Desirable Action Plan of the World Network of Island and Coastal Biosphere Reserves
Desirable Action Plan of the World Network of Island and Coastal Biosphere Reserves
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves, Jeju Island, Republic of Korea, September 12-14 2017
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The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves
Foreword

It is somehow becoming a tradition for me to introduce the annual publication of the World Network of Island and Coastal Biosphere Reserves, which was held this time in Jeju Island, Republic of Korea in September 2017.

The book elaborates on the presentations given by the distinguished speakers from Island and Coastal Biosphere Reserves at this meeting and consecrates the success of this lively network that met this year already for the seventh time.

At the moment of writing this foreword in late 2017, there are 669 biosphere reserves in 120 countries worldwide. The number of transboundary biosphere reserves increased to 20 and almost one third of the network sites are located on islands and in coastal areas. With this continuously growing network, we are not only becoming more and more, but also stronger, as an international movement, in our battle for biodiversity protection and sustainable development. Needless to say that in the face of ongoing climate change, island and coastal biosphere reserves are at the forefront of this movement and hold a particular relevance and role within the framework of the Sustainable Development Goals 2030, especially with regard to the goals 13 on Climate Action, 14 on Life below Water and 15 on Life on Land. As innovative open-air laboratories and experimenting sites, biosphere reserves have the potential and socio-political support to achieve their important contribution in this regard and address frontally and innovatively upcoming vulnerabilities. Cooperation remains the main keyword on this path and the MAB Secretariat reiterates its strong believe in and recommendation for transboundary collaborations and integrated management of natural resources and sustainable development.

With this publication, we address directly the first expected Outcome (A 1.) of the Lima Action Plan for Biosphere Reserves 2016-2025 (A 1. “Biosphere Reserves recognized as models contributing to the implementation of the Sustainable Development Goals {SDGs} and Multilateral Agreements”). We target in particular that the World Network of Island and Coastal Biosphere Reserves become a leader for the primary Action (A 1.1.) on the contribution of Biosphere Reserves to achieving the SDGs. This book and the contributions are the direct feedback of the biosphere reserves participating in the Jeju event in this regard.

I would like to express my renewed special thanks to the Government of the Jeju Autonomous Province, the Island Council of Menorca, the Spanish Ministry for Agriculture, Food and Environment and its Autonomous Organism for National Parks, as well as the Government of the Republic of Korea and its National Park Service, that have been providing all over the years very strong support to the MAB Programme. It is only that with this unconditional support from UNESCO’s Member States that the World Network of Island and Coastal Biosphere Reserves can achieve this important progress that it has made until now. The clear and strong engagement of both Island Governments, i.e. Jeju and Menorca, made the functioning of this Network a great success.

To all actors of the World Network of Island and Coastal Biosphere Reserves, I wish that relying on their respective biosphere reserves will allow the good accomplishment of their local and national agenda as well as the contribution to the Sustainable Development Goals 2030. We are all looking forward to learn about and from these successes at the forthcoming meeting of World Network of Island and Coastal Biosphere Reserves in the island of Menorca, Spain, in May 2018.

Paris, November 2017
Foreword

The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves was successfully held in Jeju Special Self-Governing Province in September, 2017 with the theme of “Desirable Action Plan of the World Network of Island and Coastal Biosphere Reserves.”

I extend my sincere gratitude to the distinguished speakers and guests who graced us with their presence at the meeting and it is my pleasure and honor to leave a congratulatory message for the publication of this casebook.

Jeju Island has achieved UNESCO’s coveted “Triple Crown,” a Biosphere Reserve, World Natural Heritage and Global Geopark in addition to the five Ramsar sites. The heritage of Haenyeo, the female divers indigenous to Jeju Island, is also listed as an intangible cultural heritage of humanity.

Jeju Island’s natural environment is the most important asset, and its core value, Harmonious Coexistence of Man and Nature, is consistent with the vision of the UNESCO.

Jeju and Menorca secretariats have coordinated the World network of Island and Coastal Biosphere Reserves since 2012. This Network enables distant territories facing common challenges to cooperate and share knowledge.

UNESCO MAB and Jeju Special Self-Governing Province signed MOU at the meeting. It is an agreement of great importance and has immense symbolic resonance in that it will support the implementation of the MAB Programme Vision and the sustainable development of the Network for the next five years (2018-2022).

The World Network of Island and Coastal Biosphere Reserves will continue to contribute to the conservation of biodiversity and sustainable development both at the national and global level. In addition, Jeju Special Self-Governing Province will closely work with Menorca and UNESCO MAB to make this network an important part of the biosphere reserves around the world and we look forward to your active support.
Biosphere Reserves in Islands and Coastal Areas: UNESCO Tools to Achieve the SDGs

Dr. Miguel Clüsener-Godt

The Man and the Biosphere Programme (MAB), UNESCO
Biosphere Reserves in Islands and Coastal Areas: UNESCO Tools to Achieve the SDGs

Dr. Miguel Clüsener-Godt
By Dr. Miguel Clüsener-Godt, Director a. i. of the Division of Ecological and Earth Sciences and Secretary a.i. of the Man and the Biosphere Programme (MAB), UNESCO

With its 669 Biosphere Reserves (WNBR) in 120 countries, the World Network of Biosphere Reserves covers an approximate area of one billion hectares covering all major ecosystems and is home to over 200 million people. It is a dynamic and interactive network of sites of excellence, a unique tool for international cooperation through the exchange of experiences and know-how, capacity-building and the promotion of best practices. With the support of not less than 20 transboundary biosphere reserves (Africa: 3, Europe & North America: 12, Latin America and the Caribbean: 3), including one transcontinental biosphere reserve between Europe (Spain) and Arab States (Morocco), the World Network of Biosphere Reserves is deeply engaged in transboundary cooperation as well as North-South and South-South collaboration.

Following the adoption of the 2030 Agenda for Sustainable Development and the Paris Climate Change Agreement, the MAB’s Council adopted in 2015 the new MAB Strategy for 2015-2025 to ensure a strong response to contemporary development challenges and opportunities, and with the aim to achieve the SDGs Goals and implement the 2030 Agenda for Sustainable Development, through the global dissemination of models of sustainability.

The MAB Strategy 2015-2025 will support Member States to conserve biodiversity, enhance ecosystem services and foster the sustainable use of natural resources. It targets also the facilitate biodiversity and sustainability science, education for sustainable development and capacity building as well as the mitigation mitigation and adaptation to climate change and other aspects of global environmental change. The MAB
Strategy envisages:

A. That the WNBR will increasingly consist of effectively functioning models for sustainable development
B. Inclusive, dynamic and result-oriented collaboration and networking within the MAB Programme and the WNBR
C. Effective external partnerships and sufficient and sustainable funding for the MAB Programme and the WNBR
D. Comprehensive, modern, open, and transparent communication, information and data sharing
E. An effective governance of and within the MAB Programme and the World Network of Biosphere Reserves

The Programme’s new strategy has been promoted at the 4th World Congress of Biosphere Reserves in Lima, where over 1,000 participants from 115 countries could participate in 34 workshops and side events related to SDGs and climate change. Beyond the continuing growth of the World Network of Biosphere Reserves with the nomination of 20 new sites, the congress launched the Lima Action Plan (LAP) 2016-2025.

The Lima Action Plan includes targeted outcomes, actions and outputs that will contribute to the effective implementation of the strategic objectives contained in the MAB Strategy and specifies the entities with prime responsibility for implementation, together with time range and performance indicators. The LAP is structured according to the five Strategic Action Areas of the MAB Strategy 2015-2025, and includes 62 Actions with specific outcomes and performance indicators.

Since the adoption of the LAP, several countries, such as Colombia, Ecuador, Iran, Japan, Romania, Indonesia and Sweden, have organized national workshops to discuss the LAP and look at how to implement it into their national context. Some countries have already adopted their National LAP, as in the Democratic Republic of the Congo, which was the first country to adopt its National LAP.

By implementing LAP Strategic Areas and actions, the Biosphere Reserve sites worldwide will be enabled to address 14 out of the 17 SDGs, namely SDG 2 “Zero Hunger”, SDG 4 “Quality Education”, SDG 5 “Gender Equality”, SDG 6 “Clean Water and Sanitation”, SDG 7 “Affordable and Clean Energy”, SDG 8 “Decent work and Economic Growth”, SDG 9 “Industry, Innovation and Infrastructure”, SDG 11 “Sustainable Cities and Communities”, SDG 12 “Responsible Consumption and Production”, SDG 13 “Climate Action”, SDG 14 “Life below Water”, SDG 15
“Life on Land”, SDG 16 “Peace, Justice and Strong Institutions” and SDG 17 “Partnerships for the Goals”.

In this regard, Biosphere Reserves Products and Services Branding workshops have been held (Lima 2015; Shanghai 2015; Bogota 2016; Parma 2016; Tumbes 2016; Santa Marta 2016) focusing on biosphere reserves products and services. A “Green Economy in Biosphere Reserves project” (GEBR) is currently being implemented in three sub-Saharan African countries: Ghana, Nigeria, and Tanzania. With regard to youth in biosphere reserves, the first the World MAB Youth Forum in the Delta del Po Biosphere Reserve took place in September 2017 in Italy. This time, the younger people from biosphere reserves from all over the world gathered to discuss their expectations and opportunities when living in or around a UNESCO biosphere reserve.

Within the World Network of Biosphere reserves, the World Network of Island and Coastal Biosphere Reserves (WNICBR) is among the most prominent, with 212 Biosphere Reserves in 74 countries. Among these, Mexico is the country with most Marine, Island and Coastal Areas. The aim of the WNICBR is to study, implement and disseminate island and coastal strategies in order to preserve biodiversity and heritage, promote sustainable development, and adapt to and mitigate the effects of climate change. The network has two technical headquarters, the Island of Jeju (Republic of Korea) focusing on climate change and Menorca (Spain) specializing in sustainable development.

The WNICBR is involved in the main project on Biosphere reserves as a tool for coastal and island management in the South-East Pacific Region (BRESEP), coordinated by the MAB Programme with the support of the Flemish Government of Belgium. The objective of the BRESEP project is to create and reinforce existing biosphere reserves on the coastal areas and islands of the west coast of Chile, Colombia, Ecuador, Panama and Peru, as well as to promote biosphere reserves as tools to bring added value to local socio-economical activities. Among the national activities are for instance a feasibility study to establish the first biosphere reserve on the Pacific coast in Colombia and in Ecuador a feasibility study to establish a new biosphere reserve in the Gulf of Guayaquil. Several biosphere reserve extensions took place within this project: the extension of the Juan Fernández Biosphere Reserve in Chile to include its marine area and strengthen the governance of the Fray Jorge Reserve. Other extensions are the extension of the Galapagos Biosphere Reserve in Ecuador to include its marine area; the extension of the Darién Biosphere Reserve in Panama to include marine and coastal areas; the extension of the Noroeste Biosphere Reserve in Peru to the coast and to include the Mangrove Forest of Tumbes.

Binational and regional activities are implemented as well within the project with for example:

- Internationally recognized sites by UNESCO’s Man and the Biosphere (MAB) Programme that include terrestrial, marine and coastal ecosystems.
- They promote solutions reconciling the conservation of biodiversity with its sustainable use.
- Sites for testing interdisciplinary approaches to understand and manage changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity.
- They provides local solutions to global challenges.

They consist of three interrelated zones that aim to fulfill three complementary and mutually reinforcing functions:

- The **core area** comprises a strictly protected zone that contributes to the conservation of ecosystems, species and genetic variation.

- The **buffer zone** surrounds the core area. Is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.

- The **transition area** is where communities foster socio-culturally and ecologically sustainable economic and human activities.
instance the work of Ecuador and Peru towards the first transboundary Biosphere Reserve in South America, and the twinning agreement between the Galapagos (Ecuador) and Archipielago de Juan Fernández (Chile) Biosphere Reserves, as well as regional workshops on “Ecosystem Management and Planning for Protected Marine and Coastal Areas” and “Biosphere Reserves’ Products and Services, tools to improve living conditions”

In conclusion, it should be highlighted that one of MAB’s best stories happens in an Island Biosphere Reserve. It aims to raise environmental awareness by engaging people and considering their own needs. In the high-impact project “No Plastic, a small gesture in your hand” that has been implemented in Principe Biosphere Reserve, the local population has been involved to get plastic waste out of the ecosystem, while improving people’s access to safe water. For every 50 collected plastic bottles, one ‘Principe Biosphere Bottle’, a reusable stainless steel bottle was produced. These bottles can then be replenished at safe freshwater fountains installed in public spaces. This campaign is promoted in towns and schools throughout the island of Principe, since children are its primary target as future advocates for a healthy environment. Since 2014, this campaign allowed to collect over 300,000 disposable bottles and to distribute 6,000 Principe Biosphere Bottles.

- Supports Member States to conserve biodiversity, enhance ecosystem services and foster the sustainable use of natural resources.
- Facilitate sustainability science, education for sustainable development and capacity building.
- Support mitigation and adaptation to climate change and other aspects of global environmental change.

Biosphere Reserves contributing to SDGs

- Observatories for climate change research, monitoring, mitigation and adaptation, including in support of the UNFCCC COP21 Paris Agreement
- Identify, and disseminate good practices

- BRs undertake research and ensure the long-term conservation of the socio-ecological systems
- BRs work on restoration and appropriate management of degraded ecosystems
- BRs identify, and disseminate good practices for sustainable development, and identify and eliminate unsustainable practices
- BRs implement programmes to preserve and promote species and varieties of economic and/or cultural value

Biosphere Reserves contributing to SDGs

- They establish alliances at local, regional, international levels for biodiversity and geology conservation
- They create and implement twinning arrangements between diverse sites in different countries
- Designate and implement transboundary BRs (TBRs)
- They establish an international network of scientists/knowledge holders working in and with BRs, that engages with national and other international networks of scientists/knowledge holders
- BRs create opportunities for projects and activities funded by national and regional funding agencies
- They encourage joint promotion and marketing of BRs products and services
Island BR Network; a View from Baltic

Toomas Kokovkin

MAB Estonia
Island BR Network; a View from Baltic

Toomas Kokovkin
MAB Estonia

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Coastal Biosphere Reserves in the Baltic Sea region

There are 9 coastal/insular Biosphere Reserves in the Baltic Sea area:
Sweden (3), Denmark (1), Finland (1), Germany (1), Poland (1), Latvia (1) and Estonia (1).
Since 2017, Sweden initiated a co-operation programme for the biosphere reserves in the Baltic Sea area.

Coastal Biosphere Reserves in the Baltic Sea region

The Baltic biosphere reserves co-operate within the NordMAB network. There also exist several bi- and trilateral projects.
Some examples of co-operation projects of the Estonian, Latvian and Swedish (Blekinge Archipelago) BRs for cultural heritage, tourism, as well as sustainable fishing:
Exchange experiences and learning from each other (fishing, BR ambassadors, financing, cultural heritage)
RECORDI – The EU project for Revitalizing Coastal Heritage: skills, legends, handicrafts, cuisine, video films.
Work placement small boat harbours (Estonian students in Blekinge Archipelago)

West-Estonian Archipelago BR

Total Area: 15601 km²
Land only: 4038 km²
Population is about 40 000, population density 10 pers/km²
A mosaic landscape of woodlands, meadows, wetlands, arable land and coastal grasslands.
The strategic vision:
A leading Estonian region for innovation and pilot projects in the field of sustainable use of the natural resources
In both natural and semi-natural land and marine ecosystems.
The awareness of sustainable development principles is high and local policies support this.
The islands’ communities, business people and public support green economy and acknowledge it as a functioning cooperation model for achieving social and economic success in the region.
West-Estonian Archipelago BR

According to the Estonian approach, the biosphere reserve is a „meeting point“, which brings together people and nature, local and global dimensions, as well as age-old heritage and new technologies.

See below a page from a brochure which describes this approach.

West-Estonian Archipelago BR

The WEABR works in accordance with the Sustainable Development Programme 2014-2020.

**Strategic objectives of the WEABR:**

1. A PILOT AREA FOR A SUSTAINABLE ECONOMY AND USE OF THE NATURAL ENVIRONMENT AND NATURAL RESOURCES
2. BIODIVERSITY HAS BEEN PRESERVED
3. PRESERVED AND EXHIBITED ISLANDS’ CULTURAL HERITAGE
4. RESEARCH, MONITORING AND TRAINING CENTRE THAT SUPPORTS A GREEN ECONOMY
5. ACTIVE CO-OPERATION IN ACHIEVING OBJECTIVES OF THE BR
West-Estonian Archipelago BR
**Coastal BRs: what defines them?**
There is a vast number of BRs adjacent to coastline, or in a proximity of coastline (e.g. via river estuaries). However the explicit coastal BRs, in our opinion, include marine ecosystems and sea-related economies. This should be expressed in the zonation, as well as management plans of a BR.

**Island BR-s: what makes them different?**
- High ratio of coastal zone area vs terrestrial environments
- High „marine influence“ on islands (e.g. in geochemistry, in biological and ecological components, as well as culture and social life)
- Dependence on marine resources in economies
- Isolation
- Vulnerability due to smaller carrying capacity
- More suitable for modeling the sustainability issues

**Quality of Life and biosphere reserves**

**Dimensions of the Quality of Life** (according to the Report by the Commission on the Measurement of Economic Performance and Social Progress, 2009):

i. Material living standards (income, consumption and wealth);
ii. Health;
iii. Education;
iv. Personal activities including work
v. Political voice and governance;
v. Social connections and relationships;
vii. Environment (present and future conditions);
viii. Insecurity, of an economic as well as a physical nature.

**Whereas the objective nr 2 from the MAB Strategy is:**
Contribute to building sustainable, healthy and equitable societies, economies and thriving human settlements in harmony with the biosphere.
One may say that biosphere reserves address, at large, the same concept as the concept of the quality of life. The overall objective of biosphere reserves is Human development and well-being in long-lasting (sustainable) interaction with the natural environment. Biosphere reserves can be regarded (and developed) as sites of rural well-being and high quality of life. They provide an alternative to urbanisation as attractive environments for living, where modern solutions of nature management are applied.

Some thoughts of the future action plan of the World Network of Island and Coastal Biosphere Reserves
- The thematic division, which is (a) Climate change and (b) Sustainable development model, is sufficient;
- Active regional sub-networks are welcome. For instance, there are good prospects for the Baltic sub-network;
- A big question: should we differentiate between coastal BRs and „proper“ islands. There are pros and cons for this differentiation.

Some thoughts of the network’s action plan (continued)
The actions of the network in coherence with the Lima action plan
Proposal of priority actions for the WNICBR:
A1.4 Use BRs as priority sites/observatories for climate change research, monitoring, mitigation and adaptation.
A1.5. Promote green/sustainable/social economy initiatives inside BRs
A1.6. Undertake research and ensure the long-term conservation of the socio-ecological systems of BRs
A4.1. Establish partnerships with universities/research institutions to undertake research, especially UNESCO Chairs and Centres
B1.1. and B1.2 Organize global and regional education, capacity building and training programmes

Conclusions
- Island and Coastal BRs are a special case well suitable for sustainable development modeling
- In accordance with LAP, the Island-and-coast BRs act for climate change research, monitoring and adaptation in cooperation with universities
- In accordance with LAP, Island-and-coast BRs act for green economies and sustainable industries, as well as solutions based on cultural heritage
- Biosphere reserves can be regarded – and developed – as sites of well-being and high quality of life in rural environments, as opposed to urban areas.
The Biosphere Reserve of the Iroise Sea and Islands

Cécile Lefeuvre

Iles et Mer d’Iroise
First I will present the Iroise Biosphere Reserve and then I will give you some examples of projects we have undertaken. I hope you will find them interesting for your BR.

So to begin, let’s take a closer look at the Iroise Biosphere Reserve. The biosphere reserve of the Iroise Sea and Islands is located in the Brittany region of France. As you can see on the map, it’s on the west coast of Brittany.

I would now like to present some key figures for the BR and explain the geography. The Iroise was designated as a reserve in nineteen eighty-eight. Then, we submitted a proposal to extend and rename the BR in twenty - eleven. Our aim was to have a continuous biosphere reserve. After examining our proposal, UNESCO approved it in two thousand twelve. This was very good news for us.

If you look at the map, you’ll see that there are three main inhabited islands. To the North, there are Ouessant and Molène. And since the extension of the BR in two thousand twelve, the island of Sein in the South.

With the inclusion of Sein in the BR, the perimeter has grown significantly and a much greater percentage of the BR is in the sea. In fact, only 2% of the BR is on land.
There is also an archipelago, between the mainland and Ouessant.

The population in two thousand fourteen was one thousand two hundred and forty-three. I should mention that the population has been declining for a long time (thirteen-point-five% in fifteen years). This is a concern for us.

I would just like to point out that the BR is jointly managed by a natural marine park and a regional natural park.

Now, I would like to talk about the heritages of the BR.

As you can see from the images on the screen, the Iroise BR has a very rich bi-odiversity. There are marine mammals such as bottlenose dolphins and land animals such as black sheep which is typically found in Ouessant.

In addition to this vibrant biodiversity, the reserve is also home to a rich cultural heritage. You can see different lighthouses in the photos. In fact, it’s a particularity of the Britanny region, that we have a very high number of lighthouses. This is due to Britanny’s distinctive and beautiful rocky coast.

On to the second part of the presentation, I’m going to present different projects that we have put in place over the years.

For each project you will see that I have noted the relevant outcomes from the Lima action plan at the top of the slide.

We developed a charter with tour operators proposing activities such as bird watching, geology on the shore, scuba diving and dolphin watching.

The aim is to encourage them to commit to best practices so that tourists can enjoy these activities without harming the marine life.

At this stage, we have written the charter and we are now focusing on getting operators to sign it. Twenty of them have already done so. In return, they receive a label (from the marine natural park) identifying them as a partner in protecting the marine life.

Obviously, not all tour operators will sign on. So, the challenge we face now is to have stronger regulations in place to protect the marine mammals.

I would now like to talk about another kind of charter that we are working on. Eco-players is a French concept effective in 5 BR’s.

At the Iroise BR we are at the beginning stages. We have contacted other French BR’s to learn more about the process and we have started promoting the concept with local businesses in
an effort to generate interest.

Eco-player means any local organization or business that making a positive contribution to the surrounding environment. They can commit to concrete actions to reduce their environmental footprint. For example, a hotel reducing its water usage by a certain percentage.

The charter hasn’t been written yet for the Iroise BR. We held a meeting with the stakeholders and they agreed to have this kind of charter.

Now, about a very different project, which goal is to preserve the heritage of the local fishing culture.

A professional photographer captured the daily life of fishermen – handling the equipment, catching the fish, selling the fish, etc.

And we interviewed them about their lives aboard the boats, where and how they fish and how they interact with the marine environment.

We chose these fishermen from the Iroise because they operate in respect of the regulations of the BR.

The public is not really aware of how fishing is done at the Iroise BR so it’s important to educate people about it.

I would now like to move on to another project that aims to improve our knowledge of ecosystem services. The kelp forest in the archipelago of Molène is the biggest kelp forest in French waters and the most diverse in Europe.

We worked with Ifremer, a French marine institute, and French marine stations.

We have developed a research program with marine biologists to better understand the ecosystems services of the kelp fields.

In the same spirit of the sister city program, we are looking to twin with other BR’s that face the same challenges as us.

We want to expose our people to other cultures and ways of thinking, and to leave their bubble.

Finally I would like to focus on the role of farmers. Nowadays there are no more farmers in the BR, except on one little island. In Quéménès, a couple and two children, in addition to guest
rooms, grow potatoes and raise a few sheep. But they will leave at the end of the year to return to the mainland.

As you know, when the land isn’t maintained, especially the pastures, the risk is to transform the habitats in negative ways and to weaken the biodiversity of the reserve.

And at the same time, we are trying to attract families to islands on the BR in the context of two calls for projects.

So we hope to have new inhabitants for the beginning of the next year.

B6.1. Create and implement twinning arrangements between BRs in different countries

=> **Twinning**: project in our BR action plan.
   First informal exchanges at Euromab with the Blekinge archipelago in Sverige.

If any of you are interested, I’d be happy to talk with you.

C4.2. Create opportunities for collaboration and partnerships with private sector which are open, accountable and sustainable

=> Encouraging the **farmers to settle** on an island where they are no longer present.
   Call for project proposals in progress in Ouessant.

=> **Agro-environmental management project** on an island French State ownership.
   Call for project proposals in progress in Quéménès.
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves
Jeju Island, Republic of Korea, September 12 – 14, 2017
Baa Atoll UNESCO Biosphere Reserve

Abdulla Shibau

Baa Atoll Biosphere Reserve
Baa Atoll UNESCO Biosphere Reserve

Abdulla Shibau

Baa Atoll Biosphere Reserve
Population: 366,972 (2014 Census)

1190 islands
194 inhabited
101+ Resort Islands

26 geographic atolls
Divided into 20 atolls for admin. purposes

Each atoll is identified by the letter from the local alphabet.
(total letters in the DIVEHI alphabet: 24)

Official Language: Divehi

Length: 820km
Width: 130km

Capital: Male' City

Major Economic Activities:
Fishing and Tourism
Baa Atoll

**Population:** 14,000

- 74 islands
- 13 inhabited
- 10 Resort Islands
- 3 geographic atolls

The word BAA stands for the fifth letter in the Divehi alphabet, hence Baa Atoll

**Capital:** Eydhafushi Island
AEC PROJECT / Background

2004  Project Inception workshop in Eydhafushi, Baa Atoll

December 2004, Project put on hold by the government due to the tsunami

Late 2005  Project restarts

Project OBJECTIVES

- Mainstreaming biodiversity into existing policies and plans and future plans
- Conservation of biological diversity
- Livelihood Improvement
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2009</td>
<td>AEC Project mid-term Evaluation undertaken</td>
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<td></td>
<td>Recommends to pursue UNESCO’s designation as a Biosphere Reserve</td>
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<td></td>
<td>as all work undertaken by the AEC Project in line with CBD and</td>
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<td></td>
<td>Ecosystem approach</td>
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<td>2009</td>
<td>Environment, Tourism and Fisheries ministers meets and agrees for</td>
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<td></td>
<td>the nomination of Baa Atoll as a UNESCO Biosphere Reserve</td>
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<td>2010</td>
<td>Meeting with high level authorities informing about Baa Atoll UNESCO</td>
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<td>Biosphere Reserve and its nomination</td>
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<td>2010</td>
<td>Survey undertaken of Baa Atoll Community in declaring Baa Atoll</td>
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<td>as a UNESCO Biosphere Reserve</td>
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<td></td>
<td>• Over 85% in favor</td>
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<td>28 June 2011</td>
<td>UNESCO declares Baa Atoll as a UNESCO Biosphere Reserve</td>
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<tr>
<td>23 Nov 2011</td>
<td>Baa Atoll a UNESCO Biosphere Reserve, gazetted by the</td>
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<td>Government of Maldives</td>
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Baa Atoll UNESCO BIOSPHERE RESERVE
Governance

MINISTRY OF ENVIRONMENT AND ENERGY

BR ADVISORY BOARD
ADVISING AND OVERSEEING OF BR PROGRAMMES

ATOLL COUNCIL X 1
ISLAND COUNCIL X 1
RESORTS X 1
EPA X 1
BACF X 1
INDEPENDENT EXPERTS X 2
LGA X 1
LIVEABOARD ASSOCIATION X 1

Biosphere Reserve Office

CONSERVATION UNIT
IMPLEMENTATION OF CONSERVATION PROGRAMME

OUTREACH UNIT
IMPLEMENTATION OF LEARNING AND RESEARCH PROGRAMME

LIVELIHOODS UNIT
IMPLEMENTATION OF LIVELIHOOD AND SUSTAINABLE PROGRAMME

EPA
PROVIDING TECHNICAL ASSISTANCE AND AVIDSE
CORE AREAS

Mendhoo Region
(Core Area: 589.8h Buffer Area: 583ha)

Special Features
Very high biodiversity and standing population of hard and soft corals and associated marine invertebrates and vertebrates.
Nesting sites for green and hawksbill turtles.
Nibiligaa is a key bird roosting and nesting site for Lesser Noddies and Brown Noddies as well as the Black-Naped Tern, Greater Crested Tern.
CORE AREAS

Maahuruvalhi
(Core Area: 1520ha Buffer Area:352.6ha)

Special Features
High biodiversity and standing population of hard and soft corals and associated marine invertebrates and vertebrates (especially fin fish).

High populations of IUCN red listed species including Napoleon fish (Cheilinus undulatus),

It is known as a grouper and may be a fish aggregation site for reproduction.
CORE AREAS

Angafaru
(Core Area: 590.8ha Buffer Area: 227.9ha)

Special Features
High Biodiversity marine region with standing population of hard and soft corals and associated marine vertebrates and invertebrates.

The reef system is directly associated with the unique dynamic water circulation system of the protected area of Hanifaru, that nurturing south-west monsoons aggregates for feeding high numbers of endangered mega fauna animals (whale sharks and manta rays).
**CORE AREAS**

**Bathalaa Region**  
**Core Area:** 502ha, **Buffer Area:** 200ha

**Special Features**

Very high biodiversity, diverse habitat and standing population of hard and soft corals and associated marine invertebrates and vertebrates.

Nesting sites for green and hawksbill turtles and includes known grouper aggregation spawning sites. Roosting site for black-naped tern and includes known grouper aggregation and spawning site.
CORE AREAS

Dhigalihaa and Dhigaligiri
(Core Area:32.19ha Buffer Area:59.25)

Special Features
High biodiversity and standing population of hard and soft corals and associated marine invertebrates and vertebrates.

This area is a long and narrow reef characterised by a colourful reef top with overhangs. The reef top at Dhigalihaa is between 12m and 16m deep, with slopes down to depths of about 32m. Red-encrusting coralline algae are abundant and there are many colonies of digitate and branching Acropora spp. Corals.

At the time declared protected Dhigalihaa was famous for sighting barracudas and turtles. Sharks have declined markedly in B. Atoll the last few years.
CORE AREAS

Ohugiri Island and Reef
(Core Area: 41.95ha Buffer Area: 61.36ha)

Special Features
Located at the southern end of Baa Atoll the island is one of two islands in the Maldives with regular roosting of Frigate Birds (mainly Lesser Frigate Fregata ariel). The island is also known for breeding red-billed tropic bird and nesting turtles.

In the past the island was used by traditional medicine practitioners for collecting medicinal plants. The island was also used for collecting coconuts, palm leaves, firewood and agriculture mainly by both Thulhadhoo and Hithadhoo.
CORE AREAS

Dhorukandu / Mathifaru Huraa
(Core Area:22.6ha Buffer Area:33ha)

Special Features
High biodiversity and standing population of hard and soft corals and associated marine invertebrates and vertebrates.
Nesting sites for green and hawksbill turtles.
Includes known grouper aggregation spawning sites.
Roosting and nesting sites for the Black-Naped Tern, Lesser Noddies and Brown Noddies.
CORE AREAS

Goidhoo Koaru
(Core Area:10.34ha Buffer Area:3.55ha)

Special Features
This area has the highest biodiversity and largest mangrove forest within Baa Atoll and one of the largest mangrove ecosystems within the nation and has a high biodiversity population of mangrove associated vertebrates and invertebrates.

This site is also a popular roosting site for migratory birds such as the Ruddy Turnstone and Northern Shoveler. A number of other migratory birds are generally found as well during the north-east monsoon in this area.
CORE AREAS

Baa Atoll BR

**Name:** Hanifaru  
(Core Area: 467.5ha Buffer Area: 192.6ha)

**Special Features**

High biodiversity marine region possessing a unique dynamic water circulation system that during western monsoons, aggregated for feeding (whale sharks and manta rays) and mating (manta rays) in high numbers of endangered mega fauna animals (whale sharks and manta rays).

The site is biologically and biodiversity significant for Baa Atoll, Maldives and globally.

Nesting sites for green and hawksbill turtles.

Occasional roosting site for black-naped tern, lesser noddies and brown noddies.
Baa Atoll Conservation Fund, Background


- The Fund is governed by the Fund Board of Directors and the Fund Managing Director in accordance with the provisions of the founding documents, TOR and Rules of Procedure and other applicable laws and regulations of the Republic of Maldives.

- BACF Secretariat based at Ministry of Environment and Energy.
Purpose

- Co-finance activities that ensure that Baa Atoll is a world class model of atoll ecosystem conservation in accordance with its designation as a UNESCO World Biosphere Reserve in 2011.

Objectives

- Conserving and enhancing the natural beauty, biodiversity and cultural heritage of Baa Atoll.

- Promoting opportunities for the understanding and enjoyment of the special qualities of Baa atoll by local communities and visitors.

- Supporting the sustainable development of Baa Atoll, including fishing, tourism and the economic and social interests of those who live and work in the area.
Valuing Biodiversity
This economic case for biodiversity conservation in the Maldives

BAA ATOLL ECONOMY

For households, biodiversity-based activities contribute:
- employment worth Rf 78 million
- business earnings worth Rf 80 million
- fresh fish worth Rf 1.8 billion
- other biological resources worth Rf 19 million
- 47% of employment
- 47% of wages
- 51% of business earnings
- and occupy 61% of the population

- 40% of households have members employed in the tourism sector, earning Rf 68 million
- 60% are engaged in biodiversity-based business, which contributes 51% of all business earnings and generates income of Rf 80 million
- More than 40% engage in fishing with a catch worth Rf 1.8 billion
- 55% harvest other biological resources together worth well over Rf 19 million
- Six tourist resorts entertain 45,000 tourists a year, selling bednights worth around US$ 160 million
- Six dive centres generate income of around US$ 2.3 million

The contribution of biodiversity to economic and development indicators in Baa Atoll

- 47% Employment
- 61% Occupation
- 47% Wages
- 51% Business earnings
Way forward

Lessons learnt from Baa Atoll Biosphere Reserve are being replicated across the country.

Baa BR Experience has been shared across all over the country.

Management Plans for PAs are being drawn up based on experience of Baa Atoll BR.

MALDIVES a UNESCO BIOSPHERE RESERVE

Work is currently being undertaken to nominate the whole of Maldives to be declared a UNESCO BIOSPHERE RESERVE.
Partner programme of Biosphere Reserve
Lower Saxon Wadden Sea

Jürgen Rahmel
Astrid Martin
Peter Südbeck

Lower Saxon Wadden Sea National Park Authority
Partner programme of Biosphere Reserve
Lower Saxon Wadden Sea

Biosphere reserves need a broad (and regional) support to reach their goals in ecology, nature conservation and education. For this, a strong network is crucial, and especially business institutions and other bodies can be essential partners on the way. They are meant to support the biosphere aims and change their activities towards sustainability in their field of work, and all this in addition to governmental organisations. Therefore, partner programmes have been developed successfully to organise this societal background.

1. The biosphere reserve

The Wadden Sea is situated in Europe on the southeastern coast of the North Sea (fig. 1). Being the largest tidal area behind barrier islands in the world, it stretches along the coastlines of the three countries The Netherlands, Germany and Denmark over a distance of 400 kilometers with a total area of 10,000 km². The ecological and geological characteristics of this ecosystem and its significance for the conservation of biodiversity justified its outstanding universal value and designation as a world nature heritage site. As nature conservation is a task of the federal states in Germany the coastal areas of Schleswig-Holstein, Hamburg and Niedersachsen (Lower Saxony) are preserved as separate national parks. Each of them is also designated as a
MAB biosphere reserve by the UNESCO. A detailed map of the biosphere reserve Lower Saxon Wadden Sea is shown in fig. 2. Here, efforts are going on to enlarge the transition zone towards the mainland.

2. History of the partner programme

The partner programme started 20 years ago in 1997. At that time tour guides and guides of tidal flat walks where the first partners. Many of them were from the area so they had strong commitments or they were even concerned with nature conservation. They wanted to increase acceptance and get support from tourists who experienced the beauty of the landscape and the unique nature of plants and animals of the ecosystem.

After the first evaluation of the biosphere reserve and the inscription of the Wadden Sea to the World Heritage the more comprehensive partner programme was installed. In a co-creational approach, together with the advisory committee, criteria for partners were formulated. After several further steps which can be derived from Tab. 1 in 2017 a new project was started which aims to extend and optimize the partner programme.

<table>
<thead>
<tr>
<th>Year</th>
<th>Development step</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>First certification of national park tidal flat guides and national park tour guides</td>
</tr>
<tr>
<td>2005</td>
<td>National park experience cruises in cooperation with shipping companies</td>
</tr>
<tr>
<td>2009</td>
<td>Start of the official partner programme of the biosphere reserve</td>
</tr>
<tr>
<td>2010</td>
<td>Advisory committee installed</td>
</tr>
<tr>
<td>2010 – 2015</td>
<td>Development of criteria for partners (co-creation), first certification of partners based upon these criteria</td>
</tr>
<tr>
<td>2012 – 2015</td>
<td>Quality management for National Park Guides (2017 transition from old system completed)</td>
</tr>
<tr>
<td>2015</td>
<td>Start of certification of sustainable agricultural products – „Wattenmeerprodukte“</td>
</tr>
<tr>
<td>2017</td>
<td>New project: „Partner initiative Wadden Sea – safeguard, extend, link“</td>
</tr>
</tbody>
</table>
3. Background and aims

The partner programme is not isolated from other developments. Rather it has relations to national and international institutions and cooperation. On the national level EUROPARC, the roof organisation of the German national parks, biosphere reserves and nature parks, is responsible for the certification of partner programmes in those conservation areas. Europarc has defined minimum standards for these programmes and has additionally developed the common cooperative design.

Within the framework of the Trilateral Cooperation for the Conservation of the Wadden Sea, in which The Netherlands, Denmark and Germany work together, there is also a Working Group „Business Cooperation“ which aims to establish standards for partner programmes in the whole World Nature Heritage Wadden Sea.

As a basic output, a number of quite ambitious goals were developed by the partner programme. Among them are an increase in acceptance of nature conservation and the safeguarding of the integrity and the OUV of the Wadden Sea as well as a support of the Sustainable Tourism Strategy of the World Heritage. Furthermore the partner programme shall develop an influence on the local market and land use by conviction and support the creation of a transition zone for the MAB – Biosphere Reserve Wadden Sea of Lower Saxony. By these aims conservation, sustainability and knowledge of the Wadden Sea region shall be safeguarded and realized comprehensively (fig. 3).

4. Criteria of the partner programme

Partners of the Biosphere Reserve and National Park Lower Saxon Wadden Sea are meant to comply with a number of quality criteria. Generally spoken, they must prove their commitment to nature conservation in the Wadden Sea, its OUV and integrity. Also, they have to contribute to the conservation of the area by multiplying information and so raising awareness of guests, employees and locals about nature and environment. Furthermore, they are meant to support of sustainable regional development.

The latter plays an important role in the biosphere reserve. And therefore in their application the future partner are asked to explain their own approach concerning the following topics:
- quality and sustainability of companies
- promotion and use of sustainable regional products and of environment-friendly mobility
- education for sustainable development
- conservation of historical architecture
- cooperation in the network.

5. Structure of the partner programme

Different categories of partners exist within the partner programme. There are individuals like National Park Guides who are active in the fields of information and education. Companies can be partners in the five categories accommodation, gastronomy, education, destination management
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves
Jeju Island, Republic of Korea, September 12 – 14, 2017

and agriculture. But also local municipalities like Dornum, Sande, Wurster Nordseeküste, Juist, Langeoog and Spiekeroog have already signed cooperation agreements with the biosphere reserve authority. Additionally, the partner programme promotes the certification of sustainable regional products which are assigned as ‘Wattenmeerprodukte’.

Except for minor deviations all partners follow the same process of certification (fig 4). An application is followed by an examination through employees of the biosphere reserve authority. Partners which fulfil the criteria, are accepted by the advisory committee. Finally, the partners get certified.

During the certification process the biosphere reserve authority needs support and advice which is provided by the Advisory Committee. This group of regional stakeholders gives input of competences and knowledge and prevents top-down decisions by active participation. The members of the committee are nominated by the National Park Advisory Board. They represent regional institutions like the Chamber of Commerce or organisations in the fields of tourism organisations, accommodation / gastronomy, agriculture, research, NGOs and biosphere reserve partners as well. The main tasks are decisions on applications and the development of criteria for partners.

6. Development

Besides earlier certified nature guides and shipping companies, the first partners were certificated in 2010. Since then, an average of 8 new partners have joined the network per annum (fig. 5). A more direct approach to potential partners shall increase this annual number in next years without decreasing the quality demands of the programme.

The distribution of partners over the different sectors which is displayed in fig. 6 reflects to some extent the temporal development of the programme. The largest group of partners is are national park guides. They mainly offer nature experience trips and have a high interest in the conservation of nature and landscape themselves. The second largest group consists of companies who offer accommodation for tourists. The third are partners in education and destination management organisations. Although the absolute numbers seem to be quite low they represent a relative high number of the total group of the region. However, for the sectors accommodation, gastronomy and agriculture an appreciable potential for the recruitment of new partners is

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**Fig. 4: Process of partner certification. (LEB = Ländliche Erwachsenenbildung, Bad Zwischenahn; NNA = Alfred Toepfer-Akademie, Schneverdingen)**

**Fig. 5: Temporal development of the certification of partners.**
expected.

Besides the mere numbers the quality of our partners’ offers and activities is a key criterion. First important steps to quality development and management have been taken together with the national park guides. In the period 2012 – 2017 a project was carried out to raise the demands on the guides significantly. However, the majority of already certificated guides decided to cope with these new demands. So they even went through some examinations to keep their certification which is an effort that was not necessary before.

7. Benefit for Partners

Although many of the partners have an own strong affinity to nature conservation and sustainability benefits from the partner programme are highly welcome. The image of the partner improves significantly when they demonstrate their commitment to world heritage, nature conservation and sustainability. They are provided with information material. The national park guides receive tool-kit for nature-touristic activities. The status as „Partner“ can be demonstrated by the use of the corporate logos of Biosphere Reserve and World Heritage Wadden Sea on the company’s homepage, flag, letters or menus, for example. Apparently, also precise economic interests may play a role. Biosphere reserve partners also have a higher attraction for biosphere reserve or world heritage tourists. The regional economic effects of national park tourism have been investigated by Job et al. (2009 and 2013). Based on data which were received in 2006/07 the area of National Park ‘Niedersächsisches Wattenmeer’ hosts 3 million day trippers and overnight tourists who stay for 20 million nights. The ratio of ‘real national park tourists’ whose single reason of their stay is the conservation status, has been found to be 11%. The economical input of this group amounts to an added value of 114 Mio. € corresponding to > 3,000 employments. Biosphere reserve partners have a better approach to this group of tourists.

8. Outlook
As mentioned in section 2 (history) the funding of the partner programme was prolonged for five more years. This period will allow to implement some new developments and improvements. One important point is the increase of benefits for our partners (e.g. training of employees concerning WH via e-learning). A closer cooperation between the different groups of partners is aspired and this is expected to be especially fruitful for the sectors tourism and agriculture. Furthermore, in co-creation workshops regional products shall be created or revitalized, using the creative power of the partner network. These new products shall be tested within the network which can serve as a test tube or platform for business development.

The most general effect of the activities in the coming years is expected to be the strengthening of the emotional connection of the partners to biosphere reserve, national park and world heritage site Lower Saxon Wadden Sea. This shall help them to connect nature conservation and sustainable development to their own identity. Help them to gain the ownership of our common property.
Palawan Biosphere Reserve and Desirable Action Plan of the Network of Island and Coastal Biosphere Reserves

Nelson P. Devanadera

Palawan Council for Sustainable Development
Palawan Biosphere Reserve and Desirable Action Plan of the Network of Island and Coastal Biosphere Reserves

Nelson P. Devanadera
Palawan Council for Sustainable Development

Introduction

To the organizers, hosts and participants of the 7th meeting of the world network of island and coastal biosphere reserve, good morning.

I would like to thank you for giving me the honor and opportunity to share how we strive for sustainable development through the action plans we identified for the province of Palawan as a biosphere reserve.

Palawan: the last frontier

Palawan is the country’s largest province composed of 1,768 islands out of the Philippines’ more than 7,100 islands. It is located in the western side of the Philippines with a current population of 1.1 Million, and a total land area of 1.5 M hectares.
We have nine (9) declared protected areas and two UNESCO World Heritage sites, namely: the Puerto Princesa Subterranean River National Park, also one of the new 7 Wonders of Nature, and Tubbataha Reefs Natural Park which was also awarded recently with the Global Ocean Refuge System (GloRES) award for superlative marine protected areas around the world.

### Palawan as the best island destination in the world

In the recent years, more tourists have taken notice of the beauty of Palawan. Since 2013 until recently, Palawan was named as the “top island in the world” and “the world’s best island”.

In addition, Palawan was also acclaimed as the “best island destination in the world” and was deemed as the “most beautiful island in the world” last 2015.

### Pursuit of sustainable development in Palawan

In 1990, Palawan was declared as a biosphere reserve by UNESCO Man and Biosphere Programme. Two years later, Republic Act 7611, or the Strategic Environmental Plan (SEP) for Palawan, was approved by the Philippine Congress.

This plan provides a comprehensive framework that follows the general philosophy of sustainable development.

The Palawan Council for Sustainable Development (PCSD) is the administrative machinery for the implementation of the SEP Law, which serves as “de facto” management authority for the Palawan Biosphere Reserve.

### Environmentally Critical Areas Network (ECAN)

The SEP established the environmentally critical areas network (ECAN) zoning system which is an integrated, ridge-to-reef strategy to safeguard the natural capital of Palawan and properly manage it.
as a fragile island ecosystem.

In the br, the ecan ensures the conservation and protection of forest and watershed, preservation of biological diversity, protection and preservation of tribal culture, protection of the rare and endangered species and their habitat.

Issues in Palawan

From the previous public consultations, we have identified four major issues faced by Palawan. First is on physical infrastructure where there is poor long term green infrastructure management program, lack of innovation and unsustainable livelihood practices and resource use.

Second is the level of awareness on the sustainable development and climate change. There is also a weak monitoring of the impacts of projects and businesses on the environment and its people, as well as in research and development (r&amp;d) and technology transfer.

In social services, some of Palawan’s communities are vulnerable to hazards due to climate change, there is threat to our watersheds, a continuous and rapid increase in population and instability in power supply.

Lastly, on sustainable financing and partnerships, Palawan has a low level of tax collection. Our natural wealth is not fully accessed and utilized, there is a lack of transparency and accountability for duty bearers and there is no common ground/platform.

17 UNSDGs and the Lima Action Plan

To address these issues, we have conducted consultations with the concerned national government agencies, private sector, non-government organizations, indigenous people, academe and people’s organizations. Based on the input from our stakeholders we have developed an agenda and action plan with themes focusing on knowledge management, sustainable management, science/research for policies, partnerships/networking, and monitoring/enforcement.

To ensure that we are on the right track in the pursuit of sustainable development, our sustainable development agenda and action plans are aligned with the Lima action plan and the
Strengthening knowledge and information sharing is an essential and necessary action to promote sustainable development and to empower the communities in economic, social and ecological goals as a biosphere reserve.

Currently, we have an established working group composed of local research and scientific institutions, organizations and academe which is called the palawan knowledge platform. This is our subnational implementation of the clearing house mechanism of the convention on biological diversity. The palawan knowledge platform can be accessible through the website www.Pkp.Pcsd.Gov.Ph

Information education and communication activities are also being conducted regularly through caravans, newsletter publication and radio programs. We also facilitate information dissemination through our official website and the social media.

Sustainable management of resources will ensure intra- and inter-generational equity. We promote effective governance and management structures, good practices for sustainable development, and identification of ecosystem services to ensure their long term provision.

We have initiated the implementation of a sustainable management online tool (smot) in the sustainability assessment of the extractive industries. We started the assessments of the smot on the
mineral industry and eventually to tourism, agriculture, fisheries and oil and natural gas.

We also have the zero-carbon project which intends to contribute to the sustainable development of the tourism sector and its value chain through increasing resource efficiency and encourage the use of renewable resources.

And third, the conduct of natural capital accounting. Our natural resources in Palawan are considered as important assets that need to be properly accounted for. The accounts can support policy making and in informing policy makers on trends in ecosystems and the services they supply.

These activities correspond to four (4) lima action plans and nine (9) un agenda 2030.

Action 3: science and research for policies

We have established the Pcsd - scientific advisory panel that convenes annually to deliberate on Palawan’s issues in order to provide policy recommendations and propose solutions to our leaders and decision makers. The members of the panel are experts in their various fields such as marine sciences and water management, forestry and agriculture, biodiversity conservation, tourism, mining, sociology and indigenous studies.

We also hold annual research symposiums that provides venue to showcase local and national researches. The most recent symposium, the 3rd national conference on sustainable development and 4th Palawan research symposium.

As well as the publication of our state of the environment report for year 2004, 2009 and 2015. These initiatives align to six (6) actions of the lima action plan indicating that biosphere reserves should be a priority site for researches on climate change and infrastructure, and encourage and establish an international network of scientists for research and knowledge exchange.

Additionally, these activities also correspond to four (4) lima action plans and nine (9) un agenda 2030: on good health and well-being, affordable and clean energy, decent work and
economic growth, industry, innovation and infrastructure, sustainable cities and communities, responsible consumption and production, climate action, life below water and life on land.

**Action 4: partnership and networking**

We have tapped and connected with various national and international organizations, including this world network of island and coastal biosphere reserve (wnicbr), south east asian biosphere reserve network (seabnet), network of regional government for sustainable development (nrg4sd), canadian manicouagan-uapishka br (rmbmu), jeju br, asian climate change education center, philippines; environment and climate change research institution (eccri) and the academe (up, nagoya university and university of montreal).

We are also tapping funding institutions on sustainable financing and heritage funds such as adb, worldbank, conservation international, wwf, international finance corporation (ifc), etc. And established networking that follows the same goal: sustainable development. The lima action plan describes to establish alliances and partnerships for research and raising funds.

**Action 5: monitoring and enforcement**

The fifth action is focused on the monitoring of the environment and the enforcement of law. Monitoring and enforcement of policies on fisheries, wildlife and waste are being continuously implemented.

**Way forward**

In the next few years, palawan biosphere reserve will mainstream the palawan sustainable development agenda and action plan and with it, we will be able to achieve a knowledge-based society, strong networks and partnerships, capacitate the local government units and communities and access the global climate fund (gcf) that each of us should consider.
Conclusion

Palawan’s ecosystem and biodiversity are important assets of our country, it is our responsibility to ensure that we conserve and manage our resources wisely.

As a member of the world network of island and coastal biosphere reserves, we aim to continuously expand our horizon by learning from the experiences shared by the other members and we hope that the experiences in our biosphere reserve can be useful for everyone.

With the UN SDGs and the Lima action plan as our guide, Palawan is committed and dedicated in achieving the outcomes of the Palawan SD agenda.

The road ahead is never easy, but it is the only way to go to ensure that we will achieve an ecologically-balanced and biodiversity centered economic development and that our people will enjoy a good and dignified life.

Thank you!
Portuguese Island UNESCO Biosphere Reserves

António D. Abreu

Madeira Island Biosphere Reserve
Portuguese Island UNESCO Biosphere Reserves

António D. Abreu
Madeira Island Biosphere Reserve

Portugal entered in the MAB Programme in 1981 with its first Biosphere Reserve, Paúl do Boquilobo, and currently contributes with 11 Biosphere Reserves, distributed across the country, including the archipelagos of the Azores with 4 and Madeira with 1 Biosphere Reserves.

The Portuguese Island UNESCO Biosphere Reserves are Corvo, Graciosa, Flores, Santana and Fajãs de São Jorge.

Corvo Island Biosphere Reserve, Azores

Corvo is the smallest of the Azorean islands, located in the extreme northwest of the Archipelago. Corvo Biosphere Reserve encompasses the entire emerged land area of the island and a surrounding marine zone, covering a total area of 25,853 hectares and including landscapes and biological values of great regional, national and international importance. The resident population on Corvo diminished to about half its numbers in less than a century. This reduction in size was mainly due to various waves of emigration that reached a peak between the 1960s and 1980s, and directly affected the population by the departure of individuals and indirectly by reducing the birth rate. The main emigration destinations were the USA and Canada. At present, Corvo has about 450 habitants concentrated into the only urban nucleus on the island, Vila do Corvo.
A large part of the population is simultaneously linked to several activity sectors and the local economy is still heavily dependent on the primary sector and in particular, livestock breeding, subsistence agriculture and fisheries, which are also subsidised. The only existing manufacturing industry on the island is the production of cheese by a local factory while several services exist that serve domestic needs and some related to tourism, although these are still insubstantial. Exports are insignificant and almost entirely limited to milk products, livestock and fish. Corvo Biosphere Reserve includes special protected areas including EU’s Natura 2000 Network sites and Corvo Regional Natural Park The Buffer Zones comprise public and private lands or marine zones, with land/sea-use practices in accordance with the various territory planning and activity schemes, on national, regional, and local levels. The Transition Areas consist of urban and development areas, in public and private lands, with land-use practices in accordance with territorial planning and activity schemes.

**Graciosa Island Biosphere Reserve, Azores**

Graciosa is the most northerly of the Central Group of islands in the Azores Archipelago and, with an area of only 60.7 km² and 38.9 km of coastline, it constitutes the second smallest island in the region (after Corvo). Graciosa is also the flattest of the islands, with its highest point reaching 405 m. With a maximum length of 12.6 km and maximum width of 7.0 km, the island extends along a NW-SE orientation. Presently, Graciosa has approximately 4,800 inhabitants. Graciosa’s population continues to be strongly linked to the primary sector as a principal source of income and as a secondary activity. The Biosphere Reserve displays a zonation comprising core areas corresponding to 4 non-contiguous sites (Ponta Branca, Ilhéu de Baixo Islets–Restinga, Caldeira and Vila Islet). These constitute sites classified under the European Union’s Natura 2000 Network, marine resource special protection areas and the Caldeira Natural Regional Monument of Graciosa Island. The Buffer Zones consist of public and private lands or marine areas, with land/sea-use practices according to several different territory and activity planning schemes, on a national, regional and local level. The Transition Area encompasses both terrestrial and marine zones and surrounds the entire Core and Buffer Zones. The Transition Area includes urban and development areas, in public and private lands, with land/sea-use practices in accordance to several territorial and activity planning measures.

**Flores Island Biosphere Reserve, Azores**

Flores Island Biosphere Reserve covers the total terrestrial area of Flores Island as well as the marine area reaching a distance of 3 miles from the coast. Flores Island is the surface part of a seamount located near the Mid Atlantic Riff, originated from Vila Nova do Corvo.
the volcanic activity which started less than 10 Miles. The island as an oval shape with a total area of 14,300 ha. The high central plateau, with an average altitude of 600-700 m above sea level is the major topographic feature of the Island. It is in this area where we can find some of the most important natural habitats of the island as the high altitude turf zones. These habitats have also a major role in the hydrological systems of the island as well as in the landscape features of Flores Island. The island coasts are mostly high cliffs and several small capes, islands and coastal caves as a result of the continuous maritime erosion. The coastal zone is the nesting location for several marine bird species. Special remark to the Roseate Tern (Sterna dougallii) that has around 40% of it’s European population nesting in the coastal zone of the Flores Island. Flores Island was not inhabited by the time of the Portuguese discoveries. In 2006 the population was 4,059 (1.67% of the Archipelago’s population), suggesting some inversion of the trend. The majority (61%) of the active people works in the tertiary, 24% in the secondary sector (especially in the milk industry) and only 16% belongs to the primary sector. All zones of the Biosphere Reserve are contiguous and all of them have a distinct feature making each of them as a land management unit: - The Core Zone coincide with natural protected areas included in the Island Natural Park under the categories of Natural Reserve or Natural Monument; the Buffer Zone corresponds to the zones of the Island Natural Park classified as Protected Area for the Management of Species or Habitats, Protected Landscape Area and Area for the protection and Resources Management. The Transition Zone includes marine, agro-forestry and urban areas submitted to land and marine specific juridical regulations oriented to a responsible and sustainable management and exploitation.

Fajãs de São Jorge Biosphere Reserve, Azores

The Fajãs de São Jorge Biosphere Reserve covers the entire island of São Jorge, the fourth-largest island in the Archipelago of the Azores. The island’s rugged coastal cliffs form a unique landscape of highland meadows, peat bogs and scrubs. The combination of high altitude and coastal ecosystems has resulted in a wealth of endemic terrestrial flora. It is also home to diverse invertebrates, terrestrial arthropods, molluscs and bird species. Almost 10,000 people live on the island.

São Jorge Island has a unique landscape consisting of remarkable geological, environmental and cultural assets. Due to its elongated shape, the island has an extensive coastline, the third-longest in the Azores Islands. Its hilly configuration is the result of the island’s rocky cliffs, which are located mainly on the island’s north side and create a steep landscape. The coastline
is occasionally interspersed with flat areas known as fajãs (detritic fajãs and lavic fajãs), which are a distinctive feature of the island. The highlands of São Jorge are extremely windy and humid with high levels of rainfall and frequent fogs, even during the summer season. In combination with the island’s orographic features, this strong hydrological potential sustains large wetland areas of local and regional importance.

In terms of biodiversity, São Jorge Island hosts a significant number of endemic animal and plant species belonging to several groups of organisms, such as mammals, birds, molluscs, arthropods, vascular plants and bryophytes. Faunal species include the little egret (Egretta garzetta), Azores wood pigeon (Columba palumbus azorica), sperm whale (Physeter microcephalus) and short-breaked common dolphin (Delphinus delphis). The area of the biosphere reserve also includes two Ramsar sites: the São Jorge Central Plateau/Pico da Esperança and the Fajãs of Caldeira de Santo Cristo Lagoon and Cubres Lagoon at São Jorge.

Agriculture permeates the island’s communities, but the main focus is livestock associated with São Jorge cheese production and fish processing to produce canned tuna. Both industries play an extremely important role in the island’s economy, due to the high number of people involved and the amount of revenue they generate. The tourism sector is also on the rise linked mainly to outdoor activities. The increasing number of visitors to the island is also driving development in other sectors such as accommodation, catering, handicrafts and entertainment.

**Santana, Madeira Biosphere Reserve, Madeira**

Madeira Island is characterized by having very steep relief and the coastal area is almost entirely composed of steep sea cliffs and some cliff deposits as a result of the retreat of the cliffs due to oceanic abrasion. In the center of the island there is a mountain massif composed of several mountains with altitudes above 1600 m, cut by numerous basaltic dykes and veins. In the eastern part of the massif, there is an extensive plateau with an average altitude of 1550 meters. The link between coastal and central mountain massif is made up of several hills and valleys, resulting from the water weathering of bedrock. This geomorphological complexity results in a huge set of heterogeneous bio-climatic characteristics that create conditions for the existence of a wide diversity of native climatophylyous broadleaf vegetation and unique habitats, especially the Macaronesian coasts with
endemic vegetation, the Mediterranean laurel forest of the Canary laurel, the temperate laurel forest of the Madeira laurel and high-altitude heathlands.

Santana, Madeira Biosphere Reserve corresponds to the entire onshore area of the municipality of Santana, and includes the adjacent marine area to the isobath of 200 m of depth.

The total resident population in the area of the proposed Biosphere Reserve is of 8591 inhabitants, of which 99% live in the transition zone, 1% in the buffer zone and 0% in core areas.

The core zones are Sites of Community Interest, which integrate EU’s Natura 2000 Network Protected areas and the buffer zones correspond to ruled usage areas through various planning and management instruments. The transition zones consist mainly of rural land, urban and public and private plots, with rules for its use imposed by activities management plans.

Challenges and opportunities

Apart their insular condition, the Portuguese insular UNESCO Biosphere Reserves share a set of common features such as the occurrence of high level of endemic biodiversity spread in a vast diversity of habitats, unique cultural heritage and small and vulnerable economies strongly dependent on tourism. These conditions induce similar challenges such as the need to ensure conservation and sustainable use of natural resources like water, landscape, species and ecosystem diversity and, at the same time, to preserve cultural heritage and tradition as pillars of their singular identities. These conditions and limitations are being explored by each Biosphere Reserve as assets and some success cases are identified that can be shared, between the Portuguese Island Biosphere Reserves but, also, through the exchanges within the UNESCO World Network of Island and Coastal Biosphere Reserves as well as the REDBIOS Network of Macaronesia and West Africa Biosphere Reserves.

Sustainable practices were introduced and integrated in traditional production processes leading to the creation of sustainability and responsible labels given by the Biosphere Reserves and adding value and visibility to products and service
providers. This is a highly appreciated service provided by the Biosphere Reserves that can be further elaborated benefiting from other experiences in different Biosphere Reserves – Jeju Island and La Palma have similar projects that can be compared and jointly evolve in the future.

Although endemicity means singularity and the existence of unique biodiversity elements (species and habitats) in each island, it is possible to identify common challenges and threat patterns that would benefit from exchange and transfer knowledge between insular Biosphere Reserves. Invasive exotic species, habitat fragmentation and landscape management are immediate examples of common challenges as well as cooperation initiatives for insular Biosphere Reserves as it is illustrated by the CDTECOTUR – land Stewardship and Ecotourism project within the European Interreg Programme that brings together UNESCO Biosphere Reserves of Madeira, Azores and Canary Islands.

Climate change adaptation, energy and water management and awareness on sustainable development are also evident common challenges that may benefit from cooperation and transfer knowledge between Insular Biosphere Reserves.

landscape and biological diversity in Santana BR
Biosphere Reserve Brand Use

Je-Ryang Ko

Jeju Ecotourism Association
Biosphere Reserve Brand Use

Je-Ryang Ko
Jeju Ecotourism Association

Designated back in December 2002, Jeju’s UNESCO Biosphere Reserve is divided into three zones: core zone, buffer zone, transition area, covering about 830.94 km², 45 percent of the island’s surface area including Mt. Hallasan, Seop-seom, Beom-seom and Mun-seom islets and Hyodoncheon and Yongcheon Streams.

Biosphere Reserve Branding aims to strengthen market competitiveness and increase brand value of local community and its products, which also ensures the clean image of Jeju Island Biosphere Reserve.

The oval shape of the Jeju Island Biosphere Reserve logo symbolizes the earth and Jeju Island. The colors found in the logo represent nature of Jeju: Green- Ecosystem, White- Mt. Hallasan, Light Blue- Stream, and Dark Blue- Ocean. The rough, bold lettering indicates basalt, volcanic rock that has been eroded by wind and waves. The brand vision is to improve the quality of life of local residents through BR conservation and build a sustainable social system that maintains the virtuous cycle of the biodiversity conservation. Trademarked in 2012, the total number of 43 products from 16 businesses in agriculture, fishery, livestock, forestry, natural resources and food processing have been registered.
Jeju Island has succeeded in promoting ecotourism by designating two ecotourism villages, Jeoji-ri and Harye-ri within the biosphere reserve area. Jeoji Gotjawal in Jeoji-ri and Hyodoncheon Stream in Harye-ri are located in Jeju Island Biosphere Reserve. Consortiums for ecotourism in the villages have been established to strengthen residents’ capacity, plan ecotourism programs, and promote the villages, which is to balance the use and conservation of nature with the goal of preserving the environment, revitalizing the local economy, and raise public awareness.

The Ecotourism villages utilize the brand of Jeju Island Biosphere Reserve by producing ecotourism products. Also, they boost local economy by promoting local agricultural products and maintain biodiversity with the revenue generated from the biosphere reserve.
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves
Jeju Island, Republic of Korea, September 12 – 14, 2017

1. Population (Total 1,740, male 893, female 847)
2. Number of Households
   (521 agriculture households out of 721 households (72%))
3. Area 30㎢
4. Tangerine producing area
5. Map of Haryeri eco-tourism

6. Schedule of eco-tourism in Haryeri
   - 2014: Designated as an excellent village for natural ecology in Harye 2ri
   - April, 2014: Designated Jeju Special Self-Governing Province Ecotourism
   - May, 2014: Establishment of Haryeri Eco-tourism Village
   - December, 2014: Ministry of Environment designated eco-tourism
   - November, 2016: Government 3.0 National Design Award Excellence Award 2017
     Cooperative will be scheduled
3. Biosphere Reserve Ecology Education

- Training program for UNESCO school
  - Target: UNESCO School in Jeju (12 elementary and junior high schools)
  - Business contents: UNESCO triple crown, campus education, ecological experience learning, student camp, etc
  - Expenses: 25 million won per year

- Biosphere Reserve Ecological Experience Program
  - Target: 200 people participated by parents and children annually
  - Business contents: Biosphere Reserve Yeongcheon & Hyodoncheon stream ecology experience
  - Expenses: 5 million won per year
MAB Vietnam’s SLIQ Approach and the Quality Economy Development Model in Cat Ba Biosphere Reserve

Dr. Nguyen Van Thanh
Nguyen Tu Trong
Le Thanh Tuyen

Cat Ba Biosphere Reserve
MAB Vietnam’s SLIQ Approach and the Quality Economy Development Model in Cat Ba Biosphere Reserve

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Abstract

Biosphere reserves with the wholistic philosophy of “man and nature in harmony and prosperity”, functioning as “learning laboratories for sustainable development” through “conservation for development, and development for conservation” have proved excellent platform in practice for designing and implementing sustainable conservation and development systems.

This paper presents Vietnam’s Biosphere Reserve experiences in using the SLIQ approach (Systems Thinking, Landscape Planning, Intersectoral Coordination and Quality Economy) in planning and coordinating biosphere reserves in Vietnam and an outline of Quality Economy Development Model (using biosphere reserve certification label and social enterprise initiatives) in the Cat Ba Biosphere Reserve, Haiphong City, Vietnam.

I. SLIQ – MANAGEMENT MODEL FOR BIOSPHERE RESERVES IN VIETNAM

Currently there are 669 biosphere reserves in 120 countries worldwide. Vietnam has 09 biosphere reserves (BRs) locating across the country, which encompass almost all typical ecosystems and contributing to socio-
economic development of local and national scales.

The SLIQ approach is elaborated by Vietnam National MAB Committee for designing, establishing and sustainable management of BRs in Vietnam (Figure 1). SLIQ stands for Systems Thinking, Landscape Planning, Intersectoral Coordination, Quality Economy. SLIQ has provided the scientific basis and methodology for the establishment and deployment of BRs in Vietnam in response to sustainable development goals of Vietnam and UN in the first decades of the 21st century.

1. Systems Thinking

In a systems perspective, each biosphere reserve is a system, consisting of different components with complex relationships, connecting natural and socio-economic dimensions, material structure and architectures with human values, cultural spaces, natural landscape with political ecology and creative ecology (Figure 2).

2. Landscape planning

It is the 3-zone compulsory rule (i.e. core, buffer, transition) is the distinctive feature of biosphere reserves recognized by UNESCO (Figure 3), according to the Seville Strategy and Statutory Framework of the World Network of Biosphere Reserve (WNBRs).

3. Intersectoral Coordination

The ‘management’ of biosphere reserves, in fact, is coordination among and optimal application of existing legal provisions, structures, human and financial resources for realizing conservation and sustainable development goals of the biosphere reserves (Figure 4).

Engagement and Involvement of stakeholders (such as government, scientists, enterprises, CBOs and local citizens) in management and operation of the biosphere reserve is of utmost necessity. This is the bridge between stakeholders, government and citizens.

4. Quality Economy: Biosphere Reserve Certification Labeling and Social Enterprises

Quality Economy program in Vietnam’s biosphere reserve consists of two main components:
- Registering and application of BR certification labeling for local high-quality services and products linked with global reputation of biosphere reserve title; and
- Support and develop Social Enterprises in areas such as nature conservation, cultural conservation, sustainable socio-economic development; job creation, addressing social welfare needs, green growth, innovation, industrial revolution, green city, new rural village, cultural urban wards, etc.
II. SOME TOOLS FOR DEVELOPING QUALITY ECONOMY IN CAT BA BR

1. Cat Ba BR Certification Label

   This BR Certification Label has been granted for 25 enterprises and businesses with 27 products and services, such as: bee honey, fish sauce, hotels, restaurants, resorts, passenger transports, tourist boats.

   Criteria for products and services to be qualified for the certification label:

   - Products and services that are environmentally friendly, enhancing the environment of the biosphere reserve, of safety, hygiene, and good for the health of the consumers;
   - Products and services that contribute to a large proportion of the socio-economy of Cat Ba biosphere reserve;
   - Employing local labours, support community development, protecting the landscape, environment, conservation of traditional cultural values;
   - Meeting their respective industry standards, registered at a responsible agency for goods and services quality assurance.


2. Sustainable Development Fund of Cat Ba Biosphere Reserve

   Established in 2010, the Cat Ba Biosphere Reserve Sustainable Development Fund is a not for profit fund operating on the basis of voluntary donations of domestic and international institutions and individuals, for the benefit of conservation and sustainable development of the Cat Ba Biosphere Reserve. This is an action initiative in response to the call of the UNESCO Madrid Declaration of the 3rd World Congress of Biosphere Reserves in Madrid (Spain) in February 2008, in which Biosphere Reserves acts as bridges to develop long term and effective cooperation between governments and enterprises in the field of sustainable development, adaptation and mitigation of climate change.

   Specific activities according to the Fund’s charter:

   - Supporting the conservation and sustainable development of Cat Ba Biosphere Reserve in line with the laws and the Fund’s Charter;
   - Providing loans for social investment;
   - Loans without interest (core fund to be returned);
   - Receiving trust fund and providing loans in trust, grants;
- Receiving, managing and uses of donations, grants from domestic and international institutions and individuals for the benefit of conservation and sustainable development of Cat Ba Biosphere Reserve etc.

3. Promoting Social Enterprising Initiatives

In 2017, MAB Vietnam launched Social Enterprise Program of the Vietnam’s Network of Biosphere Reserve. According to Article 10, Enterprise Law 2014, Social Enterprise must meet following criteria: registered as an enterprise under Enterprise Law, operational aims to address social/environmental issues for the benefit of communities; reinvest at least 51% of annual profit for fulfilling registered social/environmental objectives.

3.1 Mangrove Homestay Ecotourism of Phu Long Commune

In 2012, a community based ecotourism model was set up in the mangrove commune of Phu Long, with support by the MCD. The model was formed and run by 18 households voluntarily and cooperatively, to make commercially available to visitors some local services like cooking, homestay, guide (for visiting village, mangrove forest, limestone karst cave), aquaculture, boat rowing, folk music (chèo singing, fan dance etc.). With marketing and linkage with tour agencies, the model gradually grows its operation, creating more incomes more local households.

It is crucial to provide professional development, esp. skills and capacities in venturing, social enterprising, increase competitiveness for products and services for the community startups initiatives, so that farmers can transformed themselves into agriculture entrepreneurs, and capable of making sustainable livelihoods in the rural island area.

3.2 The 4 point linkages to create new value added products

Since 2007, the Truong Xanh (Evergreen) Foods Joint Stock Company has been working with local farmers in Cat Ba to grow the Hibiscus flower. This proves a highly adaptable to the local poor, dry and rocky soil conditions of the Cat Ba limestone island, creating more jobs for local households in Cat Ba island.

A part from buying the hibiscus produces, the company also provide technical supports, fertilizer for local farming. At the same time, it invests in research and application of food processing technologies to create new products from this high value plant in Cat Ba.

At present, the company has developed 07 different products from the Hibiscus flower, including: hibiscus wine, hibiscus tea, hibiscus energy drink, natural food color from hibiscus flower, hibiscus syrup and Hibiscus Vodka. The products have been marketed at national and international organic produce exhibition (Figure 6).

It is necessary to provide support for enterprises to develop linkage and cooperation with farmers or for the companies to transform themselves into social enterprises. This will help to extend the social impact of enterprise, particularly for poverty alleviation and raising
income for the rural people.

**SUMMARY**

**SLIQ Approach** (Systems Thinking, Landscape Planning, Intersectoral Coordination, Quality Economy) is initiated and applied by MAB Vietnam for designing, coordinating and management of Biosphere Reserve Network in Vietnam. SLIQ has delivered remarkable initial outcomes, particularly through demonstration and improvement in Cat Ba BR of Haiphong City.

Biosphere Reserve Certification Label, Sustainable Development Fund and Social Enterprising Initiatives have been important tools for implementing Quality Economy development program in Vietnam’s BRs, and Cat Ba, contributing to local, national and international sustainable development agendas./.

**References:**


Principe Island UNESCO Biosphere Reserve

António D. Abreu
José Cassandra

Principe Island Biosphere Reserve
Príncipe Island UNESCO Biosphere Reserve

Príncipe Island was declared by UNESCO as Biosphere Reserve in 2012, after the preparation and development of a nomination process under a solid and active participation of the population that took around 2 years.

The island of Príncipe is one of three existing oceanic volcanic islands of the Gulf of Guinea and is geologically the oldest of the group, formed 31 million years ago. The biosphere reserve includes the entire emerged area of the island of Príncipe, and its islets Bom Bom, Boné do Jóquei, Mosteiros, Santana and Pedra da Galé, and Tinhosas islands as well as a vast marine area around the Island.

The island of Príncipe is part of the biodiversity hotspot of tropical forests of West Africa, having in the terrestrial component of the proposed Biosphere Reserve, a wide range of plant communities and habitats of high international importance such as primary tropical forests, shadow forests, palm trees and lowland riparian habitats. As an oceanic island, the native biological richness of Príncipe is accentuated by its geographic isolation, including several taxa of endemic flora and fauna.

The island is characterized by its gentle relief in the northern half of the island and a mountain range in the southern half composed of several phonolitic peaks with altitudes between 500 and 948 meters where there is a patch of primary rainforest. The difference in geomorphology and terrain between the two sides, results in differentiated bioclimatology, has influence in the distribution of major types of ecosystems of the island, such as lotic systems in the area of the massif and its valleys and lentic systems in the northern plains area.
Príncipe Island Biosphere Reserve is the home of a great biodiversity in terrestrial as well as in marine ecosystems, with high rates of endemism in many groups of organisms, especially vascular plants, molluscs, insects, birds, reptiles and bats. It is part of the biodiversity hotspot of tropical forests of West Africa, containing a wide range of plant communities and habitats of high international importance such as primary tropical forests, forest shade, palm trees and lowland riparian habitats. Considering the importance of Príncipe Island for the reproduction of sea turtles, seabirds and cetaceans, as well as coral reefs, on the international scene, it is also an area of great interest for the conservation of global biological diversity.

The economic activities in the biosphere reserve are essentially fishing and agriculture (especially cocoa, coffee and copra) besides a small tourist development, mainly composed of some accommodation facilities in the capital of Santo Antonio and resorts in the northern part of the island. Agriculture and fisheries are mainly subsistence activities, particularly for consumption and trade surpluses in the local market. Agricultural and fish products are mostly consumed in their primary form, with a few processed products such as dried fish, fried bananas, the “cacharamba” (local sugar cane rum) and palm wine.

The island of Príncipe, with a land area of 142 Km² and a maximum altitude of 948 meters, is the smaller of the two islands that make up the archipelago and country of the Democratic Republic of São Tomé e Príncipe. Príncipe Island is an autonomous region (political and administrative autonomy) with a local government and parliament, which, during the last years, are devoting much attention to the implementation of a sustainable development model for the island.

The reduced size of the island as well as its small population (less than 8,000 inhabitants) were strong arguments to include all island and the surrounding marine area as a UNESCO Biosphere Reserve. Príncipe Island fits well as a suitable natural and social laboratory to implement and develop sustainable development initiatives and to promote international cooperation providing real size demonstration of the possibilities to enhance and proceed with a development able to integrate the respect and conservation of the natural resources and biodiversity and the sustainable use at the service of the human well being.

**Príncipe Island Biosphere Reserve Action Plan**

For the first five years, Príncipe Island BR developed an integrated Action Plan structured under three strategic lines: 1 – Conservation and research; 2 – Communication and awareness and, 3 – Social and economic development, ensuring the fulfilment of the functions assigned to the
Biosphere Reserve under the MAB Programme framework.

Conservation and research

Under conservation and research a diversity of specific actions and projects were launched aiming to:
- Support to the Government with legal instruments for managing biodiversity, access and use of genetic and natural resources;
- Develop an Atlas of Biodiversity and habitats through inventory of Biodiversity (marine and terrestrial species and habitats) and integration of all available and new information on the conservation, education and awareness activities in the island. Scientific expeditions gathering international teams of experts are being attracted to map Príncipe Island biodiversity and habitats as it was the case of BioPríncipe 2016 Expedition for marine and coastal ecosystems and biodiversity.
- General inventory and assessment of conservation status of endemic and indigenous species including the development of management plans for key species;
- Mapping and assessment of special habitats and development of conservation action plans (Mangroves).
- Participation in the Climate Change in Island Biosphere Reserves Research Project within the World Network of Island and Coastal Biosphere Reserves (WNICBR).

Communication and awareness

Several relevant initiatives are promoted aiming to raise awareness on environmental and sustainability topics, such as:
- Best practices on waste management – community–based.
- Water & Recycle Project;
- Biosphere Responsible Communities project, recognizing those local communities with best practices on waste management, conservation and participation on the Biosphere Reserves activities;
- Participation in the UNESCO BiosphereSmart Initiative, a global observatory created to share ideas, knowledge, good practices, and experiences among Biosphere Reserves on issues related to climate change, green economies, and sustainable development.
• Publication of a Newsletter (4 issues every year)
• Development of a Plan for the Education for the Sustainable Development including manuals and activities of education for the sustainable development for the students, schools and communities.

Social and Economic Development

The contribution of the Biosphere reserve on the economic and social development dimension includes a set of initiatives and investments aiming to offer opportunities for the development of services and products promoting job creation:

• The creation of a Nature Network of Trails (Biosphere Trails);
• Promotion of a certified ecotourism guide course;
• Creation of a label (Responsible Príncipe) for the certification of goods and services based on local values, sustainable production and best practices;
Shinan Dadohae Biosphere Reserve (SDBR) and its conservation activities

Kyung Gyu Lee

Shinan Dadohae Biosphere Reserve
Shinan Dadohae Biosphere Reserve (SDBR) and its conservation activities

Kyung Gyu Lee
Shinan Dadohae Biosphere Reserve

Introduction

Shinan County is located in the southwestern sea of the Korea, a part of Yellow Sea. More than 2,000 islands are distributed in this sea, specially called Dadohae meaning a sea with lots of islands. Shinan consists of 1,025 islands spread in Dadohae (Fig. 1).

The islands of Shinan not only give a place for local residents but also provide a variety of habitats for wildlife, including endangered species such as White-tailed Sea Eagles and *Vanda falcate*, a species of orchid. Due to the importance of biodiversity, and the sustainable life style of the local residents of Shinan, in 2009 a part of Shinan (573.1km²) was designated as Shinan Dadohae Biosphere Reserve (SDBR), and in 2016 it was extended to the entire county of 3,238.74km².

This report aims to briefly introduce SDBR and its conservation activities on the core areas of SDBR. The activities of conservation were conducted by the cooperation with several organizations such as, Ministry of Environment, National Park, Cultural Heritage Administration, Shinan Culture, MAB Korea Committee and university researchers.

Shinan Dadohae Biosphere Reserve

Shinan County consists of 1,025 islands distributed across the southwestern part of the Korean peninsula, comprising
12,654 km² of sea (Fig. 1). Actually it had more islands before small islands were united as a big island. For example, Jeungdo consisted of 99 small satellite islands in which these were connected with each other through dikes. Among 1,025 islands, 73 islands are inhabited while 952 islands are uninhabited. The size of islands in the Shinan County differs widely; Jido is the biggest one with 58km², but small islets like Sangebokjung have even less than 10 meters in diameter.

The islands of the Shinan County were created recently. About 17,000 years ago in the last glacial period (110,000-15,000 year ago), the Yellow Sea was not sea but land. At that time the sea level of Yellow Sea was 120 meters below than now. Since then, the sea level had rapidly grown up in the interglacial period and then gradually slowed down to 10 meters below the sea level during last 7,000 years. Thus, the islands of Shinan were considered to be created less than 10,000 years ago.

In 2009, the area of 573.1km² of the four sub-counties, or Heuksando, Bigeumdo, Dochodo, and Jeungdo was designated as SDBR due to its values pertained to undisturbed evergreen forest, seabird colonial breeding sites, wetlands and the sustainable life style of local residents.

After some sub-counties were designated as a biosphere reserve, Shinan decided to extend the biosphere reserve to entire 14 sub-counties comprising the area of 3,238.74km². The purpose of its extension was to reflect on the requests of local residents who do not live in the region of biosphere reserve and to reinforce the sustainable development policy in the county. The extended biosphere reserve includes a variety of habitats such as the wetlands of Jido and Apaedo, the salt pen of Sinuido, the Sand Dune of Uido, and the warm temperate forests of Gageodo.

The core areas with superior biological diversity comprise about 6.5% (209.99km²) of Shinan Dadohae Biosphere Reserve (Fig. 1, Table 1). It includes national parks such as islands Heuksando, Hongdo, and Uido, wetland provincial parks of 10 sub-counties, and sea areas within marine protected regions. A buffer area surrounding the key areas includes national parks, wetland provincial parks, and sea areas in coastal regions, comprising about 38.7% (1,252.14km²) of the entire regions. In addition, a transitional area, living environments, covers 54.8% (1,776.61km²) of Shinan County, including land and sea areas outside the protected regions (Fig. 1, Table 1).

<table>
<thead>
<tr>
<th>Zone</th>
<th>Total (km²)</th>
<th>Core (km²)</th>
<th>Buffer (km²)</th>
<th>Transition (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3238.74</td>
<td>209.99</td>
<td>1252.14</td>
<td>1776.61</td>
</tr>
<tr>
<td>Land</td>
<td>668.31</td>
<td>27.92</td>
<td>17.19</td>
<td>623.20</td>
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<tr>
<td>Tidal Flat</td>
<td>352.50</td>
<td>137.64</td>
<td>214.86</td>
<td>0</td>
</tr>
<tr>
<td>Sea</td>
<td>2,217.93</td>
<td>44.43</td>
<td>1020.09</td>
<td>1153.41</td>
</tr>
</tbody>
</table>

Biodiversity

The biodiversity of SDBR underlies a wide range of natural resources, including sea (12,654 km²), tidal flat (352.5km²), and 1,025 islands, which

Figure 1. The map of Shinan Dadohae Biosphere Reserve in the the southwestern of Korea.
provide temporal or permanent habitats. The tidal flat is also an important place for local residents since it contains many tidal flat organisms such as invertebrate animals, fish and shellfish, and carapace. Various biological species, including 536 species of macro benthic invertebrates and 200 species of mollusca, live in this tidal flat, and these organisms are served as food resources for both migratory birds and native fishes and birds. The Ministry of Maritime Affairs and Fisheries estimated the annual economic value of the tidal flats is about 3.3 million dollars per km².

The SDBR has well known as warm and humid oceanic climate and the region of immense organism diversity with an ecosystem that supports a mix of broad-leaved and evergreen broad-leaved forests. It possesses an outstanding landscape with warm temperate plants hardly seen in other regions. Among vascular plants, 1,353 species (157 families) have been recorded in the islands near Heuksando.

The islands of Shinan provide an important stopover site for migratory birds during migration between breeding and wintering grounds. In the islands near Heuksando about 370 species of birds were recorded. Also vast tidal flats provide feeding and roosting sites for shorebirds in spring and fall. The uninhabited islands have been breeding grounds for the Eurasian Oystercatchers. The four islets, or Soguguldo, Guguldo, Chilbaldo, and Gaelindo, are breeding grounds for seabirds. Specifically, Guguldo is one of the most significant breeding colonies in the world for Swinhoe’s storm-tailed petrels in that more than 50,000 pairs have bred on the islets.

People of Shinan

Fourteen large islands including Aphaedo, where Shinan County office is located, are the basic administrative units of Shinan, and the units have 20–216 islands. The number of local residents in Shinan was 44,020 in 2015, and the units have 1,159–6,668 residents. Among the total population 85% of residents is engaged in agriculture, and 34% is in fishery including both.

Agricultural and Marine Products

There are various agricultural products including rice, onions, spring onions, and spinach grown in the islands of Shinan County. Especially spinach grown in Bigeum and Docho (called Sumcho) is more expensive by 30-40% than that grown in land because Sumcho is grown with a strong sea breeze which makes it sweeter and its stem and leaves are thicker so that it can be kept for a relatively long period without damages. About 1,500 farmers earn 10 million dollars annually.

Solar salt

Salt has been an essential nutrient for mankind. Humans have obtained salt directly by mining or produced it by boiling or drying seawater in the sun. In Korea, people traditionally have produced salt by boiling seawater for a long time, but the method of naturally evaporating seawater in

Photo 1. The White-tailed Eagle at Heuksando (left) and a long sand dune at Jido (right).
Salt pan (called Solar salt) has been widely spread since the early 20th century.

The process of producing solar salt which is done through pulling water up from the sea to salt pan starts in March and finishes in October. Solar salt can be divided into two types based on what’s on the bottom of the salt pan; an artificial floor or tidal flat. The latter can produce salt in the most natural way and therefore the salt produced in that condition is relatively expensive due to the complicated production process (Photo 2).

While refined salt is composed primarily (more than 99%) of sodium chloride (NaCl), solar salt produced in Shinan County is composed of relatively low contents of NaCl (82%) and contains other minerals, such as calcium, potassium, and magnesium as well.

Shinan County has annually produced 23,000 tons of salt (70% of the total amount of salt produced in Korea) from 3,017 ha of salt pan. It has been able to produce such amount of salt due to clean water and extensive areas of tidal flat (Photo 2).

**BIORE – Logo of SDBR**

Shinan County developed BIORE, logo of SDBR for the purpose of promoting SDBR and its environmental-friendly local products (Table 2). Shinan made municipal ordinance on the use of BIORE and now in the final process of trademark registration of BIORE. If the use of BIORE is commercialized it will contribute to increasing in income of local residents and activating regional economy.

<table>
<thead>
<tr>
<th>Meaning of BIORE</th>
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<tbody>
<tr>
<td>B : Brilliant</td>
</tr>
<tr>
<td>I : Islands</td>
</tr>
<tr>
<td>O : Organic</td>
</tr>
<tr>
<td>RE : Reservation, Recreation, Restoration</td>
</tr>
</tbody>
</table>

**The conservation activities in the core area of SDBR**

The core area of SDBR is 209.99 km² (6.5% of total area) with land (27.92 km²), tidal flat (137.64 km²), and sea (44.43 km²). This is protected areas such as Dadohae Maritime National Park, Natural Monuments, Wetland Protection Area, or Provincial Tidal Flat Park. Thus most human activities which could change the natural characteristics of the area are under control of local management authorities.

Especially, some of the core area is even not allowed to human visit. For example Ramsar Wetland, Jangdo Island High Moor is designated as a special protected area of National Park and is isolated to public for 20 years from 2013 to 2032. Only few researchers and managers could visit the wetland under permission. As human activities are regarded as main causes of habitat deterioration, isolation...
could be the first step of conservation.

Then, could we say the areas are safe from human induced disturbances? It might be yes because currently there are only small disturbances by human activities. To answer this question more correctly we present three case studies on habitat deteriorations and conservation activities in the core area of SDBR.

Case study 1. Chilbaldo Islet

Chilbaldo Islet is located in the 47km away from land and has 36,993m². It is a colonial breeding site of seabirds, mainly Swinhoe’s Storm-Petrels (*Oceanodroma monorhis*), about 10,000 breeding pairs (Photo 3). A light house on top of the islet was built in 1905, and lighthouse keepers had lived in the islet until 1997. However now it is uninhabited and people are not allowed to enter the islet by the Natural Heritage Act. Chilbaldo was also designated as East Asian-Australasian Flyway (EAAF) Network Site in 2009 and IUCN Ia (Strict Nature Reserve) in 2016.

Swinhoe’s Storm-Petrels are the main breeding seabirds in Chilando. This birds breed in East Asia, such as China, Japan, Korea, and Russia and regarded as Near Threatened species of IUCN. Swinhoe’s Storm-Petrels lay an egg, and make a nesting burrow usually under *Carex boottiana* grasslands. Especially the islands of Shinan are important for the petrels, because more than 70% of world population is breeding in the islands of Shinan-gun County, Korea including Chilbaldo, Guguldo, and Gaerindo islets.

In the comparison on nesting burrows of Swinhoe’s Storm-Petrels the density of invasive grasslands such as *Achyranthes japonica*, *Miscanthus sinensis* was fewer than that of pure *Carex boottiana* grasslands. Especially invasive plants wildly spread in the smooth slope of the southern part of the islet. Moreover during the survey of 2009, several hundreds of dead petrels were found in the islet. The wings of the dead petrels were entangled by the utricle of *Achyranthes japonica*, which has a hook-like shape. Thus invasive plants impact on the breeding seabirds not only indirect habitat reduction but also direct cause of mortality (Photo 4).

*Achyranthes japonica* is a common species in Korea and usually land birds do not be trapped in the utricle of the plants. However for the petrels *Achyranthes japonica* is not a common plant in the breeding habitat, and seabirds have relatively narrow wings to glide a long distance of sea. Thus when the petrel caught in the utricle of *Achyranthes japonica*, it is not easy to escape from the plants due to weak flap power of the petrels.

Once Chilbaldo might have pure *Carex boottiana* grasslands, the favorable places for breeding seabirds. The plants grow slowly in the rocky slope. However light house was built in 1905, and keepers and goats had lived in the islands until 1997. During this period invasive plants could be introduced to Chilbaldo by men and goats. The invasive plant *Achyranthes japonica* grows much faster than the native plant *Carex boottiana*. Thus if habitats are disturbed, the invasive plants are more
Throughout the survey of 2009-2010 Shinan and Bird Researcher Center of National Park found that the invasive plants severely impacted on the breeding seabirds. Thus a restoration committee was launched, including National Park, Natural Heritage Administration, and Researchers.

Removing invasive plants is not enough due to rapid reintroduction of the plants. Thus it should be substituted by native plants. Throughout the conservation activities in 2015-2017 removing invasive plants and planting native plants were conducted in the southern part of the islet. Especially National Park and Goguryo University are the central role in the conservational activities.

**Case study 2. Jangdo Island High Moor**

Jangdo Island (E 125° 22′, N 34° 40′) is about 3km², and about 100 residents have lived with fisheries in the island (Photo 5). In particular, Jangdo Island High Moor (90,414m²) was publicly announced in 2003 and then was designated as ‘Ramsar Wetland’ in 2005 due to the values of wetlands discovered in such a small island and biodiversity including 9 endangered species such as Eurasian Otters, and Calanthe striata, a species of orchid. It was also designated as Wetland Protection Area in 2004 and National Park in 2013.

The Jangdo Island is mainly consisted of quartzite, a type of metamorphic sandstone, but about 8,000 million years ago, granite, a type of igneous rock, intruded into the Jangdo Island High Moor. Thus the wetland has mainly two types of rocks, quartzite and granite.

The concave landform of Jangdo wetland was formed due to different weathering speeds of the two rocks: granite in the bottom and quartzite in the surrounding area. The granite is more rapidly weathered than quartzite, and thus eventually a concave landform of Jangdo is made.

When plants die, decomposers remove their bodies. However, the broad and slow gradient of Jangdo Island valley retards the flow of water. Thus, sustained fresh cold water slows down the decomposition of plants, and the undecayed organisms make a layer that oxygen cannot penetrate. Peat is an accumulation of partially decayed vegetation matter, and Jangdo’s peat layers are well preserved until now.

The people who first visit Jangdo Island High Moor would be disappointed by the landscape of the wetland, because it might not be the wetland they imagine. The appearance of Jangdo Island High Moor looks like a grassland. There is no big lake or swamp, but lots of grass, and even trees. Especially willows and Pseudosasa japonica, a species of bamboo spread into the wetland. Only we can feel the wetland when we see our footprints which covered with the water slowly released from surface.

The local residents said the wetland contained more water about 50 years ago, when it was used to as a rice field. Usually it is not easy to raise rice in a small island, but Jangdo was possible due to the wetland. Also there were many cows (maximum 200). Due to frequent management of people and feeding on grass by cows the wetland could contain
more water and prevent the emergence of trees.

After 2004 when the high moor was designated as Wetland Protection Area, manmade disturbance was disappeared. People uses such as cultivating rice and raising livestock are not possible any more. Moreover people entrance was controlled after 2013. However the wetland seemed to more rapidly change into land after removing human disturbance. Cease on the manmade control might lead to succession of vegetation.

To sustain the wetland of Jangdo restoration activities of Ministry of Environment have been conducted, especially holding surface water and monitoring on vegetation change. Jangdo is not the rainy area. Actually it has lower precipitation level; average annual precipitation of Jangdo has only 1,125mm but the mainland of Korea is 1,277mm. The underlying impermeable mud layer and frequent sea fog help to sustain the wetland. Also in several plots vegetation change were monitored annually.

**Case study 3. Uido Island S and Dune**

Uido Island (E 125° 50′, N 34° 36′) is located in the 53km away from the mainland of Korea and has 10.8km² of area (Photo 7). It is famous for its beautiful landscapes, such as sand dune, beaches. Especially the sand dune with 53m in height is known as the biggest one in Korea. Also Uido has three beautiful and untainted beaches, Tibatnome, Sungcheon and Donmok. Because the beaches are not tainted by tourists, they have high density of Stimpson’s ghost crabs (*Ocypode stimpsoni*) with 20-30 individuals/4m² and *Gomphina veneriformis* (a type of shells) with 10-47 shells/4m².

Uido Island Sand Dune was estimated to be formed 5,000 years ago, and annually about 1mm depth of sand is deposited. To make sand dune, wind velocity to move sand grains to a certain hill is important. Usually sand grains could be moved at least 4m/s of wind velocity. The wind velocity of Uido is on average 5m/s (max 10m/s) in winter, and 4m/s in summer (National Park unpublished data). Thus winter is good season to form sand dune. The area of Uido Island Sand Dune is 24,000m² with 53m in height, 5m in depth, and 33°C in slope.

Uido Island Sand Dune had more plenty of sand than now (Photo 6). In 1988 the slope of sand dune was much steeper and there was no vegetation in the slope (Photo 7). However in 2013 the slope of sand dune became a concave shape due to loss of sand in the slope and was covered with lot of vegetation (about 75% of the area). The researchers of Chonnam University calculated the mount of sand loss in the sand dune in 2000. The result was amazing that it was 11,394 tons just only for 10 months with 60cm decrease of the height of sand dune (Ryu et al. 2000).

Ironically protection on forest and the sand dune was thought as one of possible causes of grass intrusion into the sand dune. Before designated as National Park the hills and sand dune were used for local residents, as a place for goats grazing and cutting trees for fuel. However after designation as National Park in 1982 these activities gradually had been decreased.
Especially the intrusion of pine trees in the northern slope of the sand dune where the strong wind of winter makes the movement of sand to southern slope were thought to be main cause of the sand loss of the sand dune. National Park started to remove the pine trees in the northern slope and monitored the height of the sand dune. After removing pine trees there was some conservation achievements; the height of sand dune increased 1.8m from 51.6m in 2012 to 53.4m in 2015 (National Park unpublished data).

**Conclusion**

More than one thousands islands are the main characteristic of SDBR. In the islands residents live by engaging in agriculture, fishery and salt production. Also colonial breeding seabirds, wetlands and sand dunes are still remained in the islands. Thus the islands serve as a living ground for people and wildlife, and the isolated location of Shinan makes possible to live together.

Isolation is a significant strategy to protect a natural world in that human and man-made activities are the main threat on nature worldwide. Actually, the islands of Shinan themselves are isolated from public. Thus many endangered species are found in the islands. For example, White-tailed Eagles, internationally endangered species are known as wintering bird species in Korea. However the birds are permanent residents and even breeding in Hueksando, the only breeding site in Korea. Breeding is possible in the favorable habitats offering plenty of food and shelters, because the birds should offer additional food for their chicks except their own, and need a safe place to raise chicks.

However, the isolation was not enough to sustainably protect the core areas of SDBR. The three islands in the core areas have one thing in common; these were used by people and isolated to protect (Table 3). In Chilbaldo several lighthouse keepers lived in there with goats and they cultivated vegetables for livings. Also Jangdo Island High Moor was used a rice field and the trees and shrubs near Uido Sand Dune were used by people and goats. The three islands were also isolated to protect from public. Chilbaldo, Jangdo and Uido were not allowed to enter since 1997, 2004 and 2006, respectively.

Especially, the three areas seemed to have more severe man-induced impacts after isolation. We hope the ecosystem itself has strength to recover its natural characteristics, but the disturbance by human might be more severe than rehabilitation of the islands. Thus, more positive monitoring and conservation activities on the core areas with the cooperation of relative organizations are urgently needed.
Table 3. The summary of the characteristics of three islands in the score areas of SDBR

<table>
<thead>
<tr>
<th>Category</th>
<th>Chilbaldo</th>
<th>Jangdo</th>
<th>Uido</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Seabird breeding</td>
<td>Peat wetland on a small island</td>
<td>The biggest sand dune in Korea</td>
</tr>
<tr>
<td>Residence</td>
<td>Uninhabited since 1990s</td>
<td>Inhabited but not allowed to enter</td>
<td>Inhabited but not allowed to enter</td>
</tr>
<tr>
<td>Protection Status</td>
<td>National Park, Natural Heritage, EAAFP Network Site</td>
<td>National Park, Wetland Protection Area, Ramsar Wetland</td>
<td>National Park</td>
</tr>
<tr>
<td>Authority</td>
<td>KNPS, NHA, SC</td>
<td>KNPS, NE, SC</td>
<td>KNPS, SC</td>
</tr>
<tr>
<td>Threat</td>
<td>Death of seabirds</td>
<td>Lose of wetland</td>
<td>Lose of sand dune</td>
</tr>
<tr>
<td>Possible Causes</td>
<td>Introduction of invasive plants by human activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restoration Activities</td>
<td>KNPS, NHA, SC</td>
<td>KNPS, NE, SC</td>
<td>KNPS, SC</td>
</tr>
</tbody>
</table>

Note: KNAS – Korea National Park Service, NHA : Natural Heritage Administration, SC - Shinan County, ME- Ministry of Environment

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How to Overcome the Limitations Inherent in Sustainable Development

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Jeju Secretariat of WNICBR
How to Overcome the Limitations Inherent in Sustainable Development

I. The Implication of Industrialization

Industrial society emerged in the 18th century from hunting-gathering era three million years ago via agricultural society. Industrialization improved material affluence and convenience in everyday life. This has been achieved from the sacrifice of nature being exposed as environmental problems which may be termed the side-effect of industrialization. The major source of nature being sacrificed are to extract resources from nature and to discharge wastes to nature more than the carrying capacity of nature. It is reported that the carrying capacity of nature in terms of resource supply and absorption of wastes exceeds 2.50 times as of 2000 (Chambers, et al., 2000: 122-123).

From this context, even though industrialization has contributed to the improvement of material affluence and convenience in life, this causes the crisis of nature which are resource depletion, original quality of nature being polluted, and destruction of self-regulating system. The crisis of nature does not end in itself, but is the crisis of human existence on the earth, because nature can exist without humans, but humans can not survive without nature. In this sense, humans are the beneficiaries and victims of industrialization. This is that humans committed a self-contradiction. It was the 1960s to recognize the seriousness of environmental problems.

The mechanism of nature being polluted and destructed by human activities for improving material affluence and convenience in life is diagrammed as <Figure 1> (Jeong, 2004: 172).
II. Emergence Process of the Concept and Implications of Sustainable Development

1. Neoclassical Economy in the 19th Century

Even though neoclassical economists did not use the terminology, sustainable development, they argued the implication of sustainable development in the late 19th century when the improvement of material affluence and convenience in life began to emerge after the industrial revolution in the 18th century. Their argument focused on limited natural resources in relation to improvement of material affluence as below (Van den Bergh and Van der Straaten, 1994; Noorman et al., 1998).

Not only the process of not resource extraction for improving material affluence and convenience in life, but also the process of producing and distributing manufactured goods and services deteriorate nature which is the common assets of the mankind. Market price of manufactured goods and services does not include the ecological cost connected with the actual or potential deterioration of natural assets due to economic activities. This implies air, water and the function of natural ecosystem, etc. are treated as free resources.

Therefore, if ecological cost is included in the market price of manufactured goods and services, the market price will increase and then contribute to decrease in consumption. This is the way to save limited natural resources and to prevent nature being polluted and deteriorated.

2. Debate on Industrialization in the 1970s

Globally, it took until the 1960s to recognize and popularize how serious the environmental problem was (eg. Carson, 1962). In accordance with this newfound recognition, two main streams of thought appeared in academic circles in the 1970s. They were pessimistic and optimistic point of view on industrialization. The pessimistic point of view on industrialization may be one of the first environmental reports to have had a profound social impact (eg. Meadows et al., 1972). Meadows et al. argued that there should be a limit to economic development in terms of population, energy, food, pollution, and psychological health, for at the time he argued it seemed to be reaching levels that would soon be unsustainable. Meadows et al. (1992) maintained a pessimistic perspective on industrialization in 1992, providing 13 possible scenarios for the future to 2100 in relation to natural resources, industrial production, food, population, natural environmental pollution, and the material quality of human life.

Contrary to this, Kahn et al. (1979) argued that limits could be overcome by innovation in technology and economic development on the basis of re-investment of capital in eco-businesses. Kahn et al continued to argue that the re-investment of capital in eco-businesses by advanced countries will lead developing and underdeveloped countries to new pattern of industrialization with no environmental problems through omitting the trial.
and error advanced countries committed up to the 1970s from the industrial revolution, and rather would be a

driving force for developing and underdeveloped countries to promote industrialization.

On the other hands, international organizations such as United Nations and IUCN expressed their points

of view on industrialization in relation to its negative impact on nature in the 1970s. Their points of view are

summarized as below (Jeong, 2010: 134-135).

Environmental strategy at a global level would be more effective than that by country because the motion

of nature is based on the earth as a unit. This implies that protection of nature requires collaborative activities

among all countries. Even though the argument of pessimistic view on industrialization is not entirely true,  

industrialization. However, we can not stop the promotion of industrialization. However, industrialization

should be promoted, but in different way from the past.

As such, their argument is a compromise between pessimistic and optimistical perspective on

industrialization on the basis of cooperative activity among countries at a global level. In order to promote a

new pattern of industrialization, they proposed ‘Only One Earth’as its ideology in the 1970s, and substituted

the ideology with ‘Eco-development’ in the early 1980s. However, they did not proposed action plan to

achieve ‘Eco-development’.

3. WCED and Rio Environment Conference since the 1980s

(1) WCED in 1987

In 1987 the WCED (World Commission on Environment and Development, renamed the Bruntland

Commission) suggested a different model in its book Our Common Future, called “sustainable
development.” The Commission promoted the concept as a goal to evaluate long-term environmental policies,

describing it in broad terms as: “development that meets the needs of the present without compromising the

ability of future generations to meet their own needs” (WCED, 1987: 43).

In accordance with this definition, the WCED(1987: 3) promoted the idea that: “It is impossible
to separate economic development from environmental issues; many forms of development erode the

environmental resources upon which they must be based, and environmental degradation can undermine

economic development. Poverty is a major cause and effect of global environmental problems. It is therefore

futile to attempt to deal with environmental problems without a broader perspective that encompasses the

factors underlying world poverty and international inequality.”

The WCED (1987) recognized that sustainable development does imply limits, not absolute limits, but
limitations imposed by the impact of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. The WCED’s concept is a much broader, integrative interpretation than that of neoclassical economics and Meadows et al. However, the WCED adds poverty alleviation as a component of sustainable development to its two other main components - economic development and the maintenance of the soundness of the natural environment.

The WCED’s perspective on sustainable development is an integrated conceptual framework of the three components, is diagramed as <Figure 2>. However, the WCED did not suggested action plan to achieve sustainable development.

(2) Rio Environmental Conference in 1992

The concept of sustainable development was further popularized and strategically elaborated at the Rio Earth Summit Conference in 1992. The outcome of this Conference, Agenda 21, outlined the global actions that would need to be taken in order to achieve a sustainable world within the next century rather than defining what sustainable development is (UNCED, 1992).

Agenda 21 (UNCED, 1992) as an action plan for achieving sustainable development describes the role by organization including government, civil organization, enterprise and citizen, proposes a top-down and bottom-up approach to sustainable development, and adopts institutional base of international conventions, domestic policies and international collaborative activities, etc.

Athanasiou (1996) criticizes this conference’s strategies and activities as a form of corporatization of the environmental movement, it could be counterargued that environmentalism is only now reaching its political maturity in that “The current debates on environmental problems are exacerbated, if not caused, by the planet’s division into ‘warring camps of rich and poor’. The bottom line is that there will be no sustainability without a large measure of justice. Without profound political and economic change, there can be no effective global environmental action, no real effort to save the planet.”

Nonetheless, Rio Earth Summit Conference continued to be held every five or ten years for reviewing and evaluating the achievement of sustainable development at a global level. The examples include Rio+5, Rio+10 and Rio+20. In addition, other global conferences on specific issues such as population, food security, and disaster, etc. are being held non-periodically.

Furthermore, Millennium Development Goals (MDGs) that are composed of the international development goals for 15 years from 2001 to had been established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. As the period of MDGs ended in 2015, United Nations set up Sustainable Development Goals (SDGs) for 15 years from 2016 to 2030. The SDGs
are known as ‘Transforming Our World: the 2030 Agenda for Sustainable Development’ or ‘Agenda 2030 in short’.

The core contents of MDGs and SDGs are summarized as <Table 1> (UN, 2000; 2015).

<Table 1> Summarized Comparison between MDGs and SDGs

<table>
<thead>
<tr>
<th>Goal Category</th>
<th>MDGs (2001~2015)</th>
<th>SDGs (2016~2030)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>8 goals and 21 associated targets</td>
<td>17 goals and 169 associated targets</td>
</tr>
<tr>
<td>Target</td>
<td>The issues developing country should achieve</td>
<td>Common issues of both developed and developing countries</td>
</tr>
<tr>
<td>Major Sector</td>
<td>Focusing on social issues such as poverty and medical treatment, etc.</td>
<td>Focusing on economic development and climate change, etc. in an integrated framework among economy, society and environment</td>
</tr>
<tr>
<td>Major Participant</td>
<td>Government</td>
<td>All stakeholders such as government, private sector, and civil organization, etc.</td>
</tr>
<tr>
<td>Source of Finance</td>
<td>Official development assistance (ODA) (donor country → recipient country)</td>
<td>Domestic public finance (tax), Private finance (trade, investment), etc.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Submitting voluntarily implementation report to United Nations</td>
<td>Recommending to submit implementation report led by United Nations</td>
</tr>
</tbody>
</table>

III. Debates on Sustainable Development since the 1990s

As explained in the previous sections, the concept and implications of sustainable development have been proceeded in a variety of directions since the later 19th century. On the other hands, there have been debates on sustainable development since the 1990s after WCED suggested officially the concept and implication of sustainable development.
The debates may be categorized into three streams. One was the debate on whether sustainable development is useful or useless. Another one was the debate on what to supplement the weakness of sustainable development, maintaining the existing framework of sustainable development. This is the emergence of the debate on weak and strong sustainability. The other one was to suggest alternative framework of sustainable development. This is the emergence of the framework of ecological modernization.

1. Debate on Usefulness and Uselessness in the 1990s

Dissenting arguments about the terminology “sustainable development” emerged in the 1990s. Cohen (1995) argued that notions like sustainable development or carrying capacity are important but are not concepts with any objective and scientific utility. He continues by stating that a question like, ‘How many people can the earth support?’ is inherently normative and value laden. Lele (1991) argues that sustainable development is merely a concept implying different forms of industrialized economic development - promoted since the industrial revolution began; - since he argued like many eco-Marxists that the sacrifice of nature is an inevitable ‘second contradictory’ part of capitalist economic development. Catton (1997) argues that there is no such thing as sustainable development, which is a rhetorical and ideological term for those who wish to continue destructive growth and ‘feel good about it.’

With such dissenting views, there has been hot debate on whether the concept of sustainable development is useful or a mere form of ‘green-washing’ ongoing unsustainability (eg. Beckerman, 1994; 1995; Daly, 1995; Jacobs, 1995).

Regardless of such arguments, definitions of sustainable development abound (van den Bergh and van der Straaten, 1994).

It is generally agreed that ‘ecological sustainability’ has more clarity as a concept than ‘sustainable development’. The confusion usually arose from what was meant by development, and how broadly or specifically the term was defined. In accordance with this, concepts of weak and strong sustainability have emerged, the former relating to economy and the latter to nature (eg. Bell and Morse, 1999; Rao, 2000; Turner 1998). Regardless of how the concept of sustainable development has been defined, its implication converges in industrial expansion within the carrying capacity of the environment.

2. Weak vs. Strong Sustainability in the 1990s

The debate of this stream was on how to harmonize the conservation of nature with economic development. The scholars of both weak and strong sustainability agreed that there are four categories of resources - natural resource, human-made resources, human resource and social resource. The latter three resources are synthesized as a terminology of human capital. The weak and strong sustainability are distinguished by the perspective on how to use natural resources and human capital.

The scholars of weak sustainability is in a position that human capital can substitute natural resource, while the scholars of strong sustainability is in a position that human capital and natural resource are complementary, but not interchangeable (Turner, 1998; Bell and Morse, 1999: 13; Rao, 2000: 87-90).

In this context, both weak and strong sustainability is
based on a resource approach to sustainable development with a special reference to intergenerational equity. However, it may be argued that strong sustainability focuses more on economy, while weak sustainability focuses more on nature.

3. Emergence of Ecological Modernization in the 2000s

Modernization refers to a model of a progressive transition a transitional to a modern society in terms of political, economical, social, and cultural factors. Social science defines modernization as democratization in politics, industrialization in economy, urbanization in society, and transition from collectivism to individualism in culture, and argues that modernization began to emerge in the 17th century. These profiles of modernization emerged in a separate process without an integrated frame. For example, economic industrialization began to emerge due to autonomous decision-making of enterprise contributed by political democratization, and caused the emergence of urbanization which rural population moves to a region where industrial complex was formed. Unlike the population in rural region, the population in urbanized region is heterogenous rather than homogeneous in terms of personality, way of life, and the level of economic wealth, etc. The heterogeneity contributed to the emergence of cultural transition from collectivism to individualism.

Economic industrialization is the direct cause of current environmental problems which are serious as much as to threaten the existence of humans. In such a context, a lot of scholars began to argue in the 2000s that sustainable development can be achieved from an integrated framework of environment, economy and society, placing environment as the top value. They called this framework ecological modernization in that humans need to promote a new modernization in relation to responding to environmental problems.

Their critical and revised perspectives on sustainable development are summarized as below (Gibbs, 2000; Mol and Sonnenfeld, 2000; Fisher and Freudenburg, 2001; York and Rosa, 2003; Pataki, 2005; Weiland, 2006; Harper, 2007: 211-213; Murphy, 2007).

The existing paradigm of sustainable development is a multi-dimensional perspective including environment, economy and society in an integrated framework, and sets up the goal of environment as conservation, the goal of economy as development, and the goal of society as material affluence. The existing paradigm is a horizontal perspective in that the three goals are all equally important. Realistically, the three goals are in conflict. For example, if the goal economy (development) is promoted, the goal of society (material affluence) can be achieved, but the goal of environment (conservation) is difficult to be achieved. Nonetheless, the existing paradigm has no mechanism to solve the conflict among the three goals.

In order to revise such weaknesses inherent in the existing paradigm of sustainable development, a new paradigm focusing on ‘what should be sustained, including environment, life support, community, people, economy, and society, etc.’ should be established. The possible approach to a new paradigm is to place the goal of environment as the top value. This is a vertical paradigm for achieving actually sustainable development in that if the goals of economy and society should be promoted within the extent that the goal of environment is not hindered. Therefore, the paradigm of ecological modernization is termed super-industrialization rather than sustainable development.
IV. Limitations Inherent in Sustainable Development and How to Overcome Them

1. Shift from Horizontal to Vertical Paradigm

As ecological modernization suggests, the existing paradigm of sustainable development has no mechanism to solve the conflict among the goal of environment, economy and society. This is why we still have human-induced societal challenges causing climate change, water security, and disaster risk, etc., even though a wide range of strategies have been implemented at a global, national and local level since the adoption of sustainable development in the 1990s.

A desirable vertical paradigm placing the goal of environment as the top value would be diagrammed as Figure 3.

If sustainable development is promoted on the basis of Figure 3, it is expected that Figure 3 results in ecologicalization of not only environmental, but also economic and social sectors within the carrying capacity of nature.

2. Not Inclusive Coverage of Social Sectors

Society as a category of sustainable development has a wide range of sub-components which impact on the state of environment and economy being determined. The examples include population growth, technology, lifestyle as a cultural ethos, and social form, etc. (Jeong, 2004: 269-284). In other words, these sub-components of society except poverty impact significantly not only on the sustainability of environment, but the direction and level of economic development. Nonetheless, as is shown in Figure 2, the existing paradigm of sustainable development focuses on only poverty.

In this sense, the existing paradigm of sustainable development is not inclusive in terms of the coverage of social sectors. Such a limitation would result in not a full societal sustainability of society as a whole including economy.

3. Less Efficient Approach to the Achievement of SDGs

Sustainable Development Goals (SDGs) are composed of 17 major goals and 169 associated targets. They do not exist independently, rather are in a mechanism interacting each other as an integrated reality. Nonetheless, they are approached independently by goal. This implies that the individual approach by goal in a conflict with the approaches of other goals. This means the approaches to SDGs are less efficient, focusing on them as if they are independent reality.
Another less efficient approach to the achievement of SDGs is that the means to achieve the goals are focused more on technology-based one than nature-based one. The difference in the two is that nature-based approach is an attempt to achieve goals through focusing on the conservation of nature, while technology-based approach is an attempt to achieve through focusing on sustainable use of nature and development of technology.

Nature-based approach would be more desirable from long-term point of view in terms of reducing ecological cost and improving eco-efficiency, all of which are the means to achieve sustainable development on the basis of placing environment as the top value shown in <Figure 3>.

4. No Mechanism for Deriving Social Consensus

As <Figure 1> shows, enterprises and citizens are the major contributors to unsustainable development. The former pollutes and deteriorates environment in the process of extracting resources, producing manufactured goods and services, and distributing the goods and services. The latter pollutes and deteriorates environment in the process of consumption in everyday life.

Government is the primary agent responding to unsustainable development by policies regulating enterprises' economic activity and citizens' way of life for conserving environment. However, government regulation alone is not enough to achieve sustainable development without the voluntary participation of enterprises and citizens in the promotion of sustainable development by government. Enterprises are required to adopt voluntarily green management for improving eco-efficiency with reduction of ecological cost through saving resource and energy and improving the efficiency of resource and energy use. Citizens are required to behave voluntarily eco-friendly behavior in everyday life through saving resource and energy.

Civil organizations, in particular environment NGOs as the intermediate groups between citizens and both of government and enterprises should be active in carrying out the role of pressure group to government and enterprises, and the role of educator to citizens in relation to the achievement of sustainable development.

In addition, mass medias are required to provide information, the fabric of discussion and publicity on sustainable development.

In this context, without the active participation of all social groups as a social consensus, it would be difficult to achieve sustainable development. Nonetheless, no mechanism for deriving social consensus from them is institutionalized in the existing paradigm of sustainable development.

V. Concluding Remarks

The promotion of sustainable development requires a lot of finance and advanced technology. Quite few countries and regions are ready for the finance and advanced technology. Therefore, how to build the capacity related to the finance and technology is the first key point on whether sustainable development is successfully achieved or not.

The second key point is to change the paradigm of sustainable development from horizontal to vertical one. Without the change, there would be no way to solve the conflicts inherent in the goal of sustainable development to
be achieved.

The third key point is how to draw social consensus toward sustainable development among social groups. For drawing social consensus, it is strongly recommended to introduce governance system to the process of policy-making of sustainable development, inviting a variety of social groups such as stakeholders, experts, enterprises, mass medias, and civil organization. The governance system is a means to establish sustainable development policies on the basis of social consensus, and internalize social conflict in advance that may arise in the process of implementing policies.

The fourth key point is how to set up cultural ethos that environment is placed as the top value prior to economic development and enjoyment of material affluence and convenience in everyday life. This refers to the change of cultural ethos from consumerism to environmentalism.

References

----- 1992. Beyond the Limits: Global Collapse or a


Development and Achievements of the Work Plan for the WNICBR Presented in Lima

Javier Ares García
David Carreras Martí
Eva Cardona Pons
Irene Estaún Clarisó
Development and Achievements of the Work
Plan for the WNICBR Presented in Lima

1. BACKGROUND

Exchanging of knowledge and experiences within the WNICBR is a great opportunity to learn and take a step forward in implementing at the local level the sustainable development concept. This is the main goal of the WNIBR, which is jointly managed by the Jeju BR Secretariat, Menorca BR

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・ Training And Exchange for Br Managers
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・ Network Expansion
・ Conclusion

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secretariat and the UNESCO headquarters. In this sense, the Menorca BR discussed with similar and close BRs a working plan proposal for 2016-2017 for the WNICBR. This plan was presented to the Network’s members at the 4th World Congress of Biosphere Reserves, held in Lima, Peru, in March 2016, during the Islands and coastal zones workshop.

Subsequently, most of the actions of the work plan have been carried out basically by the BR secretariat of Menorca and BR secretariat of Jeju through the collaboration agreements with the MAB programme of UNESCO. The operational goals defined in this plan will be described here as well as the achievements done during this period, the ongoing actions and the pending tasks. We hope that this may serve as a revision of the plan and help to set the goals and action plan for the next years.

2. REGULATORY FRAMEWORK

A first proposal for an internal regulation has been drafted in order to set up the Network’s internal operation regulations: objectives, functions, composition, organization and coordination of the Network. This draft document has to be revised, amended if necessary and approved by the WNIBR members.

On the other hand, we have prepared a membership document as a statement of interest and contact details of each BR manager. Currently, 19 BRs have signed and sent to Menorca Secretariat the membership document.

3. DOCUMENTARY BASIS.

In order to create an information and documentation collection about all the BR members of the Network, we have worked in several points. First of all, we are collecting different documents:

- BR nomination forms, monitoring and periodical assessment
- Planning and sustainable development documents
- Technical reports and scientific studies
- Informational and educational publications
- Cartographic information and images
We are currently working to upload all the documents in a documentary management program called Zotero, which will be accessible from the web for all Network members.

On the other hand we are working on a BR members database with standardized information. Every file contains: geographical data; administrative and management data; geoenvironmental data, socioeconomic data and, when available, environmental vectors (water, energy, waste). All this information is very useful to calculate some statistics and, this way, to compare and improve the knowledge about the BR members (Batet & Cardona, 2017).

Finally, the compilation of a catalogue of noteworthy experiences is in process in order to promote exchange. After the selection of the most remarkable experiences of every BR, we proceed to standardisation in a specific format for a real and effective knowledge sharing. Figure 6 shows a table with the first results classified by topics.

4. PROMOTE COMMUNICATION AMONG MEMBERS

To create a dynamic and fluent communication among the Network members, we use commonly email and telephone. However, now we have a powerful new tool for communication, the website of the WNICBR (www.islandbiosphere.org). This platform includes a section dedicated to the news of the network, an interactive map to find every BR and a database associated.

The resources section includes MaB official documents, basic information about the members of the network, the catalogue of outstanding experiences, a gallery of photos and videos, the network’s publications and soon it will address to the documentary collection (scientific papers, reports and documents of the network members). With the searcher by keywords it is easy to find any topic or site.

In this operational goal, we have a pending work: defining a

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**Table 6. Example of database file in Spanish and English language. Corvo Island (Portugal).**

<table>
<thead>
<tr>
<th>Reserva de Biosfera</th>
<th>Isla de Corvo (Azores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Año de declaración</td>
<td>1967</td>
</tr>
<tr>
<td>País</td>
<td>Portugal</td>
</tr>
<tr>
<td>Región geográfica</td>
<td>Macaronésico</td>
</tr>
<tr>
<td>Características</td>
<td>El núcleo de la reserva de biosfera incluye un sistema de vida marino y un ecosistema terrestre con una importante diversidad de especies marinas y terrestres.</td>
</tr>
<tr>
<td>Principales amenazas</td>
<td>erosión costera y terrestre</td>
</tr>
<tr>
<td>Breve descripción</td>
<td>Corvo es un islote situado en la costa norte de Portugal, caracterizado por su rica biodiversidad, especialmente en la fauna marina.</td>
</tr>
</tbody>
</table>

**Figure 5. Percentages of Network’s BRs according to territorial scope.**

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**Graph 1. Biosphere reserves according to territorial scope.**

- Island
- Archipelago
- Coastal zone
- Part of a main island

- >5,000,000 ha
- >1,000,000 ha
- 100,000 a 1,000,000 ha
- 50,000 a 100,000 ha
- <50,000 ha
5. NETWORKING

The purpose of this goal is very important: to work as a real network. For this reason, it is essential to encourage the exchange of ongoing studies, monitoring and control programs and comparative studies of the different BRs. One of the tools that we currently have is the edition of the annual casebook, with the collaboration of several BRs since several years ago. The Network’s Newsletter is another initiative helping to promote exchange. Moreover, we would like to highlight the work carried out by Jeju secretariat on the study of Climate Change Impacts and Strategies.

The work plan proposed two more actions on this matter. The second one was setting up specialized themed areas: creating themed forums, meetings and themed workshops among those BRs that have been working on a specific subject (for example energy, climate change, sustainable tourism, etc.). The third action was referred to the possibility to make campaigns and joint demands, facing pressure factors. It would imply jointly submitting of proposals, challenges or claims related to plans, projects or regulations that may affect the sustainability of the BRs or of the whole of the Network. These two actions are not yet developed.

6. TRAINING AND EXCHANGE FOR BR MANAGERS.

This goal is about defining of a basis to create an international training and exchange program for managers, experts, researchers and other groups of the member BRs concerning sustainability and climate change. In this aspect, it is important to highlight the annual training courses organized by Jeju Secretariat.
7. SUSTAINABILITY INDICATORS PROPOSAL.

Another interesting aim is starting collaboration by means of the analysis of indicators to assess the sustainability on islands and coastal areas. For this work, the first step is the analysis of indicators used by each of the BRs. The second step is the discussion and agreement of some common aims. In this sense, the Lima Action Plan for 2016-2025 recognises the BRs as models contributing to the implementation of the Sustainable Development Goals (SDGs). Then, the idea is develop a Sustainable Indicators System based on SDGs, and we are already working to build a proposal to submit to the Network.

8. NETWORK EXPANSION.

To identify and contact non-member island and coastal biosphere reserves who may wish to join to the network is another operational goal. We have contacted 68 BRs to formalize accession and we are currently working in identifying new BRs that could join the Network.

9. CONCLUSION

We are very satisfied with the answer of the BRs community and the achievements of the work plan. Especially, with the start-up of the website and the catalogue of outstanding experiences, where each BR can collaborate. We have to continue this way, feeding the resources of the web and contacting new BRs. We expect that in the future new tools as the indicators system of sustainability or as maps created through Geographical Information Systems are going to be very useful in order to assess sustainability and improve knowledge exchange among BR members.

Finally, from BR Secretariat of Menorca we want to thank the good understanding and collaboration with the managers of UNESCO’s MAB Programme and BR Secretariat of Jeju. Undoubtedly, without them we hadn’t could reach all these achievements.
Figure 10. Scheme of the Sustainable Development Goals adopted in 2015 by United Nations.

References


Activities in the Gouritz Biosphere Reserve

Steve du Toit

Gouritz Cluster Biosphere Reserve
Activities in the Gouritz Biosphere Reserve

INTRODUCTION

The Gouritz Cluster Biosphere Reserve is situated on the Southern Coast of Africa. It is approximately 3.2 million hectares in extent.

The GCBR area is globally unique as it is the only area in the world where three recognized biodiversity hotspots, the Fynbos, Succulent Karoo and Maputoland Tongoland-Albany hotspots, converge. It also includes three recognised UNESCO World Heritage sites.

The entire domain falls within the Cape Floristic Region - the smallest, but one of the richest of the six floral kingdoms of the world. The biosphere reserve is rich in endemic plant species, with more than 670 of the ca. 5 000 plant species present endemic to the biosphere. Even the arid inland portion of the biosphere reserve is rich in endemic species, with at least 400 of the 3 200 plant species restricted to the biosphere reserve.

WHAT’S WORKING?

The GCBR has a well-established project record and is currently developing a programme framework for future activities. The focus of the Framework is “Increased Socio-Ecological Resilience”. There are 6 main activity areas linked with this aim:
1. Water resources – with a focus on the significant improvement in management of water resources.
2. Land and Landscapes – with a focus on the sustainable use of landscapes.
3. Biodiversity – with a focus on reduced loss.
4. Institutional Relations – with a focus on more engagement with biodiversity.
5. Knowledge, Learning and Education – with a focus on more people embracing sustainable living.
6. Economic diversity and Livelihoods – with a focus in a diversified regional economy which adds value to natural assets.

BIODIVERSITY GOAL

Within the aim of “Reduced loss of indigenous biodiversity”, there are 6 focus areas. Projects include Jobs for Carbon, Ecological Corridors and the sustainable management of estuaries and rivers.

Vision 2032 for the Biodiversity Goal:

- Species indigenous to the GCBR are thriving and the viability of threatened species has been enhanced.
- Ecological processes that support the local biodiversity are maintained.
- Human use of environmental resources does not endanger biodiversity.

Actions required to achieve this include:

- Focus on alien eradication, both plants and animals that threaten the ecosystem processes.
- Build sound ecological corridors to support ecological processes and the dependent biodiversity.
- Raise awareness and support actions of local communities to safeguard biodiversity.

JOBS FOR CARBON

Jobs for Carbon is a flagship project of the GCBR. Major activities include:

1. Fine scale mapping
2. Land owner outreach
3. Carbon baseline assessment
4. Spekboom harvesting and planting
5. #spekkies
6. Knowledge acquisition and dissemination
The main principle is “Sound Science Leading To Good Practice”

Jobs for Carbon outputs by Feb 2018 include:
- At least 550 hectares of degraded thicket restored
- Carbon baseline data from 70 sample plots
- 60 previously unemployed people in decent employment
- 3 eco-entrepreneurs capacitated to take on contract work
- 1 small enterprise developed - #spekkies

Product and brand development includes “#spekkies” with an emphasis on producing the compot in Vanwyksdorp, a tiny hamlet in the Western Cape of South Africa.

An important part of the Jobs for Carbon project includes:
- Learning about carbon markets
- Developing institutional models for carbon trading
- Reinvesting carbon revenue in land restoration
- Mapping new domains
- More carbon baseline assessments
- Growing Jobs for Carbon

In terms of the GCBR’s valuable water resources, the goal is “Significant improvement in water resource management in the GCBR.”

Vision 2032 for water resource management:
- Innovations are taken up which increase the efficiency of water use by agriculture and urban populations.
- Land owners have made observable reductions in invasive alien plant infestations and actively rehabilitated cleared areas.
- Artificial wetlands have been developed at municipal waste water treatment works, for improved water quality and reuse of purified waste water
- Comprehensive Ecological Reserves for the Goukou River and Estuary have been determined and human water use does not have a significant negative impact on natural ecosystems.
The “De Rust Wetlands Waterwise Project” falls under the Water Resources Goal. The objectives:
- To increase water supply and improve water quality for community agricultural use by reconstructing an artificial/constructed wetland;
- To promote food security and ecologically sustainable livelihoods through climate-smart agriculture

The De Rust Wetlands Waterwise Project” includes:
- Re-design and re-construction of sewage works
- Monitoring of water quality
- Harvest of bulrushes and reeds
- Development of agricultural enterprise
- Capacity building for business development

CONCLUSION: THE ORGANISATION IN A NUTSHELL

Our Inspiration:
By 2020, the GCBR will be (inter-)nationally recognised and respected for its balanced and effective approach to ecological sustainability and human development. The GCBR will be experienced as an inclusive, approachable and ‘desired collaborator’ for all population groups and institutions in the domain.

Our Priority Practical Efforts
Practical work for the domain is already underway, focusing on three priority areas.
1. Flagship initiatives which (at scale)
   a. Restore degraded landscapes while creating employment
   b. Convert alien biomass into economically viable products
2. A suite of smaller scale (peri-)urban and rural projects to catalyse ecologically sustainable livelihoods, for example:
   a. Stimulate employment opportunities through development of tourism related to our scenic beauty and unique biodiversity
   b. Promote enterprises that contribute to ecological gains
3. Knowledge generation and communication about innovations and practices that have a positive impact on the domain’s ecology and all its populations. Examples may include:
   a. Environmental education involving schools and youth
   b. Collaboration with (inter-)national research initiatives
   c. Testing new models of financing restoration at scale on privately owned degraded land
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves

Date: September 12 – 14, 2017
Venue: Jeju Island, Republic of Korea
Participants: 14 Biosphere Reserves (12 countries)
Theme: Desirable Action Plan of the World Network of Island and Coastal Biosphere Reserves
Statement

Islands and coastal areas have shared characteristics and faced common challenges. They are sensitive sites due to their high level of biodiversity and fragile and rare ecosystems. The World Network of Island and Coastal Biosphere Reserves aims to study, implement and disseminate island and coastal strategies to preserve biodiversity and heritage, promote sustainable development, and adapt to and mitigate the effects of climate change.

The 7th meeting was held in Jeju Island, Republic of Korea, on September 12 – 14, 2017 and 14 BRs from 12 countries attended the meeting. Participants came from Estonia (West Estonian Archipelago BR), France (Iles et Mer d’Iroise BR), South Africa (Gouritz Cluster, Garden Route BRs), Maldives (Baa Atoll BR), Germany (Wadden Sea BR), Philippines (Palawan BR), Portugal (Madeira BR), Vietnam (Cat Ba BR), Spain (Menorca BR), Republic of Korea (Gochang and Shinan Dadohae BRs), the MAB National Committee of the Republic of Korea, the Autonomous Organism of National Parks of Spain, Korean National Commission for UNESCO and Man and the Biosphere Programme of UNESCO.

The theme of the meeting was ‘Desirable Action Plan of the World Network of Island and Coastal Biosphere Reserves.’ The participants introduced their respective BR and explained the various activities that they perform. To further examine desirable action plans, they have made a few decisions as follows.
Conclusions:

1) Needs for the systematic management have been identified as membership in the World Network of Island and Coastal Biosphere Reserves gradually increases. Menorca Secretariat has drafted the first regulation and the two Secretariats will discuss and establish Management Regulations.

2) Jeju Island and Menorca signed MOU related to the achievement of sustainable development goals for the next five years (2018-2022). The memorandum includes the joint research on the impact of climate change, response strategies and the project on habitat conservation and sustainable development facing global changes.

3) Jeju and Menorca Secretariat will issue a newsletter every six months, which will be posted on the websites of the Joint Secretariats and UNESCO MAB.

4) Highly useful and informative sources presented in the meeting will be presented in a casebook published by Jeju Secretariat with Menorca’s support.

5) The 8th Meeting of the World Network of Island and Coastal Biosphere Reserves will take place in Menorca Island (Spain) from May 22 to 25, 2018. The planned schedule for the event is to hold the meeting sessions from the 22nd to the 24th, including field trips, and to hold a training workshop for biosphere reserve managers on the 25th.

6) The 6th Training Course for Island and Coastal Biosphere Reserve Managers is scheduled for October, 2017. The purpose of this training course is to share experiences and build the capacities needed to adapt to climate change and achieve sustainable development. BR managers of island and coastal biosphere reserves, especially the areas recently designated or have yet to participate in the training course, are encouraged to participate.

7) As a joint secretariat of the UNESCO World Network of Island and Coastal Biosphere Reserves, Jeju will continue to cooperate with UNESCO and Menorca to systematically operate the network and to carry out the activities that are core to the international community.
The 7th Meeting of the World Network of Island and Coastal Biosphere Reserves
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