encountered on a global scale¹.



Figure 7 Daurian steppe, Daursky Biosphere Reserve, Russia.

2. STRENGTHEN MITIGATION, RESILIENCE, ADAPTATION

A. CLIMATE MITIGATION

Energy transition within the public sphere

Mitigation can only be truly effective if the community achieves to make an energy transition. Hence, biosphere reserves aim to replace the use of polluting sources of energy by renewable, sustainable sources of energy. This is achieved through an improvement of municipal facilities' energy efficiency and the introduction of new technology. Here are some upgrades carried out by the network of biosphere reserves:

- Replacement of woodfuel by gas (Golestan BR, Iran)
- Replacement of fossil fuel by solar, hydro, wind or geothermal energy (Georgian Bay BR, Canada)
- Creation of green villages (Tang-e-Sayad and Sabzkuh BR, Iran)
- Installation of co-operative solar on building roofs (Brighton & Lewes Downs BR, UK)
- Gasification of office buildings and reduction of use of coal for heating (Voronezhsky BR, Russia)
- Substitution of exterior and municipal buildings' lights by LED lamps (Rhön BR, Germany) or fueled by solar energy (Badiar BR, Guinea)
- Making traditional irrigation system more efficient (Huascarán BR, Perú)
- Installation of drainage systems piloted in urban parks (Brighton and Lewes Downs BR, UK).

Energy transition at individual level

Biosphere reserves target individual energy consumption, notably through RENFORUS⁴-led projects, which strive to demonstrate the value added of UNESCO sites as privileged windows for developing sustainable energy projects based on the maximum use of renewable energy sources. RENFORUS ensures access to basic energy services, even in the most remote areas, in order to contribute to climate change mitigation, as well as address local sustainable development. Most biosphere reserves have thus been implementing energy transition principles into individual households:

- Construction of more efficient cooking stoves that save energy by using less firewood (Mt Elgon BR, Kenya)
- Biomass as a source of energy for heating; buying of e-cars (Kärtner Nockberge BR, Austria)
- Substitution of diesel boilers by biomass boilers (Mt Mulanje BR, Malawi).

In this sense, biosphere reserves contribute directly to the UN 7th Sustainable Development Goal, which aims to “Ensure access to affordable, reliable, sustainable and modern energy for all”¹, contributing at the same time to the Paris Agreement’s target to “foster [...] low greenhouse gas emissions development.”² In addition, some reserves cooperate with the local government to which they are attributed to accelerate mitigation. It allows reserves to promote the switching to renewable energies and implement it more easily through financial assistance. For instance, the Kagoshima prefecture of Japan recently raised a budget for the purchase of e-cars within the Yakushima biosphere reserve.



Figure 8 In time of birds' migration, Daursky Biosphere Reserve, Russia

B. RESILIENCE AND ADAPTATION WITHIN BIOSPHERE RESERVES

Risk-Management

Biosphere reserves aim to improve their communities' resilience and adaptation to climate related hazards, especially natural disasters. Thanks to their constantly updated research and knowledge on climate change related risks, experts have been working on improving risk management, and assess how they can make their communities more resilient. Some main works include the implementation of:

- Flood defences, by increasing the height of sea walls (Dublin Bay BR, Ireland)
- Forest fires protections, through the construction of firewalls (Barranca de Metztitlán BR, México)
- Disaster management planning (all Kenyan biosphere reserves).

By developing risk-management, MAB biosphere reserves enhance locals' resilience and adaptation to climate change, thus contribute directly to Article 7 of the Paris Agreement, which strives to “[enhance] *adaptive capacity*, [strengthen] *resilience* and [reduce] *vulnerability to climate change*, [...] [by] *ensuring an adequate adaptation response in the context of the temperature goal* [...]”.²

Conserve, restore and enhance biodiversity

The biosphere reserves have been moving towards the achievement of the MAB Strategy Plan 2015-2025's³ first target, which is to “*Conserve Biodiversity, Restore and Enhance Ecosystem Services and Foster the Sustainable Use of Natural Resources*”. People in charge of biosphere reserves have indeed been strengthening resilience and adaptation by improving their environment's probability to survive. This is foremost achieved by conserving and protecting vulnerable sites, as well as enhancing the latter to make plants and wildlife thrive. For instance, forests that are subject to encroachment have been reopened. It enhanced natural habitats that had previously been damaged by climate change, and allowed wildlife and especially rare species to thrive again. This strengthening of nature makes the reserves less vulnerable to climate change hazards and contributes directly to Target 7.B of the UN Millenium Goals to “*reduce biodiversity loss, achieving [...] a significant reduction in the rate of loss*”⁵.

Moreover, water management is at the centre of resilience efficiency. For instance, the construction of dams helped replenish a dried up lake of the Ichkeul biosphere reserve, Tunisia. Meanwhile, in the Daursky biosphere reserve, Russia, the creation of artificial watering in dry period helped wild species in critical state, and in Finnish North Karelian biosphere reserve, previously drained mires were restored by normalising watersheds' hydrological cycle.

Finally, reserves' environments are protected either by the managing of tourists flow, as done in the Vallée du Fango biosphere reserve in France, of hunting activity in Oxapampa-Asháninka-Yánesha biosphere reserve, Perú, and of polluting businesses within the Sierras de Béjar y Francia biosphere reserve, Spain.



Figure 9 Tang-e-Savad and Sabzkuh Biosphere Reserve, Iran

The MAB reserves have shown their will to strengthen mitigation locally, and to make their area less vulnerable to climate-related hazards. In this sense, they improved their environments' resilience and adaptive capacities, thus contributing directly to SDG 13.1 to *“strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries”*¹, as well as to the MAB Strategy Plan target 4 which strives to *“Support mitigation and Adaptation to Climate Change and other aspects of Global Environmental Change”*³.

3. FOSTER CLIMATE ACTION

A. THE POWER OF EDUCATION

Educating and raising awareness within and outside the biosphere reserve

The crucial role of MAB reserves is to increase human capacity for climate action. Education and raising awareness are key to strengthen locals' role as actors in early warning, mitigation, adaptation and resilience. The more people are aware of climate change issues and about the way they can contribute, the more efficient these processes will be.

The most important point is to make locals realise how climate change impacts their daily lives and how it may evolve in the future. In this sense, all reserves educate on the risks of climate change. In the Oxapampa-Asháninka-Yánesha biosphere reserve (Peru), where exposure to sun and heat is becoming more and more dangerous, locals are regularly alerted on the importance of wearing hats and sunscreen, as well as the dangerous effects of exposition to sunlight. This type of education meets with the MAB's target of early warning, giving the population the tools to become resilient and adapt to climate change.

Educating on climate change is also achieved by reaching out to people living outside the biosphere reserve, notably through visits of the protected areas. In Inlay Lake biosphere reserve of the Republic of the Union of Myanmar, more than 10,000 students visit the reserve every year. In this sense, the biosphere reserves contribute directly to Article 6 of the UNFCCC which strives to *“[...] promote and facilitate [...] the development and implementation of educational and public awareness programmes [...] and public access to information on climate change and its effects [...]”*⁶.

This first step of informing and communicating is essential in the process of capacity-building, as it allows future information linked to action against climate change to be fully understood. Hence, numerous reserves organise local events and activities to discuss these issues, and once this step of informing seems successful, local communities show to be more prone to act in the spirit of the MAB objectives. By educating locals on these scientific and social facts, the MAB is thus directly supportive of Article 12 of the Paris Agreement², as

well as SDG 13.3 which aims to *“Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.”*¹



Figure 10: Educating children in Oxapampa Biosphere Reserve, Peru.

B. FOSTER A SPIRIT OF INDIVIDUAL COMMITMENT AND ORGANISED ACTION

Encouraging sustainable ways of life

Biosphere reserves highlight the vital role that well-informed inhabitants play by becoming active, even at a local level. Through diverse projects, inhabitants of biosphere reserves and their surroundings learn what it means to take part in climate action, and the multiple ways to become actors, essentially through an introduction to sustainable ways of living and working. In this sense, the biosphere reserves contribute directly to Article 6 of the UNFCCC⁶, which aims to “[...] *promote and facilitate [...] public participation in addressing climate change and its effects and developing adequate responses*”. The survey shows that daily life and local economy have indeed been progressively subject to changes, and proved that the biosphere reserves lead locals to reduce their carbon footprints.

Hence, by promoting sustainable ways of living, the biosphere reserves comply with the MAB Strategy Plan target 2, which aims to “*Contribute to Building Sustainable, Healthy and Equitable Societies, Economies and Thriving Human Settlements*”³. The concept of sustainability is especially introduced through the importance of switching to renewable energies and reducing individual consumptions of energy. The promotion of reusing, recycling, sustainable mobility, consumption of local products and green jobs is at the centre of biosphere reserves’ communication strategy. For instance, the biosphere reserve of Kärntner Nockberge in Austria has been promoting car-sharing, thus encouraging locals to reduce their carbon emissions on a daily basis. Thanks to these types of projects, local communities have been learning about the benefits of living a sustainable life and have started to take action in most reserves. The biosphere reserves thus contribute to the Lima Action plan target to “*develop and strengthen models for sustainable development in the WNBR*”³.

Furthermore, biosphere reserves show locals how changing small habits can contribute to mitigation. In Canadian Bras d'Or Lake and Iranian Tang-e-Sayad and Sabzkuh biosphere reserves, where wood is commonly used for heating or cooking, locals are led to reduce or stop using wood for these purposes. Moreover, becoming more sustainable regarding water management is essential for areas that suffer of an increase of droughts. In this sense, the reserves of Inlay Lake of the Republic of the Union of Myanmar and



Figure 11 Highest peaks of Mulanje Mountain Forest Biosphere Reserve, Malawi

Barranca de Metztitlán in México encourage their communities to value water, which led to projects to keep rainwater and the creation of communal water tanks.

Encouraging locals to protect their environment

The fight against pollution is another project in which locals take action. The Dong Nai Biosphere Reserve in Vietnam, for instance, has been distributing eco-bags in order to raise awareness on plastic waste issues and through campaigns of clean energy. Since then, locals have significantly reduced their plastic waste. Furthermore, in Inlay Lake biosphere reserve, farmers are encouraged to reduce their use of pesticides and agrochemicals, while the Chinese reserve of Yancheng has forbidden its locals to burn straw. Biosphere reserves allow locals to reconnect to their environment by adopting sustainable ways of living and learning to appreciate and respect nature.

Empowering individuals to develop their resilience

Biosphere reserves show locals how to enhance their resilience capacities. One of the most common projects is community forestry. The Fundy biosphere reserve, in Canada, developed workshops where locals helped plant climate-change resilient trees. Scientists on the field had first identified tree species that are resilient to global warming, and solicited locals to take part in an afforestation project. The community planted more than 2,500 trees to create forest corridors and allow wildlife to pass through more easily. This type of capacity-building related to afforestation is also popular in regions that have seen damaging of forests in recent years, such as the reserve of Tang-e-Sayad and Sabzkuh, in Iran. Moreover, the reserve of Ranong, Thailand, restored its mangrove forest and even managed to merge locals' participation with both the government and the private sector. In this sense, biosphere reserves contribute directly to the Lima Action Plan's fourth mission namely to help *"Member States and stakeholders to urgently meet the SDG through experiences from the WNBR, in 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."*³

Lastly, biosphere reserves promote sustainable and local economy. The biosphere reserve of Boucle du Baoulé, in Mali, created an herbalist shop to develop apiculture and market gardening, which represents a new source of revenue for locals. Meanwhile, the Barranca de Metztitlán reserve in México has been promoting sustainable activities like clay polishing, production of cactuses and honey, medicinal plants, and organic fertilisers. These types of projects encourage locals to engage into sustainable, economic activities that benefit to the community. The biosphere reserves' work therefore contributes significantly to the 13th Sustainable Development Goal¹ and the Paris Agreement².

Figure 12 Planting climate-resilient trees in Fundy Biosphere Reserve, Canada.



Figure 12 Supporting local fishers in Oxapampa Biosphere Reserve, Peru





Figure 13 Sunset in Inlay Lake Biosphere Reserve, Myanmar.

CONCLUSION

Biosphere reserves allow to protect the environment by preserving areas of nature, restoring and enhancing them. In the wake of climate change, the MAB aims to make biosphere reserves real-life observatories of climate change. Through diverse monitoring procedures, and evaluations of fluctuations and changes within these areas, the MAB was able to go further into worldwide research and measure the diversity of impacts that threaten nature and society differently according to the region. Rises in temperature and seasons, changes in rainfall patterns, multiplication of natural disasters, and many other consequences were tracked and considered mostly as “rather worrying” or “very worrying”.

Furthermore, biosphere reserves show responses to these changes that can be separated into two procedures. The first procedure aims to give the biosphere reserve the tools to start or improve mitigation, resilience and adaptation capacities, both at the regional and individual level. For instance, the MAB introduces technologies that are more energy efficient, and replaces most polluting sources of energy by renewable sources of energy.

However, the heart of the MAB Strategy is to foster climate action within its biosphere reserves. By encouraging local communities to improve responsibly and independently their impact on nature, the MAB proves that Man’s relationship to nature can be respectful and sustainable while promoting local economy. This is and can only be achieved through education and activities that raise awareness. Today, by taking the decision to live sustainably, biosphere reserves’ children and adults take part in the fight against climate change. The biosphere reserves’ actions are thus directly supportive of the SDG¹ and the Paris Agreement².



Areas of improvement of biosphere reserves

All biosphere reserves agree that efforts should be done to further encourage local participation, raising awareness and educating both children and adults. Improving this aspect would lead local communities take further action by lobbying decision-makers or simply ask local governments to make changes on a regional level and finance projects. This idea was particularly present in biosphere reserves in Europe, Asia and North America. In Asia, improvement needs to be done to enhance locals' livelihood, especially ethnic minorities. Needs of international collaboration in technical and financial assistance are also highlighted in this part of the world, as well as in some African countries. Moreover, biosphere reserves that include agriculture at the centre of their economies should further improve their cropping pattern and develop sustainable agriculture. Reducing nomadism agriculture was also stated as a target of improvement.

Furthermore, the lessons learned within these communities are not efficiently transmitted to the rest of the world. Hence, improvements should be made in current communication tools and methods in order for the MAB to reach the Lima Action Plan objective to *"communicate the experiences and lessons learned, facilitating the global diffusion and application of these models"*³. The MAB Secretariat took note of these remarks and works constantly with national committees to enhance biosphere reserves.

The fight against climate change is already taking place today in MAB biosphere reserves. However, this process includes another complex challenge: the fact that this fight needs the action of various actors in science, administration, businesses, NGOs, but most of all, decision-makers at regional and national levels. It is only once the biosphere reserves achieve to make all these actors work together that this fight will be granted the attention and actions it needs to succeed efficiently.

Appendix

i. Latest figures from IDMC estimate that more than 19.3 million people were forced to flee their homes by disasters in 100 countries in 2014. For more information: <http://www.internal-displacement.org/assets/library/Media/201507-globalEstimates-2015/20150713-global-estimates-2015-en-v1.pdf>

¹ UN Sustainable Development Goals

On September 25th 2015, the UN adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all, with each goal having specific targets to be achieved over the next 15 years.

Goal 13. Take urgent action to combat climate change and its impacts.

13.1 strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries

13.2 integrate climate change measures into national policies, strategies, and planning

13.3 improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

The Biosphere reserves also work towards Goal 7, which aims to ensure access to affordable, reliable, sustainable and modern energy for all:

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

7.3 By 2030, double the global rate of improvement in energy efficiency [...]

<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

² Paris Agreement, 12 December 2015

Article 2

1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change [...].

Article 7

1. Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2. [...]

Article 12

Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement.

<https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>

³ MAB Strategy (2015-2025) and the Lima Action Plan for the UNESCO MAB Programme and its World Network of Biosphere Reserves (2015-2025)

Vision and Mission of the MAB Programme

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.

The mission statement of MAB includes the following point:

- help Member States and stakeholders to urgently meet the Sustainable Development Goals through experiences from the WNBR, in 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's Strategic Objectives for 2015-2025 subsequently includes the following objective:

4. Support Mitigation and Adaptation to Climate Change and other aspects of Global Environmental Change

This objective is reflected in the Lima Action Plan through Action:

A1.4. Use BRs as priority sites/observatories for climate change research, monitoring, mitigation and adaptation, including in support of the UNFCCC COP21 Paris Agreement

<http://unesdoc.unesco.org/images/0023/002346/234624e.pdf>

⁴ RENFORUS

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 in UNESCO Sites (Biosphere reserves and World Heritage Sites). While addressing climate change mitigation, this initiative will also aim to demonstrate the benefit of harnessing the locally available renewable energy sources and their potential impacts on the environmental and ecological preservation of UNESCO sites.

[...] At the level of local communities and households, renewable energy can ensure access to basic energy services even in the most remote areas, including lighting and communications, transport, cooking, heating and cooling and pumping water. Thus, besides contributing to climate change mitigation, it will also help address local sustainable development.

For more information on RENFORUS' actions: <http://www.unesco.org/new/en/natural-sciences/special-themes/global-climate-change/related-info/projects/renforus/renforus-in-action/>

⁵ UN Millenium Goals

Goal 7. Ensure environmental sustainability

Target 7.A Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

Target 7.B Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss [...]

http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20%28July%201%29.pdf

⁶ UN Framework Convention on Climate Change

Article 6

[...] the Parties shall:

(a) Promote and facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:

(i) the development and implementation of educational and public awareness programmes on climate change and its effects;

(ii) public access to information on climate change and its effects;

(iii) public participation in addressing climate change and its effects and developing adequate responses; and

(iv) training of scientific, technical and managerial personnel [...]

<https://unfccc.int/resource/docs/convkp/conveng.pdf>