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The Earth Network

Sharing tools for biodiversity conservation and sustainable development in UNESCO-designated sites

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Forewords

This toolkit is a collection of best practices found across UNESCO Chairs, Category 2 Centres under the auspices of UNESCO and the UNESCO Earth Network project to support biodiversity conservation and sustainable development in UNESCO-designated sites, namely:

- Biosphere Reserves: composed of a core area, a buffer zone and a transition area, these sites have the triple objective of biodiversity conservation, sustainable development for local communities, and research, monitoring and education.
- Global Geoparks: composed of sites and landscapes of international geological significance, geoparks are managed through a bottom-up approach integrating protection, education and sustainable development.
- World Heritage sites: the World Heritage Convention seeks the identification, protection and preservation of cultural and natural heritage considered to be of outstanding value to humanity. Sites which are nominated for inclusion in the World Heritage List, can designate natural heritage, cultural heritage or both.

The best practices in this toolkit do not only support UNESCO-designated sites but also contribute to the 2030 Agenda for Sustainable Development, composed of 17 Sustainable Development Goals (SDGs), as well as the Kunming-Montreal Global Biodiversity Framework (GBF) Targets, established during the 15th Conference of the Parties to the Convention on Biological Diversity (COP 15). Additionally, this toolkit showcases key examples of youth engagement, empowering future generations on local, regional, and global scales.

UNESCO Chairs

Launched with the aim of promoting international inter-university cooperation, to share knowledge and develop collaborative work, there are some 1000 UNESCO Chairs globally. The Chairs contribute at each stage of UNESCO's work: from the exploration of emerging issues, through the development of international normative instruments to the implementation of policy recommendations at the national level. They also bring together partners in academia, civil society, local communities and policy-makers in dialogue for project implementation. Furthermore, each Chair endeavours to spread UNESCO's humanistic values through teaching activities.

Category 2 Centres under the auspices of UNESCO

Category 2 Centres (C2C) serve as international or regional poles of expertise, providing technical assistance and services to UNESCO and its Member States. They are not legally a part of the Organization, but are associated with it through formal agreements between UNESCO and the Member State hosting the centre. Each C2C specialises in a field of activity to advocate for the importance of cultural and natural heritage as a global public good, reinforces capacities and fosters cooperation and network.

The Earth Network project was launched in 2021 with the support of the Government of Italy. It brings together over 380 experts from more than 60 countries, encompassing diverse biodiversity-related fields. The specialists volunteer to put their unique skill sets and knowledge at the disposal of sites designated by UNESCO which request their assistance. The network integrates diverse knowledge systems — scientific, practitioner, local, and Indigenous — enabling experts to provide tailored support through technical advice, data collection, partnership building, and training specific to each site's needs. It enhances the knowledge base on ecosystem management, restoration, and resilience in UNESCO sites and contributes to the UNESCO Biodiversity Portal, the first global database focused on these areas.

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France – University of Toulouse Paul Sabatier

Master degree in Biodiversity, Ecology and Evolution - Man and Biosphere (MAB) pathway

Gap addressed

The Master degree in Biodiversity, Ecology and Evolution at University of Toulouse Paul Sabatier aims to close a gap between the theory of UNESCO Biosphere Reserves and their implementation. The lack of professionals specifically trained on managing biosphere reserves has been identified. In collaboration with MAB France, the University launched a Master's pathway adressing the theory-practice gap, allowing students to gain field experience in one of France's biosphere reserves, working on a project side to side with site managers.

Beneficiaries

Students have carried out projects in the following French biosphere reserves: Bassin de la Dordogne, Cévennes, Camargue (delta du Rhône), Mont Ventoux, Luberon Lure, Mont Viso, Gorges du Gardon, and the biosphere reserve application processes developed by Pyrénées Ariégeoises National Park and Golfe du Lion Marine Park.

Youth empowerment

The programme is specifically designed to support young graduate students acquire the necessary skills to enter the workforce of biosphere reserve management and related fields. To support young students land their first job, the programme coordinators have organised events on youth engagement in biosphere reserves and relied on the support system of the alumni network.

Young students are especially absent from the spaces of biodiversity negotiations and governance, which is why the programme invites practitioners to speak about the biennial UN Biodiversity Conference and share opportunities with students to attend this conference as youth delegates for MAB.

Programme overview

The programme has an overview of 2 years. The MAB pathway is taught during the second year and students have the flexibility to join only for this pathway if eligible. This option is mainly targeting practitioners returning to higher education for specific training.
The courses are available in French, with compulsory English language courses. Students can choose to conduct their internship in a biosphere reserve outside of France to foster international collaboration.

During the first year, the students acquire scientific, theoretical, conceptual and methodological knowledge of ecology, population dynamics, conservation biology, GIS and data analysis. Students are required to conduct a 2 months internship, either on research or management.

During the second year, the students study the relationship between Man and Nature, using approaches from the human and social sciences, thanks to the involvement of a diverse group of professionals. GIS and ecology courses are also offered for students that joined the programme at this stage. Project management courses are offered to prepare students to the projects they will conduct in a French biosphere reserve. This project is developed throughout a semester and includes a one week field trip. The master's finishes with a mandatory 6 months internship.

Many of the students who want to conduct the one-year MAB pathway are from African francophone countries, facing multiple obstacles when arriving in France. MAB France coordinates with the Ministry of Foreign Affairs to help with the visa process. Once the students have arrived in France, they are provided with support to find accommodation and scholarships.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 1 and 23: The MAB pathway is training the next generation of workers to manage territories through participatory, integrated and biodiversity-inclusive spatial planning, aiming to reduce and ultimately halt biodiversity loss. Since 2012, 101 out of 194 students have been women, making this programme instrumental in training female conservationists and biosphere reserve managers in a field that has been traditionally dominated by men.

GBF 11: The MAB pathway has a unique focus on the relationship between people and nature, exploring this from the perspectives of human and social sciences, as well as through practical experiences on the ground in biosphere reserves. Through analysing conflict over natural resources and the political dimension of biodiversity conservation, the MAB pathway takes a holistic approach to land use planning.

SDG 15 and 16: Students acquire scientific, theoretical, conceptual and methodological knowledge of ecology, population dynamics, conservation biology, GIS and data analysis to contribute to the protection of terrestrial and aquatic ecosystems.

SDG 17: Through partnerships with other universities and the exchange between students from different nationalities, the programme has created the multicultural and collaborative environment needed for a holistic understanding of biosphere reserve management. An example of collaboration with other universities is the Edu-BioMed project, which strengthened the link between educational programmes at universities in Morocco, Lebanon, Spain and France and Mediterranean biosphere reserves that could benefit from the programme's research outcomes.

Democratic Republic of the Congo - ERAIFT

Category 2 centre under the auspices of UNESCO

Professional Master's in Biosphere Reserve Management

Gap addressed

Historically, the management of protected areas in Africa has focused on strict and coercive biodiversity protection and not on the sustainable development of local communities. In 2014 a training needs assessment for the Congo basin was carried out through a consultation with NGOs, public authorities, and research institutions. The results highlighted the need to go beyond training on protected areas management to address the specificities of biosphere reserves. The training, hosted by ERAIFT (*Ecole Régionale Postuniversitaire d'Aménagement et de Gestion intégrés des Forêts et Territoires tropicaux*) provides opportunities for students to carry out field work in partnership with biosphere reserves, responding specifically to the sites' needs.

Beneficiaries

Students have carried out research for their master's thesis on the following sites in DRC: Luki Biosphere Reserve, Yangambi Biosphere Reserve, Kahuzi-Biega National Park - World Heritage Site, Virunga National Park - World Heritage Site.

Programme overview

The programme has a duration of 24 months and is delivered in French. There are 40 students per cohort and is fully funded (including travel and accommodation).

During the first year, common core courses are delivered for all master's, providing the basis of biodiversity conservation through a holistic approach. During the following years, students choose courses according to their specialisation and write their thesis on a development issue often in their home country or in one of the Erasmus partner countries: Kisangani University (DRC), USTM (Gabon), ENEF (Gabon), University of Dschang (Cameroon), University of Yaoundé 1 (Cameroon), South African Wildlife College (South Africa) and College of African Wildlife Management (Tanzania).

Examples of past thesis topics:

- Urban development and the socio-spatial and environmental implications for protected areas in South Kivu.
- Remote sensing monitoring of forest degradation through the selective exploitation of timber and wood feedstock in the landscape of the Yangambi Biosphere Reserve.
- Governance of natural World Heritage sites in zones of armed conflict in Africa.
- Ancient forest disturbances in the Yangambi Biosphere Reserve.
- Virunga National Park under urban pressure: Contribution to the analysis of anthropisation factors and proposal of mitigation strategies adapted to the Beni and Butembo landscapes.

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Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 13: The Congo Basin is one of the world's most important carbon sinks, meaning it is not only a biodiversity hotspot but also a key lever for climate mitigation. Master's students have been involved in the installation of a flow tower at the Yangambi Biosphere Reserve for measuring the level of greenhouse gases and thereby monitoring the REDD+ process in the Congo Basin countries. This initiative is the first of its kind, and the data obtained will benefit both the national and international community.

GBF 20: 'Yangambi, Science for People' project is implemented in collaboration with Ghent University and the Center for International Forestry Research (CIFOR), and aims to protect biodiversity and to strengthen capacity building for sustainable forest management through training and scientific research oriented towards development. The data collected in this project is freely accessible for researchers globally, thereby contributing to a wider dissemination of data for further research.

GBF 21 and 22: Fully funded scholarships allow students from low income backgrounds to attend the programme. ERAIFT also accommodates the needs of older students by pushing the maximum age to 40, enhancing the inclusivity of the programme. Moving forward, ERAIFT is working on making the masters bilingual (French and English), making it accessible for students from non-francophone African countries.

SDG 17: Partnerships with other universities in neighbouring countries has ensured that biosphere reserve management expertise is retained within the African countries that need it the most. These South-South partnerships also contribute to a high return home rate of students when they finish their masters, building capacity in their respective countries.

GBF 11: In the Luki Biosphere Reserve, students have worked on the natural regeneration in the savannahs through the establishment of Payments for Environmental Services (PES) and other sustainable, income-generating activities that strengthen climate resilience of local communities.

SDG 5: Women face specific obstacles to leave their homes and families for the 2 year duration of the programme. To ensure gender equality amongst the programme's students, the selection process includes gender positive discrimination. Namely, female candidates are prioritised when selecting between equally competent applications. For the 2023-24 cohort of PhD candidates, 5 out of 11 students were women.

Iceland - GRÓ

Category 2 centre under the auspices of UNESCO

Land Restoration Training Programme (GRÓ LRT)

Gap addressed

GRÓ LRT trains working professionals in low and middle income countries in the methods and theories of sustainable land management and restoration of degraded land, to strengthen their capacities to advance and implement those activities in their home countries. The programme also partners with institutions working in land restoration and sustainable land management in low and middle income countries, providing them financial and technical support to develop and deliver postgraduate-level short courses on restoration of degraded land and sustainable land management. GRÓ LRT provides theoretical knowledge of land degradation and restoration processes and principles, and the project management skills needed to bring about changes through a holistic and multidisciplinary approach.

Beneficiaries

Since GRÓ LRT launched its collaboration with MAB in 2020, six experts from UNESCO's MAB network in Africa have already graduated. Four came from the Forestry Research Institute of Nigeria with work obligations in the Omo Biosphere Reserve. The other two came from Mulanje Mountain Conservation Trust in Malawi, and Bia Biosphere Reserve in Ghana.

The programme spans a duration of six months, accommodating the needs of fellows from low- and middle-income countries who are working professionals and may find it challenging to relocate to Iceland for an extended period. Conducted entirely in English, the programme supports up to 25 fellows per cohort. There is no open application process; instead, GRÓ selects fellows from a candidate shortlist provided by partner institutions. The programme is fully funded, covering all expenses, including travel and accommodation, to ensure accessibility for selected participants.

In 2023, 52% of fellows came from lower middle income countries and 48% from least developed countries. Namely, fellows came from: Mongolia, Kyrgyzstan, Uzbekistan, Ghana, Uganda, Malawi, Nigeria and Lesotho.

GRÓ LRT is implemented jointly by the Agricultural University of Iceland and the Land and Forest Iceland Institute, in Hvanneyri, Iceland.

The programme covers the following modules: scientific methods and dissemination skills; course principles and frameworks; biophysical fundamentals of land management; sustainable land management and restoration planning; implementation; evaluation and lessons learned; key global environmental challenges; individual research project under the supervision of experts.

Beyond the 6 months programme, GRÓ LRT provides financial and technical support to develop and deliver short courses in partner countries. These courses are designed and delivered in cooperation with specialists from GRÓ LRT and partner institutions. These short courses, together with three co-created MOOCs, allow GRÓ to reach more people than during the 6 months programme. The MOOCs are open for all and free of charge. GRÓ LRT offers scholarships to former fellows, who have completed the six-month training, to pursue graduate studies in Icelandic universities on land restoration and related subjects.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 5: GRÓ LRT is committed to promoting gender equality by maintaining gender balance in the admission of fellows as well as providing a gender-sensitive learning environment. In 2023, 52% of fellows were women.
In November, GRÓ LRT conducted a three-day training course on "Gender, the Environment, and Sustainable Land Management" in Kyrgyzstan. The course was tailored for 16 natural resources management experts from Camp Alatoo Foundation, delving into effective integration of gender equality and climate considerations into the design and implementation of sustainable land management projects.

GBF 20: By applying the project cycle as a process management framework, GRÓ links the science and practical aspects of land issues and project management thereby building the technical capacity of fellows. Through the research project fellows gain experience in applying and synthesising knowledge, and critically analyse and summarise topics related to sustainable land management and restoration, while developing realistic recommendations and strategies.

GBF 21 and 22: By providing fully funded scholarships to fellows from low and middle income countries, GRÓ LRT makes knowledge and capacity building accessible for the professionals that need it the most. Since 2023, 2 fellow spots are reserved for representatives from African UNESCO biosphere reserves in every cohort.

SDG 17: Ensuring that the short courses delivered in partner countries are demand-driven and individually tailored to local needs require close collaboration with partner institutions. Working together on the design and implementation of the courses, often engaging the expertise of former fellows, guarantees strong ownership at country level.

SDG 15: GRÓ LRT focuses on restoring ecosystems and land management through a holistic approach that includes biodiversity, climate change adaptation and mitigation. Related topics are covered by the other GRÓ programmes on fisheries, geothermal and gender.

Japan – Yokohama National University

UNESCO Chair on Education in Biosphere Reserves for Sustainable Societies

Teacher's Guidebook on biosphere reserves for Education for Sustainable Development

Gap addressed

The unavailability of education for sustainable development (ESD) is one of the key obstacles to tackle the deterioration of the natural environment. Biosphere reserves can be seen as learning centres for ESD, with their local communities, nature, culture and research outputs all being potential sources of learning. This guide explains in detail how teachers can access and transmit this valuable knowledge, using one of Japan's biosphere reserves as a case study.

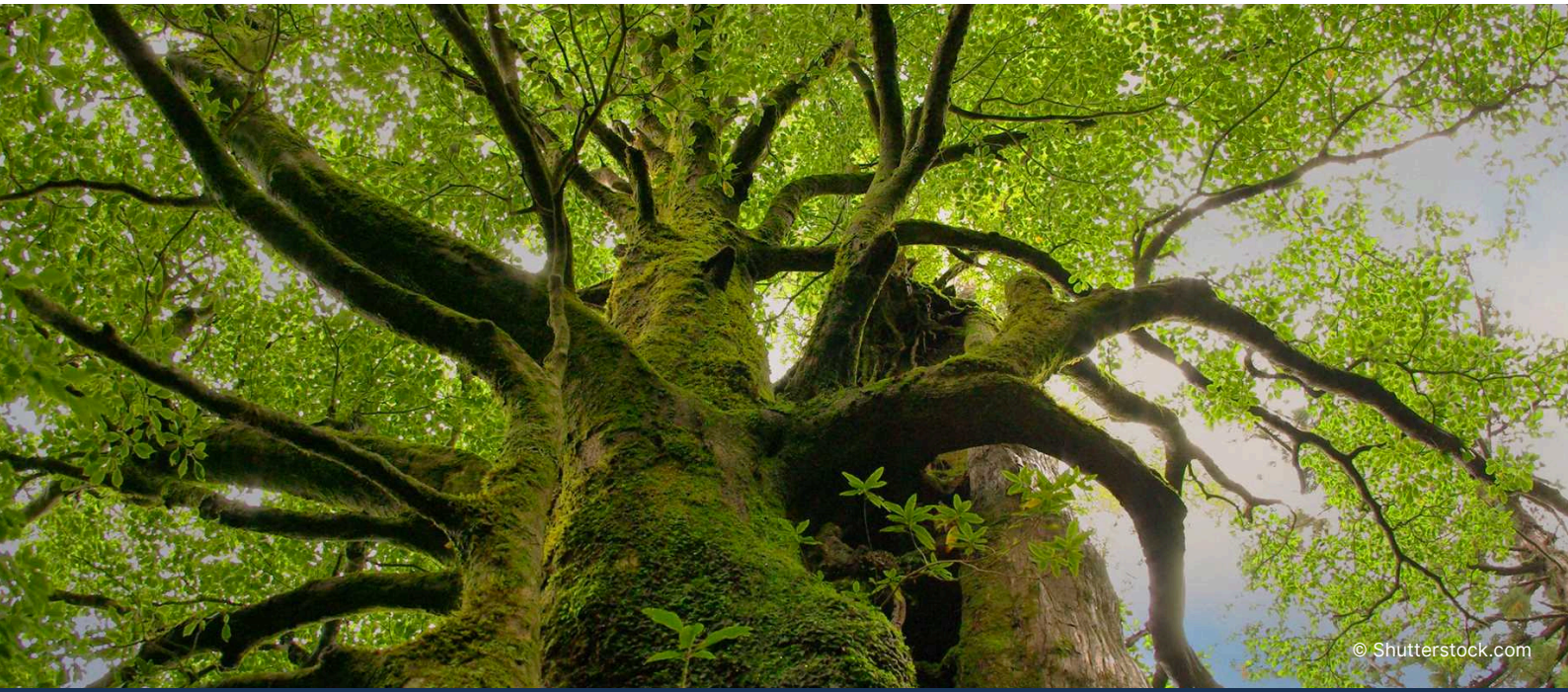
Beneficiaries

Whilst the Guidebook focuses on the Tadami Biosphere Reserve, students from Yokohama National University have also focused their undergraduate and masters' thesis on the following biosphere reserves in Japan: Kobushi, Yakushima, Minakami, Minami Alps, Aya.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 22 and 23: Through teaching ESD with this guidebook, it empowers a new generation of researchers and practitioners in biodiversity conservation and sustainable development. Since 2015, 14 students finalised theses on UNESCO Biosphere Reserves, 6 males and 8 females.

GBF 11: Nature's contributions to people are not conceptualised as just the coexistence between humans and the environment. Three other types of coexistence are identified for ESD using biosphere reserves: coexistence between local communities to achieve sustainable development, coexistence of the future and the present to meet the needs of the future generations, and coexistence between past and present, respecting and using traditional wisdom and cultures.



GBF 21: This Guidebook goes beyond making theoretical knowledge available to drive biodiversity action, as it is presented in a way that encourages teachers making use of the biosphere reserve for a practical teaching of the guidebook, promoting ESD which is tailored to the curiosity and motivation of students. An example of this is a thesis conducted by a Yokohama National University master's student on ecosystem services of snowy intermountainous areas, focusing on the distribution of fern in Kinonezawa, Tadami Town and Fukushima (Tadami Biosphere Reserve).

GBF 1: By focusing on the Tadami Biosphere Reserve as a case study, the Guidebook gives concrete examples of how territorial planning and management can contribute to biodiversity loss, including the explanation of the Natural Capital Tadami Declaration as regional branding and the Sixth Tadami Town Development Promotion Plan.

Resource overview

The Guidebook is divided into 2 parts:

Part 1 - ESD using biosphere reserves:

The importance of education for sustainable development (ESD)

1. Background on Education for Sustainable Development (ESD)
2. Learning approaches in ESD
3. Skills to foster through ESD

What are UNESCO MAB Programme and biosphere reserves ?

1. Philosophy of UNESCO MAB Programme and biosphere reserves
2. Zoning of biosphere reserves and its utilisation
3. Basic philosophy of ESD using biosphere reserves
4. Four types of "coexistence"
5. ESD perspectives using biosphere reserves qualities and abilities to acquire through ESD using biosphere reserves

Part 2 - The case study of Tadami Biosphere Reserve:

1. Overview of Japan's biosphere reserves
2. Tadami Biosphere Reserve
3. Nature and People's Lives in Tadami Biosphere Reserve
4. Geographical location and social/ecological background of Tadami Town
5. Characteristics of natural environment of Tadami Biosphere Reserve
6. Cultural relationship between nature and people's lives
7. Challenges in the biosphere reserve
8. Existing initiatives
9. Exercises

Discover the Teacher's Guidebook on biosphere reserves for Education for Sustainable Development
Access the guidebook here

Spain – UNESCOMED

Category 2 center under the auspices of UNESCO

Mediterranean biosphere reserves Network

Gap addressed

MedMaB is an initiative promoted by the UNESCOMED center, whose mission is to achieve the strategic objectives of UNESCO's MAB programme in the Mediterranean region, with the aim of making human activities compatible with the sustainability in biosphere reserve territories, through the MedMaB network. The MedMaB facilitates overcoming the geographical, political and administrative boundaries of other existing regional networks that include some of the Mediterranean countries. This network is key to strengthening the Mediterranean identity shared by the biosphere reserves in the region, characterised as the mix of biogeographic, intangible, emotional and cultural values of the Mediterranean, that inspire its inhabitants to collaborate on cross-cutting themes of interest. Efforts to move away from working in silos and set up a network of Mediterranean biosphere reserves dates back to 1977, and this was finally achieved in 2015.

Beneficiaries

By the end of 2022 MedMaB included 74 biosphere reserves from 16 different countries: Albania, Algeria, Bulgaria, Croatia, France, Greece, Italy, Jordan, Lebanon, Montenegro, Morocco, North Macedonia, Portugal, Slovenia, Spain and Tunisia.

Programme overview

The UNESCOMED was established in 2013 under the auspices of UNESCO and was the first center of category 2 focussed exclusively on the UNESCO MAB Programme, combining public and private support. A pioneer in the public-private partnership, located in the headquarters of the Abertis Foundation, promotes collaboration, exchanges and transfer of knowledge in Mediterranean biosphere reserves, generating impact based on the training and development of innovative and sustainable projects in the area.

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Right from the beginning, since 2015, it has laid the foundations for the creation of MedMaB, realising the relevance and necessity of having a Mediterranean Thematic Network of Biosphere Reserves, which lies:

(1) In the region's inherent character as a hotspot of biodiversity, cultural diversity and richness, socio-economic exchanges and shared historical trajectory.

(2) In the so-called Mediterranean identity, defined by the Mediterranean biosphere reserves' managers as the mix of intangible, emotional and cultural values of the Mediterranean, that inspire its inhabitants to collaborate on cross-cutting themes of interest.

(3) The implementation of MedMaB Thematic Network (coordinated by a Category 2 Center under the auspices of UNESCO) facilitates overcoming the geographical, political and administrative boundaries of other existing regional networks that include some of the Mediterranean countries.

For millennia, the Mediterranean region has been a cultural crossroads for flows of people, cultures and exchanges of visions and knowledge. This intercultural dialogue and shared knowledge are rooted in the respect for diversity and the interactions with the surrounding environment, characterised by rich cultural and natural diversity. It provides relevant examples of people living in harmony with nature – a core principle of the World Network of Biosphere Reserves – and offers unique assets for the future.

MedMaB coordinates the work carried out by the biosphere reserves of the countries bordering the Mediterranean and tackles the current socio-environmental challenges generated by the effects of global change, with the basis of a long-term programme that, through the UNESCO MAB Programme, integrates the implementation of the Programme Action Plans, paying particular attention to the uniqueness of the cultural, social and environmental context of each region. MedMaB brings together biosphere reserves that share environmental, ecosystem, geopolitical and cultural similarities.

It provides valuable insights into sustainable development models in line with the Sustainable Development Goals and the potential for global change mitigation and adaptation through collaborative research, knowledge-transfer and capacity-building. UNESCO-MAB Biosphere Reserves are places where contemporary societal challenges in innovative ways and explore different and new kinds of solutions to global challenges can be addressed.

The Mediterranean network promotes biodiversity conservation and sustainable development in the region by strengthening relations between biosphere reserves across the Mediterranean through:

(1) The development of cooperation initiatives and exchange of experiences, and knowledge supporting transcontinental relations and North-South-East-West relations.

(2) The promotion of research on socio-environmental issues and challenges for Mediterranean biosphere reserves.

(3) The strengthening of links between biosphere reserves, academia, civil society and business, promoting projects related to key issues such as the circular bioeconomy and sustainable management of water, natural resources, biodiversity and tourism.

It facilitates exchanges and the implementation of joint research and transferability on a great variety of issues, providing biosphere reserves with not only the necessary knowledge basis for their sound management, but at the same time a global and a shared perspective on sustainable development. They also have the potential to deliver results that could be of interest to the nearby territories and inspire actions and policies for sustainable development by the Member States themselves (also in the wider context of internationally agreed objectives and frameworks like the CBD, the UNFCCC or the UN Decade on Ecosystem Restoration), thus fully supporting biosphere reserves to carry out their role of model territories for sustainable development.

MedMaB membership is open to a wide range of stakeholders such as biosphere reserve managers, biosphere reserve representatives, representatives of local populations, research institutes and training centres, UNESCO C2Cs, UNESCO Chairs, National MAB Committees, Regional decision-making bodies specific to Mediterranean region, interested individuals and organisations can also become (non-voting) MedMaB partners, including private stakeholders, international organisations, donor organisations, NGOs.

Following around a decade of work using this network methodology, MedMaB was officially recognised by the 35th MAB-ICC (12-15 June 2023, UNESCO Headquarters, Paris) as a MAB Thematic Network, the third worldwide.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 13: One of the tangible examples of how the C2C is contributing to the Paris Agreement on Climate Change is through projects like the RES-MAB, which is developing a socioecological modelling tool for landscape resilience to climate change in the Mediterranean biosphere reserves. Taking a Water-Energy-Food-Ecosystems (WEFE) Nexus approach, this project is developing adaptation and mitigation solutions through the integration of the modelling tool in 7 biosphere reserves, which will then be extrapolated to the rest of the MedMaB network.

SDG 17: MedMaB offers a dynamic networking platform among the member biosphere reserves, encouraging projects of mutual interest, aiming at synergies, offering support and advice, and sharing information, knowledge and experiences.

GBF 19: UNESCOMED is the first centre on the MAB Programme to combine public commitment with the support of private funding, namely from the Abertis Foundation. This private entity will provide the core funding for MedMaB, together with other private and public donors. This is a pioneering example of public-private cooperation between the two shores of the Mediterranean Sea, as well as mobilisation of private finance for biodiversity.

GBF 21: The International University Campus for Mediterranean biosphere reserves, hosted by UNESCOMED, contributes to making knowledge available to guide biodiversity action across the MedMab. Its primary goal is to promote interdisciplinary research in relation to biosphere reserves at the undergraduate, master's and PhD levels.

Ghana - Ghana Museums and Monuments Board

UNESCO Earth Network project

Community-based inventorying of intangible cultural heritage and biodiversity

Gap addressed

The Earth Network project is matching experts with UNESCO-designated sites facing ecological challenges. Three experts provided their support to the Asante Traditional Buildings (ATBs) World Heritage Site, and identified the need for a conservation management plan for the ATBs as a World Heritage Site. This plan had to ensure appropriate and relevant use of Intangible Cultural Heritage (ICH) spaces and practices, which had been lost due to religious reasons and intergenerational knowledge gaps between elderly knowledge custodians, the next generation who do not know the origins of the traditional practices they carry out and a new generation which is eager to understand why they do things the way they do. There was also a need to conserve the natural resources essential for the upkeep of intangible cultural heritage (ICH) practices, as well as building capacity and skills for the local community to maintain and conserve the built heritage.

Beneficiaries

Asante Traditional Buildings (ATB) World Heritage Sites' stakeholders in Ghana

Methodology overview

The elements of ICH and Biodiversity that were identified and the data collected during the exercise was done under the five domains of the UNESCO 2003 Convention:

(1) Oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
(2) Performing arts; dances, songs, music, dramas or theatre;
(3) Social practices, rituals and festive events;
(4) Knowledge and practices which relate to nature and ways of being in the world;
(5) Traditional craftsmanship; drum making, the craft of pottery, etc.

The team met with various stakeholders including custodial family members, chiefs and elders of host communities of the ATBs, district/municipal cultural officers, local assembly representatives and most importantly knowledge-bearers of practices linked to the Asante Traditional Buildings.

The Ghana Museums and Monuments Board organised a meeting with the data collection team by inviting local actors, including traditional leaders, custodial family members, and cultural officers from various assemblies. These meetings took place at the sites, with a minimum of around 35 participants representing the different local stakeholders. During the sessions, participants were introduced to the purpose of the gathering, the team members, and the data collection processes. They were then asked to sign pre-informed consent forms following this initial briefing.

An expert volunteer provided a detailed overview of Intangible Cultural Heritage (ICH), explaining key concepts and domains relevant to the site. Afterward, participants engaged in an open discussion to ask questions and seek clarifications. Following this forum, the data collection team was divided into 2 to 4 groups, depending on the number of participants, who were randomly assigned to each group. Team leaders facilitated brainstorming sessions within these groups to identify ICH elements associated with the site and pinpoint individuals with extensive knowledge for interviews. Participants were also assured of their right to freely express themselves while safeguarding sacred or sensitive information.

To further support the identification process, the groups conducted a walkabout of the site. During this activity, they documented ICH and biodiversity elements, recording details such as the element's name, description, custodians or knowledge bearers, related biodiversity and climate change threats, other risks, safeguarding measures, concerned communities, associated tangible and intangible elements, photographs, and locations where applicable.

The identified elements were then mapped onto a site map on a flip chart, with active participation from both the data collection team and the attendees.

The collected data was later reviewed and validated in a five-day workshop. Day 1 focused on synthesising the data, day 2 involved data presentation and validation, day 3 addressed biodiversity and climate change issues, and days 4 and 5 were dedicated to safeguarding and stewardship strategies. Additionally, in-depth interviews were conducted with custodians and knowledge bearers to gather specific insights about the ICH elements associated with the site.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG target 11.4: Training for community members on Indigenous drumming and dancing collected in the inventory helped strengthen efforts to protect and safeguard the world's cultural heritage. This is an income-generating opportunity, especially in Asante where these services are usually in high demand for performances at funerals and other events. The Bodwease community is particularly interested in this, since transmission is ongoing but some training is required to revive/recover the loss of drumming rhythms.

SDG targets 8.5 and 8.6:
The training of young community members on mural decoration, drum making, royal sandals, and associated crafts collected in the inventory will not only help preserve and safeguard the ICH elements connected to the ATBs but will also equip young individuals with skills to help establish a career thereby reducing the proportion of youth not in employment, education or training.

The need to recover and record traditional heritage does not mean that this knowledge must remain static going forward. ICH is a living heritage which is continuously evolving and requires creativity for this. The youth are key players for reimagining ICH, through social media and technologies for example. The GMMB is engaging with the Kwame Nkrumah University of Science and Technology to build a plan for building an office using traditional techniques. This project will involve the training of young people in the art of earthen architecture.

SDG 5: Lead by a female expert, the inventorying team kept track of the percentage of women in field visits per community group: Edwenase 30.9%, Asawase 28.6%, Adako Jachie 35.1%, Saaman 33.3%, Kentinkrono 35.8%, Abirem 35.2%, Patakro 36.5%, Bodwease 49%, Asenemanso 25.7%, Besease 41.9%. The preparatory work in line with community protocols allowed to create a trustworthy, inclusive environment where women felt that they could speak openly.

SDG 1 and 6: The inventorying process laid the ground for the development of sustainable tourism activities that will create a source of income for local communities. Firstly, the data gathered in the inventory can be translated into structures of interpretation of the ATBs. Explanatory labels will give visitors a richer and more meaningful experience, thereby boosting tourism development. Secondly, installed washrooms with mechanised boreholes will also contribute to the provision of portable drinking water and basic sanitation services for visitors and local communities.

Madagascar - Mananara Nord Biosphere Reserve

UNESCO Earth Network project

Training on marine biodiversity monitoring for fisheries management

Gap addressed

The Earth Network project is matching experts with UNESCO-designated sites facing ecological challenges. The experts identified the need for fishers to learn new monitoring techniques to achieve environmentally sustainable fishing practices.

Beneficiaries

Local communitites in the Mananara Nord Biosphere Reserve, of which 80% is Betsimisaraka, and the second main ethnic group is Tsimihety.

Methodology overview

The data being collected focused on three main aspects: fishing efforts, fishing catches, and socio-economic factors.
For fishing efforts, the temporal data included details such as the fishing date, the name and status of the fisherman, the number of fishers corresponding to the catches, the duration of the outing, weather conditions, the fishing site, and the tide. Spatial data captured the trajectory of fishing trips, the location of fishing activities (including the number and duration of fishing trips by area), and the specific fishing sites.

Regarding fishing catches, temporal data included measurements like the total weight, sample weight, the number of individuals, and the length and weight of individual fish.
The spatial aspect focused on the total catch and production, categorised by area, gear type, or village. Finally, the socio-economic dimension addressed the destination of the catches, providing insight into how the fish were distributed or utilised.
This had to be complemented with data on monitoring landings, daily fishing activities, and canoe movements for small-scale fishing.

The workshop on marine biodiversity monitoring focused on fishery data collection methods and interpretation of results, including the explanation of technical terms used in small-scale fisheries. Training also focused on the identification of information to be collected: census of fishers, daily monitoring of fishing activities, monitoring of fishers's landings, and tracking of pirogue movements or activities at sea. The workshop adressed the interpretation of results (case studies conducted in southwestern Madagascar) as well as explanation of the relationship between science and resource management.

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A field visit was conducted on to apply a method of monitoring fishers' landings using technology adapted to small-scale fishing. During this visit, two fishers were monitored, and various types of data were collected. For efforts, information recorded included the fishing output rate (covering the day before yesterday, yesterday, and the day of monitoring), the gear used, the name of the fisher, the number of fishers corresponding to the catches, and the fishing site visited. Regarding catches, data gathered included the total weight of fish, the total weight of other catches, the sample weight, and the total length of the fish. The socio-economic aspect focused on the fisher's income.

To streamline data collection, fish were photographed in the field based on their morphospecificity, saving time for later analysis. These photographs were subsequently utilised in a training session to demonstrate how to measure fish, process and interpret data, and understand the significance of fisheries data for effective management.

In order for Mananara-Nord National Park managers to be able to provide further training for fishers and other local stakeholders, they have been advised to participate in the national workshop on octopus fishing, reef fish, shrimp, and other species in order to build on the expertise acquired during this mission.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 21: The mission contributed to the development of strategies and community capacity building, with an emphasis on young people and women, for the management of natural resources in the biosphere reserve. For example, local women discussed with the experts their interest in how to transform and better valorise the fish products they were selling. The experts also trained the fishers on adaptation and resilience strategies to address environmental challenges, including exploring new fishing areas, adopting sustainable management practices, and diversifying livelihoods.

GBF 20: The accuracy and reliability of data on fishermen's landings was increased through the use of suitable technologies such as mobile applications or GPS tracking devices. This complemented efforts to optimise sustainable fishing management measures such as fishing quotas, seasonal closure periods, and the establishment of regulated fishing zones. Moreover, the experts trained the MNP staff in biodiversity protection mapping (GIS) and monitoring marine biodiversity techniques, as well as support for the reintroduction of *Propithecus diadema* in Mananara-Nord National Park.

GBF 11: Capacity building on sustainable fisheries management was done within the biosphere reserve context of natural resource protection in the Mananara Nord Biosphere Reserve. For instance, narratives were collected from community members about traditions, beliefs, and cultural practices related to conservation and sustainable use of natural resources. For example, community elders shared stories about environmental protection rituals passed down through generations. These cultural values were complemented with scientific awareness raising, such as on the importance of the lemur species Propithecus Diadema in the local villages of Varary and Marafototra.

France - University of Bourgogne

UNESCO Chair on wine culture and traditions

Cultivating the grapevine without pesticides: Towards agroecological wineproducing socio-ecosystems

Gap addressed

In France, viticulture is the second largest consumer of plant phytosanitary products after arable crops, posing important threats to biodiversity. None of the current alternative protection methods are by themselves as efficient as pesticides. Therefore, the project does not aim for a single solution to replace them, but rather a shift from a curative approach of agrosystems protection to an approach combining the prevention (epidemic surveillance) with the mobilisation of multiple alternative methods. Achieving the goal of zero pesticide requires technical and systemic innovations, as well as renewing grapevine systems by considering the social and economic impacts on farms. To address this, the project is composed of an interdisciplinary group of researchers, ranging from ecological sciences to economics.

Project structure

The project, running from 2021 to 2026, is structured into several work packages addressing three main categories: technical innovations, system innovations, and a foresight study.

The technical innovations work packages focus on advancing methods to combat grapevine diseases. In microbiota management, efforts are directed toward identifying protective microbiota that disrupt both the asexual and sexual stages of downy mildew. Development of biocontrol emphasises creating new bioproducts, exploring combinations of bioproducts with different modes of action, and optimising application times for maximum efficacy.

Meanwhile, grapevine genetic resistance investigates novel resistance genes, pathogen virulence factors, and strategies for the durable deployment of resistance at the landscape level.

The system innovations work packages address broader agroecological and economic dynamics. Harnessing biodiversity examines agroecological management strategies, from field to landscape levels, that influence trophic networks and pest control while evaluating their unintended impacts on ecosystem functions and services.

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At the cropping and farming scale, the focus is on overcoming barriers to implementing pesticide-free systems through a systemic approach that integrates pest and disease management with agronomic, economic, and environmental performance metrics. Economic valuation and incentives assess consumer expectations for pesticide-free production and explore economic and regulatory mechanisms that can encourage winegrowers to adopt zero-pesticide practices.

Finally, the foresight study develops interdisciplinary scenarios for phasing out pesticides at the territory level. These initial scenarios are shared with wine industry organizations to gauge winegrowers' acceptance of new practices and identify social, structural, and economic factors influencing their adoption. Based on the sector's socio-economic context, the study generates practical recommendations for winegrowers, technical institutes, and policymakers to support the transition toward sustainable practices.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 22: The youth are engaged through a training module on vineyards agroecology based on the results of the project. Engineering Master's students specialised in viticulture and enology are targeted, as well as Business and Management Master's students, thereby addressing the importance of consumer and distributor information and education. Furthermore, the VITAE consortium researchers are integrating their work on the project in their university classes across the world to provide their students with practical examples of ongoing research developments.

SDG 17: The Chair will promote this project, together with other ones such as AgriForAdapt High Resolution Scenarios of Adaptation Strategies to Climate Change of Agroecosystems, in search of new partnerships for further research and knowledge sharing in biosphere reserves. The Chair has established a preliminary contact with researchers in South Africa and Canada to explore this further.

SDG 5: 7 out of the 16 members of the Project Executive Committee are women. The Chair is also organising an online event in November titled "The place of women in French vineyards from the 19th century to the present day" to delve into the gender issues at play in viticulture and explore how they intersect with the transition away from pesticides. The event will be organised at a national scale, with plans to organise a second edition at the international scale.

GBF 10: This research project is contributing to the development of sustainable grape producing and wine making practices through the substitution of pesticides for other techniques that contribute to the conservation of biodiversity. This work is complemented by other events organised by the Chair on interrelated topics impacting the agrobiodiversity of wine production, for example the role of water consumption during the 18th Clos Vougeot Encounter in October.

GBF 21: The research results will be disseminated during the World Congress of Vine and Wine, organised by the International Organisation of Vine and Wine, and knowledge sharing events such as the workshop organised by INRAE "Multi-scale pluridisciplinary research towards pesticide free agriculture" and the French priority research programme Growing and Protecting Crops Differently.

Norway - Bergen University

UNESCO Chair on Sustainable Heritage and Environmental Management - Nature and Culture

BECOME - Biosphere Reserves as Effective Conservation Measures

Gap addressed

BECOME addresses the causality gap between variables of perceived 'effectiveness' and the conservation effects of management efforts in biosphere reserves. Additionally, the project develops a suite of evaluation metrics to facilitate and track both compliance monitoring and adaptive learning outcomes, thereby going beyond evaluating biosphere reserve effectiveness through managers' self-reporting and thus help reduce bias. This is done using existing data and resource infrastructure to analyse changing trends in over 100 biosphere reserves worldwide whose management approaches have been followed for over 10 years. Furthermore, BECOME is generating new data and understandings through a case study, mixed-methods approach, working with local stakeholders and rightsholders to capture and develop context-dependent but generalizable metrics.

Beneficiaries

The case studies take place in the following biosphere reserves: Kristianstads Vattenrike (Sweden), Castro Verde (Portugal), Vhembe (South Africa), Redberry Lake (Canada), Nordhordland (Norway), Fontainebleau (France), Vindelälven-Juhttátahkka (Sweden), Magaliesberg (South Africa), and one to be determined in Chile.

Targeting Youth

The third work package has a strong focus on youth engagement, following a 2 workshop methodology to include their inputs into the BECOME research process. The first workshop is divided into 2 steps: the first one involves youth participants to develop descriptions of desired biosphere reserve futures in each case study region.

This visualisation exercise includes the development of monitoring mechanisms and measurement indicators. The second step involves engagement with artists to translate the workshop outcomes into a visual representation. Following this first workshop, a second one is organised bringing together youth and decision making stakeholders in each site. The latter are presented with the future vision developed by the youth participants and they then co-develop a plan to materialise this vision. Decisionmakers can add more elements that could help implement this vision and refine the list of indicators. The outcome of this process is an action plan for each site, and the BECOME consortium will then synthesise all the plans into a global report.

In addition to this, the BECOME team is exploring how their indicator development for biosphere reserve effectiveness can be linked to the Global Youth Biodiversity Network (GYBN) indicators. These have been developed through youth consultations and will be submitted to the Convention on Biological Diversity (CBD) to feed into the Kunming-Montreal Global Biodiversity Framework.

Project methodology

Running from April 2023 to the end of 2026, the project is organised into five work packages (WPs), each subdivided into tasks aimed at specific objectives.

WP1 focuses on evaluating whether biosphere reserve zonation effectively supports conservation by minimizing land-use and biodiversity changes while enhancing participation and adaptive governance over a 10-year period. This involves repeating the survey on biosphere reserve characteristics and self-reported success for the 150 reserves that participated in the World Network of Biosphere Reserves (WNBR) study, resulting in a 13-year longitudinal dataset comparable with other effectiveness measures like land-cover changes, ecosystem conditions, and biodiversity trends. It also includes detecting land-use and biodiversity changes in 145 biosphere reserves over the 2008–2022 period through a landscape-scale analysis of land-cover and land-use (LULC) for core areas, buffer zones, and transition areas using Google Earth Engine data.

Furthermore, species-level changes will be analysed using the IUCN Red List of Threatened Species. These findings will be linked to WNBR survey results to assess the impact of management approaches and self-reported effectiveness on LULC and biodiversity changes.

WP2 aims to document case studies of diverse biosphere reserve management approaches and develop participatory monitoring frameworks. This involves creating a common framework for interviews and document reviews to ensure comparability across social-ecological inventories, governance, and management studies in all case studies. The governance structures and management approaches of each reserve will be examined to identify key social-ecological system components. Additionally, the work package will assess process indicators (e.g., procedural justice, representation, and fairness) and outcome indicators (e.g., stated goals versus results). This will include identifying effectiveness indicators already used in monitoring, relating indicator performance to governance analysis, and engaging in a co-production process with governance bodies and local communities to refine these indicators.

WP3 leverages futures visioning technologies to create shared visions and learning opportunities among biosphere reserve stakeholders and rightsholders while generating new indicators for monitoring future changes. This involves identifying the stakeholders and rightsholders for participatory involvement in relevant tasks. The IPBES Nature's Futures Framework (NFF) and the Seeds of a Good Anthropocene methodology will be adapted to co-develop descriptions of desired futures for biosphere reserves in each case study region. These participatory methods will explore how shared visions can link stakeholders across generations. Moreover, this work package will aim to identify perspectives on future biosphere reserve effectiveness and develop collective indicators to monitor anticipated changes over time.

The project's WP4 focuses on synthesising the findings from all work packages to analyse biodiversity and development trade-offs in biosphere reserves, exploring how these sites navigate land-sharing versus land-sparing approaches and address cross-scale tensions to achieve a social-ecological fit. A conceptual framework will be co-developed to integrate the literature review with insights from WP1, WP2, WP3, and WP4, highlighting the trade-offs and synergies of various land-use and land-intensity configurations. The synthesis will employ mixed-methods analysis, combining global and case study findings from all work packages. Additionally, a Delphi assessment process will be conducted within the research consortium, involving experts and associated researchers to refine indicators and evaluate effectiveness.

WP5 is dedicated to the coordination and facilitation of the project's transdisciplinary processes. A full-time, experienced group process facilitator will oversee the implementation and integration of activities across all work packages, ensuring seamless collaboration and effective project management.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 22: Ensuring the participation of Indigenous Peoples in decision-making and access to justice is at the core of BECOME, which specifically tackles in WP2 the facilitation of decolonial processes in the selected biosphere reserves in Sweden, South Africa, Chile and Canada. The analytical framework assesses processes of recognition, procedure, distribution and reconciliation in each site.

GBF 14: Producing policy relevant knowledge on the role of biosphere reserves in the implementation of the Kunming-Montreal Global Biodiversity Framework is a key objective for BECOME. In order to integrate the research results at every decision-making level, the team works closely with CBD Focal Points in each national environmental governmental organization (e.g., Miljødirektoratet in Norway, INCF in Portugal, DFFE in South Africa). Through this collaboration, BECOME provides evidence for how biosphere reserves contribute to the GBF targets, and if biosphere reserves should be considered Other Effective area-based Conservation Measures (OECMs) within each country's accounting system.

At the national level, the UNESCO and MAB national committees and national environment ministries are participating in stakeholder workshops in order to understand the implementation and monitoring of biosphere reserves within national systems (WPs 2 & 4) and for the incorporation of indices into national monitoring schemes. Within the European Union, BECOME works closely with research-policy interface organizations such as Expertise France and the "post-2020 Biodiversity Framework – EU Support" project.

Oman - University of Nizwa

UNESCO Chair on Aflaj Studies and Archaeo-hydrology

The Falaj Indigenous knowledge in the Middle East and North Africa

Gap addressed

Many countries in the Middle East and North Africa (MENA) region possess a harsh environment where people's survival and development entail a deep knowledge about their surroundings. A considerable part of this knowledge has crystallised around the falaj (aflaj in plural), a hydraulic technique that transfers water from a groundwater source or seasonal runoffs to cultivated lands, which have historically served as the only water source in an otherwise barren arid land. The loss of Indigenous knowledge has changed the position of local communities from coexistence to over-exploitation of water resources, leading to scarcity issues. The research conducted by the Chair valorises this Indigenous knowledge as a tool for sustainable development if recovered to inform current and future water management.

Beneficiaries

World Heritage Sites of Aflaj Irrigation Systems of Oman, the Persian Qanat in Iran, and other relevant sites across the MENA region, namely in: Morocco, Algeria, Tunisia, UAE, Libya, Egypt, Syria, Iraq, Saudi Arabia, Lebanon, Yemen.

Programme overview

The project started in 2022 and is ongoing.
A falaj is a gently sloping subterranean tunnel or open channel that drains out groundwater or valley runoffs, and conveys it to farmlands. While aflaj are seemingly simple hand-dug tunnels, the construction and maintenance of the tunnel demand a high level of knowledge that has been amassed over centuries and handed down from generation to generation.

These include technical, socio-economic, geological and ecological knowledge. For instance, aflaj often transcend different territorial jurisdictions, so the construction of a falaj takes on a socio-economic dimension both within the beneficiary community and between neighbouring communities, satisfying the interests of the basin upstream and downstream. Falaj-holding communities also possess deep ecological and botanical knowledge, as they are able to identify where to dig a well based on the distribution density and health of Indigenous plants, as well as soil texture, the colour of geological formations and the order of soil layers.

The methodological approach relies on a combination of quantitative data developed by Indigenous People through the construction and maintenance of falaj, textual sources and field studies. The latter included tens of unstructured ethnographic interviews with Indigenous People in the region. All interviewees were wakil, the person who oversees falaj maintenance, water division and fundraising. Therefore, they enjoyed sufficient knowledge about the technical and socio-economic aspects of falaj. All the interviewees knowingly participated in our studies, and they were clearly informed about the objectives and nature of our questions before they decided whether to participate.

The Chair has also been studying ancient manuscripts containing valuable information on aflaj systems. This is supported by the collection of data on water quantity and quality for complementing projects implemented by the Chair.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 13: The aflaj can be dated back to a change in climate around 500 BC when most of the MENA region experienced a dramatic decline in their precipitations, and have proven to be an effective practice of resilience that can inform modern day adaptation strategies for water scarcity exacerbated by anthropogenic climate change. Notably, one can note the synergies between aflaj systems and current Water-Energy-Food-Ecosystem nexus approaches, as aflaj were not only used for agricultural irrigation and drinking water but also as a source of energy through water mills working with the falaj water flow.

SDG 17: This project has resulted in the transnational collaboration between MENA countries to valorise common cultural and environmental heritage, whilst being nuanced about the specificities of each national context. The Chair has signed two Memorandums of Understanding with Ibn Zohr University (The College of Arts, Humanities and Social Science) in Morocco, and UNESCO International Center on Qanats and Historic Hydraulic Structures (UNESCO-ICQHS) in Iran, and expanding its network of collaborations across the MENA region.

SDG 6: By introducing aflaj as a source of environmental-societal knowledge, rather than just a water supply system the Chair valorises aflaj as a lesson that sustainable water resource management cannot be achieved without a shift in paradigm from looking upon water as a detached physical factor to seeing water in a broader environmental, social, cultural and political context.

GBF 10: Water for agricultural irrigation has historically been allocated in the aflaj system based on water availability in each given time. Irrigation cycles were so central to the communities that time was measured using the water clock, which was primarily destined to calculate the time of irrigation. The irrigation cycle and water distribution system were also strongly dependent on close collaboration between farmers, as over-exploitation of water resources could result in conflict within the community, and was thus avoided.

SDG 11: The falaj system offers valuable lessons for making arid villages more resilient and sustainable, as it supports an economy largely dependent on virtual water imports. Its multifunctionality extends to sectors like tourism. The Chair is helping integrate falaj systems into the growing tourism sector in some MENA countries, offering local communities income to withstand harsh environmental conditions. For example, the Chair successfully prevented a development project on a falaj site by raising awareness of its importance to local communities if preserved and revived.

Sweden - Umeå University

UNESCO Chair on biosphere reserves as Laboratories for Inclusive Societal Transformation

The Conservation Incentive Payments (CIP) pilot programme

Gap addressed

In Tanzania's Ngorongoro Conservation Area (NCA), human-lion conflict is a serious problem for both people and lions. Lions cause an estimated 30,000 USD in livestock losses per year, a significant burden on the NCA's residents, who rely largely on livestock for their livelihood and face rising levels of poverty. These losses have led to numerous retaliatory lion killings over the past several decades, which have largely isolated the Ngorongoro Crater lion population from the rest of the Greater Serengeti Ecosystem (GSE). Transforming the economic impact of lions on the NCA's residents through compensation schemes can play a key role in mitigating human-lion conflict in the area. To address the risks of fraud, moral hazard, high transaction costs, long payment delays, and lack of trust and transparency associated with traditional compensation schemes, this project has used conservation incentive payments. With a distinctive feature of conditionality, payments are made if and only if the agreed-upon action is taken or the agreed-upon outcome is achieved.

Beneficiaries

The Ngorongoro Conservation Area is a World Heritage Site and, together with neighbouring Serengeti National Park (SNP), a biosphere reserve located in Tanzania.

Targeting Youth and underrepresented groups

While the participating villages spent their CIP earnings on a variety of projects, by the second half of the pilot, nearly all villages had focused their funding on education.

Among other things, the participating villages were able to furnish primary school classrooms with desks for over 650 students and to send a total of 215 students to secondary school using their CIP funds.

Trust is key when working with underrepresented Indigenous communities facing displacement risks amongst others. This project is based on a decade-long relationship of trust with the NCA's communities, the NCA Authority, and the tourism sector. Since 2014, KopeLion have worked to mitigate the NCA's human-lion conflict by engaging local community members to monitor lions, find and retrieve lost livestock, warn herders of the presence of lions in the area, and prevent retaliation against lions when depredations occur, using a model developed by Lion Guardians in Kenya. Crucially the rules of the programme have been set up by the communities and the KopeLion team is also predominantly composed of community members.

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Programme overview

The pilot programme, conducted from 2020 to 2023, involved six villages: Kaitakiteng, Longojoo, and Misigiyo in the Misigiyo ward, with a combined population of approximately 7,000, and Kayepus, Mokilal, and Oloirobi in the Ngorongoro ward, with a population of about 10,000.

The groundwork for the programme began in 2017 with a feasibility study, followed by a workshop in 2018 that brought together members of four key stakeholder groups—the NCA Authority, the NCA Pastoral Council, NCA residents, and tourism operators. Together, they outlined the framework for the lion Conservation Incentive Programme (CIP). The pilot programme was officially launched in October 2020.

Under the programme, villages earned direct payments based on verified observations of lions or their signs (such as tracks, scat, or hair) within ward land. KopeLion verified these sightings through methods like visual identification, radio telemetry, call-ups, and data from GPS-collared lions. Payments, distributed equally among villages, were proportionate to the number of lions identified. Every four months, earnings were disbursed based on compliance with specific requirements: submission of a budget plan and receipts accounting for earnings, public announcements at General Assembly meetings regarding earnings and their intended or actual use, and a publicly displayed summary of earnings and expenditures in village offices or other prominent locations. While villages were free to use the earnings for any lawful community purpose, individual disbursements were prohibited. Earnings were capped at 9 million TZS per four-month period, with any excess allowed to carry over to future periods within the same year. A penalty of six months of earnings was applied for any lion killing or attempted killing on ward land or by ward residents (12 months if poison was used), except for killings determined to be in self-defense.

The programme was overseen by a CIP Design Committee, comprising representatives from all key stakeholder groups, which met twice yearly to review and provide recommendations on programme administration. Each village also had two CIP Community Liaisons, tasked with promoting programme awareness, gathering community feedback, and assisting in resolving disputes or concerns.

As the pilot concluded in October 2023, a comprehensive household survey was conducted within and beyond the pilot wards, along with focus groups involving key stakeholders. These efforts aimed to evaluate community perceptions of the programme and its impact on attitudes towards lions and human-lion coexistence.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 8: In total, Misigiyo and Ngorongoro wards earned ~35,000 USD (81,000,000 TZS) each over the course of the pilot, which more than doubled the value of livestock injured or killed by lions in each ward during that period.

SDG 4 and GBF 21: Awareness of the CIP programme within the participating villages was extremely high, with 92% of respondents having heard of the programme. Notably, the household survey, focus groups, and anecdotal reports all indicated that the shift in focus towards supporting education dramatically boosted both awareness and approval of the programme. Overall, 93% of respondents who were aware of the programme believed it was funding important projects in their village and 99% reported that they wanted the programme to continue.

GBF 4: The CIP programme was also associated with more favourable attitudes and actions towards lions. Compared to respondents from villages where the CIP programme was not piloted (both within and outside the area of operations), respondents from the CIP villages were more likely to view the economic impacts of lions on their village as positive, more likely to be happy about an increase in lion numbers on their land, and 60 to 65% less likely to favour killing a lion after an attack on livestock. Moreover, of 34 known human-lion conflict events within the area of operations during the three years in which the CIP programme was piloted, only one (a lion killing) occurred within the CIP pilot wards and that one killing was determined by government authorities to have been in self-defence.

Nicaragua – University of the Autonomous Regions of the Nicaraguan Caribbean Coast

UNESCO Chair on Indigenous Native Wisdom and Knowledge

CCRISAC – Cultivating and Nurturing Wisdoms and Knowledge

Gap addressed

In the field of conventional research, Indigenous communities have historically been subject of studies without their participation, free, prior and informed consent and access to the results of the studies. In contrast, from the CCRISAC perspective, research is the creation and recreation of knowledge, know-how, wisdom and practices for and by the communities, contributing to the strengthening of the identity of the Abya Yala peoples and tackling the challenges they face at the individual and collective levels. To achieve this, the second edition of the CCRISAC foundational document outlines research techniques based in Indigenous knowledge, as well as a detailed description of how the CCRISAC must be carried out and evaluated.

Programme overview

Research under this framework can focus on various topics, including the decolonisation of thinking in intercultural communication; intercultural communication in political, multicultural, and plurinational contexts; and the communication systems and processes of nationalities, peoples, and communities of Abya Yala.

Other themes include communication as a strategy for territorial, environmental, economic, cultural, and self-determination defense; self-communication and globalisation; gender and intercultural communication; and the use of Information and Communication Technologies (ICTs) by communities to support Buen Vivir (Good Living).

The methodology timeline is carefully structured to guide the research process. It begins with an introduction that explains why the CCRISAC framework was chosen, outlines the social, cultural, and economic context of the selected territory, and describes the methodological approach to be adopted. The main objective identifies the specific object of study, the involved communities, and the aim of the research—for example, compiling myths and legends of the Twahka Indigenous Peoples in the Nicaraguan Caribbean Coast for cultural revitalization. The specific objectives, typically up to four, describe how the main objective is achieved, such as engaging in discussions with elders from Sisín, Wahutla, and Sauni communities.

A literature review is conducted to establish the theoretical foundation of knowledge and wisdom, referencing CCRISAC and other relevant sources. This is followed by a description of the CCRISAC research techniques employed, including any modifications.

These techniques include:

(1) The Chakana: A framework grounded in four pillars—*Kana* (being and experiencing daily practices), *Munay* (feeling and practicing oral narrations), *Yachay* (knowing and understanding the interrelation of knowledge), and *Ruray* (acting, analyzing knowledge critically, and reproducing it through a decolonial lens).

(2) Relational symbolic experience (vivencial-simbólico-relacional) - The process of recovery, recreation and systematisation of individual and community knowledge, applied for the solution of individual and collective problems for a full life.

(3) Creation and recreation of knowledge, know-how and practices - A participatory process, which generates new knowledge, capacities and innovations. It systematises and revalorises the historical practices and local knowledge of Indigenous Peoples, Afro-descendants, mestizos and ethnic communities in the search for Good Living.

(4) Etymological tracing and glottochronology - The search for meaning in the roots of native language terms. By breaking terms down and comparing them to previous meanings found in historical texts of different linguistic families, one can draft the timeline of languages and their associated cultures.

(5) The cosmovision (cosmovidencia) - The process of tracing to the projective or retrospective experience carried out through a direct process or accompanied by people possessing gifts for the connection with the cosmos.

(6) The discussion (conversatorio) - Differs from an interview because it constitutes a community based, bidirectional dialogue. This is particularly relevant for the inventorying of oral knowledges and wisdoms.

The research then presents a detailed description of the results, accompanied by a critical analysis. Finally, it concludes with a proposed solution to address the identified problem, including a timeline for implementation, required financial resources, and other necessary elements for successful execution.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

SDG 4: Whilst members of Indigenous communities have historically faced barriers of access to education due to economic and discrimination factors, efforts to combat this have also resulted in the imposition of western thought at the expense of the transmission and reproduction of ancestral Indigenous knowledge. In response to this, the CCRISAC is the result of a process of collaboration between the Network of Communitary and Intercultural Indigenous Universities of Abya Yala (RUIICAY), which offers higher education taught by Indigenous scholars as well as the promotion of a political and academic positioning of the Indigenous identity.

GBF 21: Through the CCRISAC Framework, knowledge is shared to guide biodiversity action through different Indigenous techniques such as miajara; which means to the Sia people to observe to be able to identify, interpret and internalise messages from nature. Complementing research techniques include tõbai (touching the textures of trees, leaves); k'aa, sene and kĩrame (biting and tasting plants, fruits and nuts); ɨi (smelling leaves, tree trunks and branches); and akɨ (learning from daily activities such as fishing and farming).

GBF 11: In recognition of nature's contributions to Indigenous communities, one of the core principles of the CCRISAC Framework is bioethics; an ethic of valuing and respecting life, which guarantees a life in plenitude, in a harmonious relationship with Pachamama (Mother Earth). Following this logic, the CCRISAC research methodology is conceptualised as cultivating and nurturing knowledge, and each research step is aligned with the phases of the cultivation cycle (i.e. preparing the land, planting the seeds, harvesting).

Gabon – UNITWIN Network on Bantuphony

Languages and Cultures in Danger: Biodiversity and Indigenous Knowledge

Gap addressed

The attention paid to the decline in biodiversity has been matched by a recent interest in many languages that are in danger of extinction. However, most language documentation and revitalisation programmes focus on grammatical categories rather than on the lexicon of flora and fauna. This research programme postulates that by safeguarding ethnobiological data (naming, categorisation, perception, endogenous ecosystem management standards), we are helping to preserve biodiversity.

Beneficiaries

Lopé-Okanda UNESCO World Heritage Site
Ivindo National Park, UNESCO World Heritage Site.

Programme overview

With the ultimate aim of understanding the logic and dynamics of endogenous knowledge in relation to the zoological world, it is necessary to take stock of old documentation concerning the names of animals (mammals, birds, fish) and the beliefs (taboos, prohibitions) associated with them in traditional societies in Gabon. Four ethnolinguistic groups have been selected for the study following a number of criteria, namely: (1) to have been the subject of several studies in linguistics and ethnobiology, from the period of exploration to the present day; (2) to be located in an environment with a varied and stable ecosystem; (3) to have speakers located in urban, peri-urban and rural areas.

Three types of data have been collected: linguistic, ethnographic and biological. Linguistic data have been collected using traditional linguistic survey methods. A questionnaire, accompanied by illustrations representing the animals recorded in the area where the ethnic group is located, has been used to collect names, while beliefs relating to the organisms (taboos, prohibitions, anthroponymy, etc.), the key to understanding the traditional management of ecosystems, has been collected through open interviews. This has been supplemented with field visits with the participants to identify the animals in their natural environment. Biological data has been collected in situ by a zoologist

The linguistic and ethnographic data collected has been analysed in two time frames: synchronically and diachronically. In synchronicity, linguistic analysis has been used to assign a precise meaning to the identified elements in accordance with their position in the scientific taxonomy. A diachronic analysis will show how endogenous knowledge has evolved between two points in time. For example, linguistic and cultural data observed at an early period and absent from current endogenous knowledge could indicate the disappearance of zoological species.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 22: The role of the youth has been crucial in this project, where researchers have analysed intergenerational knowledge transfer gaps when animals exist but they are no longer known. In order to ensure their preservation, knowledge transmission to the new generation of nature custodians is essential. Knowledge transmission must also target the youth living in urban areas, as they are often more disconnected from traditional ecological knowledge. This is why the UNITWIN Network on Bantuphony is piloting an extracurricular education for sustainable development project on mangrove conservation in an urban arboretum.

GBF 3: This project has documented contemporary linguistic and cultural data, including the presence of animal names in tales, proverbs or other forms of oral tradition that continue ancient traditions of knowledge about living organisms. This inventorying work is critical to integrate this Indigenous knowledge into biodiversity conservation strategies and move towards conserving 30% of land, waters and seas.

SDG 17: Whilst the project is hosted by Omar Bongo University, it capitalises on the expertise of other universities in the UNITWIN Network, namely, Stellenbosch University in South Africa, Yaounde I University in Cameroon, Ibadan University, Port-Harcourt University and Abéokuta University in Nigeria. The project also benefits from the partnership between Omar Bongo University and the Ministry of Water and Forestry, which has been critical to ensure that the project results are translated into national level policies, as well as national parks in Gabon.

Canada - University of Saskatchewan

UNESCO Chair in Biocultural Diversity, Sustainability, Reconciliation, and Renewal

"Conservation with Equity" (Co-WE): A Framework for UNESCO Biosphere Regions in Canada

Gap addressed

The Chair aims to address the contextual factors that influence the Recognition Procedure and Distribution by adapting this framework to the specific context of three knowledge systems, as well as adding ecological reconciliation to the framework.

Beneficiaries

Redberry Lake Biosphere Region (including Mistawasis Nêhiyawak and Muskeg Lake Cree Nation, who are not part of the designation but also benefit from this project), the Mount Arrowsmith Biosphere Region and the Clayoquot Sound Biosphere Region.

Programme overview

The Co-WE Framework encompasses four pillars —recognition, procedure, distribution, and ecological reconciliation— each with defined criteria and corresponding indicators to guide its implementation.

Under the Recognition pillar, the criteria focus on acknowledging and respecting land tenure and resource rights, the right to self-determination and autonomy, and the value of Indigenous and Local Knowledge (ILK) alongside cultural management practices. Indicators for this pillar include the recognition of land and resource rights, including customary laws, and the valuation and application of ILK.

The Procedure pillar emphasizes participation in decision-making processes. Its criteria include transparent and inclusive engagement, clearly defined responsibilities, access to justice and grievance mechanisms, and adherence to Free, Prior, and Informed Consent (FPIC).

Indicators measure support for local capacity building and leadership, representation in management and boards, gender equity through the involvement of women in boards and advisory committees, youth participation and public engagement, and the implementation of FPIC processes to ensure Indigenous well-being.

For the Distribution pillar, the focus is on equitable benefit-sharing. Criteria include fostering economic opportunities and equitable growth while implementing risk mitigation and compensation strategies. Indicators assess access to economic and social well-being programmes for Indigenous and local communities and preventive measures against unsustainable activities, such as industrial forestry and mining.

Finally, the Ecological Reconciliation pillar aims at fostering conservation through reconciliation. Criteria include efforts to reconcile relationships between First Nations and settlers and to reconnect Indigenous Peoples with their lands. Indicators include the establishment of collaborative Indigenous-led conservation initiatives, the restoration of traditional names and languages, the designation of cultural or sacred areas for ceremonies, and the facilitation of healing ceremonies to acknowledge and address past harms.

Each pillar and its components collectively contribute to advancing equitable and sustainable relationships between communities, their lands, and resources.

Impact and alignment with the Kunming-Montreal Global Biodiversity Framework and Sustainable Development Goals

GBF 3: This framework addresses the critical role of Indigenous Peoples as nature custodians in order to reach the 30% by 2030 conservation target, as a large part of biodiversity hotspots in Canada, both in biosphere regions and other protected areas, overlap with Indigenous territories.

GBF 22: Through field visits with Indigenous communities and interviews with community members and knowledge keepers, and biosphere region managers, the researcher leading this project facilitated the access to justice and information related to biodiversity for local stakeholders. He was also able to weave into this project his Indigenous knowledge from his upbringing in a hunting community in Ghana, brining a more holistic approach to the framework development process.

SDG 17: This framework will feed into the previously featured BECOME project, led by the UNESCO Chair on Sustainable Heritage and Environmental Management. This partnership will allow the BECOME consortia of researchers to learn from Indigenous knowledge systems from Canada and use the framework in other relevant biosphere reserves/regions in Sweden, South Africa and Chile.

Each site holds a great power, the power of connecting people together and building a better place to live all together, humans and non-humans.

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United Nations
Educational, Scientific
and Cultural Organization

The Earth Network project operates through over 2,000 sites around the world, including UNESCO-designated sites and areas related to elements of Intangible Cultural Heritage.

As it has grown, the Earth Network has developed a comprehensive database of proven environmental solutions—featuring results and projects that can be replicated, adapted, or scaled to address biodiversity loss worldwide.

Learn more about the Earth Network project

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